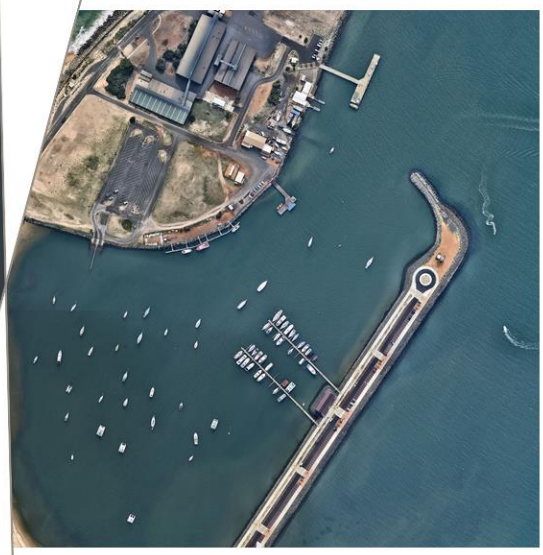
Sampling and Analysis Plan - Implementation Report

Casuarina Harbour Dredging Studies

CW1146500



Prepared for
Department of Transport

4 July 2022

Contact Information

Cardno (WA) Pty Ltd
ABN 77 009 119 000

11 Harvest Terrace
West Perth WA 6005
PO Box 447

www.cardno.com
Phone +61 8 9273 3888
Fax +61 8 9486 8664

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Author(s):



Julian Brown
Environmental Scientist – Coastal & Marine

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Approved By:



Daniel Strickland
Section Lead – Coastal & Marine

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1 Introduction

1.1 Background

The Casuarina Boat Harbour, located in Bunbury, Western Australia (WA), is planned to be transformed into a marina and marine industry precinct through the Transforming Bunbury's Waterfront development project. A maximum volume of 240,000 m^3 of seabed material (including overdredge allowance and additional buffer for environmental assessment) is proposed to be dredged across two dredging programs (phases) to construct the project. Dredging is required to prepare a breakwater foundation and create a navigable channel and mooring area.

The dredged material was originally proposed to be reused for reclamation works as part of the future onshore development of the Casuarina Harbour breakwaters. However, geotechnical testing conducted by Galt Geotechnics (2019) indicated that the material is not suitable for reuse in the reclamation works. Due to the substantial volume of material to be dredged, onshore disposal is not the preferred option in terms of constructability, geotechnical or financial viability. It is preferred that all dredged material of suitable quality is disposed offshore.

A 'Sea Dumping Permit' is required by the Department of Agriculture, Water and the Environment (DAWE) for offshore disposal of the material and this application is being managed by the Department of Transport (DoT) ('the proponent'). As per the requirements of the *Environmental Protection (Sea Dumping) Act 1981* (Sea Dumping Act), the disposal material and proposed disposal site have been characterised and assessed in accordance with the *National Assessment Guidelines for Dredging* (NAGD) (Commonwealth of Australia, 2009). The benthic communities and habitats (BCH) at the disposal site have also been mapped to gain an understanding of potential environmental impact of the disposal activities.

1.2 Project Location

A locality plan is presented in **Figure 1-1**, showing the proposed dredging area and disposal site. The proposed disposal site is a portion of the site defined for the purpose of obtaining a Sea Dumping Permit by Lanco Resources Australia Pty Ltd (Permit No. SD2013/2482) in 2016.

1.3 Purpose and Structure of this Document

Cardno have been engaged to undertake the following work elements to characterise and assess the disposal material and the proposed disposal site:

- Dredge sediment sampling and analysis;
- Dredge sediment elutriate and bioavailability testing;
- Disposal (receiving) site sediment sampling and analysis;
- Disposal area BCH confirmation;
- Assessment of the proposed dredge sediment's suitability for offshore disposal; and
- Recommendations for management measures required to protect environmental receptors.

Cardno prepared a Sampling and Analysis Plan (SAP) (Cardno, 2021) detailing the purpose, methodologies and equipment used to undertake the field sampling required for an assessment of proposed dredge sediments within Casuarina Harbour, as well as the sediment quality and BCH at the proposed disposal site. The SAP was reviewed and endorsed by DAWE in March 2021. Assessment in this report also include results of previous sampling and analysis carried out by RPS (2017). These results have been incorporated and reassessed, where appropriate. This SAP Implementation Report outlines the methods undertaken by Cardno to complete the work scope elements, and reports on the results and findings. The report has been structured as follows:

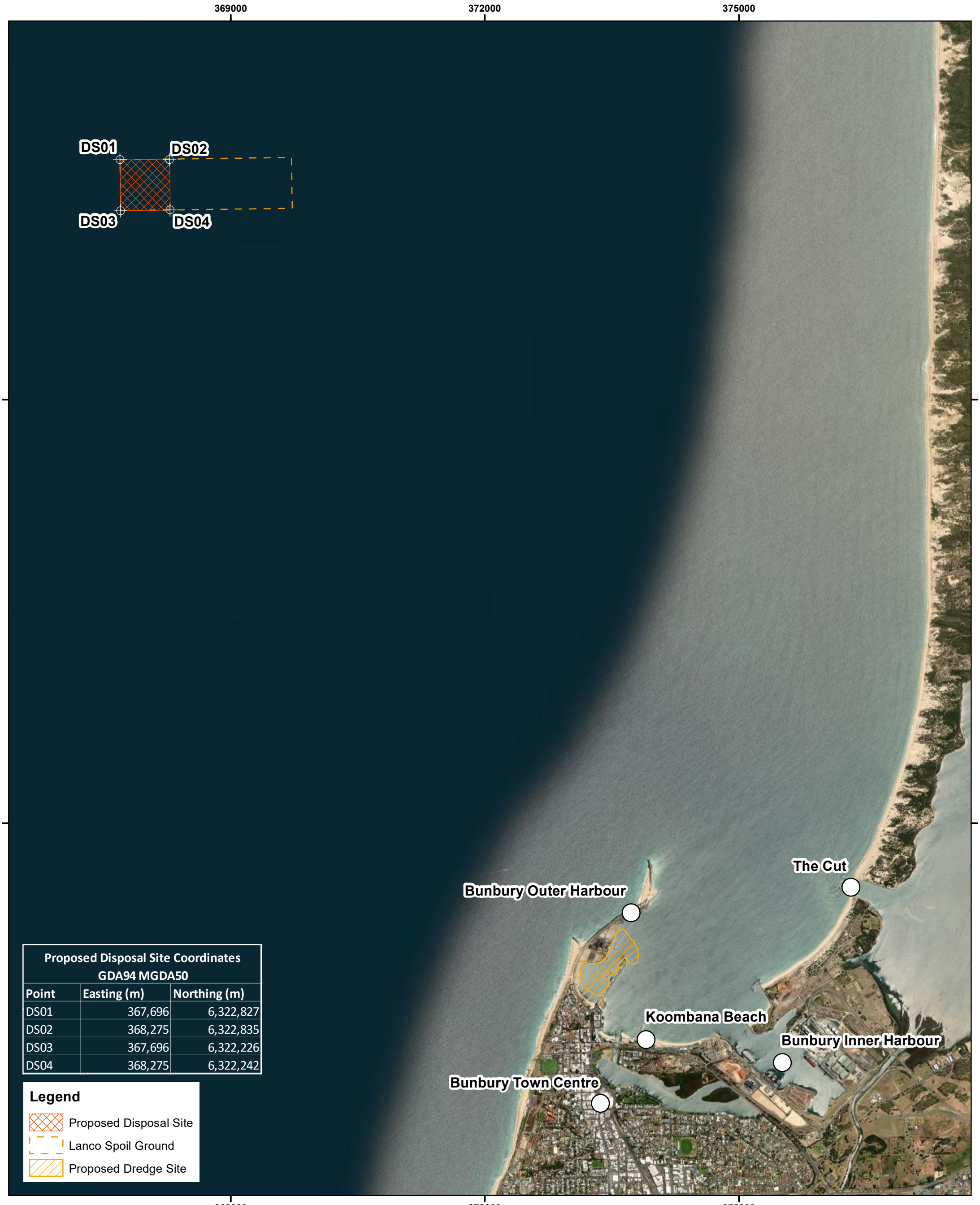
- This section (**1**) introduces the project and document purpose;

- **Section 2** provides a site description and details of the site's history;
- **Section 3** details the sediment sampling and analysis methodology and results;
- **Section 4** details the subsequent elutriate sampling and analysis methodology and results;
- **Section 5** details the BCH sampling and analysis methodology and results; and
- **Section 6** provides conclusions and recommendations, based on the outcomes of the investigations.

1.4 Legislation and Guidelines

The sampling and analysis have been undertaken in accordance with the following applicable industry standards and guidelines:

- *National Assessment Guidelines for Dredging (NAGD).* Department of the Environment, Water, Heritage and the Arts, 2009;
- *Assessment and Management of Contaminated Sites*. Department of Water and Environmental Regulation, 2014;
- *Australian and New Zealand guidelines for fresh and marine water quality* (ANZG, 2018);
- *Water Quality—Sampling. Part 9: Guidance on sampling from marine waters*. Standards Australia. 1998. AS/NZS 5667.9:1998;
- *Technical Guidance – Protection of Benthic Communities and Habitats* (EPA, 2016); and
- *Environmental Factor Guideline – Benthic Communities and Habitats* (EPA, 2016).



Proposed Disposal Site Coordinates GDA94 MGDA50		
Point	Easting (m)	Northing (m)
DS01	367,696	6,322,827
DS02	368,275	6,322,835
DS03	367,696	6,322,226
DS04	368,275	6,322,242

Legend

- Proposed Disposal Site
- Lanco Spoil Ground
- Proposed Dredge Site

N

1:40,000 Scale at A3

km
0 0.75 1.5

Locality Plan

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 1-1

Cardno

Map Produced by Cardno WA (6100)
Date: 2022-02-07
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: CW1146500_005_SpoilGround_Locaility.mxd 01

2 Site Description and History

2.1 Site Identification and Regional Setting

Casuarina Harbour is located approximately 175km south of Perth, within the City of Bunbury's retail and tourist district, a short distance from the central business precinct. It lies within the Greater Bunbury Region, and is controlled by both Southern Ports Authority (SPA) and the DoT.

The harbour affords access to the Indian Ocean, Koombana Bay and Leschenault Inlet. Facilities associated with the harbour include:

- Swing moorings (66);
- 4 catamaran pens;
- 48 recreational boating pens with walkway;
- Multi-purpose boat pen building;
- Volunteer Sea Rescue group;
- Boat service jetty (25 m);
- Slipway (40 tonne capacity);
- 2 concrete boat launch and retrieval ramps (public use) and jetty;
- Landside facilities and amenities including:
  - BBQ facilities;
  - Playground;
  - Carparks and boat trailer parking; and
  - Public toilets.

2.2 Site Surrounds and Land Uses

The Casuarina Harbour comprises infrastructure facilitating the use of both marine and terrestrial environment. A number of these facilities are available for public use within the area.

2.2.1 Marine Uses

- Recreational and commercial boating pens/births;
- Recreational and commercial boat maintenance;
- Swimming area;
- Recreational water ski zones;
- Boat launch and retrieval site;
- Available swing mooring sites; and
- Slipway facilities.

2.2.2 Terrestrial Land Uses

- Industrial and commercial development;
- Residential development;
- Volunteer rea rescue group;
- Inner and Outer Harbour services utilised by the Port of Bunbury for vessel berthing; and

- Storage and exportation facilities for alumina, caustic, copper, mineral sands, timber and woodchips.

2.3 Site Description

2.3.1 Topography and Bathymetry

The topography of the foreshore adjacent to Casuarina Harbour ranges from one to five metres above Australian Height Datum (AHD). The bathymetry of Casuarina Harbour ranges from approximately -0.6 m AHD to -5 m AHD.

The proposed disposal site is located approximately 8.5km directly west from the mainland coastline, and 11.5 km north-west from the Bunbury Inner Harbour. The bathymetry of the site is relatively flat, with an average depth of approximately 22 m below mean sea level (MSL).

2.3.2 Regional Geology

Regional geological mapping at 1:250,000 scale (Department of Mines, Industry Regulation and Safety, 2022), indicates that the majority of the geological units at the dredge site are based upon Safety Bay Sands (Qts and Qrsm), though alluvium deposits (clay, sand and silt, Qra) are present to the south-east of the site. Bunbury Basalt (Kbb) is present to the west of the site.

2.3.3 Acid Sulfate Soils

The specific dredging and disposal locations are not covered by the Department of Water and Environmental Regulation's (DWER) Acid Sulfate Soil (ASS) risk mapping (2022). The land immediately south of the site and the Leschenault Inlet are mapped as 'high to moderate risk of ASS occurring within 3 metres of natural soil surface'. The Koombana Bay foreshore is mapped as 'moderate to low risk of ASS occurring within 3 metres of natural soil surface', but 'high to moderate risk of ASS beyond 3 metres of natural soil surface'.

2.3.4 Sediment Quality

Substantial sediment quality sampling has been recently undertaken at the dredge site by RPS (2017), the results of which are summarised in **Section 2.7**.

Chemical analysis of the surface samples collected at the proposed disposal site by Wave Solutions (2012) found the material to be 'clean', with results below the relevant guideline values stipulated by NAGD for a range of analytes.

2.3.5 Water Quality

Previous studies undertaken in the region have identified that:

- There is a correlation between rainfall and river flow from the Preston River and water quality (turbidity and nutrient levels) within Bunbury Outer Harbour (RPS, 2017); and
- Turbidity levels within Bunbury Outer Harbour are more variable and likely to be influenced by river inflows and tidal exchange from the Leschenault Estuary, wind speed and direction, wave height, and resuspension of bottom sediment (Wave Solutions, 2012).

Physical water quality at the disposal site was interpreted from the measurements of an acoustic wave and current (AWAC) device, deployed at the seabed during July-August 2011 (Wave solutions, 2012). The acoustic backscatter recorded by such instruments can be analysed to infer total suspended solids (TSS) concentrations. It demonstrated the potential for winter wave conditions to generate elevated turbidity through the water column, with substantial periods of TSS greater than 20 mg/L.

Being an open ocean environment, the disposal site is expected to have typically good marine water quality, in terms of its chemistry, with no known sources of contamination nearby.

2.3.6 Benthic Habitats

Some of the most southern existing assemblages of white mangroves (*Avicennia marina*) occur within the Leschenault Inlet and Estuary, which serve as nurseries for juvenile marine organisms. Koombana Bay is also

known to comprise low to subtidal benthic communities and habitats such as sea grasses (*Halophila ovalis*, *Rupia megacarpa* and *Heterozostera tasmanica*) and algae species which provide habitat for marine fauna assemblages (Semeniuk et al., 2000).

Seagrass communities (*Posidonia spp* and *Amphibolis spp*) were identified as the primary sensitive environmental receptor in the vicinity of the disposal site by Wave Solutions (2012). Significant portions of bare seabed were also identified at the disposal site and in the region.

2.3.7 Wetlands

The overall strategic proposal's project area is situated directly to the south of the Leschenault Inlet, which is mapped by the Department of Biodiveristy, Conservation and Attractions (DBCA) as a Conservation Category Wetland (CCW). The Leschenault Inlet is connected to Koombana Bay by a narrow channel, which is intermittently closed by a storm surge barrier to protect Bunbury's low-lying areas from coastal processes. The Leschenault Estuary, which lies approximately 2 kilometres to the east of the strategic proposal's project area, is also mapped by DPaW as a CCW.

2.3.8 Fauna

The Leschenault Estuary provides a nursery for the Blue Swimmer Crab (*Portunus pelagicus*) as well as numerous species of marine fin fish, whilst both the inlet and estuary provide significant habitat for waterbird populations (Semeniuk et al. 2000).

The DBCA managed Leschenault Peninsula Conservation Park is located approximately 3 km north east of the proposed project area. This conservation park supports a range of terrestrial vegetation flora and fauna including the Chuditch (*Dasyurus geoffroii*), Quenda (*Isoodon obesulus*) and the Western Ringtail Possum (*Pseudocheirus occidentalis*) (Department of Conservation and Land Management, 1998).

An EPBC Act lists several significant marine fauna species as known or likely to occur in the area, including dozens of seabirds, four species of turtle, the Indian Ocean Bottlenose Dolphin (*Tursiops aduncus*) and three species of whale.

2.4 Site History

Since 1838, Koombana Bay has been operating as a port, initially being utilised as a shipping birth to transport cargo and passengers between the land and ships anchored offshore. In 1864, construction of a timber jetty occurred, extending 400m offshore from Koombana bay, with a further 1-kilometre extension in 1952. The Cut was opened to connect Koombana Bay to the Leschenault in 1951. By 1970, an increasing export demand called for further development within the Inner Harbour. This involved dredging of the Inner Harbour for ship navigation and berthing, supporting exports for woodchip, mineral sands, alumina and phosphate industries. These major works were completed in 1976. No previous dredging is understood to have occurred in Casuarina Harbour, however the inner harbour was dredged during its construction in 1970 (RPS, 2017).

2.4.1 Aerial Photography

Aerial images of Casuarina Harbour captured from 1959 were reviewed to create a summarised timeline of development events that have occurred at the site. **Table 2-2** describes these historical changes to the area.

Table 2-1 Historical Aerial Photography Summary

Year	Site and Surrounding Area
1959	Aerial imagery does not represent site, although the eastern-most groyne can be observed. Terrestrial development present south of site, such as railway infrastructure and corridors.
1996	Fully developed site that demonstrates all sites that are present to this date.

Year	Site and Surrounding Area
2001	No significant changes
2003	No significant changes
2006	No significant changes
2010	Highly deteriorated timber jetty. No significant changes.
2013	Timber jetty structure removed, as well as the demolition of mineral related storage to the west.
2015	No significant changes
2017	No significant changes
2018	Demolition of mineral related storage sheds to the west of the harbour.
2019	No significant changes
2020	Jetty road causeway redevelopment commencement. Eastern boundary causeway refurbishment and sealed road installation.
2021	Jetty road causeway redevelopment progress, sealed road and parking established. Multi-purpose building and public amenities developed at boat pens. Fishing/Viewing platform development progress.

2.5 Proposed Dredging Details

The dredge design has been modified since the sediment sampling was undertaken by RPS in 2017, with an additional area included beneath the northern breakwater, and the estimated design dredge volume has increased from 107,000 m^3 to 175,300 m^3. Including an allowance for overdredging and additional buffer for environmental assessment, the total estimated dredge volume is 240,000 m^3.

The dredge area is presented in later **Figure 3-1** and encompasses an estimated total surface area of 140,675 m^2. The dredging volume is broken up into two stages and nine dredge areas as outlined in **Table 2-3**. The majority of additional dredging volume in the revised dredge area is related to the northern breakwater (Area 7).

Table 2-2 Estimated Dredge Areas and Volumes

	Dredge Area	Estimated Dredge Surface Area (m^2)	Estimated Design Dredge Volume (m^3)	Overdredge allowance (m^3)	Estimated Total Dredge Volume (m^3)
Stage 1	Area 6	4,200	3,790	1,260	5,050
	Area 7	51,150	106,390	NIL	106,390
	Area 9	855	880	257	1,137
Stage 1 Total		56,205	111,060	1,517	112,577
Stage 2	Area 1	11,600	4,420	3,480	7,900
	Area 2	40,450	34,730	12,135	46,865
	Area 3	14,990	17,180	4,497	21,677
	Area 4	4,720	1,550	1,416	2,966
	Area 5	8,190	1,540	2,457	3,997
	Area 8	4,520	4,820	1,356	6,176
Stage 2 Total		84,470	64,240	25,341	89,581
Overall Total		**140,675**	**175,300**	**26,858**	**202,158**

2.6 Proposed Disposal Site Selection

In selecting the proposed disposal site to be investigated by this study, the DoT considered and assessed several options. Initially SPA was consulted on the potential to use their existing maintenance dredging disposal site, which they agreed with in principal. SPA then raised concerns that this dredging program may impede their ability to renew their sea dumping permit, related to the disposal site, for future maintenance dredging and the option was abandoned for this project.

DoT identified an alternative disposal ground which had previously been assessed and approved under the *Environment Protection (Sea Dumping) Act 1981* (the Sea Dumping Act). Lanco Resources Australia Pty Ltd (Lanco) were issued a Sea Dumping Permit (SD 2013-2483) in 2013, as part of the Berth 14A Expansion Project. DoT's site selection was based on an initial review of Lanco's site selection for their proposed capital dredging program. The general details regarding DoT's selection of the site as the preferred disposal site include:

- Reviewing Lanco's investigation of three potential disposal sites in and around Koombana Bay - one being BPA's site, one further south of the Port, and the third located 13 kms offshore of Koombana Bay (a favourable option in terms of proximity);
- The offshore disposal site was identified as the preferred site due to its low dispersive characteristic (located in a depression at -22 m CD) and its relatively low abundance of benthic habitat;
- Existing investigations completed for the site included a sediment stability analysis, geomorphological assessment, studies on wave and current characteristics and benthic habitat. The previous site selection process was consistent with NADG requirements;

- The site is located in Commonwealth waters and has been the subject of an EPBC Act assessment and approval (EPBC 2014/7200) - so the site has previously been assessed and approved for receiving dredge spoil; and
- The site has not been used by Lanco and their Sea Dumping Permit expired in May 2021. DoT discussed this disposal site with DAWE in late 2020, who confirmed that DoT could apply for a Sea Dumping Permit for the same site, and approved the associated SAP in March 2021.

2.7 Previous Investigations

2.7.1 Sampling of Dredge Material

RPS undertook sampling and analysis of the proposed dredge material in October 2017. Sampling was undertaken across 19 locations within the proposed dredge area as per the NAGD minimum number of sample sites for a dredge volume of 107,000 m^3. Sediment samples were collected at various depths to a maximum depth of 3 meters below seabed. The sediment sampling locations are presented in **Figure 2-1**.

The full details of the sediment sampling and analysis undertaken in 2017 is outlined in the respective *SAP Implementation Report* (RPS, 2017).

2.7.1.1 Sediment Analysis

In the RPS assessment, sediment samples were analysed and assessed against the following guidelines, as outlined in NAGD.

- ANZECC & ARMCANZ 2000:
  - Interim Sediment Quality Guidelines - Low (ISQG-Low); and
  - Interim Sediment Quality Guidelines – High (ISQG-High).

Results for Mercury, tributyltin (TBT), dibenz(a,h)anthracene (a PAH), and DDT (an OC pesticide) were reported at concentrations above ISQG guidelines. The majority of concentrations were below ISQG-Low with the exception of TBT. All mean, median and 95% upper confidence limit (UCL) concentrations were below the ISQG-Low with the exception of TBT.

A significant number of subsamples were not collected or analysed for TBT, other contaminants or total organic carbon (TOC), subsequently leaving gaps in the full sample of data required by the NAGD – i.e. analysis for all contaminants of potential concern (CoPC) (see **Section 2.9**) at each 0.5m depth interval.

Laboratory analysed TBT data was not normalised. Under NAGD, TBT data is required to be normalised to 1% TOC. This results in the TBT value increasing where TOC in the sample is less than 1%, and decreasing where TOC is greater than 1%. Without normalisation, a correct 95% UCL cannot be calculated nor can the data be compared to the Screening Levels. Data for other organics (PAHs, TRH/BTEX and OC/OP pesticides) has been normalised to 1% TOC based on the upper 95% confidence limit (95% UCL) of TOC data, which was 1.88%. This normalisation was incorrect. The data for each sample should be normalised to 1% TOC based on the TOC content of that sample, by dividing the contaminant analysis value by the %TOC value.

Where possible (i.e. TOC results available), this assessment has undertaken correct normalisation.

2.7.1.2 Elutriate Analysis

Elutriate testing was also undertaken for the sediment samples and results were assessed against the following guideline.

- ANZECC & ARMCANZ 2000
  - Marine Ecosystem Protection Guidelines (MEPG) 95% protection level.

Concentrations of metals within the elutriate for several metals were higher than the concentrations identified in elutriate water however the majority of the results were below the MEPG 95% protection level. Elutriate testing was not undertaken for TBT.

Casuarina Harbour water was used as the leachate solution for elutriate analysis. This does not strictly comply with NAGD, which stipulates the use of water from the disposal site or, if this cannot be obtained, “clean seawater”. Given that background concentrations of the Casuarina Harbour water were assessed, the results are still considered valid as this can be considered to be “clean seawater”.



Figure 2-1 Historical sediment sampling locations (RPS, 2017).

2.7.2 Disposal Site Benthic Communities and Habitat Assessment

A BCH assessment was undertaken at the proposed disposal site in 2012 as part of the proposed Bunbury Port Berth 14A Expansion and Coal Storage Facilities environmental investigations for Public Environmental Review (Lanco, 2012).

Benthic habitat survey of the area was undertaken using a combination of high-resolution satellite imagery analysis and ground-truthing of benthic habitats from ROV surveys. Benthic habitats were then modelled using a supervised classification method.

From the benthic communities and habitat assessment it was concluded that two benthic groups occur within the proposed disposal site, *Posidonia* spp. and *Amphilbolis* spp. The distribution of benthic habitats is presented in **Figure 2-2**.

2.7.3 Disposal Site Sediment Characteristics

As part of the proposed Bunbury Port Berth 14A Expansion and Coal Storage Facilities environmental investigations for Public Environmental Review, ten surficial sediment grab samples were taken at the proposed disposal site (Lanco, 2012). The samples were analysed for particle size distribution (PSD) to characterise the sediment within the proposed disposal site. Results from the PSD analysis indicate that the disposal site consists of fine to coarse sand.

2.8 Contaminated Sites

Casuarina Harbour is not a known site of contamination according to the DWER Contaminated Sites online Database as either:

- Remediated for restricted use;
- Contamination - restricted use;
- Contaminated – remediation requires

2.9 Contaminants of Potential Concern

The following activities were outlined as potential contamination sources, extracted from *Contaminated Sites Management Series, Assessment and Management of Contaminated Sites* (2014) by the Department of Water and Environmental Regulation:

- Vessel servicing, building and maintenance;
- Port/dock/wharf activities (including dredge spoil);
- Storage and processing of mineral sands; and
- Storage and export of ore, minerals and/or metal concentrate.

The following CoPC have been identified, based on the above list, as well as the findings of previous investigations by RPS (2017):

- Metals (Ag, Al, As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Se, Th, U, V & Zn);
- Monocyclic aromatic hydrocarbons (e.g. benzene, toluene, ethyl benzene and xylenes);
- Polycyclic aromatic hydrocarbons (PAH) (e.g. creosote, naphthalene);
- Tributyl tin (TBT);
- Organochlorine pesticides (e.g. endosulfan, pentachlorophenol, chlordane);
- Organophosphate pesticides; and
- Total recoverable hydrocarbons (TRH).

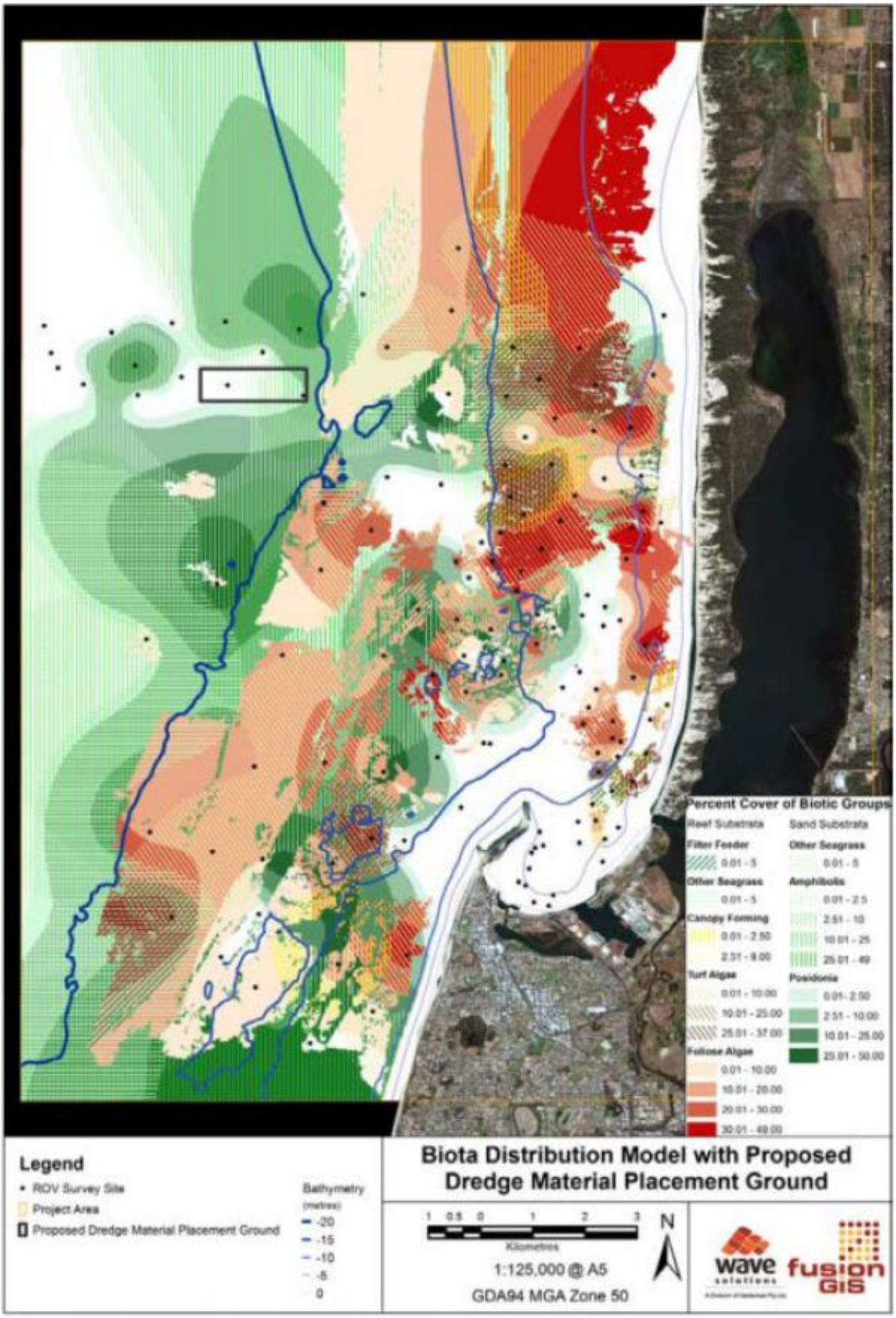


Figure 2-2 Benthic habitat map of the project area (Lanco, 2012)

3 Sediment Sampling and Analysis

3.1 Methodology

3.1.1 Sediment Sampling Locations

Justification for the number and location of selected sampling sites is detailed in the SAP (Cardno,2021), which was approved by DAWE in March 2021. The total number of sample sites for this SAP considered a total dredge volume of 173,730 m^3, while accounting for the sites already sampled as part of previous investigations (RPS, 2017), as well as geological information which indicated the likely volume of unconsolidated marine sediments.

All dredge area sediment sampling sites (previous and additional) are depicted in **Figure 3-1**. Six new sites were sampled within the dredging area. Previous sediment sampling sites that were re-sampled as part of this SAP are listed in **Table 3-1**. Ten sites within the proposed disposal area were also sampled, as depicted in **Figure 3-2**.

3.1.2 Sampling Methodology

Vibracoring was used to collect sediment samples within the dredge area, which is the technique recommended by NAGD for sampling in the 3 to 6 metre water depth range. Sample collection was undertaken as per NAGD, ANZG (2018) and Simpson et al. (2013). A Ponar grab sampler was used to collect surficial sediment samples at the proposed disposal site. The sampling details are outlined below in **Table 3-1**. Chain of custody (CoC) documentation is provided in **Appendix J**.

Table 3-1 Sediment Sampling Details

Item	Details
Sample Sites	Six (6) additional sites were sampled across the Stage 2 dredge area. Four (4) existing sites (C02, C03, C04 and C06) were resampled. Ten (10) sites were sampled in the proposed disposal area.
Collection Method	Vibracoring – minimum 50mm diameter, polycarbonate liners (decontaminated) within the dredge area. Ponar Grab Sampler at the disposal site.
Sampling Method	Sampling was undertaken by trained, experienced staff to ensure that the correct procedures were followed and documented. Sediment samples from each core were collected over 0.5 m intervals, from the surface, i.e., 0-0.5 m, 0.5-1.0 m, 1.0-1.5 m until target depth or refusal (as per NAGD), with in the dredge area. Surficial sediment grab samples were collected within the disposal area.
Sample Preservation and Holding Times	Samples were collected directly into appropriately labelled and preserved laboratory supplied jars/containers and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation. Sample containers, preservation procedures, sample storage requirements and holding times were in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Volatiles (such as BTEXN) were sampled in accordance with the NAGD and AS4482.2 1999 – noting that volatiles cannot be mixed. All samples were labelled with an indelible marker pen on water resistant labels attached to the sample jars/bags.
Decontamination Procedures	Vessel plant was washed down and inspected before work. Surfaces were covered by plastic sheeting for sample preparation. Polycarbonate core liners and the Ponar grab were rinsed with dilute acid, deionised water and a suitable solvent. Disposable, powder-free gloves were used when taking samples and changed after each sample. Sample mixing bowls and apparatus were decontaminated between each sample.

Item	Details
Laboratory Testing	Sediment samples were submitted to a NATA accredited laboratory for the following analysis. ▪ PSD ▪ Total Metals – Aluminium, Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Thorium, Uranium, Vanadium and Zinc ▪ Tributyltin (as Sn) ▪ TOC ▪ Nutrients – NH3, NO2, NO3, NOX, TKN, TN, TP and RP ▪ Total recoverable hydrocarbons TRH ▪ Benzene, Toluene, Ethylbenzene and Xylenes BTEXN ▪ Organotins – TBT and DBT ▪ Ultra-trace PAHs ▪ Ultra-trace OC/OP Pesticides
Laboratory testing – quality control	Quality control procedures were followed in accordance with guidelines for sampling presented in the Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds Australian Standard (AS4482.1-2005). Standard laboratory QA/QC procedures. Two duplicate, split and triplicate samples as required by NAGD.
Laboratory accreditation	All laboratory analysis was carried out by NATA accredited facilities.

373100 373200 373300 373400 373500 373600 373700 373800

6313800 6313600 6313400 6313200 6313000

CA01 CA02 CA03 CA04 CA05 CA06

C01 C02 C03 C04 C05 C06 C07 C08 C09 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19

AREA 1 AREA 2 AREA 3 AREA 4 AREA 5 AREA 6 AREA 7 AREA 8 AREA 9

DESIGN RL -2.5m LAT
DESIGN RL -3.0m LAT
DESIGN RL -3.5m LAT
DESIGN RL -4.0m LAT
DESIGN = SALT LAYER

COLOUR CODED DIFFERENCES
(EXISTING SURFACE TO DESIGN)

0.0
0.2
0.7
1.0
2.0
3.0
4.0
5.0

SHALLOWER THAN DESIGN

GENERAL
THE VALUES ON THE PLAN HAVE BEEN CALCULATED USING DATA INTERPOLATED FROM THE ORIGINAL SURVEYS

GRIDDING PARAMETERS 2.0m GRID

QUANTITIES

DREDGE AREA	ESTIMATED VOLUME ABOVE DESIGN (m³)	ESTIMATED SURFACE AREA ABOVE DESIGN (m²)
AREA 1	4,420	11,600
AREA 2	34,730	40,450
AREA 3	17,180	14,990
AREA 4	1,550	4,720
AREA 5	1,540	8,190
AREA 6	3,790	4,200
AREA 7	106,390	51,150
AREA 8	4,820	4,520
AREA 9	880	855
TOTAL	**175,300**	**140,675**

Legend

Additional Sediment Sample Site

Existing Sediment Sample Site (RPS, 2017)

N

1:3,000 Scale at A3

Dredge Site Sediment Sampling Locations

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 3-1

Cardno

Map Produced by Cardno WA (6100)
Date: 2020-11-03
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: CW1146500_001_DedgeArea_SedimentSamplingLocations.mxd 01

352000 360000 368000 376000 384000

6330000 6320000 6310000 6300000 6290000

115°35'0"E 115°35'30"E 115°36'0"E

33°13'30"S 33°14'0"S

SS01 SS02 SS03 SS04 SS05 SS06 SS07 SS08 SS09 SS10

Legend

Proposed Disposal Area

Sediment Sample Sites

N

1:150,000 Scale at A3

km 0 3 6

Disposal Area Sediment Sampling Locations

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 3-2

Cardno

Map Produced by Cardno WA (6100)
Date: 2021-12-03
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500

3.2 Results

3.2.1 Physical Properties and Observations

The material retrieved was relatively typical of a harbour setting (i.e. settled fines tainted by organic matter breakdown). Material retrieved from CA01 to CA06 at the outer edge of the harbour was dark and silty with components of sand. Within the harbour at existing sites the material was effectively black silt. The material had an associated sulphurous odour. Seagrass (primarily *Amphibolis*) was present at the surface of sample cores at various sites. Sampling borehole logs that describe the material retrieved by vibracorer at each site are provided in **Appendix I**.

3.2.2 Particle Size Distribution

Full laboratory analysis results for PSD are provided in **Appendix F**. Median grain diameter (D_{50}) values for each sample have been listed in **Table 3-2**. In general:

- Dredging Stage 1 sediment ranged from very fine sand to medium sand and would be classified on average as fine sand;
- Dredging Stage 2 sediment ranged from medium silt to fine sand and would be classified on average as course silt; and
- Disposal Area sediment ranged from medium sand to very coarse sand and would be classified on average as coarse sand.

Table 3-2 Median grain diameter from PSD analysis

Stage 1 Site	D_{50} (µm)	Stage 2 Site	D_{50} (µm)	Disposal Site	D_{50} (µm)
C02_0.5m	181.49	C06_0.5m	148.17	SS01	886.37
C02_1.0m	204.13	C06_1.0m	149.59	SS02	359.96
C02_1.5m	248.37	C06_1.5m	161.78	SS03	319.74
C03_0.5m	261.57	CA01_0.5m	74.32	SS04	744.73
C03_1.0m	285.08	CA01_1.0m	39.3	SS05	441.19
C04_0.5m	78.57	CA02_0.5m	38.49	SS06	948.08
C04_1.0m	64.08	CA02_1.0m	28.18	SS07	974.35
Average	**189.04**	CA02_1.5m	31.14	SS08	1333.58
		CA02_2.0m	27.63	SS09	1016.2
		CA03_0.5m	33.47	SS10	669.96
		CA03_1.0m	29.33	**Average**	**769.42**
		CA03_1.5m	27.05		
		CA04_0.5m	43.44		
		CA04_1.0m	31		
		CA04_1.5m	26.21		
		CA05_0.5m	30.14		
		CA05_1.0m	30.09		
		CA05_1.5m	31.5		
		CA05_2.0m	34.37		
		CA06_0.5m	28.26		
		CA06_1.0m	26.04		
		CA06_1.5m	31.95		

	CA06_2.0m	33.36	
	Average	**49.34**	

3.2.3 Sediment Chemistry

Summary laboratory analysis results for sediment chemistry are provided in **Appendix A** to **D**. Laboratory analysis reports are provided in **Appendix K** and **L**.

3.2.3.1 Assessment Criteria

Sediment sample results have been compared to the following guidelines, as per NAGD:

- National Assessment Guidelines for Dredging (2009):
  - Sediment Quality Screening Levels (ISQG-Low values) – referred to as 'low threshold' below; and
- ANZG - Guidelines for Fresh and Marine Water Quality (2018):
  - Interim Sediment Quality Guidelines – High (ISQG-High) – referred to as 'high threshold' below.

The 95% upper confidence limit (UCL) of sediment sample results within the dredge area is used to determine compliance with the Screening Levels. Results have been separated into the Stage 1 and Stage 2 dredging areas for the purpose of analysis and assessment, as these dredging programs will occur at distinct times. Combined analysis results tables (i.e. including RPS, 2017) for Stage 1 and Stage 2 are provided as **Appendix A** and **B**, respectively. A summary of calculated mean and 95% UCL statistics for each analyte and stage are is provided in **Appendix D**. Individual sample exceedances have also been mapped in **Figure 3-3** for visual reference. This figure also distinguishes the two dredging stage areas.

3.2.3.2 Stage 1 Dredge Area

3.2.3.2.1 Metals

- Eight (8) samples exceeded the low threshold for Antimony (at CA02, CA04, CA05 and CA06), resulting in a low exceedance of the 95% UCL for the analyte;
- Four (4) samples exceeded the low threshold for Arsenic (at CA05 and CA06), but this did not result in an exceedance of the 95% UCL for the analyte; and
- One (1) sample at CA06 exceeded the low threshold for Mercury, but this did not result in an exceedance of the 95% UCL for the analyte.

3.2.3.2.2 Organotins

One sample at C06 exceeded the low threshold for TBT, but this did not result in an exceedance of the 95% UCL for the analyte;

3.2.3.2.3 Nutrients

No sediment quality guidelines are available for nutrients (Phosphorous or Nitrogen) in WA. Measured nutrient concentrations were relatively high, with average concentrations of both Total Phosphorous and Total Nitrogen an order of magnitude greater than average concentrations at the disposal site. The elevated concentrations are consistent across sites within the dredge area.

Phosphorous was predominantly in total (non-reactive) form, indicating that it is bound to the sediment. Nitrogen was predominantly present in organic form (Kjedahl Nitrogen), indicating it is also bound to the sediment. Inorganic forms of Nitrogen were generally below the LOR, with some elevated Ammonia concentrations still much lower than the concentration of organic forms.

3.2.3.2.4 Polycyclic Aromatic Hydrocarbons (PAH)

Total PAH values were below thresholds for all samples.

3.2.3.2.5 Benzene, Toluene, Ethylbenzene and Xylene (BTEX)

No sediment quality guidelines are available for BTEX but all sample results were below limit of reporting (LOR).

3.2.3.2.6 Total Petroleum Hydrocarbons (TPH)

Total TPH values were below thresholds for all samples.

3.2.3.2.7 Total Recoverable Hydrocarbons (TRH)

No sediment quality guidelines are available for TRH.

3.2.3.2.8 Organochlorine Pesticides (OC)

All OC results were below LOR and, subsequently, below available thresholds.

3.2.3.2.9 Organophospate Pesticides (OP)

All OP results were below LOR.

3.2.3.3 Stage 2 Dredge Area

3.2.3.3.1 Metals

- One (1) sample at C04 exceeded the low threshold for Antimony, but this did not result in an exceedance of the 95% UCL for the analyte.
- Three (3) samples exceeded the low threshold for Arsenic (at C10, C11 and C18), but this did not result in an exceedance of the 95% UCL for the analyte;
- Two (2) samples exceeded the low threshold for Copper (at C02), but this did not result in an exceedance of the 95% UCL for the analyte;
- Five (5) samples exceeded the low threshold for Mercury (at C09, C11, C12, C18 and C19), but this did not result in an exceedance of the 95% UCL for the analyte;

3.2.3.3.2 Organotins

- Two (2) samples exceeded the low threshold for TBT (at C02); and
- Four (4) samples exceeded the high threshold for TBT (at C02 and C03)

This resulted in a high exceedance of the 95% UCL for the TBT.

3.2.3.3.3 Nutrients

No sediment quality guidelines are available for nutrients (Phosphorous or Nitrogen) in WA. Measured nutrient concentrations were relatively high, with average concentrations of both Total Phosphorous and Total Nitrogen an order of magnitude greater than average concentrations at the disposal site. The elevated concentrations are consistent across sites within the dredge area.

Phosphorous was predominantly in total (non-reactive) form, indicating that it is bound to the sediment. Nitrogen was predominantly present in organic form (Kjedahl Nitrogen), indicating it is also bound to the sediment. Inorganic forms of Nitrogen were generally below the LOR.

3.2.3.3.4 Polycyclic Aromatic Hydrocarbons (PAH)

Total PAH values were below thresholds for all samples.

3.2.3.3.5 Benzene, Toluene, Ethylbenzene and Xylene (BTEX)

No sediment quality guidelines are available for BTEX but all sample results were below limit of reporting (LOR).

3.2.3.3.6 Total Petroleum Hydrocarbons (TPH)

Total TPH values were below thresholds for all samples.

3.2.3.3.7 Total Recoverable Hydrocarbons (TRH)

No sediment quality guidelines are available for TRH.

3.2.3.3.8 Organochlorine Pesticides (OC)

- One (1) sample at C02 exceeded the low threshold for Dichlorodiphenyldichloroethane (DDD), but this did not result in an exceedance of the 95% UCL for the analyte;
- There was one (1) low exceedance and one (1) high exceedance (at C02) for Dichlorodiphenyldichloroethylene (DDE), resulting in a low exceedance of the 95% UCL for the analyte; and
- There was one (1) low exceedance (at C03) and two (2) high exceedances (at C02) for Dichlorodiphenyltrichloroethane (DDT), resulting in a low exceedance of the 95% UCL for the analyte.

3.2.3.3.9 Organophospate Pesticides (OP)

All OP results were below LOR.

3.2.3.4 Disposal Site

A complete sediment analysis table for samples collected at the disposal site is provided in **Appendix C**. Full laboratory analysis reports are presented in **Appendix K**. All sample results were below relevant guideline values or the respective LORs.

3.2.4 QA/QC

A QA/QC review of the SAP implementation methodologies is included in **Appendix E**. The review did not identify deficiencies in the sediment sample collection, handling and transport process. The review identified deficiencies in the QAQC process relating to laboratory analysis. In spite of these deficiencies, the review concluded that the analysis dataset is complete and reliable for the assessment against guideline values applied in this report.

CA01
CA02
1.0-2.0 Antimony
C06
0.50-1.00, 1.00-1.50 TBT
C05
C04
CA03
CA04
1.0-1.5 Antimony
CA05
0.00-1.00 Arsenic
0.00-1.50 Antimony
CO3
0.00-0.25 DDT
0.00-0.50 TBT
C07
0.00-0.50 DDD
0.00-0.50, 0.50-1.00 Copper
1.0-1.5 TBT
0.00-0.50, 0.50-1.00 TBT
0.00-0.05 DDT, DDE
C02
C08
CA06
0.00-1.00 Arsenic
0.00-1.00 Antimony
1.00-1.50 Mercury
C09
0.50-1.00 Mercury
C01
C10
C11
0.00 - 0.20 Mercury
C19
0.00-0.25 Mercury
C18
0.20-0.50 Mercury
C17
C12
C16
C13
1.10-1.50 Mercury
C15
C14

Legend

- Site Boundary
- Dredge Design
- Sample Sites
- Existing Sample Sites
- Resampled Sites
- Phase 1 Dredging
- Phase 2 Dredging
- Low Exceedence
- High Exceedence

N

1:3,000 Scale at A3

km
0 0.055 0.11

Dredge Site
Sediment Sample Exceedances

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 3-3

Cardno

Map Produced by Cardno WA (6100)
Date: 2021-06-25
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: CW1146500_Sediment Samples_Dredge Site_Trigger.mxd 01

4 Elutriate Sampling and Analysis

4.1 Methodology

Targeted elutriate testing of dredge area sediment samples was undertaken due to the 95% UCL exceedances described in **Section 3**. Elutriate testing for DDE and DDT exceedances at C02 and C03 was not undertaken as these analytes are in the same sediment to be tested for TBT. If TBT (and DDE, DDT) was to pass elutriate screening, further toxicity testing would be required for this sediment, and these analytes, anyhow (DAWE, 2021).

4.1.1 Sampling Locations

Four samples sites were analysed for Antimony within the Stage 1 dredge area (CA02, CA04, CA05 and CA06) and two sites were analysed for TBT within the Stage 2 dredge area (C02 and C03). The sample sites were depicted in previous **Figure 3-3**.

4.1.2 Sampling Methodology

Details of the sampling methodology for the collection of marine water for elutriate testing is outlined in **Table 4-1**. Chain of custody (CoC) documentation is provided in **Appendix J**.

Table 4-1 Sampling details for elutriate testing

Item	Details
Sample Sites	Antimony - CA02, CA04, CA05 and CA06 TBT – C02 and C03 Seawater samples for leachate were collected at the disposal site.
Collection Method / Equipment	Sediment – Composite samples along core from vibracoring (see **Table 3-1**) Marine water sampling - Submersible Pump to bulk sample container (8L)
Sampling Method	Sampling was undertaken by trained, experienced staff to ensure that the correct procedures are followed and documented. Water samples were collected near the surface. Sediment samples were mixed to form representative, composite sample of the core.
Sample Preservation and Holding Times	Samples were placed directly into appropriately labelled and preserved laboratory supplied containers and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation. Sample containers, preservation procedures, sample storage requirements and holding times were in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). All samples were labelled with an indelible marker pen on water resistant labels attached to the sample containers.
Decontamination Procedures	Vessel plant was washed down and inspected before work. Surfaces were covered by plastic sheeting for sample preparation. Polycarbonate core liners were rinsed with dilute acid, deionised water and a suitable solvent. Sample mixing bowls and apparatus were decontaminated between each sample. Submersible pump was decontaminated prior to sample collection. Disposable, powder-free gloves were used when taking samples and changed after each sample.
Laboratory Testing	Elutriate samples were submitted to NATA accredited laboratories for the following analysis. ▪ Antimony (Ultra Trace in Saline Water) ▪ Tributyltin (Ultra Trace in Saline Water)

Item	Details
Laboratory testing – quality control	Quality control procedures were in accordance with guidelines for sampling presented in the Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds Australian Standard (AS4482.1-2005). Standard laboratory QA/QC procedures. Two duplicate, split and triplicate sampling as required by NAGD.
Laboratory accreditation	All laboratory analysis was carried out by NATA accredited facilities.

4.2 Results

4.2.1 Assessment Criteria

Elutriate testing results were compared to the ANZG (2018) marine water quality trigger values for 95% marine ecosystem protection. Specific advice from ANZG (2018), which has been applied to analysis of elutriate results is as follows:

- Antimony: *In the absence of sufficient marine data, a marine low reliability Antimony trigger value of 270 µg/L was derived using an AF of 1000, for use only as an indicative interim working level. Caution is advised, however, if the freshwater figure is exceeded because of the more limited marine data*; and
- TBT: *A freshwater low reliability trigger value of 0.002 µg/L (2 ng/L) expressed as [Sn] was derived using an assessment factor (AF) of 1000. This should only be used as an interim indicative working level. A marine high reliability trigger value of 0.006 µg/L (6 ng/L) expressed as [Sn] was derived using the statistical distribution method with 95% protection. This is considered sufficiently protective in slightly to moderately disturbed ecosystems.*

4.2.2 Results

Full laboratory analysis results for elutriate testing are provided in **Appendix M**.

4.2.2.1 Antimony

Antimony results within the Stage 1 dredge area were all well below the recommended trigger value of 270 µg/L, as listed in **Table 4-2**.

Table 4-2 Elutriate results for Antimony

Site	CA02	CA04	CA05	CA06	QC1 (CA02)	QC2 (CA06)	Elutriate water 1	Elutriate water 2
Antimony (µg/L)	2.4	4.1	3.0	5.1	3.7	1.9	<0.5	<0.1

4.2.2.2 TBT

TBT results within the Stage 2 dredge area were above the trigger value of 6 ngSn/L at C02 and below the trigger value at C03, as listed in **Table 4-2**.

Table 4-3 Elutriate results for TBT

Site	C02	C03	QC3 (C02)	Elutriate water 1
TBT (ngSn/L)	12	4	9	<2

4.2.3 QA/QC

A QA/QC review of the SAP implementation methodologies is included in **Appendix E**. The review did not identify deficiencies in the elutriate sample collection, handling and transport process. The review identified deficiencies in the QAQC process relating to laboratory analysis. In spite of these deficiencies, the review concluded that the analysis dataset is complete and reliable for the assessment against guideline values applied above.

5 BCH Sampling and Analysis

5.1 Methodology

5.1.1 Sampling Locations

The survey area is presented in **Figure 5-1** and was defined based on the disposal site location and the modelled disposal zone of influence (99% suspended sediment concentration [SSC]) (GHD, 2020).

A total of 30 benthic habitat sample locations were surveyed (**Figure 5-1**). A higher sampling density was surveyed within the proposed disposal site area compared to a lower sampling density as SSC concentrations become lower within the zone of influence.

5.1.2 Sampling Methodology

High definition video transects (approximately 25 m) of the seabed were captured using a towed video camera approximately 2 metres above the seabed. Each predetermined sampling location was navigated to by the survey vessel with GPS accurate to < 5m to ensure sufficient precision.

5.2 Results

5.2.1 Analysis

For each video transect, a qualified marine scientist reviewed the footage to identify the benthic habitat(s) observed. Where possible, specific species were identified and a coverage percentage was approximated. Classification for each sample location is presented in **Appendix G**. A representative snapshot of the footage at each site is presented in **Appendix H**.

5.2.2 BCH Mapping

BCH mapping was prepared based on the observations at each site and simple interpolation, based on proximity to closest surrounding sites. Consistent BCH classifications as used by Wave Solutions (2012) and RPS (2022) have been applied. Seagrass communities (*Posidonia* and *Amphibolis*) were identified as the primary sensitive environmental receptor in the study area, surrounding an area of bare ground that has guided the refinement of the disposal area. Percentage coverage of seagrass at each site was interpreted to develop an overall percentage coverage map for the disposal site, presented in **Figure 5-2**, with the BCH mapping of Wave Solutions (2012), georeferenced and underlain for context.

360000
368000
376000
6330000
6320000
6310000
6300000
115°33'0"E
115°34'30"E
115°36'0"E
115°37'30"E
33°12'0"S
33°13'30"S
33°15'0"S
BH01
BH02
BH04
BH05
BH06
BH07
BH08
BH09
BH10
BH11
BH12
BH13
BH14
BH15
BH16
BH17
BH18
BH19
BH20
BH21
BH22
BH23
BH24
BH25
BH26
BH27
BH28
BH29

Legend

- Proposed Disposal Area
- BCH Sample Sites

Modelled 99% SSC (GHD, 2020)
(mg/L)

1 2 5 10 25 50 100 500

N

1:100,000 Scale at A3

km
0 2 4

BCH Sample Sites

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 5_1

Cardno

Map Produced by Cardno WA (6100)
Date: 2021-12-03
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: CW1146500_004_SpoilGround_BCHSamplingLocations 02.mxd 01

368000

376000

6320000

6310000

Legend

Proposed Disposal Area

Lanco BCH Sample Site

BCH Classification (Lanco, 2012)

Filter Feeder

Turf Algae

Canopy Forming Algae

Foliose Algae (0.01%-10%)

Foliose Algae (10% - 20%)

Foliose Algae (20% - 25%)

Bare Sand

Seagrass - Amphibolis and Posidonia (%)

High : 75%

Low : 0% (Bare Sand)

N

1:49,216 Scale at A3

km

0 1 2

BCH Interpretive Mapping

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 5-2

Cardno

Map Produced by Cardno WA (6100)
Date: 2022-04-08
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: 4-1_BenthicHabitatMap_Lanco.mxd 01

6 Conclusions and Recommendations

This *SAP Implementation Report* is considered to demonstrate successful execution of the project's SAP (Cardno, 2021). The SAP was prepared in consultation with DoT and was approved in March 2021 by DAWE's Sea Dumping Division prior to field sampling. Further consultation with DAWE was also undertaken in August 2021, following assessment of preliminary sediment quality results, to confirm the appropriate incorporation of previous data collected at the site (RPS, 2017) and direct further data collection.

Field sampling was conducted as per the SAP and adhered to relevant guidelines, methods and QA/QC procedures. Although there were breaches of QA/QC targets for analysis during this sampling program (**Appendix E**) and associated with data incorporated from RPS (2017), the overall dataset is considered comprehensive and reliable for its purpose of classifying the dredge material for proposed disposal. The following sub-sections detail the conclusions and recommendations relating to the project's dredging sites and the receiving disposal site.

6.1 Stage 1 Dredging

Sediment within the Stage 1 dredging area has been sampled and analysed for the full range of CoPC, as per NAGD – Phase II. Assessment of results showed 95% UCL for all CoPC to be below relevant guideline values, with the exception of Antimony.

Elutriate sampling and analysis was undertaken for individual sites exhibiting Antimony concentrations above guideline values, as per NAGD – Phase III. The results found elutriate concentrations at all sites were well below the recommended guideline threshold for Antimony.

Ideally, bioavailability of Antimony would be assessed by the collection of sediment porewater at the sites of concern. However, the site's water depth and the depth of sampling do not allow porewater to be collected by any practicable sampling method. As such, as per the guidance of NAGD, elutriate results have been compared to ANZG (2018) guidelines – 95% species protection, to estimate bioavailability of Antimony.

Based on the results of sediment chemistry sampling and analysis (Phase II), as well as further elutriate and bioavailability sampling and analysis for Antimony (Phase III), the material proposed to be dredged in Stage 1 is considered suitable for open ocean disposal, as per NAGD.

6.2 Stage 2 Dredging

Sediment within the Stage 2 dredging area has been sampled and analysed for the full range of CoPC, as per NAGD – Phase II. Assessment of results showed 95% UCL for all CoPC to be below relevant guideline values, with the exception of TBT (exceeding high threshold), DDE and DDT (exceeding low threshold). All individual exceedances for these analytes occurred at sites C02 and C03, within Area 8 of the Stage 2 dredging footprint. These initial sediment results indicate that the area is a contamination 'hot spot'.

In progressing to Phase III testing, recent guidance specific to TBT (DAWE, 2021) was followed. Elutriate sampling and analysis was undertaken for individual sites exhibiting TBT concentrations above guideline values, as per NAGD. The results found elutriate concentrations for TBT to be above the ANZG (2018) guideline value for 95% species protection recommended by DAWE (2021). As with Antimony, the collection of porewater in the scenario is not considered practicable, and elutriate data has also been used to approximate bioavailability.

Based on the results of sediment chemistry sampling and analysis (Phase II), as well as further elutriate/bioavailability sampling and analysis for TBT (Phase III), the material proposed to be dredged in Area 8 of Stage 2 is unlikely to be suitable for open ocean disposal. The material in the remaining areas of the Stage 2 dredging footprint (Area 1 to 5) is considered suitable for open ocean disposal based on the outcomes of Phase II testing.

6.3 Disposal Area

The physical sediment characteristics (PSD) of the disposal area has been characterised by an array of sediment surface grab samples. The PSD results suggest that sediment in the disposal area is of a much coarser grain size than the material to be dredged from the Stage 1 and 2 dredging areas. While this does not necessarily indicate poor compatibility, it does suggest that the residence time of disposed material on the seabed is likely to be relatively short.

BCH was characterised in the disposal area, finding significant portions of bare seabed, but also ranging to relatively dense seagrass coverage (*Posidonia* and *Amphibolis* species). Dredging disposal has the potential to impact seagrass through blocking of available light, due to raised turbidity in the water column, and by smothering due to sediment deposition. The potential physical impact of dredging disposal on seagrass has been further investigated in the *Offshore Disposal Impact Hypothesis Report* (Cardno, 2022). There are not predicted to be significant or long-lasting impacts to seagrass, given the relatively low disposal volumes and short durations of the actions (particularly in comparison to Lanco's proposal).

Following review of the BCH mapping, DoT has further refined the proposed disposal site by reducing its size to minimise potential impacts. The refined disposal site is located entirely within the area mapped as 'bare sand' and is shown on **Figure 6-1**.

6.4 Recommendations

Key recommendations are as follows:

- Area 8 of the Stage 2 dredging footprint is considered a contamination hotspot due to the presence of elevated concentrations of TBT, DDE and DDT within sediments. The TBT also appears to have high bioavailability. Although further testing may improve understanding of the potential toxicity of these constituents, and dredging controls to minimise environmental impact of ocean disposal may be feasible, it is considered unlikely that the material is suitable for open ocean disposal. It is, therefore, recommended that this isolated area is dredged and confined for appropriate disposal on land;
- The remaining sediment outside of Area 8, in both Stage 1 and Stage 2 of dredging is considered suitable for open ocean disposal in terms of sediment quality. The physical environmental impact of dredging and disposing the material, in terms of deposition and elevating suspended sediment concentrations, still requires proper environmental impact assessment; and
- Assessment of BCH at the original proposed disposal area shows that the seabed ranges from bare sediment to relatively dense seagrass coverage. Although the disposal area has been refined to be above the area mapped as 'bare sand', sediment plume dispersion is likely to occur outside of this area, leading to elevated suspended sediment concentrations and potential sedimentation. The potential impact to seagrass as a sensitive environmental receptor should, therefore, be impact assessed prior to confirming the environmental acceptability of offshore disposal activities.

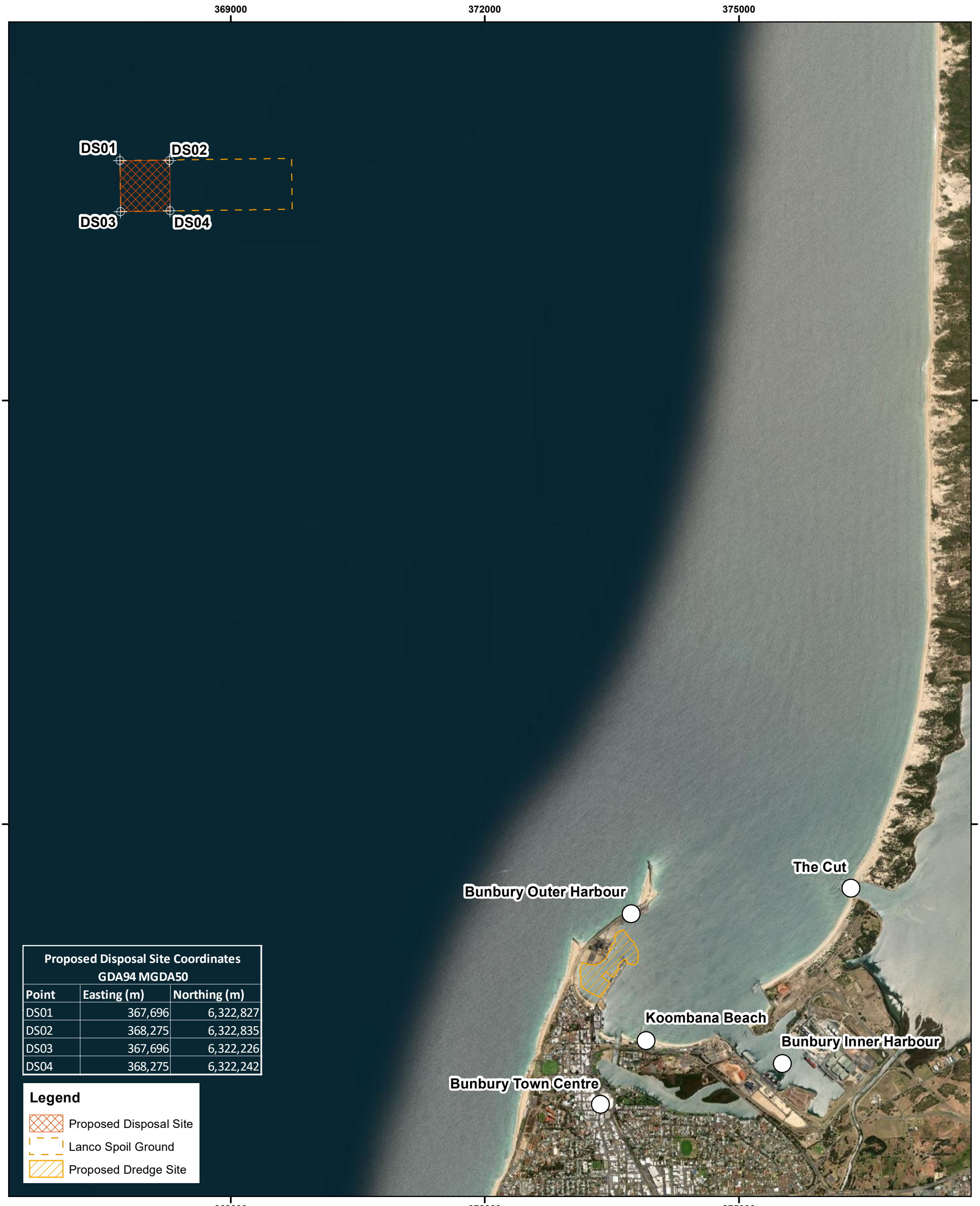
6.5 Assumptions and Limitations

The findings, conclusions and recommendations made in this report rely on several underlying assumptions and, as such, they should be interpreted with caution. When sub-sampling to understand the environmental characteristics of a broad area (such as the sediment chemistry throughout the dredge area or BCH across the disposal site) the two key assumptions made are that:

- The individual samples are representative of a broader spatial area than the area of the sample itself; and
- The time of sample collection was representative of typical or average conditions over a broader timescale.

Ground-truthed sampling guidelines and methods, as well as an understanding of statistical representativeness, are used to offer the highest likelihood of collecting a representative sample set for each respective site and environmental variable. Nevertheless, Cardno cannot warrant that the data produced are representative of anything other than the precise point in space and time that was sampled.

Furthermore, it is assumed that the data derived by the sampling program has been correctly collected, handled and analysed, to produce accurate results. By ensuring qualified and experienced staff undertake sampling and analysis work, employing NATA accredited laboratories, and adhering to strict QA/QC procedures, a high probability of accurate data is assured. The potential for human error, however, is present in any such sampling program.



Proposed Disposal Site Coordinates GDA94 MGDA50		
Point	Easting (m)	Northing (m)
DS01	367,696	6,322,827
DS02	368,275	6,322,835
DS03	367,696	6,322,226
DS04	368,275	6,322,242

Legend

- Proposed Disposal Site
- Lanco Spoil Ground
- Proposed Dredge Site

N

1:40,000 Scale at A3

km
0 0.75 1.5

Refined Disposal Site

CASUARINA HARBOUR DREDGING STUDIES
FIGURE 6-1

Cardno

Map Produced by Cardno WA (6100)
Date: 2022-02-07
Coordinate System: GDA 1994 MGA Zone 50
Project: CW1146500
Map: CW1146500_005_SpoilGround_Locaility.mxd 01

7 References

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APPENDIX

A

PHASE 1 DREDGING SEDIMENT QUALITY ANALYSIS RESULTS

Cardno

now

Stantec

				METALS																	
				Aluminium (total)	Antimony (total)	Arsenic (total)	Cadmium (total)	Chromium (total)	Copper (total)	Cobalt (total)	Hexavalent Chromium	Iron (total)	Lead (total)	Manganese (total)	Mercury (total)	Nickel (total)	Selenium (total)	Silver (total)	Thorium (total)	Uranium (total)	Vandium (total)	Zinc (total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**10**	**0.2**	**0.1**	**0.02**	**0.2**	**0.2**	**0.1**	**1**	**10**	**0.1**	**0.2**	**0.01**	**0.2**	**0.1**	**0.02**	**0.1**	**0.1**	**0.2**	**0.5**
ANZG Sediment Quality Guidelines (GV-high)					**25**	**70**	**10**	**370**	**270**				**220**		**1**	**52**		**4**				**410**
NAGD Screening Levels (GV-low)					**2**	**20**	**1.5**	**80**	**65**				**50**		**0.15**	**21**		**1**				**200**
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C06_0.5	**C06**	**0.00 - 0.50**	**22/04/2021**	2800	0.30	2.5	0.04	13	7.9	1.0	0.5	5900	8.4	74	0.005	2.1	0.05	0.01	9.8	1.7	16	13
C06_1.0	**C06**	**0.50 - 1.00**	**22/04/2021**	3300	0.40	3.3	0.06	14	6.4	1.4	0.5	6800	10	77	0.03	2.8	0.1	0.01	9.2	2.6	20	13
C06_1.5	**C06**	**1.00 - 1.50**	**22/04/2021**	2300	0.50	3.1	0.06	10	3.6	1.0	0.5	4500	5.1	54	0.01	2.0	0.1	0.01	4.8	3	14	7.7
CA01_0.5	**CA01**	**0.00 - 0.50**	**20/04/2021**	4500	0.50	3.6	0.14	20	12.0	2.0	0.5	11000	15	140	0.03	4.1	0.1	0.01	18	2.4	26	26
CA01_1.0	**CA01**	**0.50 - 1.00**	**20/04/2021**	12000	0.80	19	0.13	42	15.0	6.5	1.0	24000	20	170	0.11	13.0	0.7	0.04	4.6	5.1	61	21
CA02_0.5	**CA02**	**0.00 - 0.50**	**20/04/2021**	13000	0.70	16	0.18	34	26.0	4.3	1.0	24000	12	180	0.04	10.0	0.7	0.04	5.3	3.1	49	40
CA02_1.0	**CA02**	**0.50 - 1.00**	**20/04/2021**	16000	1.50	17	0.16	40	24.0	5.6	1.0	28000	15	210	0.04	13.0	0.7	0.05	6.7	4.4	63	39
CA02_1.5	**CA02**	**1.00 - 1.50**	**20/04/2021**	15000	2.30	14	0.32	39	24.0	5.8	1.0	27000	18	200	0.05	13.0	0.5	0.06	7	5.6	60	45
CA02_2.0	**CA02**	**1.50 - 2.00**	**20/04/2021**	17000	9.70	28	0.47	56	28.0	7.8	2.0	34000	26	240	0.11	19.0	0.6	0.08	7.7	2.9	92	59
CA03_0.5	**CA03**	**0.00 - 0.50**	**20/04/2021**	14000	1.10	18	0.15	35	30.0	4.7	1.0	26000	14	200	0.05	11.0	0.6	0.05	6	3.3	53	47
CA03_1.0	**CA03**	**0.50 - 1.00**	**20/04/2021**	16000	1.70	19	0.16	41	23.0	5.9	2.0	30000	16	240	0.04	14.0	0.8	0.05	6.2	3.1	63	39
CA03_1.5	**CA03**	**1.00 - 1.50**	**20/04/2021**	16000	1.70	16	0.16	42	29.0	5.8	2.0	29000	18	200	0.06	13.0	0.8	0.07	6.8	4.6	65	47
CA04_0.5	**CA04**	**0.00 - 0.50**	**20/04/2021**	12000	0.80	19	0.16	34	32.0	4.1	1.0	25000	14	170	0.05	10.0	0.7	0.05	5.2	2.6	48	46
CA04_1.0	**CA04**	**0.50 - 1.00**	**20/04/2021**	15000	1.60	21	0.14	40	30.0	5.5	2.0	27000	15	230	0.06	13.0	0.8	0.05	5.8	3	58	54
CA04_1.5	**CA04**	**1.00 - 1.50**	**20/04/2021**	17000	2.00	19	0.17	44	28.0	6.3	2.0	31000	21	220	0.07	14.0	0.8	0.09	7.6	4.7	70	55
CA05_0.5	**CA05**	**0.00 - 0.50**	**22/04/2021**	16000	3.00	22	0.18	44	22.0	6.9	1.0	32000	19	230	0.06	15.0	0.9	0.08	6.8	6.1	74	42
CA05_1.0	**CA05**	**0.50 - 1.00**	**22/04/2021**	16000	6.90	25	0.19	50	24.0	8.6	2.0	34000	17	270	0.07	17.0	0.9	0.06	7.2	3	84	37
CA05_1.5	**CA05**	**1.00 - 1.50**	**22/04/2021**	17000	3.20	16	0.2	38	17.0	5.2	3.0	27000	23	140	0.1	13.0	0.9	0.04	7.3	3.7	63	27
CA05_2.0	**CA05**	**1.50 - 2.00**	**22/04/2021**	11000	0.40	12	0.15	28	11.0	3.8	2.0	20000	15	94	0.12	10.0	1	0.04	4.4	5.1	53	15
CA06_0.5	**CA06**	**0.00 - 0.50**	**23/04/2021**	16000	3.40	23	0.2	43	22.0	6.4	2.0	32000	21	220	0.09	14.0	0.8	0.07	7.3	5.9	70	45
CA06_1.0	**CA06**	**0.50 - 1.00**	**23/04/2021**	18000	6.60	23	0.17	42	18.0	6.1	2.0	30000	24	190	0.14	14.0	1	0.05	8.2	4	72	30
CA06_1.5	**CA06**	**1.00 - 1.50**	**23/04/2021**	16000	0.50	14	0.15	33	15.0	4.9	2.0	25000	23	100	0.21	12.0	0.9	0.04	7	4	62	19
CA06_2.0	**CA06**	**1.50 - 2.00**	**23/04/2021**	17000	0.40	16	0.12	33	14.0	5.1	2.0	25000	16	97	0.12	12.0	0.9	0.03	7.2	3.6	69	15
C05S01, C05S03	**C05**	**0.00 - 0.50**	**4/10/2017**	4300	0.25	4	0.05	15	12.3	1.0	---	8900	15	70	0.01	2.2	0.3	0.10	11	1.2	14	35
C06S01, C06S02	**C06**	**0.00 - 0.50**	**5/10/2017**	3000	0.25	8	0.05	16	14.5	1.6	---	8580	9	89	0.02	3.2	0.3	0.05	3.9	2	21	28
C06S05	**C06**	**1.50 - 2.00**	**5/10/2017**	4220	0.25	15	0.10	21	8.7	2.9	---	10400	11	116	0.02	5.3	0.6	0.10	1.6	7.7	35	17
C07S01	**C07**	**0.00 - 0.50**	**5/10/2017**	2240	0.25	8	0.05	12	7.4	1.1	---	6140	4	69	0.09	2.3	0.2	0.05	1.0	1.4	13	16
C08S01, C08S02	**C08**	**0.00 - 0.50**	**5/10/2017**	4640	0.25	9	0.10	24	12.4	3.7	---	12300	12	104	0.14	7.6	0.7	0.05	1.1	5.0	37	20
C08S05	**C08**	**1.50 - 2.00**	**5/10/2017**	4560	0.25	11	0.10	22	9.0	2.7	---	11900	14	91	0.04	6.3	0.8	0.05	1.1	2.6	33	17
		Phase 1 Dredge Area - Mean		**11237**	**1.78**	**15**	**0.15**	**32**	**18.1**	**4.4**	**1.5**	**21256**	**16**	**155**	**0.07**	**9.9**	**0.6**	**0.05**	**6.4**	**3.7**	**50**	**32**
		Phase 1 Dredge Area - 95% UCL		**13380**	**2.62**	**17**	**0.18**	**37**	**21.2**	**5.2**	**1.8**	**24861**	**17**	**178**	**0.09**	**11.8**	**0.7**	**0.06**	**7.6**	**4.3**	**59**	**37**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOTINS*			TOC	NUTRIENTS								POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*						
				Monobutyltin	Tributyltin	Dibutyltin	Total Organic Carbon	TOTAL Phosphorus	Reactive Phosphorus as P	Nitrogen (Total)	Kjeldahl Nitrogen Total	Ammonia as N	Nitrate (as N)	Nitrite (as N)	NOx as N in water	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene
				µgSn/kg	µgSn/kg	µgSn/kg	% C	mg.P/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				1	0.5	1	0.1	0.05	0.1	20	20	20	0.1	0.1	0.1	0.005	0.004	0.004	0.004	0.004	0.004	0.004
ANZG Sediment Quality Guidelines (GV-high)					70																	
NAGD Screening Levels (GV-low)					9																	
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C06_0.5	**C06**	**0.00 - 0.50**	**22/04/2021**	0.6	3.38	0.63	0.8	0.33	0.2	700	700	10	0.05	0.05	0.05	0.003	0.003	0.003	0.003	0.009	0.013	0.011
C06_1.0	**C06**	**0.50 - 1.00**	**22/04/2021**	0.9	3.09	3.64	1.1	0.31	0.05	720	720	10	0.05	0.05	0.05	0.002	0.002	0.002	0.002	0.005	0.008	0.009
C06_1.5	**C06**	**1.00 - 1.50**	**22/04/2021**	0.6	2.50	0.63	0.8	0.27	0.05	830	830	10	0.05	0.05	0.05	0.003	0.003	0.020	0.034	0.048	0.050	0.041
CA01_0.5	**CA01**	**0.00 - 0.50**	**20/04/2021**	0.3	4.93	0.33	1.5	0.63	0.2	920	920	10	0.05	0.05	0.05	0.002	0.001	0.005	0.008	0.011	0.008	0.009
CA01_1.0	**CA01**	**0.50 - 1.00**	**20/04/2021**	0.1	2.43	0.14	3.7	0.44	1	2850	2850	30	0.05	0.05	0.05	0.002	0.001	0.004	0.004	0.008	0.009	0.010
CA02_0.5	**CA02**	**0.00 - 0.50**	**20/04/2021**	0.1	2.33	0.10	4.8	0.73	0.3	3980	3980	10	0.05	0.05	0.05	0.001	0.000	0.002	0.002	0.003	0.004	0.004
CA02_1.0	**CA02**	**0.50 - 1.00**	**20/04/2021**	0.1	1.02	0.10	4.9	0.67	0.2	4310	4310	10	0.05	0.05	0.05	0.001	0.000	0.002	0.002	0.004	0.004	0.005
CA02_1.5	**CA02**	**1.00 - 1.50**	**20/04/2021**	0.1	2.51	0.13	3.9	1.3	1.4	3300	3300	60	0.05	0.05	0.05	0.002	0.001	0.003	0.003	0.005	0.006	0.006
CA02_2.0	**CA02**	**1.50 - 2.00**	**20/04/2021**	0.1	1.05	0.13	3.9	1.9	5.7	4040	4040	140	0.05	0.05	0.05	0.001	0.001	0.002	0.002	0.004	0.005	0.005
CA03_0.5	**CA03**	**0.00 - 0.50**	**20/04/2021**	0.1	0.79	0.10	4.8	0.68	0.3	4140	4140	10	0.05	0.05	0.05	0.001	0.000	0.002	0.002	0.005	0.006	0.005
CA03_1.0	**CA03**	**0.50 - 1.00**	**20/04/2021**	0.1	2.04	0.10	5.2	0.75	0.7	4300	4300	10	0.05	0.05	0.05	0.000	0.000	0.003	0.003	0.008	0.010	0.008
CA03_1.5	**CA03**	**1.00 - 1.50**	**20/04/2021**	0.1	1.48	0.10	5.2	0.74	1.4	4400	4400	60	0.05	0.05	0.05	0.000	0.000	0.002	0.003	0.006	0.006	0.005
CA04_0.5	**CA04**	**0.00 - 0.50**	**20/04/2021**	0.1	0.64	0.09	5.6	0.77	0.7	4360	4360	10	0.05	0.05	0.05	0.000	0.000	0.008	0.006	0.008	0.012	0.011
CA04_1.0	**CA04**	**0.50 - 1.00**	**20/04/2021**	0.1	16.81	0.10	5.2	0.72	0.3	4440	4440	10	0.05	0.05	0.05	0.000	0.000	0.004	0.004	0.007	0.010	0.009
CA04_1.5	**CA04**	**1.00 - 1.50**	**20/04/2021**	0.1	0.94	0.10	4.8	0.78	0.4	3920	3920	10	0.05	0.05	0.05	0.001	0.000	0.004	0.003	0.006	0.008	0.007
CA05_0.5	**CA05**	**0.00 - 0.50**	**22/04/2021**	0.1	0.47	0.10	4.9	0.75	0.3	3740	3740	10	0.05	0.05	0.05	0.001	0.000	0.003	0.003	0.007	0.008	0.007
CA05_1.0	**CA05**	**0.50 - 1.00**	**22/04/2021**	0.1	0.15	0.10	4.8	0.77	1.7	3080	3080	100	0.05	0.05	0.05	0.002	0.000	0.002	0.002	0.004	0.006	0.004
CA05_1.5	**CA05**	**1.00 - 1.50**	**22/04/2021**	0.1	0.04	0.08	5.9	0.88	6.3	4980	4980	200	0.05	0.05	0.05	0.000	0.000	0.001	0.001	0.003	0.003	0.008
CA05_2.0	**CA05**	**1.50 - 2.00**	**22/04/2021**	0.1	0.04	0.07	7.1	0.69	4.5	4370	4370	270	0.05	0.05	0.05	0.000	0.000	0.003	0.004	0.009	0.010	0.008
CA06_0.5	**CA06**	**0.00 - 0.50**	**23/04/2021**	0.1	0.40	0.11	4.5	0.77	0.3	3310	3310	10	0.05	0.05	0.05	0.002	0.000	0.005	0.006	0.009	0.011	0.010
CA06_1.0	**CA06**	**0.50 - 1.00**	**23/04/2021**	0.1	0.15	0.10	5.2	0.74	0.6	3500	3500	100	0.10	0.05	0.05	0.000	0.000	0.002	0.001	0.004	0.004	0.004
CA06_1.5	**CA06**	**1.00 - 1.50**	**23/04/2021**	0.1	0.04	0.09	5.6	0.69	1	3930	3930	210	0.05	0.05	0.05	0.000	0.000	0.000	0.002	0.005	0.007	0.007
CA06_2.0	**CA06**	**1.50 - 2.00**	**23/04/2021**	0.1	0.05	0.09	5.5	0.71	2.3	4350	4350	290	0.05	0.05	0.05	0.000	0.000	0.003	0.003	0.008	0.009	0.007
C05S01, C05S03	**C05**	**0.00 - 0.50**	**4/10/2017**	---	---	---	0.78	0.24	0.1	1100	1100	10	---	---	0.3	0.006	0.009	0.012	0.027	0.105	0.063	0.051
C06S01, C06S02	**C06**	**0.00 - 0.50**	**5/10/2017**	---	12.04	0.88	1.13	---	---	---	---	---	---	---	---	0.002	0.002	0.004	0.002	0.010	0.008	0.004
C06S05	**C06**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C07S01	**C07**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C08S01, C08S02	**C08**	**0.00 - 0.50**	**5/10/2017**	---	---	---	3.63	0.49	0.3	1790	1790	10	---	---	0.1	0.001	0.001	0.003	0.003	0.032	0.025	0.020
C08S05	**C08**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	0.44	2.8	2400	2400	230	---	---	0.05	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		**0.2**	**2.47**	**0.33**	**4.05**	**0.70**	**1.3**	**3222**	**3222**	**71**	**0.05**	**0.05**	**0.06**	**0.001**	**0.001**	**0.004**	**0.005**	**0.013**	**0.012**	**0.011**
		Phase 1 Dredge Area - 95% UCL		**0.3**	**4.06**	**0.63**	**4.76**	**0.83**	**1.9**	**3747**	**3747**	**106**	**0.06**	**0.05**	**0.08**	**0.002**	**0.002**	**0.005**	**0.008**	**0.021**	**0.017**	**0.015**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*															BTEX*		
				Benz(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	LMW PAHs	HMW PAHs	PAHs (Sum of total)	Benzene	Ethylbenzene	Toluene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.004**	**0.004**	**0.004**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.2**	**0.2**	**0.2**
ANZG Sediment Quality Guidelines (GV-high)																			**50**			
NAGD Screening Levels (GV-low)																			**10**			
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C06_0.5	**C06**	**0.00 - 0.50**	**22/04/2021**	---	0.006	0.006	0.013	0.003	0.003	0.016	0.003	0.006	0.003	0.003	0.008	0.018	---	---	0.111	0.13	0.13	0.13
C06_1.0	**C06**	**0.50 - 1.00**	**22/04/2021**	---	0.005	0.005	0.009	0.002	0.002	0.012	0.002	0.005	0.002	0.002	0.006	0.014	---	---	0.085	0.09	0.09	0.09
C06_1.5	**C06**	**1.00 - 1.50**	**22/04/2021**	---	0.025	0.025	0.058	0.003	0.003	0.100	0.014	0.025	0.003	0.019	0.071	0.096	---	---	0.649	0.13	0.13	0.13
CA01_0.5	**CA01**	**0.00 - 0.50**	**20/04/2021**	---	0.005	0.005	0.016	0.002	0.001	0.029	0.005	0.003	0.002	0.003	0.015	0.031	---	---	0.161	0.07	0.07	0.07
CA01_1.0	**CA01**	**0.50 - 1.00**	**20/04/2021**	---	0.008	0.005	0.012	0.001	0.003	0.016	0.001	0.006	0.001	0.039	0.007	0.019	---	---	0.159	0.03	0.03	0.03
CA02_0.5	**CA02**	**0.00 - 0.50**	**20/04/2021**	---	0.003	0.003	0.005	0.001	0.000	0.007	0.000	0.003	0.001	0.002	0.003	0.008	---	---	0.050	0.02	0.02	0.02
CA02_1.0	**CA02**	**0.50 - 1.00**	**20/04/2021**	---	0.003	0.003	0.005	0.001	0.000	0.007	0.002	0.002	0.001	0.002	0.006	0.008	---	---	0.057	0.02	0.02	0.02
CA02_1.5	**CA02**	**1.00 - 1.50**	**20/04/2021**	---	0.004	0.002	0.008	0.001	0.001	0.010	0.001	0.003	0.001	0.005	0.005	0.013	---	---	0.076	0.03	0.03	0.03
CA02_2.0	**CA02**	**1.50 - 2.00**	**20/04/2021**	---	0.004	0.002	0.006	0.001	0.001	0.008	0.001	0.004	0.001	0.014	0.004	0.009	---	---	0.110	0.03	0.03	0.03
CA03_0.5	**CA03**	**0.00 - 0.50**	**20/04/2021**	---	0.004	0.003	0.006	0.001	0.000	0.008	0.000	0.003	0.001	0.002	0.003	0.010	---	---	0.063	0.02	0.02	0.02
CA03_1.0	**CA03**	**0.50 - 1.00**	**20/04/2021**	---	0.006	0.004	0.011	0.000	0.000	0.012	0.000	0.005	0.000	0.003	0.007	0.017	---	---	0.105	0.02	0.02	0.02
CA03_1.5	**CA03**	**1.00 - 1.50**	**20/04/2021**	---	0.004	0.003	0.008	0.000	0.000	0.010	0.000	0.003	0.000	0.003	0.005	0.012	---	---	0.073	0.02	0.02	0.02
CA04_0.5	**CA04**	**0.00 - 0.50**	**20/04/2021**	---	0.008	0.006	0.011	0.000	0.000	0.013	0.000	0.008	0.000	0.003	0.005	0.016	---	---	0.122	0.02	0.02	0.02
CA04_1.0	**CA04**	**0.50 - 1.00**	**20/04/2021**	---	0.006	0.004	0.010	0.000	0.000	0.012	0.000	0.006	0.000	0.003	0.005	0.014	---	---	0.099	0.02	0.02	0.02
CA04_1.5	**CA04**	**1.00 - 1.50**	**20/04/2021**	---	0.005	0.004	0.008	0.001	0.000	0.010	0.000	0.004	0.001	0.003	0.004	0.012	---	---	0.086	0.02	0.02	0.02
CA05_0.5	**CA05**	**0.00 - 0.50**	**22/04/2021**	---	0.005	0.004	0.010	0.001	0.000	0.014	0.000	0.005	0.001	0.003	0.008	0.016	---	---	0.099	0.02	0.02	0.02
CA05_1.0	**CA05**	**0.50 - 1.00**	**22/04/2021**	---	0.003	0.003	0.006	0.001	0.000	0.008	0.000	0.003	0.001	0.003	0.004	0.010	---	---	0.065	0.02	0.02	0.02
CA05_1.5	**CA05**	**1.00 - 1.50**	**22/04/2021**	---	0.005	0.007	0.007	0.000	0.006	0.005	0.000	0.008	0.000	0.024	0.001	0.005	---	---	0.086	0.02	0.02	0.02
CA05_2.0	**CA05**	**1.50 - 2.00**	**22/04/2021**	---	0.006	0.004	0.011	0.000	0.002	0.015	0.001	0.005	0.000	0.002	0.006	0.017	---	---	0.107	0.01	0.01	0.01
CA06_0.5	**CA06**	**0.00 - 0.50**	**23/04/2021**	---	0.007	0.006	0.013	0.001	0.000	0.019	0.000	0.006	0.001	0.006	0.010	0.020	---	---	0.133	0.02	0.02	0.02
CA06_1.0	**CA06**	**0.50 - 1.00**	**23/04/2021**	---	0.003	0.002	0.005	0.000	0.000	0.007	0.000	0.002	0.000	0.024	0.002	0.008	---	---	0.070	0.02	0.02	0.02
CA06_1.5	**CA06**	**1.00 - 1.50**	**23/04/2021**	---	0.005	0.003	0.007	0.000	0.000	0.011	0.000	0.005	0.000	0.031	0.004	0.011	---	---	0.100	0.02	0.02	0.02
CA06_2.0	**CA06**	**1.50 - 2.00**	**23/04/2021**	---	0.007	0.006	0.011	0.000	0.000	0.017	0.001	0.006	0.000	0.049	0.007	0.018	---	---	0.158	0.02	0.02	0.02
C05S01, C05S03	**C05**	**0.00 - 0.50**	**4/10/2017**	0.022	0.008	0.021	0.047	0.008	0.035	0.172	0.026	0.033	0.009	0.012	0.086	0.168	0.087	0.314	0.918	0.13	0.13	0.13
C06S01, C06S02	**C06**	**0.00 - 0.50**	**5/10/2017**	0.004	0.002	0.002	0.002	0.002	0.002	0.017	0.002	0.004	0.002	0.002	0.007	0.019	0.014	0.032	0.076	0.09	0.09	0.09
C06S05	**C06**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C07S01	**C07**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C08S01, C08S02	**C08**	**0.00 - 0.50**	**5/10/2017**	0.010	0.013	0.008	0.016	0.003	0.016	0.036	0.001	0.015	0.001	0.014	0.007	0.037	0.008	0.086	0.248	0.03	0.03	0.03
C08S05	**C08**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		**0.012**	**0.006**	**0.006**	**0.012**	**0.001**	**0.003**	**0.023**	**0.002**	**0.007**	**0.001**	**0.011**	**0.011**	**0.024**	**0.036**	**0.144**	**0.156**	**0.04**	**0.04**	**0.04**
		Phase 1 Dredge Area - 95% UCL		**0.022**	**0.008**	**0.008**	**0.017**	**0.002**	**0.006**	**0.036**	**0.004**	**0.010**	**0.002**	**0.016**	**0.019**	**0.037**	**0.086**	**0.313**	**0.231**	**0.05**	**0.05**	**0.05**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.

Exceedes high guideline value (GV-high)

Exceedes low guideline value (GV-low)

No guideline value exists

*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				BTEX*				TOTAL PETROLEUM HYDROCARBONS (TPH)*					TOTAL RECOVERABLE HYDROCARBONS (TRH)*									
				Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	F1: C6-C10 less BTEX	C10-C16	>C10 - C16 minus Naphthalene (F2	C16-C34	C34-C40	C10 - C40 (Sum of total)	F2-NAPHTHALENE	Aldrin	Aldrin+Dieldrin
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				0.2	0.2	0.5	0.2	3	3	3	5	3	3	3	3	3	3	5	3	3	0.0005	0.0005
ANZG Sediment Quality Guidelines (GV-high)												550										
NAGD Screening Levels (GV-low)												280										
Sample ID	Location	Depth Range (m below seabed)	Sample Date																			
C06_0.5	C06	0.00 - 0.50	22/04/2021	0.13	0.13	0.31	0.13	1.9	7.5	21.3	12.5	41.3	1.9	1.9	5.0	---	30.0	7.5	42.5	5.0	0.0003	---
C06_1.0	C06	0.50 - 1.00	22/04/2021	0.09	0.09	0.23	0.09	1.4	3.6	48.2	17.3	69.1	1.4	1.4	1.4	---	61.8	9.1	70.9	1.4	0.0002	---
C06_1.5	C06	1.00 - 1.50	22/04/2021	0.13	0.13	0.31	0.13	1.9	12.5	37.5	28.8	78.8	1.9	1.9	12.5	---	55.0	12.5	80.0	12.5	0.0003	---
CA01_0.5	CA01	0.00 - 0.50	20/04/2021	0.07	0.07	0.17	0.07	1.0	6.0	13.3	8.7	28.0	1.0	1.0	5.3	---	19.3	4.0	28.7	5.3	0.0002	---
CA01_1.0	CA01	0.50 - 1.00	20/04/2021	0.03	0.03	0.07	0.03	0.4	4.3	13.5	12.2	30.0	0.4	0.4	3.2	---	22.2	6.8	32.2	3.2	0.0001	---
CA02_0.5	CA02	0.00 - 0.50	20/04/2021	0.02	0.02	0.05	0.02	0.3	4.2	8.3	7.3	19.8	0.3	0.3	2.5	---	13.5	4.0	20.0	2.5	0.0001	---
CA02_1.0	CA02	0.50 - 1.00	20/04/2021	0.02	0.02	0.05	0.02	0.3	3.9	8.6	8.6	21.0	0.3	0.3	2.7	---	14.7	4.9	22.2	2.7	0.0001	---
CA02_1.5	CA02	1.00 - 1.50	20/04/2021	0.03	0.03	0.06	0.03	0.4	3.6	14.9	15.4	33.8	0.4	0.4	2.3	---	26.4	8.5	37.2	2.3	0.0001	---
CA02_2.0	CA02	1.50 - 2.00	20/04/2021	0.03	0.03	0.06	0.03	0.4	4.6	15.6	16.4	44.1	0.4	0.4	3.6	---	27.2	10.3	41.0	3.6	0.0001	---
CA03_0.5	CA03	0.00 - 0.50	20/04/2021	0.02	0.02	0.05	0.02	0.3	3.8	8.3	8.1	20.2	0.3	0.3	2.5	---	14.0	5.0	21.5	2.5	0.0001	---
CA03_1.0	CA03	0.50 - 1.00	20/04/2021	0.02	0.02	0.05	0.02	0.3	3.8	9.0	8.8	21.7	0.3	0.3	2.9	---	15.2	5.0	23.1	2.9	0.0000	---
CA03_1.5	CA03	1.00 - 1.50	20/04/2021	0.02	0.02	0.05	0.02	0.3	4.2	8.8	8.5	21.5	0.3	0.3	3.1	---	14.6	4.8	22.5	3.1	0.0000	---
CA04_0.5	CA04	0.00 - 0.50	20/04/2021	0.02	0.02	0.04	0.02	0.3	3.9	8.4	6.8	19.1	0.3	0.3	2.7	---	13.4	3.9	20.0	2.7	0.0000	---
CA04_1.0	CA04	0.50 - 1.00	20/04/2021	0.02	0.02	0.05	0.02	0.3	1.7	1.3	1.9	25.0	0.3	0.3	1.5	---	2.7	2.1	6.3	1.5	0.0000	---
CA04_1.5	CA04	1.00 - 1.50	20/04/2021	0.02	0.02	0.05	0.02	0.3	3.3	7.9	7.1	18.3	0.3	0.3	2.5	---	12.5	4.2	19.2	2.5	0.0001	---
CA05_0.5	CA05	0.00 - 0.50	22/04/2021	0.02	0.02	0.05	0.02	0.3	3.7	7.8	8.2	19.6	0.3	0.3	2.0	---	13.7	4.9	20.6	2.0	0.0001	---
CA05_1.0	CA05	0.50 - 1.00	22/04/2021	0.02	0.02	0.05	0.02	0.3	2.9	9.8	11.5	24.2	0.3	0.3	1.5	---	18.1	6.7	26.3	1.5	0.0001	---
CA05_1.5	CA05	1.00 - 1.50	22/04/2021	0.02	0.02	0.04	0.02	0.3	2.0	5.9	6.1	14.1	0.3	0.3	1.0	---	10.3	3.4	14.7	1.0	0.0000	---
CA05_2.0	CA05	1.50 - 2.00	22/04/2021	0.01	0.01	0.04	0.01	0.2	1.8	6.3	8.0	16.2	0.2	0.2	0.8	---	12.4	4.9	18.2	0.8	0.0000	---
CA06_0.5	CA06	0.00 - 0.50	23/04/2021	0.02	0.02	0.06	0.02	0.3	3.8	8.9	7.8	20.4	0.3	0.3	2.0	---	14.4	4.7	21.1	2.0	0.0001	---
CA06_1.0	CA06	0.50 - 1.00	23/04/2021	0.02	0.02	0.05	0.02	0.3	3.1	3.3	3.7	10.0	0.3	0.3	1.2	---	5.8	2.7	9.6	1.2	0.0000	---
CA06_1.5	CA06	1.00 - 1.50	23/04/2021	0.02	0.02	0.04	0.02	0.3	3.0	6.4	6.4	15.9	0.3	0.3	1.6	---	11.1	3.6	16.3	1.6	0.0000	---
CA06_2.0	CA06	1.50 - 2.00	23/04/2021	0.02	0.02	0.05	0.02	0.3	2.5	8.0	8.0	28.0	0.3	0.3	1.3	---	13.8	4.2	19.3	1.3	0.0000	---
C05S01, C05S03	C05	0.00 - 0.50	4/10/2017	0.13	0.13	0.32	0.13	1.9	1.9	37.2	21.8	59.0	1.9	1.9	1.9	56.4	1.9	3.2	56.4	---	0.0003	0.0003
C06S01, C06S02	C06	0.00 - 0.50	5/10/2017	0.09	0.09	0.22	0.09	1.3	1.3	21.2	15.9	37.2	1.3	1.3	1.3	1.3	33.6	5.3	38.9	---	0.0002	0.0002
C06S05	C06	1.50 - 2.00	5/10/2017	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C07S01	C07	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C08S01, C08S02	C08	0.00 - 0.50	5/10/2017	0.03	0.03	0.07	0.03	0.4	0.4	16.8	13.8	30.6	0.4	0.4	1.4	1.4	28.1	4.4	33.9	---	0.0001	0.0001
C08S05	C08	1.50 - 2.00	5/10/2017	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		0.04	0.04	0.10	0.04	0.6	3.8	13.7	10.7	29.5	0.6	0.6	2.7	19.7	19.5	5.4	29.3	2.8	0.0001	0.0002
		Phase 1 Dredge Area - 95% UCL		0.05	0.05	0.14	0.05	0.8	4.6	18.0	13.0	36.0	0.8	0.8	3.6	55.7	24.8	6.3	36.1	3.8	0.0001	0.0003

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOCHLORINE (OC) PESTICIDES*																	
				a-BHC	b-BHC	chlordane	Chlordane (cis)	DDD	4,4-DDE	DDT	DDT+DDE+DDD	d-BHC	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Hexachlorobenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.0005**	**0.0005**	**0.00025**	**0.00025**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00025**	**0.0005**
ANZG Sediment Quality Guidelines (GV-high)						**0.009**		**0.009**	**0.007**	**0.005**			**0.007**					**0.06**			**0.0014**	
NAGD Screening Levels (GV-low)						**0.0045**		**0.0035**	**0.0014**	**0.0012**			**0.0028**					**0.0027**			**0.0009**	
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C06_0.5	**C06**	**0.00 - 0.50**	**22/04/2021**	0.0003	0.0003	0.00016	0.00016	0.0003	0.0003	0.0003	0.00031	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00016	0.0003
C06_1.0	**C06**	**0.50 - 1.00**	**22/04/2021**	0.0002	0.0002	0.00011	0.00011	0.0002	0.0002	0.0002	0.00023	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00011	0.0002
C06_1.5	**C06**	**1.00 - 1.50**	**22/04/2021**	0.0003	0.0003	0.00016	0.00016	0.0003	0.0003	0.0003	0.00031	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00016	0.0003
CA01_0.5	**CA01**	**0.00 - 0.50**	**20/04/2021**	0.0002	0.0002	0.00008	0.00008	0.0002	0.0002	0.0002	0.00017	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00008	0.0002
CA01_1.0	**CA01**	**0.50 - 1.00**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA02_0.5	**CA02**	**0.00 - 0.50**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA02_1.0	**CA02**	**0.50 - 1.00**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA02_1.5	**CA02**	**1.00 - 1.50**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA02_2.0	**CA02**	**1.50 - 2.00**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA03_0.5	**CA03**	**0.00 - 0.50**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA03_1.0	**CA03**	**0.50 - 1.00**	**20/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA03_1.5	**CA03**	**1.00 - 1.50**	**20/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA04_0.5	**CA04**	**0.00 - 0.50**	**20/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA04_1.0	**CA04**	**0.50 - 1.00**	**20/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA04_1.5	**CA04**	**1.00 - 1.50**	**20/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA05_0.5	**CA05**	**0.00 - 0.50**	**22/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA05_1.0	**CA05**	**0.50 - 1.00**	**22/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA05_1.5	**CA05**	**1.00 - 1.50**	**22/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA05_2.0	**CA05**	**1.50 - 2.00**	**22/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA06_0.5	**CA06**	**0.00 - 0.50**	**23/04/2021**	0.0001	0.0001	0.00003	0.00003	0.0001	0.0001	0.0001	0.00006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
CA06_1.0	**CA06**	**0.50 - 1.00**	**23/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA06_1.5	**CA06**	**1.00 - 1.50**	**23/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
CA06_2.0	**CA06**	**1.50 - 2.00**	**23/04/2021**	0.0000	0.0000	0.00002	0.00002	0.0000	0.0000	0.0000	0.00005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00002	0.0000
C05S01, C05S03	**C05**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.00032	0.00032	0.0003	0.0003	0.0003	---	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00016	0.0003
C06S01, C06S02	**C06**	**0.00 - 0.50**	**5/10/2017**	0.0002	0.0002	0.00022	0.00022	0.0002	0.0002	0.0002	---	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00011	0.0002
C06S05	**C06**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C07S01	**C07**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C08S01, C08S02	**C08**	**0.00 - 0.50**	**5/10/2017**	0.0001	0.0001	0.00007	0.00007	0.0001	0.0001	0.0001	---	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
C08S05	**C08**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		**0.0001**	**0.0001**	**0.00006**	**0.00006**	**0.0001**	**0.0001**	**0.0001**	**0.00009**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.00005**	**0.0001**
		Phase 1 Dredge Area - 95% UCL		**0.0001**	**0.0001**	**0.00009**	**0.00009**	**0.0001**	**0.0001**	**0.0001**	**0.00012**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.00007**	**0.0001**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

								ORGANOPHOSPHATE (OP) PESTICIDES*													
				Heptachlor	Heptachlor epoxide	Methoxychlor	Oxychlordane	Chlordane (trans)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos E	cis-Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00025**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
ANZG Sediment Quality Guidelines (GV-high)																					
NAGD Screening Levels (GV-low)																					
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																		
C06_0.5	**C06**	**0.00 - 0.50**	**22/04/2021**	0.0003	0.0003	0.0003	0.0003	0.00016	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
C06_1.0	**C06**	**0.50 - 1.00**	**22/04/2021**	0.0002	0.0002	0.0002	0.0002	0.00011	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
C06_1.5	**C06**	**1.00 - 1.50**	**22/04/2021**	0.0003	0.0003	0.0003	0.0003	0.00016	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
CA01_0.5	**CA01**	**0.00 - 0.50**	**20/04/2021**	0.0002	0.0002	0.0002	0.0002	0.00008	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
CA01_1.0	**CA01**	**0.50 - 1.00**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA02_0.5	**CA02**	**0.00 - 0.50**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA02_1.0	**CA02**	**0.50 - 1.00**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA02_1.5	**CA02**	**1.00 - 1.50**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA02_2.0	**CA02**	**1.50 - 2.00**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA03_0.5	**CA03**	**0.00 - 0.50**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA03_1.0	**CA03**	**0.50 - 1.00**	**20/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA03_1.5	**CA03**	**1.00 - 1.50**	**20/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA04_0.5	**CA04**	**0.00 - 0.50**	**20/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA04_1.0	**CA04**	**0.50 - 1.00**	**20/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA04_1.5	**CA04**	**1.00 - 1.50**	**20/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA05_0.5	**CA05**	**0.00 - 0.50**	**22/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA05_1.0	**CA05**	**0.50 - 1.00**	**22/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA05_1.5	**CA05**	**1.00 - 1.50**	**22/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA05_2.0	**CA05**	**1.50 - 2.00**	**22/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA06_0.5	**CA06**	**0.00 - 0.50**	**23/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA06_1.0	**CA06**	**0.50 - 1.00**	**23/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA06_1.5	**CA06**	**1.00 - 1.50**	**23/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CA06_2.0	**CA06**	**1.50 - 2.00**	**23/04/2021**	0.0000	0.0000	0.0000	0.0000	0.00002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
C05S01, C05S03	**C05**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.0003	0.0003	0.00032	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
C06S01, C06S02	**C06**	**0.00 - 0.50**	**5/10/2017**	0.0002	0.0002	0.0002	0.0002	0.00022	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
C06S05	**C06**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C07S01	**C07**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C08S01, C08S02	**C08**	**0.00 - 0.50**	**5/10/2017**	0.0001	0.0001	0.0001	0.0001	0.00007	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
C08S05	**C08**	**1.50 - 2.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.00006**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**
		Phase 1 Dredge Area - 95% UCL		**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.00009**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**	**0.003**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOPHOSPHATE (OP) PESTICIDES*						
				Azinophos methyl	Monocrotophos	Parathion	Methyl parathion	Pirimphos-ethyl	Prothiofos	Moisture Content
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
Limit of Reporting (LoR) - for 2021 analysis				0.01	0.01	0.01	0.01	0.01	0.01	1
ANZG Sediment Quality Guidelines (GV-high)										
NAGD Screening Levels (GV-low)										
Sample ID	Location	Depth Range (m below seabed)	Sample Date							
C06_0.5	C06	0.00 - 0.50	22/04/2021	0.006	0.006	0.006	0.006	0.006	0.006	35.4
C06_1.0	C06	0.50 - 1.00	22/04/2021	0.005	0.005	0.005	0.005	0.005	0.005	35.3
C06_1.5	C06	1.00 - 1.50	22/04/2021	0.006	0.006	0.006	0.006	0.006	0.006	43.9
CA01_0.5	CA01	0.00 - 0.50	20/04/2021	0.003	0.003	0.003	0.003	0.003	0.003	37.1
CA01_1.0	CA01	0.50 - 1.00	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	51.7
CA02_0.5	CA02	0.00 - 0.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.7
CA02_1.0	CA02	0.50 - 1.00	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.5
CA02_1.5	CA02	1.00 - 1.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	56.0
CA02_2.0	CA02	1.50 - 2.00	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	59.8
CA03_0.5	CA03	0.00 - 0.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	64.4
CA03_1.0	CA03	0.50 - 1.00	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.9
CA03_1.5	CA03	1.00 - 1.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.6
CA04_0.5	CA04	0.00 - 0.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	66.1
CA04_1.0	CA04	0.50 - 1.00	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	63.9
CA04_1.5	CA04	1.00 - 1.50	20/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	59.1
CA05_0.5	CA05	0.00 - 0.50	22/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	59.3
CA05_1.0	CA05	0.50 - 1.00	22/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	58.9
CA05_1.5	CA05	1.00 - 1.50	22/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	62.1
CA05_2.0	CA05	1.50 - 2.00	22/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	59.2
CA06_0.5	CA06	0.00 - 0.50	23/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	62.4
CA06_1.0	CA06	0.50 - 1.00	23/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.4
CA06_1.5	CA06	1.00 - 1.50	23/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	60.6
CA06_2.0	CA06	1.50 - 2.00	23/04/2021	0.001	0.001	0.001	0.001	0.001	0.001	59.7
C05S01, C05S03	C05	0.00 - 0.50	4/10/2017	0.006	0.006	0.006	0.006	0.006	0.006	---
C06S01, C06S02	C06	0.00 - 0.50	5/10/2017	0.004	0.004	0.004	0.004	0.004	0.004	---
C06S05	C06	1.50 - 2.00	5/10/2017	---	---	---	---	---	---	---
C07S01	C07	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---
C08S01, C08S02	C08	0.00 - 0.50	5/10/2017	0.001	0.001	0.001	0.001	0.001	0.001	---
C08S05	C08	1.50 - 2.00	5/10/2017	---	---	---	---	---	---	---
		Phase 1 Dredge Area - Mean		0.002	0.002	0.002	0.002	0.002	0.002	56.4
		Phase 1 Dredge Area - 95% UCL		0.003	0.003	0.003	0.003	0.003	0.003	60.2

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References:
ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

APPENDIX

B

PHASE 2 DREDGING SEDIMENT QUALITY ANALYSIS RESULTS

Cardno

now

Stantec

				METALS																	
				Aluminium (total)	Antimony (total)	Arsenic (total)	Cadmium (total)	Chromium (total)	Copper (total)	Cobalt (total)	Hexavalent Chromium	Iron (total)	Lead (total)	Manganese (total)	Mercury (total)	Nickel (total)	Selenium (total)	Silver (total)	Thorium (total)	Uranium (total)	Vandium (total)	Zinc (total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**10**	**0.2**	**0.1**	**0.02**	**0.2**	**0.2**	**0.1**	**1**	**10**	**0.1**	**0.2**	**0.01**	**0.2**	**0.1**	**0.02**	**0.1**	**0.1**	**0.2**	**0.5**
ANZG Sediment Quality Guidelines (GV-high)					**25**	**70**	**10**	**370**	**270**				**220**		**1**	**52**		**4**				**410**
NAGD Screening Levels (GV-low)					**2**	**20**	**1.5**	**80**	**65**				**50**		**0.15**	**21**		**1**				**200**
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	3800	0.40	3.3	0.04	15.0	170	1.1	0.5	8100	15	67	0.02	2.8	0.1	0.02	8.1	1.5	19	45
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	3900	0.30	3.2	0.08	15.0	160	1.1	0.5	7800	15	69	0.02	2.6	0.1	0.03	9	1.4	19	47
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	780	0.10	3	0.04	7.1	2	0.3	0.5	1900	1.1	32	0.005	0.8	0.1	0.01	0.8	1.4	5.8	1.4
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	1300	0.20	3.3	0.04	8.3	44	0.4	0.5	3200	5	44	0.005	1.1	0.1	0.01	2.7	0.9	9.2	19
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	730	0.10	3.5	0.04	6.5	3	0.3	0.5	2300	2.8	30	0.005	1.1	0.1	0.01	0.7	1.9	7.5	2.6
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	5600	0.50	4.7	0.06	22.0	24	1.8	0.5	12000	17	98	0.03	4.1	0.1	0.02	13	2.1	28	47
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	9300	1.50	8.2	0.17	42.0	26	3.5	0.5	17000	20	120	0.05	7.7	0.3	0.04	9.7	3.7	41	51
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	3490	0.69	12	0.05	12.9	14	2.0	---	9660	9	67	0.05	4.2	0.5	0.1	1.6	1.5	20	30
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	890	0.25	4	0.05	8.9	17	0.3	---	2740	4	43	0.01	1.1	0.1	0.1	1.6	1.2	7	19
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	680	0.25	4	0.05	7.5	12	0.3	---	2100	2	40	0.01	1.0	0.1	0.05	0.6	1.2	7	5
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	2600	0.25	9	0.05	14.2	33	1.2	---	6730	6	83	0.02	2.6	0.3	0.05	1.5	1.5	16	35
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	4420	2.61	11	0.2	17.2	11	2.7	---	11900	12	87	0.05	5.9	0.6	0.05	2.5	3.4	29	28
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	5290	1.02	19	0.2	25.3	28	3.4	---	14800	14	144	0.09	7.0	0.7	0.2	1.8	3.2	40	50
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	7960	0.25	15	0.1	25.7	15	4.6	---	18100	21	126	0.17	9.8	1.0	0.1	2.6	2.7	59	25
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	6430	0.53	25	0.1	28.6	50	3.8	---	18500	18	193	0.13	9.1	0.8	0.1	2.4	2.4	49	76
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	9600	0.25	23	0.1	31.1	40	4.8	---	24700	20	176	0.17	8.7	0.9	0.05	3.5	2.9	61	65
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	1230	0.25	5	0.05	7.1	9	0.6	---	3310	3	40	0.01	1.3	0.2	0.05	1.2	1.1	7	24
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	7430	0.25	11	0.05	16.6	11	3.8	---	15600	15	79	0.17	7.5	0.8	0.05	3.2	2.6	37	21
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	2560	0.25	8	0.05	11.8	24	1.2	---	6900	7	75	0.02	2.4	0.3	0.05	1.4	1.1	17	34
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	2040	0.25	8	0.05	11.3	14	0.9	---	5030	5	70	0.04	1.8	0.2	0.05	1.3	1.2	13	22
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	1670	0.25	10	0.05	8.2	11	0.9	---	5700	4	52	0.02	1.9	0.3	0.05	1.3	1.1	10	57
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	3460	0.25	12	0.05	15.6	16	1.6	---	8680	9	81	0.05	3.2	0.3	0.05	1.7	2	22	27
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	2300	0.25	11	0.05	12.8	15	1.3	---	6530	6	73	0.05	2.8	0.3	0.05	1.2	2	19	30
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	8720	0.25	15	0.1	20.5	23	4.8	---	20700	21	115	0.17	10.4	1.1	0.1	3.2	3.6	48	40
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	5790	0.25	23	0.1	25.1	45	2.9	---	16200	13	135	0.16	5.7	0.6	0.05	2.1	1.8	38	71
		Phase 2 Dredge Area - Mean		**4079**	**0.46**	**10.1**	**0.08**	**16.7**	**33**	**2.0**	**0.5**	**10007**	**11**	**86**	**0.06**	**4.3**	**0.4**	**0.06**	**3.1**	**2.0**	**25**	**35**
		Phase 2 Dredge Area - 95% UCL		**5199**	**0.67**	**12.7**	**0.10**	**20.2**	**49**	**2.6**	**0.5**	**12581**	**13**	**103**	**0.08**	**5.5**	**0.5**	**0.07**	**4.4**	**2.3**	**32**	**43**
		Phase 2A Dredge Area - Mean		**3091**	**0.59**	**5.2**	**0.07**	**14.9**	**46**	**1.2**	**0.5**	**6888**	**9**	**65**	**0.02**	**2.8**	**0.2**	**0.04**	**4.6**	**1.8**	**17**	**27**
		Phase 2A Dredge Area - 95% UCL		**4685**	**1.05**	**6.8**	**0.11**	**21.0**	**81**	**1.8**	**---**	**9875**	**13**	**82**	**0.03**	**4.1**	**0.3**	**0.05**	**7.2**	**2.4**	**24**	**39**
		Phase 2B Dredge Area - Mean		**4855**	**0.36**	**14.0**	**0.08**	**18.0**	**22**	**2.6**	**---**	**12458**	**12**	**102**	**0.09**	**5.4**	**0.6**	**0.08**	**2.0**	**2.1**	**31**	**41**
		Phase 2B Dredge Area - 95% UCL		**6337**	**0.48**	**17.2**	**0.10**	**22.2**	**29**	**3.4**	**---**	**15981**	**15**	**126**	**0.13**	**7.1**	**0.7**	**0.10**	**2.5**	**2.5**	**41**	**51**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOTINS*			TOC	NUTRIENTS								POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*						
				Monobutyltin	Tributyltin	Dibutyltin	Total Organic Carbon	TOTAL Phosphorus	Reactive Phosphorus as P	Nitrogen (Total)	Kjeldahl Nitrogen Total	Ammonia as N	Nitrate (as N)	Nitrite (as N)	NOx as N in water	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene
				µgSn/kg	µgSn/kg	µgSn/kg	% C	mg.P/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**1**	**0.5**	**1**	**0.1**	**0.05**	**0.1**	**20**	**20**	**20**	**0.1**	**0.1**	**0.1**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**
ANZG Sediment Quality Guidelines (GV-high)					**70**																	
NAGD Screening Levels (GV-low)					**9**																	
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	2.9	235.7	64.3	0.7	0.3	0.2	660	660	10	0.05	0.05	0.05	0.0036	0.0071	0.0086	0.0071	0.0214	0.0243	0.0300
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	37.1	180.0	174.3	0.7	0.3	0.1	350	350	10	0.05	0.05	0.05	0.0036	0.0029	0.0029	0.0029	0.0029	0.0029	0.0071
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	1.7	17.7	3.3	0.3	0.2	0.1	200	200	10	0.05	0.05	0.05	0.0083	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	23.3	753.3	23.3	0.3	0.2	0.1	300	300	10	0.05	0.05	0.05	0.0083	0.0067	0.0067	0.0233	0.0633	0.0733	0.0567
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	3.3	5.6	5.6	0.9	0.2	0.1	280	280	10	0.05	0.05	0.05	0.0028	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	0.2	4.0	0.8	2.4	0.4	0.1	1510	1510	10	0.05	0.05	0.05	0.0021	0.0008	0.0021	0.0025	0.0042	0.0054	0.0075
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	0.7	3.0	4.0	3.0	0.7	0.1	1630	1630	10	0.05	0.05	0.05	0.0023	0.0007	0.0040	0.0037	0.0057	0.0080	0.0083
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	---	3.8	2.1	1.0	0.4	0.3	860	860	10	---	---	0.05	0.0074	0.0053	0.0074	0.0063	0.0168	0.0105	0.0137
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	---	23.0	1.9	1.1	0.3	0.1	670	670	10	---	---	0.05	0.0023	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	---	---	---	---	0.1	0.1	190	190	10	---	---	0.05	---	---	---	---	---	---	---
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	---	337.6	56.5	0.9	0.3	0.2	810	810	10	---	---	0.1	0.0029	0.0024	0.0047	0.0024	0.0200	0.0165	0.0094
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	4.3	0.7	1.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	---	1.4	1.4	1.4	---	---	---	---	---	---	---	---	0.0018	0.0014	0.0043	0.0036	0.0100	0.0078	0.0093
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	---	---	---	3.7	0.5	0.4	3000	3000	10	---	---	0.05	0.0007	0.0005	0.0005	0.0005	0.0090	0.0005	0.0104
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	---	---	---	2.8	0.5	0.2	2590	2590	10	---	---	0.2	0.0009	0.0007	0.0007	0.0007	0.0130	0.0007	0.0007
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	---	2.2	1.4	0.4	---	---	---	---	---	---	---	---	0.0069	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	0.6	1.3	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	---	---	---	---	0.3	0.2	1500	1500	10	---	---	0.05	---	---	---	---	---	---	---
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	0.3	0.2	680	680	10	---	---	0.05	---	---	---	---	---	---	---
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	---	---	---	1.1	0.3	0.2	400	400	10	---	---	0.1	0.0023	0.0019	0.0019	0.0065	0.0308	0.0196	0.0131
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	---	1.0	1.3	0.8	---	---	---	---	---	---	---	---	0.0031	0.0025	0.0063	0.0025	0.0213	0.0163	0.0100
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	0.3	0.2	880	880	10	---	---	0.1	---	---	---	---	---	---	---
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	---	0.9	0.7	0.7	0.2	0.2	630	630	10	---	---	0.05	0.0036	0.0029	0.0029	0.0029	0.0600	0.0029	0.0329
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	---	---	---	---	0.4	0.2	2220	2220	10	---	---	0.05	---	---	---	---	---	---	---
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		**9.9**	**98.4**	**21.4**	**1.2**	**0.3**	**0.2**	**1019**	**1019**	**10**	**0.05**	**0.05**	**0.1**	**0.0037**	**0.0031**	**0.0041**	**0.0048**	**0.0173**	**0.0121**	**0.0133**
		Phase 2 Dredge Area - 95% UCL		**20.6**	**197.6**	**43.7**	**1.6**	**0.4**	**0.2**	**1394**	**1394**	**10**	**0.05**	**0.05**	**0.1**	**0.0049**	**0.0041**	**0.0052**	**0.0073**	**0.0262**	**0.0203**	**0.0200**
		Phase 2A Dredge Area - Mean		**9.9**	**142.3**	**30.6**	**1.2**	**0.3**	**0.1**	**660**	**660**	**10**	**0.05**	**0.05**	**0.1**	**0.0038**	**0.0033**	**0.0044**	**0.0056**	**0.0138**	**0.0149**	**0.0139**
		Phase 2A Dredge Area - 95% UCL		**20.6**	**280.6**	**61.8**	**1.7**	**0.4**	**0.1**	**986**	**986**	**---**	**0.05**	**0.05**	**0.1**	**0.0053**	**0.0048**	**0.0058**	**0.0096**	**0.0255**	**0.0283**	**0.0244**
		Phase 2B Dredge Area - Mean		**---**	**1.7**	**1.3**	**1.2**	**0.4**	**0.2**	**1418**	**1418**	**10**	**---**	**---**	**0.1**	**0.0036**	**0.0028**	**0.0036**	**0.0036**	**0.0224**	**0.0080**	**0.0123**
		Phase 2B Dredge Area - 95% UCL		**---**	**2.9**	**1.8**	**2.0**	**0.4**	**0.3**	**2043**	**2043**	**---**	**---**	**---**	**0.1**	**0.0055**	**0.0042**	**0.0057**	**0.0055**	**0.0361**	**0.0137**	**0.0198**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*															BTEX*		
				Benz(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	LMW PAHs	HMW PAHs	PAHs (Sum of total)	Benzene	Ethylbenzene	Toluene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.004**	**0.004**	**0.004**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.2**	**0.2**	**0.2**
ANZG Sediment Quality Guidelines (GV-high)																			**50**			
NAGD Screening Levels (GV-low)																			**10**			
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	---	0.0171	0.0143	0.0343	0.0036	0.0071	0.0529	0.0071	0.0171	0.0036	0.0057	0.0314	0.0543	---	---	0.3643	0.1	0.1	0.1
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	---	0.0029	0.0029	0.0086	0.0036	0.0029	0.0114	0.0029	0.0029	0.0036	0.0029	0.0057	0.0143	---	---	0.0471	0.1	0.1	0.1
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	---	0.0067	0.0067	0.0067	0.0083	0.0067	0.0067	0.0067	0.0067	0.0083	0.0067	0.0067	0.0067	---	---	0.0067	0.3	0.3	0.3
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	---	0.0367	0.0267	0.0867	0.0083	0.0067	0.0900	0.0067	0.0333	0.0083	0.0067	0.0700	0.1400	---	---	0.7433	0.3	0.3	0.3
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	---	0.0022	0.0022	0.0022	0.0028	0.0022	0.0022	0.0022	0.0067	0.0028	0.0022	0.0022	0.0022	---	---	0.0067	0.1	0.1	0.1
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	---	0.0033	0.0033	0.0071	0.0010	0.0008	0.0100	0.0021	0.0033	0.0010	0.0021	0.0050	0.0125	---	---	0.0758	0.0	0.0	0.0
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	---	0.0047	0.0047	0.0083	0.0008	0.0007	0.0133	0.0007	0.0047	0.0008	0.0027	0.0080	0.0153	---	---	0.0983	0.0	0.0	0.0
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	0.0074	0.0021	0.0021	0.0053	0.0026	0.0095	0.0453	0.0147	0.0074	0.0105	0.0021	0.0158	0.0495	0.0319	0.0728	0.2326	0.1	0.1	0.1
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	0.0019	0.0019	0.0019	0.0019	0.0023	0.0019	0.0019	0.0019	0.0065	0.0023	0.0019	0.0019	0.0019	0.0129	0.0119	0.0065	0.1	0.1	0.1
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	0.0082	0.0024	0.0071	0.0094	0.0029	0.0106	0.0329	0.0047	0.0094	0.0029	0.0024	0.0153	0.0341	0.0219	0.0657	0.1824	0.1	0.1	0.1
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	0.0036	0.0014	0.0043	0.0014	0.0018	0.0078	0.0192	0.0093	0.0064	0.0064	0.0036	0.0071	0.0256	0.0174	0.0390	0.1281	0.1	0.1	0.1
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	0.0027	0.0041	0.0025	0.0036	0.0007	0.0005	0.0186	0.0005	0.0066	0.0007	0.0027	0.0038	0.0104	0.0052	0.0233	0.0743	0.0	0.0	0.0
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	0.0025	0.0036	0.0007	0.0033	0.0009	0.0007	0.0199	0.0007	0.0080	0.0009	0.0007	0.0058	0.0156	0.0079	0.0295	0.0717	0.0	0.0	0.0
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	0.0056	0.0056	0.0056	0.0056	0.0069	0.0056	0.0139	0.0167	0.0056	0.0069	0.0056	0.0056	0.0222	0.0414	0.0428	0.0528	0.3	0.3	0.3
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	0.0065	0.0019	0.0112	0.0112	0.0023	0.0093	0.0458	0.0019	0.0084	0.0023	0.0019	0.0121	0.0458	0.0189	0.0865	0.2206	0.1	0.1	0.1
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	0.0063	0.0025	0.0088	0.0025	0.0031	0.0113	0.0275	0.0025	0.0100	0.0031	0.0025	0.0075	0.0325	0.0186	0.0605	0.1575	0.1	0.1	0.1
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	0.0029	0.0029	0.0029	0.0257	0.0036	0.0029	0.0029	0.0029	0.0143	0.0036	0.0029	0.0029	0.0029	0.0198	0.0578	0.1329	0.1	0.1	0.1
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		**0.0048**	**0.0060**	**0.0063**	**0.0132**	**0.0033**	**0.0051**	**0.0244**	**0.0049**	**0.0092**	**0.0040**	**0.0032**	**0.0122**	**0.0286**	**0.0196**	**0.0490**	**0.1530**	**0.1**	**0.1**	**0.1**
		Phase 2 Dredge Area - 95% UCL		**0.0062**	**0.0101**	**0.0094**	**0.0231**	**0.0044**	**0.0069**	**0.0354**	**0.0072**	**0.0127**	**0.0054**	**0.0041**	**0.0200**	**0.0443**	**0.0262**	**0.0636**	**0.2382**	**0.2**	**0.2**	**0.2**
		Phase 2A Dredge Area - Mean		**0.0046**	**0.0079**	**0.0074**	**0.0167**	**0.0036**	**0.0047**	**0.0241**	**0.0044**	**0.0097**	**0.0040**	**0.0037**	**0.0153**	**0.0307**	**0.0174**	**0.0389**	**0.1659**	**0.1**	**0.1**	**0.1**
		Phase 2A Dredge Area - 95% UCL		**0.0083**	**0.0148**	**0.0122**	**0.0330**	**0.0052**	**0.0069**	**0.0414**	**0.0062**	**0.0154**	**0.0057**	**0.0049**	**0.0284**	**0.0565**	**0.0225**	**0.0693**	**0.3087**	**0.2**	**0.2**	**0.2**
		Phase 2B Dredge Area - Mean		**0.0048**	**0.0032**	**0.0048**	**0.0082**	**0.0029**	**0.0057**	**0.0248**	**0.0057**	**0.0086**	**0.0040**	**0.0026**	**0.0076**	**0.0255**	**0.0205**	**0.0533**	**0.1346**	**0.1**	**0.1**	**0.1**
		Phase 2B Dredge Area - 95% UCL		**0.0064**	**0.0042**	**0.0077**	**0.0143**	**0.0044**	**0.0090**	**0.0367**	**0.0108**	**0.0107**	**0.0066**	**0.0037**	**0.0111**	**0.0387**	**0.0299**	**0.0702**	**0.1886**	**0.2**	**0.2**	**0.2**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				BTEX*				TOTAL PETROLEUM HYDROCARBONS (TPH)*					TOTAL RECOVERABLE HYDROCARBONS (TRH)*									
				Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	F1: C6-C10 less BTEX	C10-C16	>C10 - C16 minus Naphthalene (F2	C16-C34	C34-C40	C10 - C40 (Sum of total)	F2-NAPHTHALENE	Aldrin	Aldrin+Dieldrin
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.2**	**0.2**	**0.5**	**0.2**	**3**	**3**	**3**	**5**	**3**	**3**	**3**	**3**	**3**	**3**	**5**	**3**	**3**	**0.0005**	**0.0005**
ANZG Sediment Quality Guidelines (GV-high)												**550**										
NAGD Screening Levels (GV-low)												**280**										
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	0.1	0.1	0.4	0.1	2.1	8.6	25.7	21.4	55.7	2.1	2.1	5.7	---	41.4	12.9	60.0	5.7	0.0004	---
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	0.1	0.1	0.4	0.1	2.1	4.3	12.9	12.9	30.0	2.1	2.1	2.1	---	21.4	10.0	31.4	2.1	0.0004	---
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	0.3	0.3	0.8	0.3	5.0	5.0	5.0	8.3	5.0	5.0	5.0	5.0	---	5.0	8.3	5.0	5.0	0.0008	---
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	0.3	0.3	0.8	0.3	5.0	23.3	50.0	50.0	123.3	5.0	5.0	13.3	---	86.7	30.0	130.0	13.3	0.0008	---
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	0.1	0.1	0.3	0.1	1.7	5.6	6.7	2.8	12.2	1.7	1.7	3.3	---	7.8	2.8	11.1	3.3	0.0003	---
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	0.0	0.0	0.1	0.0	0.6	4.6	15.0	10.4	30.0	0.6	0.6	3.3	---	22.1	5.8	31.3	3.3	0.0001	---
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	0.0	0.0	0.1	0.0	0.5	2.7	11.3	10.3	24.3	0.5	0.5	2.0	---	18.7	6.7	27.3	2.0	0.0001	---
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	0.1	0.1	0.3	0.1	1.6	1.6	32.6	20.0	52.6	1.6	1.6	3.2	47.4	3.2	8.4	58.9	---	0.0003	0.0003
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	0.1	0.1	0.2	0.1	1.4	1.4	9.3	2.3	9.3	1.4	1.4	1.4	1.4	12.1	2.3	12.1	---	0.0002	0.0002
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	0.1	0.1	0.3	0.1	1.8	1.8	22.4	20.0	42.4	1.8	1.8	1.8	1.8	38.8	7.1	45.9	---	0.0003	0.0003
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	0.1	0.1	0.2	0.1	1.1	1.1	34.9	27.8	62.6	1.1	1.1	3.6	56.2	3.6	10.0	69.8	---	0.0002	0.0002
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	0.0	0.0	0.1	0.0	1.4	0.4	5.7	4.4	10.1	0.4	0.4	0.4	0.4	9.0	0.7	9.0	---	0.0001	0.0001
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	0.0	0.0	0.1	0.0	0.5	0.5	12.0	8.0	19.9	0.5	0.5	1.1	1.1	18.1	2.5	21.7	---	0.0001	0.0001
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	0.3	0.3	0.7	0.3	4.2	4.2	25.0	6.9	25.0	4.2	4.2	4.2	36.1	4.2	6.9	36.1	---	0.0007	0.0007
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	0.1	0.1	0.2	0.1	1.4	1.4	12.1	9.3	21.5	1.4	1.4	1.4	1.4	18.7	2.3	18.7	---	0.0002	0.0002
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	0.1	0.1	0.3	0.1	1.9	1.9	13.8	8.8	22.5	1.9	1.9	1.9	21.3	1.9	3.1	21.3	---	0.0003	0.0003
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	0.1	0.1	0.4	0.1	2.1	2.1	14.3	10.0	24.3	2.1	2.1	2.1	2.1	22.9	3.6	22.9	---	0.0004	0.0004
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		**0.1**	**0.1**	**0.3**	**0.1**	**2.0**	**4.1**	**18.2**	**13.7**	**33.6**	**2.0**	**2.0**	**3.3**	**16.9**	**19.7**	**7.3**	**36.0**	**5.0**	**0.0003**	**0.0003**
		Phase 2 Dredge Area - 95% UCL		**0.2**	**0.2**	**0.4**	**0.2**	**2.7**	**6.7**	**23.9**	**19.3**	**47.1**	**2.7**	**2.7**	**4.7**	**30.5**	**29.7**	**10.5**	**50.6**	**7.9**	**0.0004**	**0.0004**
		Phase 2A Dredge Area - Mean		**0.1**	**0.1**	**0.4**	**0.1**	**2.1**	**5.8**	**19.3**	**16.6**	**39.5**	**2.1**	**2.1**	**4.2**	**19.8**	**25.8**	**9.6**	**42.4**	**5.0**	**0.0004**	**0.0002**
		Phase 2A Dredge Area - 95% UCL		**0.2**	**0.2**	**0.5**	**0.2**	**3.1**	**9.9**	**28.1**	**25.5**	**61.2**	**3.1**	**3.1**	**6.3**	**55.5**	**41.3**	**14.5**	**65.5**	**7.9**	**0.0005**	**0.0003**
		Phase 2B Dredge Area - Mean		**0.1**	**0.1**	**0.3**	**0.1**	**1.9**	**1.7**	**16.5**	**9.6**	**25.1**	**1.7**	**1.7**	**2.0**	**15.7**	**11.1**	**3.9**	**26.9**	**---**	**0.0003**	**0.0003**
		Phase 2B Dredge Area - 95% UCL		**0.2**	**0.2**	**0.4**	**0.2**	**2.7**	**2.7**	**23.3**	**13.3**	**34.8**	**2.7**	**2.7**	**3.0**	**30.1**	**17.5**	**6.0**	**38.9**	**---**	**0.0004**	**0.0004**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.

Exceedes high guideline value (GV-high)

Exceedes low guideline value (GV-low)

No guideline value exists

*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOCHLORINE (OC) PESTICIDES*																	
				a-BHC	b-BHC	chlordane	Chlordane (cis)	DDD	4,4-DDE	DDT	DDT+DDE+DDD	d-BHC	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Hexachlorobenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.0005**	**0.0005**	**0.00025**	**0.00025**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00025**	**0.0005**
ANZG Sediment Quality Guidelines (GV-high)						**0.009**		**0.009**	**0.007**	**0.005**			**0.007**					**0.06**			**0.0014**	
NAGD Screening Levels (GV-low)						**0.0045**		**0.0035**	**0.0014**	**0.0012**			**0.0028**					**0.0027**			**0.0009**	
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	0.0004	0.0004	0.00018	0.00018	0.0070	0.0113	0.0051	0.0234	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00018	0.0004
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	0.0004	0.0004	0.00018	0.00018	0.0004	0.0017	0.0004	0.0017	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00018	0.0004
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	0.0008	0.0008	0.00042	0.00042	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.00042	0.0008
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	0.0008	0.0008	0.00042	0.00042	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.00042	0.0008
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	0.0003	0.0003	0.00014	0.00014	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00014	0.0003
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	0.0001	0.0001	0.00005	0.00005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00005	0.0001
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	0.0001	0.0001	0.00004	0.00004	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00004	0.0001
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.00026	0.00026	0.0003	0.0003	0.0003	---	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00013	0.0003
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	0.0002	0.0002	0.00023	0.00023	0.0002	0.0008	0.0098	---	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00012	0.0002
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	0.0003	0.0003	0.00029	0.00029	0.0008	0.0010	0.0037	---	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00015	0.0003
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	0.0002	0.0002	0.00018	0.00018	0.0002	0.0002	0.0002	---	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00009	0.0002
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	0.0001	0.0001	0.00007	0.00007	0.0001	0.0001	0.0001	---	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.0001
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	0.0001	0.0001	0.00009	0.00009	0.0001	0.0001	0.0001	---	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00005	0.0001
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	0.0007	0.0007	0.00069	0.00069	0.0007	0.0007	0.0007	---	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.00035	0.0007
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	0.0002	0.0002	0.00023	0.00023	0.0002	0.0002	0.0002	---	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00012	0.0002
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.00031	0.00031	0.0003	0.0003	0.0003	---	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00016	0.0003
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	0.0004	0.0004	0.00036	0.00036	0.0004	0.0004	0.0004	---	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00018	0.0004
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		**0.0003**	**0.0003**	**0.00024**	**0.00024**	**0.0008**	**0.0011**	**0.0014**	**0.0039**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00016**	**0.0003**
		Phase 2 Dredge Area - 95% UCL		**0.0004**	**0.0004**	**0.00032**	**0.00032**	**0.0015**	**0.0024**	**0.0026**	**0.0103**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00022**	**0.0004**
		Phase 2A Dredge Area - Mean		**0.0004**	**0.0004**	**0.00021**	**0.00021**	**0.0011**	**0.0017**	**0.0021**	**0.0039**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00018**	**0.0004**
		Phase 2A Dredge Area - 95% UCL		**0.0005**	**0.0005**	**0.00029**	**0.00029**	**0.0024**	**0.0038**	**0.0041**	**0.0103**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00026**	**0.0005**
		Phase 2B Dredge Area - Mean		**0.0003**	**0.0003**	**0.00029**	**0.00029**	**0.0003**	**0.0003**	**0.0003**	**---**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00014**	**0.0003**
		Phase 2B Dredge Area - 95% UCL		**0.0004**	**0.0004**	**0.00044**	**0.00044**	**0.0004**	**0.0004**	**0.0004**	**---**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00022**	**0.0004**

Indicates laboratory analysis result below LoR: Value reported as half LoR for calculation of summary statistics.

Exceedes high guideline value (GV-high)

Exceedes low guideline value (GV-low)

No guideline value exists

*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean

'---' = Not tested

GV-high = ANZG high guideline values for sediment quality

GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.

NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

								ORGANOPHOSPHATE (OP) PESTICIDES*													
				Heptachlor	Heptachlor epoxide	Methoxychlor	Oxychlordane	Chlordane (trans)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos E	cis-Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00025**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
ANZG Sediment Quality Guidelines (GV-high)																					
NAGD Screening Levels (GV-low)																					
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																		
C02_0.5	**C02**	**0.00 - 0.50**	**21/04/2021**	0.0004	0.0004	0.0004	0.0004	0.00018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C02_1.0	**C02**	**0.50 - 1.00**	**21/04/2021**	0.0004	0.0004	0.0004	0.0004	0.00018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C02_1.5	**C02**	**1.00 - 1.50**	**21/04/2021**	0.0008	0.0008	0.0008	0.0008	0.00042	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
C03_0.5	**C03**	**0.00 - 0.50**	**21/04/2021**	0.0008	0.0008	0.0008	0.0008	0.00042	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
C03_1.0	**C03**	**0.50 - 1.00**	**21/04/2021**	0.0003	0.0003	0.0003	0.0003	0.00014	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C04_0.5	**C04**	**0.00 - 0.50**	**21/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C04_1.0	**C04**	**0.50 - 1.00**	**21/04/2021**	0.0001	0.0001	0.0001	0.0001	0.00004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C01S01, C01S02	**C01**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.0003	0.0003	0.00026	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C02S01	**C02**	**0.00 - 0.50**	**3/10/2017**	0.0002	0.0002	0.0002	0.0002	0.00023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C02S03	**C02**	**0.50 - 1.00**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C03S01	**C03**	**0.00 - 0.50**	**5/10/2017**	0.0003	0.0003	0.0003	0.0003	0.00029	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C03S03, C03S04	**C03**	**0.50 - 1.00**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C04S01, C04S02	**C04**	**0.00 - 0.50**	**4/10/2017**	0.0002	0.0002	0.0002	0.0002	0.00018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C09S01	**C09**	**0.00 - 0.50**	**3/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C09S03	**C09**	**0.50 - 1.00**	**3/10/2017**	0.0001	0.0001	0.0001	0.0001	0.00007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C10S02	**C10**	**0.00 - 0.50**	**3/10/2017**	0.0001	0.0001	0.0001	0.0001	0.00009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C11S01	**C11**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S01, C12S02	**C12**	**0.00 - 0.50**	**4/10/2017**	0.0007	0.0007	0.0007	0.0007	0.00069	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C12S03	**C12**	**0.20-1.10**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C12S04	**C12**	**1.00-1.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C13S01	**C13**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C14S01, C14S02	**C14**	**0.00 - 0.50**	**5/10/2017**	0.0002	0.0002	0.0002	0.0002	0.00023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C15S01, C15S02	**C15**	**0.00 - 0.50**	**4/10/2017**	0.0003	0.0003	0.0003	0.0003	0.00031	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C16S01	**C16**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C16S04	**C16**	**1.00 - 1.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C17S01	**C17**	**0.00 - 0.50**	**3/10/2017**	0.0004	0.0004	0.0004	0.0004	0.00036	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C18S01, C18S02	**C18**	**0.00 - 0.50**	**4/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
C19S01	**C19**	**0.00 - 0.50**	**5/10/2017**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00024**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Phase 2 Dredge Area - 95% UCL		**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00032**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Phase 2A Dredge Area - Mean		**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00021**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Phase 2A Dredge Area - 95% UCL		**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.00029**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Phase 2B Dredge Area - Mean		**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00029**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Phase 2B Dredge Area - 95% UCL		**0.0004**	**0.0004**	**0.0004**	**0.0004**	**0.00044**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**

Indicates laboratory analysis result below LoR: Value reported as half LoR for calculation of summary statistics.

Exceedes high guideline value (GV-high)

Exceedes low guideline value (GV-low)

No guideline value exists

*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean

'---' = Not tested

GV-high = ANZG high guideline values for sediment quality

GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.

NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOPHOSPHATE (OP) PESTICIDES*						
				Azinophos methyl	Monocrotophos	Parathion	Methyl parathion	Pirimphos-ethyl	Prothiofos	Moisture Content
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
Limit of Reporting (LoR) - for 2021 analysis				0.01	0.01	0.01	0.01	0.01	0.01	1
ANZG Sediment Quality Guidelines (GV-high)										
NAGD Screening Levels (GV-low)										
Sample ID	Location	Depth Range (m below seabed)	Sample Date							
C02_0.5	C02	0.00 - 0.50	21/04/2021	0.01	0.01	0.01	0.01	0.01	0.01	33.2
C02_1.0	C02	0.50 - 1.00	21/04/2021	0.01	0.01	0.01	0.01	0.01	0.01	30.9
C02_1.5	C02	1.00 - 1.50	21/04/2021	0.02	0.02	0.02	0.02	0.02	0.02	29.9
C03_0.5	C03	0.00 - 0.50	21/04/2021	0.02	0.02	0.02	0.02	0.02	0.02	27.7
C03_1.0	C03	0.50 - 1.00	21/04/2021	0.01	0.01	0.01	0.01	0.01	0.01	29.9
C04_0.5	C04	0.00 - 0.50	21/04/2021	0.00	0.00	0.00	0.00	0.00	0.00	39.7
C04_1.0	C04	0.50 - 1.00	21/04/2021	0.00	0.00	0.00	0.00	0.00	0.00	44.4
C01S01, C01S02	C01	0.00 - 0.50	4/10/2017	0.01	0.01	0.01	0.01	0.01	0.01	---
C02S01	C02	0.00 - 0.50	3/10/2017	0.00	0.00	0.00	0.00	0.00	0.00	---
C02S03	C02	0.50 - 1.00	3/10/2017	---	---	---	---	---	---	---
C03S01	C03	0.00 - 0.50	5/10/2017	0.01	0.01	0.01	0.01	0.01	0.01	---
C03S03, C03S04	C03	0.50 - 1.00	5/10/2017	---	---	---	---	---	---	---
C04S01, C04S02	C04	0.00 - 0.50	4/10/2017	0.00	0.00	0.00	0.00	0.00	0.00	---
C09S01	C09	0.00 - 0.50	3/10/2017	---	---	---	---	---	---	---
C09S03	C09	0.50 - 1.00	3/10/2017	0.00	0.00	0.00	0.00	0.00	0.00	---
C10S02	C10	0.00 - 0.50	3/10/2017	0.00	0.00	0.00	0.00	0.00	0.00	---
C11S01	C11	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---
C12S01, C12S02	C12	0.00 - 0.50	4/10/2017	0.01	0.01	0.01	0.01	0.01	0.01	---
C12S03	C12	0.20-1.10	4/10/2017	---	---	---	---	---	---	---
C12S04	C12	1.00-1.50	4/10/2017	---	---	---	---	---	---	---
C13S01	C13	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---
C14S01, C14S02	C14	0.00 - 0.50	5/10/2017	0.00	0.00	0.00	0.00	0.00	0.00	---
C15S01, C15S02	C15	0.00 - 0.50	4/10/2017	0.01	0.01	0.01	0.01	0.01	0.01	---
C16S01	C16	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---
C16S04	C16	1.00 - 1.50	5/10/2017	---	---	---	---	---	---	---
C17S01	C17	0.00 - 0.50	3/10/2017	0.01	0.01	0.01	0.01	0.01	0.01	---
C18S01, C18S02	C18	0.00 - 0.50	4/10/2017	---	---	---	---	---	---	---
C19S01	C19	0.00 - 0.50	5/10/2017	---	---	---	---	---	---	---
		Phase 2 Dredge Area - Mean		0.01	0.01	0.01	0.01	0.01	0.01	33.7
		Phase 2 Dredge Area - 95% UCL		0.01	0.01	0.01	0.01	0.01	0.01	38.2
		Phase 2A Dredge Area - Mean		0.01	0.01	0.01	0.01	0.01	0.01	33.7
		Phase 2A Dredge Area - 95% UCL		0.01	0.01	0.01	0.01	0.01	0.01	38.2
		Phase 2B Dredge Area - Mean		0.01	0.01	0.01	0.01	0.01	0.01	---
		Phase 2B Dredge Area - 95% UCL		0.01	0.01	0.01	0.01	0.01	0.01	---

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

APPENDIX

C

DISPOSAL SITE SEDIMENT QUALITY ANALYSIS RESULTS

Cardno

now

Stantec

				METALS																	
				Aluminium (total)	Antimony (total)	Arsenic (total)	Cadmium (total)	Chromium (total)	Copper (total)	Cobalt (total)	Hexavalent Chromium	Iron (total)	Lead (total)	Manganese (total)	Mercury (total)	Nickel (total)	Selenium (total)	Silver (total)	Thorium (total)	Uranium (total)	Vandium (total)	Zinc (total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**10**	**0.2**	**0.1**	**0.02**	**0.2**	**0.2**	**0.1**	**1**	**10**	**0.1**	**0.2**	**0.01**	**0.2**	**0.1**	**0.02**	**0.1**	**0.1**	**0.2**	**0.5**
ANZG Sediment Quality Guidelines (GV-high)					**25**	**70**	**10**	**370**	**270**				**220**		**1**	**52**		**4**				**410**
NAGD Screening Levels (GV-low)					**2**	**20**	**1.5**	**80**	**65**				**50**		**0.15**	**21**		**1**				**200**
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
SS01	**SS01**	**0.00 - 0.50**	**21/04/2021**	360	0.1	6.1	0.01	7.2	0.2	0.3	0.5	1700	0.9	7.1	0.005	0.5	0.05	0.01	1.2	0.2	9.8	0.6
SS02	**SS02**	**0.00 - 0.50**	**21/04/2021**	410	0.2	4.2	0.01	11	0.3	0.4	0.5	2100	3.2	26	0.005	0.5	0.05	0.01	6.6	0.5	11	1.2
SS03	**SS03**	**0.00 - 0.50**	**21/04/2021**	350	0.2	4	0.01	9.9	0.2	0.3	0.5	1800	1.9	15	0.005	0.5	0.05	0.01	3.3	0.4	8.8	0.8
SS04	**SS04**	**0.00 - 0.50**	**21/04/2021**	350	0.1	4.9	0.01	7	0.2	0.4	0.5	1800	1.7	15	0.005	0.5	0.05	0.01	3.4	0.3	10	0.8
SS05	**SS05**	**0.00 - 0.50**	**21/04/2021**	340	0.1	4.2	0.01	7.7	0.2	0.4	0.5	1700	2	14	0.005	0.5	0.05	0.01	3.5	0.3	9.8	0.7
SS06	**SS06**	**0.00 - 0.50**	**21/04/2021**	430	0.2	5.9	0.01	7.3	0.3	0.5	0.5	2100	1.6	15	0.005	0.6	0.05	0.01	2.5	0.2	12	0.8
SS07	**SS07**	**0.00 - 0.50**	**21/04/2021**	420	0.2	9.2	0.01	6.5	0.3	0.5	0.5	2100	0.8	12	0.005	0.6	0.05	0.01	1.3	0.2	12	0.6
SS08	**SS08**	**0.00 - 0.50**	**21/04/2021**	400	0.1	8	0.01	8.1	0.3	0.4	0.5	2000	0.9	11	0.005	0.5	0.05	0.01	1.5	0.3	11	0.5
SS09	**SS09**	**0.00 - 0.50**	**21/04/2021**	470	0.2	10	0.01	6.6	0.4	0.5	0.5	2400	0.8	13	0.005	0.7	0.05	0.01	1	0.2	14	0.25
SS10	**SS10**	**0.00 - 0.50**	**21/04/2021**	290	0.1	8.9	0.01	10	0.1	0.3	0.5	1900	0.6	7.3	0.005	0.5	0.05	0.01	0.8	0.2	12	0.25
		Spoil Disposal Site - Mean		**382**	**0.15**	**6.5**	**0.01**	**8.1**	**0**	**0.4**	**0.5**	**1960**	**1**	**14**	**0.01**	**0.5**	**0.1**	**0.01**	**2.5**	**0.3**	**11**	**1**
		Spoil Disposal Site - 95% UCL		**415**	**0.18**	**8.0**	**0.01**	**9.1**	**0**	**0.5**	**0.5**	**2098**	**2**	**17**	**0.01**	**0.6**	**0.1**	**0.01**	**3.6**	**0.3**	**12**	**1**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

				ORGANOTINS*			TOC#	NUTRIENTS								POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*						
				Monobutyltin	Tributyltin	Dibutyltin	Total Organic Carbon	TOTAL Phosphorus	Reactive Phosphorus as P	Nitrogen (Total)	Kjeldahl Nitrogen Total	Ammonia as N	Nitrate (as N)	Nitrite (as N)	NOx as N in water	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene
				µgSn/kg	µgSn/kg	µgSn/kg	% C	mg.P/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				**1**	**0.5**	**1**	**0.1**	**0.05**	**0.1**	**20**	**20**	**20**	**0.1**	**0.1**	**0.1**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**
ANZG Sediment Quality Guidelines (GV-high)					**70**																	
NAGD Screening Levels (GV-low)					**9**																	
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
SS01	**SS01**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.4	80	80	10	0.6	0.05	0.6	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS02	**SS02**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.12	0.4	90	90	10	0.2	0.05	0.2	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS03	**SS03**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.12	0.7	120	120	10	0.6	0.05	0.6	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS04	**SS04**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.6	100	100	10	0.05	0.05	0.05	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS05	**SS05**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.06	0.4	80	80	10	0.6	0.05	0.6	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS06	**SS06**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.8	100	100	10	0.05	0.05	0.05	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS07	**SS07**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.06	0.4	40	40	10	0.5	0.05	0.5	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS08	**SS08**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.4	60	60	10	0.4	0.05	0.4	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS09	**SS09**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.4	60	60	10	0.6	0.05	0.6	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
SS10	**SS10**	**0.00 - 0.50**	**21/04/2021**	0.5	1.25	2.5	0.2	0.07	0.6	80	80	10	0.2	0.05	0.2	0.0125	0.01	0.01	0.01	0.01	0.01	0.01
		Spoil Disposal Site - Mean		**0.5**	**1.25**	**2.5**	**0.20**	**0.08**	**0.51**	**81**	**81**	**10**	**0.38**	**0.05**	**0.38**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
		Spoil Disposal Site - 95% UCL		**0.5**	**1.25**	**2.5**	**0.2**	**0.09**	**0.60**	**95**	**95**	**10**	**0.52**	**0.05**	**0.52**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
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				POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*												BTEX*					
				Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	PAHs (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene Total
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.2	0.2	0.2	0.2	0.2	0.5
ANZG Sediment Quality Guidelines (GV-high)																50						
NAGD Screening Levels (GV-low)																10						
Sample ID	**Location**	**Depth Range (m below seabed)**	**Sample Date**																			
SS01	**SS01**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS02	**SS02**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS03	**SS03**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS04	**SS04**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS05	**SS05**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS06	**SS06**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS07	**SS07**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS08	**SS08**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS09	**SS09**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
SS10	**SS10**	**0.00 - 0.50**	**21/04/2021**	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.0125	0.01	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	1.25
		Spoil Disposal Site - Mean		**0.01**	**0.01**	**0.01**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**1.25**
		Spoil Disposal Site - 95% UCL		**0.01**	**0.01**	**0.01**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.0125**	**0.01**	**0.01**	**0.01**	**0.01**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**1.25**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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					TOTAL PETROLEUM HYDROCARBONS (TPH)*					TOTAL RECOVERABLE HYDROCARBONS (TRH)*							ORGANOCHLORINE (OC) PESTICIDES*					
				Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	F1: C6-C10 less BTEX	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F2-NAPHTHALENE	Aldrin	a-BHC	b-BHC	chlordane	Chlordane (cis)	DDD
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				0.2	3	3	3	5	3	3	3	3	3	5	3	3	0.0005	0.0005	0.0005	0.00025	0.00025	0.0005
ANZG Sediment Quality Guidelines (GV-high)									550											0.009		0.009
NAGD Screening Levels (GV-low)									280											0.0045		0.0035
Sample ID	Location	Depth Range (m below seabed)	Sample Date																			
SS01	SS01	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS02	SS02	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS03	SS03	0.00 - 0.50	21/04/2021	0.5	7.5	15	7.5	12.5	15	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS04	SS04	0.00 - 0.50	21/04/2021	0.5	7.5	30	20	12.5	50	7.5	7.5	20	20	12.5	40	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS05	SS05	0.00 - 0.50	21/04/2021	0.5	7.5	20	7.5	12.5	20	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS06	SS06	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS07	SS07	0.00 - 0.50	21/04/2021	0.5	7.5	35	25	12.5	60	7.5	7.5	25	20	12.5	45	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS08	SS08	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS09	SS09	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
SS10	SS10	0.00 - 0.50	21/04/2021	0.5	7.5	7.5	7.5	12.5	7.5	7.5	7.5	7.5	7.5	12.5	7.5	1.5	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003
		Spoil Disposal Site - Mean		**0.5**	**7.5**	**14.5**	**10.5**	**12.5**	**19**	**7.5**	**7.5**	**10.50**	**10.00**	**12.50**	**14.50**	**1.5**	**0.00025**	**0.00025**	**0.00025**	**0.000125**	**0.000125**	**0.00025**
		Spoil Disposal Site - 95% UCL		**0.5**	**7.5**	**21.0**	**14.5**	**12.5**	**31.1**	**7.5**	**7.5**	**14.49**	**13.27**	**12.50**	**23.68**	**1.5**	**0.00025**	**0.00025**	**0.00025**	**0.000125**	**0.000125**	**0.00025**

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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				ORGANOCHLORINE (OC) PESTICIDES*																	
				4,4-DDE	DDT	DDT+DDE+DDD	d-BHC	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Hexachlorobenzene	Heptachlor	Heptachlor epoxide	Methoxychlor	Oxychlordane	Chlordane (trans)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00025	0.0005	0.0005	0.0005	0.0005	0.0005	0.00025
ANZG Sediment Quality Guidelines (GV-high)				0.007	0.005			0.007					0.06			0.0014						
NAGD Screening Levels (GV-low)				0.0014	0.0012			0.0028					0.0027			0.0009						
Sample ID	Location	Depth Range (m below seabed)	Sample Date																			
SS01	SS01	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS02	SS02	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS03	SS03	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS04	SS04	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS05	SS05	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS06	SS06	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS07	SS07	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS08	SS08	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS09	SS09	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
SS10	SS10	0.00 - 0.50	21/04/2021	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0001
		Spoil Disposal Site - Mean		0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.000125	0.00025	0.00025	0.00025	0.00025	0.00025	0.000125
		Spoil Disposal Site - 95% UCL		0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.000125	0.00025	0.00025	0.00025	0.00025	0.00025	0.000125

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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				ORGANOPHOSPHATE (OP) PESTICIDES*																	
				Bromophos-ethyl	Carbophenothion	Chlorfenvinphos E	cis-Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Azinophos methyl	Monocrotophos	Parathion	Methyl parathion	Pirimphos-ethyl
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Reporting (LoR) - for 2021 analysis				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ANZG Sediment Quality Guidelines (GV-high)																					
NAGD Screening Levels (GV-low)																					
Sample ID	Location	Depth Range (m below seabed)	Sample Date																		
SS01	SS01	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS02	SS02	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS03	SS03	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS04	SS04	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS05	SS05	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS06	SS06	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS07	SS07	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS08	SS08	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS09	SS09	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
SS10	SS10	0.00 - 0.50	21/04/2021	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
		Spoil Disposal Site - Mean		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		Spoil Disposal Site - 95% UCL		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
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				Prothiofos	Moisture Content
				mg/kg	%
Limit of Reporting (LoR) - for 2021 analysis				0.01	1
ANZG Sediment Quality Guidelines (GV-high)					
NAGD Screening Levels (GV-low)					
Sample ID	Location	Depth Range (m below seabed)	Sample Date		
SS01	SS01	0.00 - 0.50	21/04/2021	0.0050	15.0
SS02	SS02	0.00 - 0.50	21/04/2021	0.0050	20.0
SS03	SS03	0.00 - 0.50	21/04/2021	0.0050	22.8
SS04	SS04	0.00 - 0.50	21/04/2021	0.0050	18.4
SS05	SS05	0.00 - 0.50	21/04/2021	0.0050	18.1
SS06	SS06	0.00 - 0.50	21/04/2021	0.0050	17.8
SS07	SS07	0.00 - 0.50	21/04/2021	0.0050	14.1
SS08	SS08	0.00 - 0.50	21/04/2021	0.0050	13.4
SS09	SS09	0.00 - 0.50	21/04/2021	0.0050	13.7
SS10	SS10	0.00 - 0.50	21/04/2021	0.0050	19.4
		Spoil Disposal Site - Mean		0.005	17.3
		Spoil Disposal Site - 95% UCL		0.005	19.2

Indicates laboratory analysis result below LoR:
Value reported as half LoR for calculation of summary statistics.
Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD
#Note: TOC adjusted per NAGD for low concentration threshold

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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APPENDIX

D

SUMMARY OF MEAN AND 95% UCL CONCENTRATIONS

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	METALS																		
	Aluminium (total)	Antimony (total)	Arsenic (total)	Cadmium (total)	Chromium (total)	Copper (total)	Cobalt (total)	Hexavalent Chromium	Iron (total)	Lead (total)	Manganese (total)	Mercury (total)	Nickel (total)	Selenium (total)	Silver (total)	Thorium (total)	Uranium (total)	Vandium (total)	Zinc (total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)		25	70	10	370	270				220		1	52		4				410
NAGD Screening Levels (GV-low)		2	20	1.5	80	65				50		0.15	21		1				200
Phase 1 Dredge Area - Mean	11237	1.78	14.6	0.15	31.9	18	4.4	1.5	21256	16	155	0.07	9.9	0.6	0.05	6.4	3.7	50	32
Phase 1 Dredge Area - 95% UCL	13380	2.62	17.2	0.18	36.5	21	5.2	1.8	24861	17	178	0.09	11.8	0.7	0.06	7.6	4.3	59	37
Phase 2 Dredge Area - Mean	4079	0.46	10.1	0.08	16.7	33	2.0	0.5	10007	11	86	0.06	4.3	0.4	0.06	3.1	2.0	25	35
Phase 2 Dredge Area - 95% UCL	5199	0.67	12.7	0.10	20.2	49	2.6	0.5	12581	13	103	0.08	5.5	0.5	0.07	4.4	2.3	32	43
Phase 2A Dredge Area - Mean	3091	0.59	5.2	0.07	14.9	46	1.2	0.5	6888	9	65	0.02	2.8	0.2	0.04	4.6	1.8	17	27
Phase 2A Dredge Area - 95% UCL	4685	1.05	6.8	0.11	21.0	81	1.8	---	9875	13	82	0.03	4.1	0.3	0.05	7.2	2.4	24	39
Phase 2B Dredge Area - Mean	4855	0.36	14.0	0.08	18.0	22	2.6	---	12458	12	102	0.09	5.4	0.6	0.08	2.0	2.1	31	41
Phase 2B Dredge Area - 95% UCL	6337	0.48	17.2	0.10	22.2	29	3.4	---	15981	15	126	0.13	7.1	0.7	0.10	2.5	2.5	41	51
Spoil Disposal Site - Mean	382	0.15	6.5	0.01	8.1	0	0.4	0.5	1960	1	14	0.01	0.5	0.1	0.01	2.5	0.3	11	1
Spoil Disposal Site - 95% UCL	415	0.18	8.0	0.01	9.1	0	0.5	0.5	2098	2	17	0.01	0.6	0.1	0.01	3.6	0.3	12	1

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAGD

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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	ORGANOTINS*			TOC	NUTRIENTS								POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*						
	Monobutyltin	Tributyltin	Dibutyltin	Total Organic Carbon	TOTAL Phosphorus	Reactive Phosphorus as P	Nitrogen (Total)	Kjeldahl Nitrogen Total	Ammonia as N	Nitrate (as N)	Nitrite (as N)	NOx as N in water	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene
	µgSn/kg	µgSn/kg	µgSn/kg	% C	mg.P/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)		70																	
NAGD Screening Levels (GV-low)		9																	
Phase 1 Dredge Area - Mean	0.2	2.5	0.3	4.0	0.7	1.3	3222	3222	71	0.05	0.05	0.1	0.0013	0.0010	0.0039	0.0051	0.0128	0.0121	0.0106
Phase 1 Dredge Area - 95% UCL	0.3	4.1	0.6	4.8	0.8	1.9	3747	3747	106	0.06	0.05	0.1	0.0018	0.0017	0.0055	0.0081	0.0209	0.0174	0.0149
Phase 2 Dredge Area - Mean	9.9	98.4	21.4	1.2	207.6	0.2	1019	1019	10	0.05	0.05	0.1	0.0037	0.0031	0.0041	0.0048	0.0173	0.0121	0.0133
Phase 2 Dredge Area - 95% UCL	20.6	197.6	43.7	1.6	290.5	0.2	1394	1394	10	0.05	0.05	0.1	0.0049	0.0041	0.0052	0.0073	0.0262	0.0203	0.0200
Phase 2A Dredge Area - Mean	9.9	142.3	30.6	1.2	74.9	0.1	660	660	10	0.05	0.05	0.1	0.0038	0.0033	0.0044	0.0056	0.0138	0.0149	0.0139
Phase 2A Dredge Area - 95% UCL	20.6	280.6	61.8	1.7	153.8	0.1	986	986	---	0.05	0.05	0.1	0.0053	0.0048	0.0058	0.0096	0.0255	0.0283	0.0244
Phase 2B Dredge Area - Mean	---	1.7	1.3	1.2	355.0	0.2	1418	1418	10	---	---	0.1	0.0036	0.0028	0.0036	0.0036	0.0224	0.0080	0.0123
Phase 2B Dredge Area - 95% UCL	---	2.9	1.8	2.0	426.2	0.3	2043	2043	---	---	---	0.1	0.0055	0.0042	0.0057	0.0055	0.0361	0.0137	0.0198
Spoil Disposal Site - Mean	0.5	1.3	2.5	0.2	0.1	0.5	81	81	10	0.38	0.05	0.4	0.0125	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100
Spoil Disposal Site - 95% UCL	0.5	1.3	2.5	0.2	0.1	0.6	95	95	10	0.52	0.05	0.5	0.0125	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NAG

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
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	POLYCYCLIC AROMATIC HYDROCARBONS (PAH)*																BTEX*		
	Benz(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	LMW PAHs	HMW PAHs	PAHs (Sum of total)	Benzene	Ethylbenzene	Toluene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)																50			
NAGD Screening Levels (GV-low)																10			
Phase 1 Dredge Area - Mean	0.0117	0.0060	0.0056	0.0123	0.0013	0.0030	0.0228	0.0024	0.0069	0.0012	0.0106	0.0114	0.0240	0.0364	0.1440	0.1563	0.0	0.0	0.0
Phase 1 Dredge Area - 95% UCL	0.0222	0.0078	0.0076	0.0171	0.0019	0.0058	0.0364	0.0045	0.0097	0.0019	0.0156	0.0191	0.0371	0.0857	0.3131	0.2305	0.1	0.1	0.1
Phase 2 Dredge Area - Mean	0.0048	0.0060	0.0063	0.0132	0.0033	0.0051	0.0244	0.0049	0.0092	0.0040	0.0032	0.0122	0.0286	0.0196	0.0490	0.1530	0.1	0.1	0.1
Phase 2 Dredge Area - 95% UCL	0.0062	0.0101	0.0094	0.0231	0.0044	0.0069	0.0354	0.0072	0.0127	0.0054	0.0041	0.0200	0.0443	0.0262	0.0636	0.2382	0.2	0.2	0.2
Phase 2A Dredge Area - Mean	0.0046	0.0079	0.0074	0.0167	0.0036	0.0047	0.0241	0.0044	0.0097	0.0040	0.0037	0.0153	0.0307	0.0174	0.0389	0.1659	0.1	0.1	0.1
Phase 2A Dredge Area - 95% UCL	0.0083	0.0148	0.0122	0.0330	0.0052	0.0069	0.0414	0.0062	0.0154	0.0057	0.0049	0.0284	0.0565	0.0225	0.0693	0.3087	0.2	0.2	0.2
Phase 2B Dredge Area - Mean	0.0048	0.0032	0.0048	0.0082	0.0029	0.0057	0.0248	0.0057	0.0086	0.0040	0.0026	0.0076	0.0255	0.0205	0.0533	0.1346	0.1	0.1	0.1
Phase 2B Dredge Area - 95% UCL	0.0064	0.0042	0.0077	0.0143	0.0044	0.0090	0.0367	0.0108	0.0107	0.0066	0.0037	0.0111	0.0387	0.0299	0.0702	0.1886	0.2	0.2	0.2
Spoil Disposal Site - Mean	---	0.0100	0.0100	0.0100	0.0125	0.0100	0.0100	0.0100	0.0100	0.0125	0.0100	0.0100	0.0100	---	---	0.0100	0.5	0.5	0.5
Spoil Disposal Site - 95% UCL	---	0.0100	0.0100	0.0100	0.0125	0.0100	0.0100	0.0100	0.0100	0.0125	0.0100	0.0100	0.0100	---	---	0.0100	0.5	0.5	0.5

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NA(

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

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	BTEX*				TOTAL PETROLEUM HYDROCARBONS (TPH)*					TOTAL RECOVERABLE HYDROCARBONS (TRH)*									
	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	F1: C6-C10 less BTEX	C10-C16	>C10 - C16 minus Naphthalene (F2	C16-C34	C34-C40	C10 - C40 (Sum of total)	F2-NAPHTHALENE	Aldrin	Aldrin+Dieldrin
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)									550										
NAGD Screening Levels (GV-low)									280										
Phase 1 Dredge Area - Mean	0.0	0.0	0.1	0.0	0.6	3.8	13.7	10.7	29.5	0.6	0.6	2.7	19.7	19.5	5.4	29.3	2.8	0.0001	0.0002
Phase 1 Dredge Area - 95% UCL	0.1	0.1	0.1	0.1	0.8	4.6	18.0	13.0	36.0	0.8	0.8	3.6	55.7	24.8	6.3	36.1	3.8	0.0001	0.0003
Phase 2 Dredge Area - Mean	0.1	0.1	0.3	0.1	2.0	4.1	18.2	13.7	33.6	2.0	2.0	3.3	16.9	19.7	7.3	36.0	5.0	0.0003	0.0003
Phase 2 Dredge Area - 95% UCL	0.2	0.2	0.4	0.2	2.7	6.7	23.9	19.3	47.1	2.7	2.7	4.7	30.5	29.7	10.5	50.6	7.9	0.0004	0.0004
Phase 2A Dredge Area - Mean	0.1	0.1	0.4	0.1	2.1	5.8	19.3	16.6	39.5	2.1	2.1	4.2	19.8	25.8	9.6	42.4	5.0	0.0004	0.0002
Phase 2A Dredge Area - 95% UCL	0.2	0.2	0.5	0.2	3.1	9.9	28.1	25.5	61.2	3.1	3.1	6.3	55.5	41.3	14.5	65.5	7.9	0.0005	0.0003
Phase 2B Dredge Area - Mean	0.1	0.1	0.3	0.1	1.9	1.7	16.5	9.6	25.1	1.7	1.7	2.0	15.7	11.1	3.9	26.9	---	0.0003	0.0003
Phase 2B Dredge Area - 95% UCL	0.2	0.2	0.4	0.2	2.7	2.7	23.3	13.3	34.8	2.7	2.7	3.0	30.1	17.5	6.0	38.9	---	0.0004	0.0004
Spoil Disposal Site - Mean	0.5	0.5	1.3	0.5	7.5	14.5	10.5	12.5	19.0	7.5	7.5	10.5	---	10.0	12.5	14.5	1.5	0.0003	---
Spoil Disposal Site - 95% UCL	0.5	0.5	1.3	0.5	7.5	21.0	14.5	12.5	31.1	7.5	7.5	14.5	---	13.3	12.5	23.7	1.5	0.0003	---

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NA(

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
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	ORGANOCHLORINE (OC) PESTICIDES*																		
	a-BHC	b-BHC	chlordane	Chlordane (cis)	DDD	4,4-DDE	DDT	DDT+DDE+DDD	d-BHC	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Hexachlorobenzene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)			0.009		0.009	0.007	0.005			0.007					0.06			0.0014	
NAGD Screening Levels (GV-low)			0.0045		0.0035	0.0014	0.0012			0.0028					0.0027			0.0009	
Phase 1 Dredge Area - Mean	0.0001	0.0001	0.00006	0.00006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00005	0.0001
Phase 1 Dredge Area - 95% UCL	0.0001	0.0001	0.00009	0.00009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00007	0.0001
Phase 2 Dredge Area - Mean	0.0003	0.0003	0.00024	0.00024	0.0008	0.0011	0.0014	0.0039	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00016	0.0003
Phase 2 Dredge Area - 95% UCL	0.0004	0.0004	0.00032	0.00032	0.0015	0.0024	0.0026	0.0103	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00022	0.0004
Phase 2A Dredge Area - Mean	0.0004	0.0004	0.00021	0.00021	0.0011	0.0017	0.0021	0.0039	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00018	0.0004
Phase 2A Dredge Area - 95% UCL	0.0005	0.0005	0.00029	0.00029	0.0024	0.0038	0.0041	0.0103	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00026	0.0005
Phase 2B Dredge Area - Mean	0.0003	0.0003	0.00029	0.00029	0.0003	0.0003	0.0003	---	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00014	0.0003
Phase 2B Dredge Area - 95% UCL	0.0004	0.0004	0.00044	0.00044	0.0004	0.0004	0.0004	---	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00022	0.0004
Spoil Disposal Site - Mean	0.0003	0.0003	0.00013	0.00013	0.0003	0.0003	0.0003	0.00025	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00013	0.0003
Spoil Disposal Site - 95% UCL	0.0003	0.0003	0.00013	0.00013	0.0003	0.0003	0.0003	0.00025	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00013	0.0003

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NA(

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References:
ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

							ORGANOPHOSPHATE (OP) PESTICIDES*													
	Heptachlor	Heptachlor epoxide	Methoxychlor	Oxychlordane	Chlordane (trans)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos E	cis-Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ANZG Sediment Quality Guidelines (GV-high)																			
NAGD Screening Levels (GV-low)																			
Phase 1 Dredge Area - Mean	0.0001	0.0001	0.0001	0.0001	0.00006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 1 Dredge Area - 95% UCL	0.0001	0.0001	0.0001	0.0001	0.00009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 Dredge Area - Mean	0.0003	0.0003	0.0003	0.0003	0.00024	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phase 2 Dredge Area - 95% UCL	0.0004	0.0004	0.0004	0.0004	0.00032	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phase 2A Dredge Area - Mean	0.0004	0.0004	0.0004	0.0004	0.00021	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phase 2A Dredge Area - 95% UCL	0.0005	0.0005	0.0005	0.0005	0.00029	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phase 2B Dredge Area - Mean	0.0003	0.0003	0.0003	0.0003	0.00029	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phase 2B Dredge Area - 95% UCL	0.0004	0.0004	0.0004	0.0004	0.00044	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spoil Disposal Site - Mean	0.0003	0.0003	0.0003	0.0003	0.00013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spoil Disposal Site - 95% UCL	0.0003	0.0003	0.0003	0.0003	0.00013	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NA(

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

	ORGANOPHOSPHATE (OP) PESTICIDES*						
	Azinophos methyl	Monocrotophos	Parathion	Methyl parathion	Pirimphos-ethyl	Prothiofos	Moisture Content
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
ANZG Sediment Quality Guidelines (GV-high)							
NAGD Screening Levels (GV-low)							
Phase 1 Dredge Area - Mean	0.00	0.00	0.00	0.00	0.00	0.00	56.4
Phase 1 Dredge Area - 95% UCL	0.00	0.00	0.00	0.00	0.00	0.00	60.2
Phase 2 Dredge Area - Mean	0.01	0.01	0.01	0.01	0.01	0.01	33.7
Phase 2 Dredge Area - 95% UCL	0.01	0.01	0.01	0.01	0.01	0.01	38.2
Phase 2A Dredge Area - Mean	0.01	0.01	0.01	0.01	0.01	0.01	33.7
Phase 2A Dredge Area - 95% UCL	0.01	0.01	0.01	0.01	0.01	0.01	38.2
Phase 2B Dredge Area - Mean	0.01	0.01	0.01	0.01	0.01	0.01	---
Phase 2B Dredge Area - 95% UCL	0.01	0.01	0.01	0.01	0.01	0.01	---
Spoil Disposal Site - Mean	0.01	0.01	0.01	0.01	0.01	0.01	17.3
Spoil Disposal Site - 95% UCL	0.01	0.01	0.01	0.01	0.01	0.01	19.2

Exceedes high guideline value (GV-high)
Exceedes low guideline value (GV-low)
No guideline value exists
*Note: Values presented are normalised to 1% TOC, as per NA(

Definitions: 95% UCL = 95th percentile upper confidence limit of the mean
'---' = Not tested
GV-high = ANZG high guideline values for sediment quality
GV-low = NAGD Screening levels (ISQG trigger values). Equivalent to ANZG defaul guideline values (DGV) for sediment quality

References: ANZG = ANZG (2018) Australian and New Zealand Guideline for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT.
NAGD = Australian Government (2009) National Assessment Guidelines for Dredging (NAGD). Commonwealth of Australia, Department of the Environment, Water, Heritage and the Arts. Canberra, ACT.

APPENDIX

E

QUALITY CONTROL AND ASSURANCE EVALUATION

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Appendix E: Quality Control and Assurance Evaluation

Overview

This document reviews the Quality Assurance (QA) and Quality Control (QC) results for the sampling program. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure the sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

It should be noted that a large portion of the samples used for overall analysis of sediment quality for the project were collected by RPS (2017). A QAQC evaluation was undertaken separately for that sampling and analysis program and is presented in RPS (2017) – Appendix C of that report.

Standards and Guidelines

The following standards and guidelines were applied when sampling and analysing sediment and water samples, and have guided this QA/QC evaluation.

- *Handbook for Sediment Quality Assessment.* CSIRO, Bangor, NSW. Simpson et al. 2005;
- *National Assessment Guidelines for Dredging (NAGD).* Department of the Environment, Water, Heritage and the Arts, 2009;
- *National Environment Protection (Assessment of Site Contamination) Measure.* National Environmental Protection Council. 1999, as amended 2013 (NEPM 2013);
- *Assessment and Management of Contaminated Sites*. Department of Water and Environmental Regulation, 2021;
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018);
- *Water Quality—Sampling. Part 9: Guidance on sampling from marine waters*. Standards Australia. 1998. AS/NZS 5667.9:1998;
- *Water Quality—Sampling. Part 12: Guidance on Sampling of Bottom Sediments*. Standards Australia. 1998. AS/NZS 5667.12:1998;
- *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds.* Standards Australia. 2005. AS 4482.1; and
- *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Compounds.* Standards Australia. 1999. AS 4482.2.

Quality Control Assessment – Sediment Sampling and Analysis

The evaluation of QC procedures for sediment sampling and analysis is presented in the table below.

QA/QC Aspects	Evidence & Evaluation
	Field Procedures
Sample collection and handling	All sample collection and handling was undertaken as per the SAP and relevant guidelines and standards detailed therein and above. Sample cores were obtained by vibracorer between 20/04/2021 and 23/04/2021.

QA/QC Aspects	Evidence & Evaluation
Decontamination	Reusable equipment was decontaminated between sample locations using Decon 90 solution, followed by rinsing in deionised water.
Sample-set completeness	All targeted sites were sampled as part of the field campaign. Some sites were not sampled to the target depth due to drilling refusal. All sub-samples for both primary and QA analysis were collected as planned. A total of 40 sediment quality sites/depths were sampled. Associated QA sediment quality sampling included: - 3 x Duplicate (blind replicates for analysis by primary lab); and - 2 x Split (blind triplicate for analysis by secondary lab).
Sample storage and preservation	All samples were stored as per the SAP (chilled in eskies) until delivery to the laboratory, within specified holding times. Chain of custody and laboratory reports provide evidence of holding times. Holding times were all compliant with required timeframes. Sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1).
Documentation	Field notes and sample logs were taken, as per the SAP, and provided as part of the SAP Implementation Report (Appendix I).
Qualified Personnel	The sample collection was undertaken by qualified and experienced Scientists – Julian Brown (BSc Marine Biology) and Krzystof Wienczugow (BSc Applied Chemistry).
Sample transport and integrity	Samples were transported directly to laboratories by field personnel or courier. Chain of custody documentation has been provided as part of the SAP Implementation Report (Appendix J).
Laboratory Analysis Procedures	
Laboratory Accreditation	Laboratory reports were stamped with the NATA endorsement stamp. ALS: Accreditation No. 825 (Primary Lab) MAFRL: Accreditation No. 10603 (Primary Lab) Eurofins: Accreditation No. 1261/2377 (Secondary Lab) NMI: Accreditation No. 198 (Secondary Lab)
Laboratory testing methods	All laboratory testing methods were in line with those specified in the SAP.
Laboratory limits of reporting (LoR) / Practical quantitation limit (PQL)	Laboratory reports indicate that the method detection limits (LoR/PQL) were lower than the respective assessment criteria, where applicable. LoR/PQL did vary among laboratories for some analytes (see attached Table).
Completeness of Analysis (Primary Samples)	All primary samples were analysed for all analytes as per the SAP
Completeness of Analysis (Duplicates/blind replicates)	All duplicate samples were analysed for all analytes as per the SAP, with the exception of metals, which were not analysed due to miscommunication with the primary analysis laboratory.
Completeness of Analysis (Splits/blind triplicates)	All split samples were analysed for all analytes as per the SAP, with the exception of Organophosphate Pesticides (OPP), which were not analysed due to an error by the secondary analysis laboratory.
Data Precision & Accuracy	
Acceptance criteria	A quantitative measure of the blind and split duplicate sample results was made using calculated relative percentage difference (RPD) values for each chemical. The RPD values were calculated using the following equation. $RPD(\%) = \frac{(C_o - C_s)}{\left(\frac{C_o + C_s}{2}\right)} \times 100¤$ Where *Co* = reported concentration of the chemical of interest from the original primary sample Cs = reported concentration of the chemical of interest from the duplicate sample RPD calculations provide a measure of the precision of field sampling methods and laboratory methods. According to AS 4482.1 – 2005 (Standards Australia 2005),

QA/QC Aspects	Evidence & Evaluation
	typical RPDs are expected to range between 30% and 50%; however, this may be higher for concentrations which are close to the laboratory LoR. Considering this, Cardno has adopted the following acceptable RPD limits for the study, based on standard industry practice and the inherent variability: • 81% for concentrations within one to ten times the analyte LoR; • 50% for concentrations within ten to 30 times the analyte LoR; and • 30% for concentrations greater than 30 times the analyte LoR. RPDs have only been considered where both sample concentrations are greater than the limit of reporting (LoR).
QC Testing – Blind replicates / duplicates (Primary Lab)	For the field sampling event, blind replicates were taken from 3 samples for QC testing. Calculated RPDs for all sampling is presented in **Table 1**. • Samples Collected: 40 • Blind Replicate Samples Analysed: 3 • Blind Replicate Analyte Pairs: 297 • Number of Analyte Pairs Exceeding Criteria: 16 • Percentage of Analyte Pairs Exceeding Criteria: 5.14% Exceedances reported above the adopted quality objectives 30% were as follows: • TPH C10-C14 – DUP1: RPD (84%) greater than acceptable limit (81%) • TPH C15-C28 – DUP1: RPD (153%) greater than acceptable limit (81%) • TPH C29-C36 – DUP1: RPD (139%) greater than acceptable limit (81%) • TPH C10-C36 (Sum of total) – DUP1: RPD (133%) greater than acceptable limit (81%) • TPH C10-C36 (Sum of total) – DUP2: RPD (41%) greater than acceptable limit (30%) • TPH C16-C34 – DUP1: RPD (147%) greater than acceptable limit (81%) • TPH C34-C40 – DUP1: RPD (108%) greater than acceptable limit (81%) • TPH C10-C40 (Sum of total) – DUP1: RPD (126%) greater than acceptable limit (50%) • TPH C10-C16 – DUP2: RPD (88%) greater than acceptable limit (81%) • TPH C16-C34 – DUP2: RPD (34%) greater than acceptable limit (30%) • TPH C10-C40 (Sum of total) – DUP2: RPD (46%) greater than acceptable limit (30%) • TPH C10-C16 less Naphthalene – DUP2: RPD (88%) greater than acceptable limit (81%) • PAH (Sum of total): RPD (40%) greater than acceptable limit (30%) • Reactive Phosphorus as P – DUP1: RPD (137%) greater than acceptable limit (81%) • Reactive Phosphorus as P – DUP2: RPD (121%) greater than acceptable limit (50%). • Tributyltin – DUP1: RPD (180%) greater than acceptable limit (81%) As a conservative measure, the highest reported concentrations from the primary and duplicate pairs have been adopted for the assessment against relevant criteria (see table below).
QC Testing – Blind triplicates / splits (Secondary Lab)	For the field event two (2) blind triplicate sample was taken for QC testing. Calculated RPDs are presented in **Table 1**. • Samples Collected: 40 • Field Split Samples Analysed: 2 • Field Split Analyte Pairs: 166 • Number of Analyte Pairs Exceeding Criteria: 14 • Percentage of Analyte Pairs Exceeding Criteria: 8.4% Exceedances reported above the adopted quality objective of 30% were as follows: • PAH Benzo(a)pyrene TEQ – SPLIT2: RPD (182%) greater than acceptable limit (81%)

QA/QC Aspects	Evidence & Evaluation
	• PAH Benzo(a)pyrene TEQ – SPLIT1: RPD (160%) greater than acceptable limit (50%) • PAH Benzo(a)pyrene TEQ (upper bound) – SPLIT2: RPD (190%) greater than acceptable limit (81%) • PAH Benzo(a)pyrene TEQ (upper bound) – SPLIT1: RPD (178%) greater than acceptable limit (50%) • Total Nitrogen, Total Kjeldahl Nitrogen (TKN) – SPLIT1: RPD (194%) greater than acceptable limit (30%) • Total Nitrogen, TKN – SPLIT2: RPD (193%) greater than acceptable limit (30%) • Copper – SPLIT1: RPD (37%) greater than acceptable limit (30%) • Arsenic – SPLIT2: RPD (38%) greater than acceptable limit (30%) • Antimony – SPLIT2: RPD (60%) greater than acceptable limit (50%) • Thorium – SPLIT1: RPD (98%) greater than acceptable limit (30%) • Thorium – SPLIT2: RPD (106%) greater than acceptable limit (30%) • Tributyltin – SPLIT1: RPD (125%) greater than acceptable limit (30%) • Dibutyltin – SPLIT1: RPD (158%) greater than acceptable limit (81%) • Dibutyltin – SPLIT2: RPD (123%) greater than acceptable limit (81%) Split/triplicate RPD values that are outside of the acceptable range may reflect differing methods used by the primary and secondary laboratories. As a conservative measure, the highest reported concentration from the primary and split pairs has been adopted for the assessment.
Laboratory Internal QC	ALS (Primary), MAFRL (Primary), Eurofins (Secondary) and NMI (secondary) performed internal QC with adequate testing and satisfactory results for method blank laboratory control samples and laboratory duplicates. ***Primary Laboratory (ALS)*** The primary laboratory reported that there were no outliers for the following QC procedures: • Method blanks. • Laboratory Control. • Quality Control Sample Frequency Outliers. The following duplicate RPD exceedances were reported by the laboratory: • Dibutyltin – C02_0.5 (146%) exceeds data quality objective (0-20%) • Tributyltin – C02_0.5 (81.9%) exceeds data quality objective (0-20%) • Fluoranthene - CA04_1.0 (83.8%) exceeds data quality objective (0-50%) • Pyrene - CA04_1.0 (78.4%) exceeds data quality objective (0-50%) • Chrysene - CA04_1.0 (73.2%) exceeds data quality objective (0-50%) • Benzo(b+j)fluoranthene - CA04_1.0 (81.8%) exceeds data quality objective (0-50%) • Benzo(a)pyrene - CA04_1.0 (65.4%) exceeds data quality objective (0-50%) • Sum of PAHs - CA01_0.5 (33.4%) exceeds data quality objective (0-20%) • Sum of PAHs - DUP3 (27.9%) exceeds data quality objective (0-20%) • Sum of PAHs - CA04_1.0 (60.3%) exceeds data quality objective (0-20%) The following matrix spike recovery exceedances were reported from the primary laboratory: • Monobutyltin – CA01_1.0 (12.6%) lower than data quality objective (20-130%) • Dibutyltin – C02_1.0 (MS recovery not determined, background level greater than or equal to 4x spike level) • Tributyltin – C02_1.0 (MS recovery not determined, background level greater than or equal to 4x spike level) • Naphthalene – C02_1.0 (66.0%) lower than data quality objective (70-130%)

QA/QC Aspects	Evidence & Evaluation

- Anthracene – CA01_1.0 (69.1%) lower than data quality objective (70-130%)
- Pyrene – CA01_1.0 (68.9%) lower than data quality objective (70-130%)
- Benzo(b+j)fluoranthene – CA01_1.0 (61.8%) lower than data quality objective (70-130%)
- Benzo(b+j)fluoranthene – DUP2 (36.9%) lower than data quality objective (70-130%)
- Benzo(k)fluoranthene – CA01_1.0 (63.0%) lower than data quality objective (70-130%)
- Benzo(k)fluoranthene – DUP2 (59.9%) lower than data quality objective (70-130%)
- Benzo(a)pyrene – DUP2 (51.1%) lower than data quality objective (70-130%)
- Benzo(g.h.i)perylene – CA01_1.0 (46.8%) lower than data quality objective (70-130%)
- Benzo(g.h.i)perylene – DUP2 (46.5%) lower than data quality objective (70-130%)
- Dibenz(a.h)anthracene – CA01_1.0 (52.4%) lower than data quality objective (70-130%)
- Indeno(1.2.3.cd)pyrene – CA01_1.0 (61.4%) lower than data quality objective (70-130%)
- Indeno(1.2.3.cd)pyrene – DUP2 (57.6%) lower than data quality objective (70-130%)

The following Surrogate recovery outliers were reported by the laboratory:

- Tripropyltin – SS09 (139%) exceeds data quality objective (35-130%)
- Tripropyltin – SS10 (147%) exceeds data quality objective (35-130%)
- 4-Terphenyl-d14 – SS01 (142%) exceeds data quality objective (70-130%)
- 4-Terphenyl-d14 – CA05_1.5 (135%) exceeds data quality objective (70-130%)

The following extraction/preparation holding time compliance breaches were reported by the laboratory:

- Nitrite as N – 5 to 9 days overdue
- Reactive Phosphorus as P – 5 to 9 days overdue
- Organotin compounds – 2 to 6 days overdue

The following analysis holding time compliance breaches were reported by the laboratory:

- Moisture content – 1 day overdue

Primary Laboratory (MAFRL)

The primary laboratory reported that there were no outliers for the following QC procedures:

- Method blanks.
- Duplicates.
- Matrix Spikes.
- Laboratory Control.
- Analysis Holding Time.
- Quality Control Sample Frequency Outliers.

Secondary Laboratories (Eurofins and NMI)

The secondary laboratory reported that there were no outliers for the following QC procedures:

- Method blanks.
- Matrix Spikes.

QA/QC Aspects	Evidence & Evaluation
	• Laboratory Control. • Analysis Holding Time. • Quality Control Sample Frequency Outliers. The following duplicate RPD exceedances were reported by the laboratory: • TOC (77%) exceeds data quality objective (0-30%)
	Data Validity

Validity of Data Set	The data quality review did not find any significant systematic errors in the sediment sample collection, handling and transport process.
	Several QAQC non-compliances or data quality objective outliers have been identified above, relating to the laboratory analysis processes. For the purpose of discussing the validity of the achieved dataset, its intended purpose – comparison to NAGD (2009) screening levels and ANZG (2018) sediment quality default guideline values – has been considered to focus the review.
	Metals did not have duplicate samples analysed due to an error in communication with the primary analysis laboratory (MAFRL). Several metal analytes have relevant guideline values and accurate concentrations are necessary when assessing the dredge material. Sufficient confidence in the accuracy/validity of the primary dataset (for its intended purpose) is considered to be present due to:
	• No QAQC outliers identified for metals analysis by the primary or secondary analysis laboratory;
	• Appropriate secondary laboratory analysis of metals, testing any differing laboratory methods;
	• Few RPD exceedances between primary and split samples for metals were identified. The exceedances were:
	  ○ Zinc (CA04_1.0 vs SPLIT1) – 37% (slightly above acceptance <30%). All Zinc concentrations (primary and secondary analysis) were well below relevant guideline values.
	  ○ Arsenic (CA02_2.0 vs SPLIT2) – 38% (slightly above acceptance <30%). Previous compliant QAQC testing of Arsenic in the dredge area by RPS (2017) found no RPD exceedances. Any higher QAQC concentrations from this testing and RPS (2017) have been substituted for primary concentrations, as a conservative approach, for further data analysis.
	  ○ Antimony (CA02_2.0 vs SPLIT2) – 60% (slightly above acceptance <50%). Antimony was further assessed through elutriate sampling and analysis at this sample site.
	  ○ Thorium (CA02_2.0 vs SPLIT2) – 106% and (CA04_1.0 vs SPLIT1) – 98% (above acceptance <30%). No relevant guideline values exist for Thorium.
	• Where QAQC sample results are higher than primary analysis results (and relevant guideline values exist) these have been substituted for primary concentrations for further data analysis – a conservative approach.
	OPPs did not have split samples analysed due to an error by the secondary analysis laboratory (Eurofins). This is not considered to affect the data assessment outcome as there are no relevant guideline values for these analytes. Furthermore, all primary and duplicate sample results were below laboratory LoRs.
	There were laboratory QC outliers for:
	• Organotins (inc. TBT) (CO2_0.5 and CO2_1.0) – this site was further investigated through dedicated elutriate testing.
	• Several PAH species including total PAH. These analytes were below or close to the LoR (very low concentrations) for all samples.
	Given the laboratory analysis results and multiple levels of QAQC underpinning them, the sediment quality dataset is considered to be complete and valid for assessment purposes, in spite of the QAQC deficiencies identified.

Lab Report	EP2104662	EP2104662		EP2104662	791998		EP2104662	EP2104662		EP2104662	791998		EP2104662	EP2104662	
Field ID	CA02_2.0	DUP3		CA02_2.0	SPLIT2		CA04_1.0	DUP1		CA04_1.0	SPLIT1		CA06_2.0	DUP2	
Date	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	23/04/2021	23/04/2021	RPD

Indicates QA sample substituted for primary sample during further analysis
Indicates RPD exceeding acceptable range*
Comparison values not available
Notes:
RPD = relative percentage difference
RPDs have only been considered where both sample concentrations are greater than the limit of reporting (LoR).
*Elevated RPDs are highlighted as per Acceptance Criteria (Acceptable RPDs for each LOR multiplier range are: 81% (1 - 10 x LoR); 50% (10 - 30 x LoR); 30% (> 30 x LoR))

	Unit	LoR														
BTEX																
Benzene	mg/kg	0.2 (Primary): 0.1 (Interlab)	<0.2	<0.2		<0.2	<0.1		<0.2	<0.2		<0.2	<0.1		<0.2	<0.2	
Toluene	mg/kg	0.2 (Primary): 0.1 (Interlab)	<0.2	<0.2		<0.2	<0.1		<0.2	<0.2		<0.2	<0.1		<0.2	<0.2	
Ethylbenzene	mg/kg	0.2 (Primary): 0.1 (Interlab)	<0.2	<0.2		<0.2	<0.1		<0.2	<0.2		<0.2	<0.1		<0.2	<0.2	
Xylene (m & p)	mg/kg	0.2	<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2	
Xylene (o)	mg/kg	0.2 (Primary): 0.1 (Interlab)	<0.2	<0.2		<0.2	<0.1		<0.2	<0.2		<0.2	<0.1		<0.2	<0.2	
Xylene Total	mg/kg	0.5 (Primary): 0.3 (Interlab)	<0.5	<0.5		<0.5	<0.3		<0.5	<0.5		<0.5	<0.3		<0.5	<0.5	
Total BTEX	mg/kg	0.2	<0.2	<0.2		<0.2			<0.2	<0.2		<0.2			<0.2	<0.2	
TPH																
C6 - C9	mg/kg	3 (Primary): 20 (Interlab)	<3	<3		<3	<20		<3	<3		<3	<20		<3	<3	
C10 - C14	mg/kg	3 (Primary): 20 (Interlab)	18	18	0	18	<20		9	22	**84**	9	<20		14	25	56
C15 - C28	mg/kg	3 (Primary): 50 (Interlab)	61	75	21	61	<50		7	52	**153**	7	<50		44	61	32
C29-C36	mg/kg	5 (Primary): 50 (Interlab)	64	79	21	64	<50		10	56	**139**	10	<50		44	68	43
+C10 - C36 (Sum of total)	mg/kg	3 (Primary): 50 (Interlab)	143	172	18	143	<50		26	130	**133**	26	<50		102	154	**41**
CRC Care TPH Fractions																
C6-C10	mg/kg	3 (Primary): 20 (Interlab)	<3	<3		<3	<20		<3	<3		<3	<20		<3	<3	
C10-C16	mg/kg	3 (Primary): 50 (Interlab)	14	14	0	14	<50		8	16	67	8	<50		7	18	**88**
C16-C34	mg/kg	3 (Primary): 100 (Interlab)	106	130	20	106	<100		14	92	**147**	14	<100		76	107	**34**
C34-C40	mg/kg	5 (Primary): 100 (Interlab)	40	54	30	40	<100		11	37	**108**	11	<100		23	45	65
C10 - C40 (Sum of total)	mg/kg	3 (Primary): 100 (Interlab)	160	198	21	160	<100		33	145	**126**	33	<100		106	170	**46**
F1: C6-C10 less BTEX	mg/kg	3 (Primary): 20 (Interlab)	<3	<3		<3	<20		<3	<3		<3	<20		<3	<3	
F2: >C10-C16 less Naphthalene	mg/kg	3 (Primary): 50 (Interlab)	14	14	0	14	<50		8	16	67	8	<50		7	18	**88**
PAH																
Benzo(a)pyrene TEQ (half LOR)_	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.028	0.044	44	0.028	0.6	**182**	0.067	0.049	31	0.067	0.6	**160**	0.07	0.048	37
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.03	0.046	42	0.03	1.2	**190**	0.069	0.049	34	0.069	1.2	**178**	0.072	0.05	36
Benzo(b+j)fluoranthene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.02	0.036	57	0.02	<0.5		0.047	0.034	32	0.047	<0.5		0.041	0.035	16
2-methylnaphthalene	mg/kg	0.004 (Primary): 0.5 (Interlab)	<0.005	0.007		<0.005			<0.005	0.005	67	<0.005			<0.005	0.006	18
Acenaphthene	mg/kg	0.004 (Primary): 0.5 (Interlab)	<0.005	<0.005		<0.005	<0.5		<0.005	<0.005		<0.005	<0.5		<0.004	<0.005	
Acenaphthylene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.008	0.016	67	0.008	<0.5		0.023	0.014	49	0.023	<0.5		0.015	0.012	22
Anthracene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.008	0.015	61	0.008	<0.5		0.019	0.015	24	0.019	<0.5		0.017	0.014	19
Benz(a)anthracene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.016	0.025	44	0.016	<0.5		0.036	0.026	32	0.036	<0.5		0.043	0.027	46
BaP TEQ (zero)	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.026	0.042	47	0.026	<0.5		0.065	0.049	28	0.065	<0.5		0.068	0.046	39
Benzo(a)pyrene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.02	0.032	46	0.02	<0.5		0.051	0.033	43	0.051	<0.5		0.052	0.035	39
Benzo(e)pyrene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.012	0.018	40	0.012			0.026	0.019	31	0.026			0.027	0.018	40
Benzo(g,h,i)perylene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.016	0.019	17	0.016	<0.5		0.031	0.017	58	0.031	<0.5		0.036	0.025	36
Benzo(k)fluoranthene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.009	0.016	56	0.009	<0.5		0.022	0.021	5	0.022	<0.5		0.033	0.017	64
Chrysene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.025	0.035	33	0.025	<0.5		0.05	0.036	33	0.05	<0.5		0.06	0.038	45
Dibenz(a,h)anthracene	mg/kg	0.004 (Primary): 0.5 (Interlab)	<0.005	<0.005	0	<0.005	<0.5		<0.005	0.006		<0.005	<0.5		<0.004	<0.005	
Fluoranthene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.032	0.049	42	0.032	<0.5		0.062	0.045	32	0.062	<0.5		0.094	0.06	44
Fluorene	mg/kg	0.004 (Primary): 0.5 (Interlab)	<0.005	<0.005	0	<0.005	<0.5		<0.005	<0.005		<0.005	<0.5		0.008	<0.005	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.014	0.016	13	0.014	<0.5		0.03	0.015	67	0.03	<0.5		0.034	0.024	34
Naphthalene	mg/kg	0.01 (Primary): 0.5 (Interlab)	<0.01	<0.01	0	<0.01	<0.5		<0.01	<0.01		<0.01	<0.5		<0.01	<0.01	
PAHs (Sum of total)	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.284	0.428	**40**	0.284	<0.5		0.514	0.382	29	0.514	<0.5	69	0.869	0.707	21
Phenanthrene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.014	0.03	73	0.014	<0.5		0.028	0.02	33	0.028	<0.5		0.038	0.023	49
Pyrene	mg/kg	0.004 (Primary): 0.5 (Interlab)	0.037	0.056	41	0.037	<0.5		0.072	0.057	23	0.072	<0.5		0.099	0.064	43

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Date	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	23/04/2021	23/04/2021	RPD

Indicates QA sample substituted for primary sample during further analysis
Indicates RPD exceeding acceptable range*
Comparison values not available
Notes:
RPD = relative percentage difference
RPDs have only been considered where both sample concentrations are greater than the limit of reporting (LoR).
*Elevated RPDs are highlighted as per Acceptance Criteria (Acceptable RPDs for each LOR multiplier range are: 81% (1 - 10 x LoR); 50% (10 - 30 x LoR); 30% (> 30 x LoR))

	Unit	LoR														
Inorganics																
Moisture Content	%	1	59.8	59.2	1	59.8			63.9	63.6	0	63.9			59.7	60.8	2
Ammonia as N	mg/kg	20 (Primary): 5 (Interlab)	140	140	0	140	180	25	<20	<20		<20	33	49	290	320	10
Kjeldahl Nitrogen Total	mg/kg	20 (Primary): 5 (Interlab)	4,040	3,750	7	4,040	73	**193**	4,440	4,240	5	4,440	62	**194**	4,350	4,540	4
Nitrate (as N)	mg/kg	0.1	<0.1	<0.1		<0.1			<0.1	<0.1		<0.1			<0.1	<0.1	
Nitrite (as N)	mg/kg	0.1	<0.1	<0.1		<0.1			<0.1	<0.1		<0.1			<0.1	<0.1	
NOx as N in water	mg/L	0.1	<0.1	<0.1		<0.1			<0.1	<0.1		<0.1			<0.1	<0.1	
Nitrogen (Total)	mg/kg	20 (Primary): 5 (Interlab)	4,040	3,750	7	4,040	73	**193**	4,440	4,240	5	4,440	62	**194**	4,350	4,540	4
Reactive Phosphorus as P	mg/kg	0.1 (Primary): 10 (Interlab)	5.7	6.3	10	5.7	<10		0.3	1.6	**137**	0.3	<10		2.3	9.4	**121**
Metals																
Aluminium (total)	mg/kg	10	17000			17000	23000	30	15000			15000	18000	18	17000		
Vandium (total)	mg/kg	0.2	72			72	92	24	58			58	57	2	69		
Chromium (total)	mg/kg	0.2	49			49	56	13	38			38	40	5	33		
Manganese (total)	mg/kg	0.2	240			240	280	15	230			230	220	4	97		
Iron (total)	mg/kg	10	34000			34000	39000	14	27000			27000	29000	7	25000		
Cobalt (total)	mg/kg	0.1	7.8			7.8	9.1	15	5.5			5.5	5.9	7	5.1		
Nickel (total)	mg/kg	0.2	16			16	19	17	13			13	13	0	12		
Copper (total)	mg/kg	0.2	28			28	26	7	24			24	30	22	14		
Zinc (total)	mg/kg	0.5	59			59	54	9	37			37	54	**37**	15		
Arsenic (total)	mg/kg	0.1	19			19	28	**38**	18			18	21	15	16		
Selenium (total)	mg/kg	0.1 (Primary): 0.2 (Interlab)	0.6			0.6	<0.2		1			1	<0.2		0.9		
Silver (total)	mg/kg	0.02 (Primary): 0.01 (Interlab)	0.08			0.08	<0.01		0.05			0.05	<0.01		0.03		
Cadmium (total)	mg/kg	0.0	0.47			0.47			0.14			0.14			0.12		
Antimony (total)	mg/kg	0.2	5.2			5.2	9.7	**60**	1.5			1.5	1.6	6	0.4		
Lead (total)	mg/kg	0.1	26			26	19	**31**	14			14	15	7	16		
Thorium (total)	mg/L	0.1	7.7			7.7	25	**106**	5.8			5.8	17	**98**	7.2		
Uranium (total)	mg/kg	0.1 (Primary): 10 (Interlab)	2.9			2.9	<10		3			3	<10		3.6		
Hexavalent Chromium	mg/kg	1.0	2			2			2			2			2		
Mercury (total)	mg/kg	0.01	0.09			0.09	0.11	20	0.05			0.05	0.06	18	0.12		
SVOCs																
Coronene	mg/kg	0.005	<0.005	<0.005		<0.005			<0.005	<0.005		<0.005			<0.005	<0.005	
Perylene	mg/kg	0.004	0.053	0.058	9	0.053			0.017	0.019	11	0.017			0.272	0.309	13
Organochlorine Pesticides																
4,4-DDE	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
a-BHC	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Aldrin	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
b-BHC	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Chlordane	mg/kg	0.00025 (Primary): 0.1 (Interlab)	<0.00025	<0.00025		<0.00025	<0.01		<0.00025	<0.00025		<0.00025	<0.01		<0.00025	<0.00025	
Chlordane (cis)	mg/kg	0.00025	<0.00025	<0.00025		<0.00025			<0.00025	<0.00025		<0.00025			<0.00025	<0.00025	
Chlordane (trans)	mg/kg	0.00025	<0.00025	<0.00025		<0.00025			<0.00025	<0.00025		<0.00025			<0.00025	<0.00025	
d-BHC	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
DDD	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
DDT	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
DDT+DDE+DDD	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Dieldrin	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Endosulfan	mg/kg	0.0005	<0.0005	<0.0005		<0.0005			<0.0005	<0.0005		<0.0005			<0.0005	<0.0005	
Endosulfan I	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Endosulfan II	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Endosulfan sulphate	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Endrin	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	

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Field ID	CA02_2.0	DUP3		CA02_2.0	SPLIT2		CA04_1.0	DUP1		CA04_1.0	SPLIT1		CA06_2.0	DUP2	
Date	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	22/04/2021	22/04/2021	RPD	23/04/2021	23/04/2021	RPD

Indicates QA sample substituted for primary sample during further analysis
Indicates RPD exceeding acceptable range*
Comparison values not available
Notes:
RPD = relative percentage difference
RPDs have only been considered where both sample concentrations are greater than the limit of reporting (LoR).
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	Unit	LoR														
Endrin aldehyde	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Endrin ketone	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
g-BHC (Lindane)	mg/kg	0.00025 (Primary): 0.005 (Interlab)	<0.00025	<0.00025		<0.00025	<0.005		<0.00025	<0.00025		<0.00025	<0.005		<0.00025	<0.00025	
Heptachlor	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Heptachlor epoxide	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Hexachlorobenzene	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Methoxychlor	mg/kg	0.0005 (Primary): 0.005 (Interlab)	<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005		<0.0005	<0.005		<0.0005	<0.0005	
Oxychlordane	mg/kg	0.0005	<0.0005	<0.0005		<0.0005			<0.0005	<0.0005		<0.0005			<0.0005	<0.0005	
Organophosphorous Pesticides																
Azinophos methyl	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Bromophos-ethyl	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Carbophenothion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Chlorfenvinphos E	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Chlorpyrifos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Chlorpyrifos-methyl	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Diazinon	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
cis-Chlorfenvinphos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Dichlorvos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Dimethoate	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Ethion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Fenthion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Malathion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Methyl parathion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Monocrotophos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Prothiofos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Organotin Compounds																
Tributyltin	mg/kg	0.0005	0.002	0.0026	26	0.002	0.0041	51	0.0046	0.0874	**180**	0.0046	0.02	**125**	<0.0005	<0.0005	
Dibutyltin as Sn	µg Sn/kg	1	<1	<1		1	4.2	**123**	<1	8		<1	8.5		<1	<1	
Monobutyltin as Sn	µg Sn/kg	1	<1	<1		<1	1.3		<1	3		<1	1.9		<1	<1	
Pesticides																
Demeton-S-methyl	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Fenamiphos	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Parathion	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	
Pirimphos-ethyl	mg/kg	0.01	<0.01	<0.01		<0.01			<0.01	<0.01		<0.01			<0.01	<0.01	

Quality Control Assessment – Elutriate Sampling and Analysis

The evaluation of QC procedures for elutriate sampling and analysis is presented in the table below.

QA/QC Aspects	Evidence & Evaluation
	Field Procedures
Sample collection and handling	All sample collection and handling was as per the SAP and relevant guidelines and standards detailed therein and above. Composite samples were obtained by vibracorer between 22/09/2021.
Decontamination	Reusable equipment was decontaminated between sample locations using Decon 90 solution, followed by rinsing in deionised water.
Sample-set completeness	All targeted sites were sampled as part of the field campaign. All sub-samples for both primary and QA analysis were collected as planned. Elutriate testing was undertaken at: - 4 sites for Antimony (composite core sample); and - 2 sites for TBT (composite core sample). For each analyte, QA sampling included: - 1 x Duplicate (blind replicates for analysis by primary lab); and - 1 x Split (blind triplicate for analysis by secondary lab).
Sample storage and preservation	All samples were stored as per the SAP (chilled in eskies) until delivery to the laboratory, within specified holding times. Chain of custody and laboratory reports provide evidence of holding times. Holding times were all compliant with required timeframes. Sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1).
Documentation	Laboratory CoCs were used to record sample collection and provided as part of the SAP Implementation Report (Appendix J).
Qualified Personnel	The sample collection was undertaken by qualified and experienced Engineers/Scientists – Daniel Strickland (BEng Environmental) and Krzystof Wienczugow (BSc Applied Chemistry).
Sample transport and integrity	Samples were transported directly to laboratories by field personnel. Chain of custody documentation has been provided as part of the SAP Implementation Report (Appendix J).
	Laboratory Analysis Procedures
Laboratory Accreditation	Laboratory reports were stamped with the NATA endorsement stamp. ALS: Accreditation No. 825 (Primary Lab) Eurofins: Accreditation No. 1261/2377 (Secondary Lab) NMI: Accreditation No. 198 (Secondary Lab)
Laboratory testing methods	All laboratory testing methods were in line with those specified in the SAP.
Laboratory limits of reporting (LoR) / Practical quantitation limit (PQL)	Laboratory reports indicate that the method detection limits (LoR/PQL) were lower than the respective assessment criteria, where applicable.
Completeness of Analysis (Primary Samples)	All primary samples were analysed for all analytes as per the SAP
Completeness of Analysis (Duplicates/blind replicates)	All duplicate samples were analysed for both analytes as proposed.
Completeness of Analysis (Splits/blind triplicates)	The split sample for Antimony was analysed as proposed. The split sample for TBT was not analysed due to laboratory error.
	Data Precision & Accuracy
Acceptance criteria	A quantitative measure of the blind and split duplicate sample results was made using calculated relative percentage difference (RPD) values for each chemical. The RPD values were calculated using the following equation.

QA/QC Aspects	Evidence & Evaluation
	$$RPD(\%) = \frac{(C_o - C_s)}{\left(\frac{C_o + C_s}{2}\right)} \times 100$$ Where *Co* = reported concentration of the chemical of interest from the original primary sample Cs = reported concentration of the chemical of interest from the duplicate sample RPD calculations provide a measure of the precision of field sampling methods and laboratory methods. According to AS 4482.1 – 2005 (Standards Australia 2005), typical RPDs are expected to range between 30% and 50%; however, this may be higher for concentrations which are close to the laboratory LoR. Considering this, Cardno has adopted the following acceptable RPD limits for the study, based on standard industry practice and the inherent variability: • 81% for concentrations within one to ten times the analyte LoR; • 50% for concentrations within ten to 30 times the analyte LoR; and • 30% for concentrations greater than 30 times the analyte LoR.
QC Testing – Blind replicates (Primary Lab)	For the field sampling event, blind replicates were taken from 1 sample of each Antimony and TBT for QC testing (2 total). Calculated RPDs are presented in **Table 2**. • Samples Collected: 6 (4 Antimony, 2 TBT) • Blind Replicate Samples Analysed: 2 (1 Antimony, 1 TBT) • Blind Replicate Analyte Pairs: 2 (1 Antimony, 1 TBT) • Number of Analyte Pairs Exceeding Criteria: 0 • Percentage of Analyte Pairs Exceeding Criteria: 0% No exceedances were reported above the adopted acceptance criteria.
QC Testing – Blind triplicates (Secondary Lab)	For the field sampling event, blind triplicates were taken from 1 sample of each Antimony and TBT for QC testing (2 total), though analysis for TBT was not undertaken. Calculated RPDs are presented in **Table 2**. • Samples Collected: 6 (4 Antimony, 2 TBT) • Field Split Samples Analysed: 1 (Antimony) • Field Split Analyte Pairs: 1 (Antimony) • Number of Analyte Pairs Exceeding Criteria: 1 • Percentage of Analyte Pairs Exceeding Criteria: 100% Exceedances reported above the adopted acceptance criteria: ○ Antimony (DUP2): RPD (91%) greater than acceptable limit (81%).
Laboratory Internal QC	ALS (Primary), Eurofins (Secondary) and NMI (Secondary) performed internal QA/QC with adequate testing and satisfactory results for method blank laboratory control samples and laboratory duplicates. ***Primary Laboratory (ALS)*** The primary laboratory reported that there were no outliers for the following QC procedures: • Method blanks. • Duplicates. • Laboratory Control. • Matrix Spikes. • Surrogate Recovery. • Analysis Holding Time. ***Secondary Laboratory (Eurofins)*** The secondary laboratory reported that there were no outliers for the following QC procedures: • Method blanks.

QA/QC Aspects	Evidence & Evaluation
	• Matrix Spikes. • Laboratory Control. • Analysis Holding Time. • Quality Control Sample Frequency Outliers. ***Secondary Laboratory (NMI)*** The secondary laboratory reported that there were no outliers for the following QC procedures: • Method blanks. • Matrix Spikes. • Laboratory Control. • Analysis Holding Time. • Quality Control Sample Frequency Outliers.
	Data Validity
Validity of Data Set	The data quality review did not find any significant systematic errors in the water sample collection, handling and transport process. The key deficiency identified in the analysis QAQC process was the failure of the secondary laboratory (Eurofins) to analyse the dedicated split sample for TBT. The laboratory analysed this sample for Antimony instead. This error is not considered to compromise the results of data assessment and outcomes, as primary analysis results led to a guideline exceedance for TBT (requiring appropriate management, as described in the report). Concentrations of Antimony were low and variable, leading to an RPD exceedance for the split sample analysis compared to the primary. Although RPD results are above the acceptance limit, both results are well below assessment criteria and hence have no significant impact. As such, the set of results are considered to be complete and valid for their intended purpose – comparison against ANZG (2018) marine water quality trigger values for 95% marine ecosystem protection.

Lab Report	EP2111318	EP2111318		EP2111318	828220		EP2111318	EP2111318		EP2111318	828220	
Field ID	CA02	DUP1		CA06	DUP2		CO2	DUP3		CO3	DUP4	
Date	22/10/2021	22/10/2021	RPD	22/04/2021	22/04/2021	RPD	22/10/2021	22/10/2021	RPD	22/10/2021	22/10/2021	RPD

Indicates RPD exceeding acceptable range*

Comparison values not available

Notes:

RPD = relative percentage difference

*Elevated RPDs are highlighted as per Acceptance Criteria (Acceptable RPDs for each LOR multiplier range are: 81% (1 - 10 x LoR); 50% (10 - 30 x LoR); 30% (> 30 x LoR))

Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

	Unit	LoR												
Antimony	µg/L	0.5 (Primary): 0.1 (Interlab)	2.4	3.7	43	5.1	1.9	91	-	-	-	-	-	-
Tributyltin	ngSn/L	2 (Primary): 2 (Interlab)	-	-	-	-	-	-	12	9	29	4		

APPENDIX

F

PARTICLE SIZE DISTRIBUTION RESULTS

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Dredging Phase / Disposal site	Phase 1							Phase 2													
Site	**C02**	**C02**	**C02**	**C03**	**C03**	**C04**	**C04**	**C06**	**C06**	**C06**	**CA01**	**CA01**	**CA02**	**CA02**	**CA02**	**CA02**	**CA03**	**CA03**	**CA03**	**CA04**	**CA04**
Sample ID	C02_0.5	C02_1.0	C02_1.5	C03_0.5	C03_1.0	C04_0.5	C04_1.0	C06_0.5	C06_1.0	C06_1.5	CA01_0.5	CA01_1.0	CA02_0.5	CA02_1.0	CA02_1.5	CA02_2.0	CA03_0.5	CA03_1.0	CA03_1.5	CA04_0.5	CA04_1.0
Depth range (below seabed)	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	0.00 - 0.50	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	0.00 - 0.50	0.50 - 1.00	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	1.50 - 2.00	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	0.00 - 0.50	0.50 - 1.00
Classifications (Wentworth)																					
Total Clay % (0-4µm)	**3.50**	**3.24**	**0.27**	**0.77**	**0.70**	**4.56**	**5.94**	**2.24**	**2.39**	**1.46**	**4.58**	**6.42**	**5.14**	**7.24**	**7.29**	**8.17**	**6.01**	**6.93**	**7.62**	**4.53**	**6.95**
Very Fine Silt % (4-8µm)	3.95	3.54	0.72	1.10	0.91	5.31	6.12	2.34	2.32	1.39	4.69	6.65	6.42	8.68	7.96	8.63	7.23	8.24	9.08	5.82	8.16
Fine Silt % (8-16µm)	6.38	5.69	1.10	1.62	1.62	9.05	9.88	3.94	3.88	2.34	8.20	11.87	12.28	15.54	14.05	15.29	13.66	15.00	15.98	11.11	14.51
Medium Silt % (16-31µm)	8.14	7.27	1.80	2.27	2.67	12.39	13.19	5.76	5.77	3.86	12.27	17.77	19.04	21.92	20.56	22.05	20.55	21.84	22.23	17.62	20.39
Course Silt % (31-63µm)	8.59	7.69	2.54	2.60	3.68	14.13	14.55	7.67	7.78	6.72	15.97	22.16	23.28	23.12	22.86	23.58	23.59	23.86	23.24	23.57	21.95
Total Silt (4-63µm)	**27.06**	**24.18**	**6.16**	**7.60**	**8.88**	**40.89**	**43.74**	**19.71**	**19.75**	**14.32**	**41.13**	**58.45**	**61.03**	**69.26**	**65.43**	**69.56**	**65.02**	**68.94**	**70.53**	**58.11**	**64.99**
Very Fine sand % (63-125µm)	9.50	8.64	7.50	8.12	8.32	15.40	14.72	20.02	19.60	21.07	20.15	18.52	18.16	14.39	15.18	14.36	16.76	15.09	14.04	20.37	14.17
Fine sand % (125-250µm)	22.20	22.35	36.56	30.98	25.59	17.36	15.62	33.50	32.73	35.49	19.64	10.01	9.75	6.18	7.55	5.36	7.81	6.31	5.32	10.67	6.20
Medium sand % (250-500µm)	26.21	28.59	44.91	34.43	31.73	10.27	9.15	18.67	18.36	20.33	8.04	4.21	4.44	2.48	3.55	2.09	3.95	2.26	2.22	5.06	3.16
Coarse sand % (500-1000µm)	9.70	10.51	4.47	16.22	21.51	5.36	4.42	5.09	5.61	5.92	1.68	1.42	0.75	0.32	0.53	0.33	0.27	0.20	0.12	0.83	0.75
Very Coarse sand % (1000-2000µm)	0.99	1.13	0.12	1.52	2.98	2.47	1.92	0.62	1.12	0.94	0.54	0.64	0.24	0.09	0.17	0.13	0.10	0.24	0.07	0.16	0.99
Total Sand (63-2000µm)	**68.60**	**71.23**	**93.56**	**91.27**	**90.13**	**50.86**	**45.82**	**77.90**	**77.41**	**83.75**	**50.06**	**34.80**	**33.33**	**23.46**	**26.99**	**22.27**	**28.90**	**24.09**	**21.77**	**37.09**	**25.26**
Total Gravels (>2000µm)	**0.84**	**1.34**	**0.01**	**0.36**	**0.30**	**3.69**	**4.50**	**0.15**	**0.45**	**0.47**	**4.23**	**0.34**	**0.50**	**0.05**	**0.29**	**0.00**	**0.07**	**0.04**	**0.08**	**0.26**	**2.79**
Median Diameter (D50) (µm)	**181.49**	**204.13**	**248.37**	**261.57**	**285.08**	**78.57**	**64.08**	**148.17**	**149.59**	**161.78**	**74.32**	**39.30**	**38.49**	**28.18**	**31.14**	**27.63**	**33.47**	**29.33**	**27.05**	**43.44**	**31.00**

Reference: Wentworth, C. K. (1922) *A Scale of Grade and Class Terms for Clastic Sediments*. The Journal of Geology

Dredging Phase / Disposal site	Phase 2									Dispoal Site									
Site	**CA04**	**CA05**	**CA05**	**CA05**	**CA05**	**CA06**	**CA06**	**CA06**	**CA06**	**SS01**	**SS02**	**SS03**	**SS04**	**SS05**	**SS06**	**SS07**	**SS08**	**SS09**	**SS10**
Sample ID	CA04_1.5	CA05_0.5	CA05_1.0	CA05_1.5	CA05_2.0	CA06_0.5	CA06_1.0	CA06_1.5	CA06_2.0	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10
Depth range (below seabed)	1.00 - 1.50	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	1.50 - 2.00	0.00 - 0.50	0.50 - 1.00	1.00 - 1.50	1.50 - 2.00	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 0.50
Classifications (Wentworth)																			
Total Clay % (0-4µm)	**7.86**	**7.42**	**8.08**	**5.78**	**5.87**	**7.63**	**8.80**	**6.29**	**6.12**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Very Fine Silt % (4-8µm)	9.24	8.02	7.95	7.20	6.68	8.80	9.44	7.20	6.91	0.00	0.00	0.00	0.13	0.01	0.11	0.03	0.12	0.01	0.08
Fine Silt % (8-16µm)	16.35	14.31	13.97	14.22	12.84	15.35	15.99	13.71	13.19	0.17	0.00	0.00	0.24	0.12	0.25	0.14	0.21	0.14	0.30
Medium Silt % (16-31µm)	22.69	21.27	21.07	22.23	20.86	21.41	21.91	21.72	21.14	0.15	0.00	0.00	0.25	0.09	0.26	0.15	0.24	0.14	0.30
Course Silt % (31-63µm)	23.41	24.05	24.01	25.37	25.75	22.95	22.81	25.72	25.77	0.32	0.00	0.92	0.40	0.80	0.40	0.20	0.29	0.21	0.38
Total Silt (4-63µm)	**71.70**	**67.65**	**67.00**	**69.02**	**66.13**	**68.52**	**70.16**	**68.36**	**67.02**	**0.65**	**0.00**	**0.92**	**1.02**	**1.02**	**1.02**	**0.51**	**0.85**	**0.49**	**1.05**
Very Fine sand % (63-125µm)	13.49	15.47	15.77	16.37	17.30	14.49	13.34	16.37	17.20	0.21	0.00	2.31	0.49	1.29	0.46	0.23	0.48	0.11	1.00
Fine sand % (125-250µm)	4.83	6.04	6.38	6.38	6.59	5.74	4.96	6.05	6.81	3.95	14.47	24.94	6.11	12.04	5.66	0.86	2.59	1.34	2.54
Medium sand % (250-500µm)	1.92	3.10	2.58	2.17	2.99	2.59	2.20	2.64	2.65	22.35	77.49	66.33	17.23	44.28	17.33	11.20	11.07	16.02	22.85
Coarse sand % (500-1000µm)	0.12	0.15	0.10	0.14	0.19	0.47	0.19	0.15	0.12	29.55	7.57	4.93	51.40	36.13	28.49	39.22	31.03	31.54	66.36
Very Coarse sand % (1000-2000µm)	0.09	0.17	0.09	0.13	0.10	0.23	0.07	0.07	0.08	38.60	0.46	0.41	19.52	3.02	37.72	25.81	11.91	30.88	5.92
Total Sand (63-2000µm)	**20.45**	**24.93**	**24.92**	**25.20**	**27.17**	**23.53**	**20.75**	**25.27**	**26.86**	**94.67**	**99.99**	**98.92**	**94.74**	**96.76**	**89.66**	**77.32**	**57.08**	**79.89**	**98.67**
Total Gravels (>2000µm)	**0.00**	**0.00**	**0.00**	**0.00**	**0.82**	**0.33**	**0.29**	**0.08**	**0.00**	**4.68**	**0.01**	**0.16**	**4.24**	**2.22**	**9.32**	**22.17**	**42.06**	**19.62**	**0.28**
Median Diameter (D50) (µm)	**26.21**	**30.14**	**30.09**	**31.50**	**34.37**	**28.26**	**26.04**	**31.95**	**33.36**	**886.37**	**359.96**	**319.74**	**744.73**	**441.19**	**948.08**	**974.35**	**1333.58**	**1016.20**	**669.96**

Reference: Wentworth, C. K. (1922) *A Scale of Grade and Class Terms for Clastic Sediments*. The Journal of Geology

APPENDIX

G

BCH CLASSIFICATIONS

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Site	Location (UTM Zone 50H)	Depth (m)	Substratum Component	Biotic Component	Species identified	Approximate (Live) Coverage	Other Ecology Observed
1	369251 m E 6324736 m S	22.0	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	-
2	368296 m E 6324360 m S	24.0	Coarse sediments	Seagrass	*Posidonia / Amphibolis*	60	-
3	369032 m E 6324272 m S	22.9	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	30	-
4	368786 m E 6324084 m S	21.4	Coarse sediments	Seagrass	*Posidonia / Amphibolis*	65	-
5	368252 m E 6323863 m S	22.1	Coarse sediments	Seagrass	*Posidonia / Amphibolis*	70	-
6	369007 m E 6323643 m S	22.5	Mixed coarse sediments	Biota absent	Bare Sediment	0	-
6A	368997 m E 6323623 m S	22.5	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	5	-
7	369734 m E 6323548 m S	21.2	Mixed coarse sediments	Seagrass wrack	-	0	-
8	368061 m E 6323326 m S	24.3	Mixed coarse sediments	Seagrass wrack	-	0	-
9	368551 m E 6323258 m S	23.5	Mixed coarse sediments	Biota absent	-	0	-
10	369055 m E 6323120 m S	22.1	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	25	-

Site	Location (UTM Zone 50H)	Depth (m)	Substratum Component	Biotic Component	Species identified	Approximate (Live) Coverage	Other Ecology Observed
10A	369054 m E 6323072 m S	22.1	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	-
11	369437 m E 6323019 m S	23.0	Mixed coarse sediments	Biota absent	-	0	-
11A	369435 m E 6322999 m S	23.5	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	Fish – Leatherjacket Species
11B	369435 m E 6322985 m S	23.5	Mixed coarse sediments	Biota absent	-	0	-
11C	369436 m E 6322965 m S	23.5	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	25	-
12	367885 m E 6322909 m S	23.4	Mixed coarse sediments	Biota absent	-	0	-
13	368374 m E 6322787 m S	23.5	Mixed coarse sediments	Biota absent	-	0	-
13A	368390 m E 6322784 m S	23.5	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	25	-
14	368864 m E 6322720 m S	23.4	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	25	-
15	369336 m E 6322599 m S	22.2	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	45	-
16	367785 m E 6322436 m S	23.6	Coarse sediments	Seagrass wrack	-	0	-

Site	Location (UTM Zone 50H)	Depth (m)	Substratum Component	Biotic Component	Species identified	Approximate (Live) Coverage	Other Ecology Observed
17	368286 m E 6322285 m S	23.3	Coarse sediments	Seagrass wrack	-	0	-
18	358836 m E 6322194 m S	23.2	Mixed coarse sediments	Seagrass wrack	-	0	-
18A	368833 m E 6322131 m S	23.2	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	75	-
19	369243 m E 6322050 m S	23.1	Mixed coarse sediments	Seagrass, sponge	*Posidonia / Amphibolis*	75	-
19A	369243 m E 6321997 m S	23.1	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	75	-
20	367561 m E 6321684 m S	23.1	Mixed coarse sediments	Biota absent	-	0	-
21	368157 m E 6321653 m S	23.2	Mixed coarse sediments	Seagrass wrack	-	0	-
22	368589 m E 6321423 m S	23.2	Mixed coarse sediments	Seagrass wrack	-	0	-
23	369109 m E 6321298 m S	23.0	Mixed coarse sediments	Biota absent	-	0	-
24	367508 m E 6320964 m S	23.8	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	-
25	368178 m E 6320823 m S	23.3	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	30	-

Site	Location (UTM Zone 50H)	Depth (m)	Substratum Component	Biotic Component	Species identified	Approximate (Live) Coverage	Other Ecology Observed
25A	368178 m E 6320791 m S	23.3	Mixed coarse sediments	Seagrass wrack	-	0	-
25B	368175 m E 6320764 m S	23.3	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	-
26	368735 m E 6320599 m S	23.1	Mixed coarse sediments	Seagrass wrack	-	0	-
27	367428 m E 6320434 m S	23.4	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	10	-
27A	367418 m E 6320384 m S	23.4	Mixed coarse sediments	Seagrass wrack	-	0	-
28	368482 m E 6320180 m S	22.5	Mixed hard substrata and coarse sediments	Biota absent	-	0	-
28A	368486 m E 6320121 m S	22.5	Mixed hard substrata and coarse sediments	Seagrass	-	20	-
29	367818 m E 6319626 m S	22.7	Mixed coarse sediments	Seagrass wrack	-	0	-
29A	367852 m E 6319533 m S	22.7	Mixed coarse sediments	Seagrass	*Posidonia / Amphibolis*	50	-

APPENDIX

H

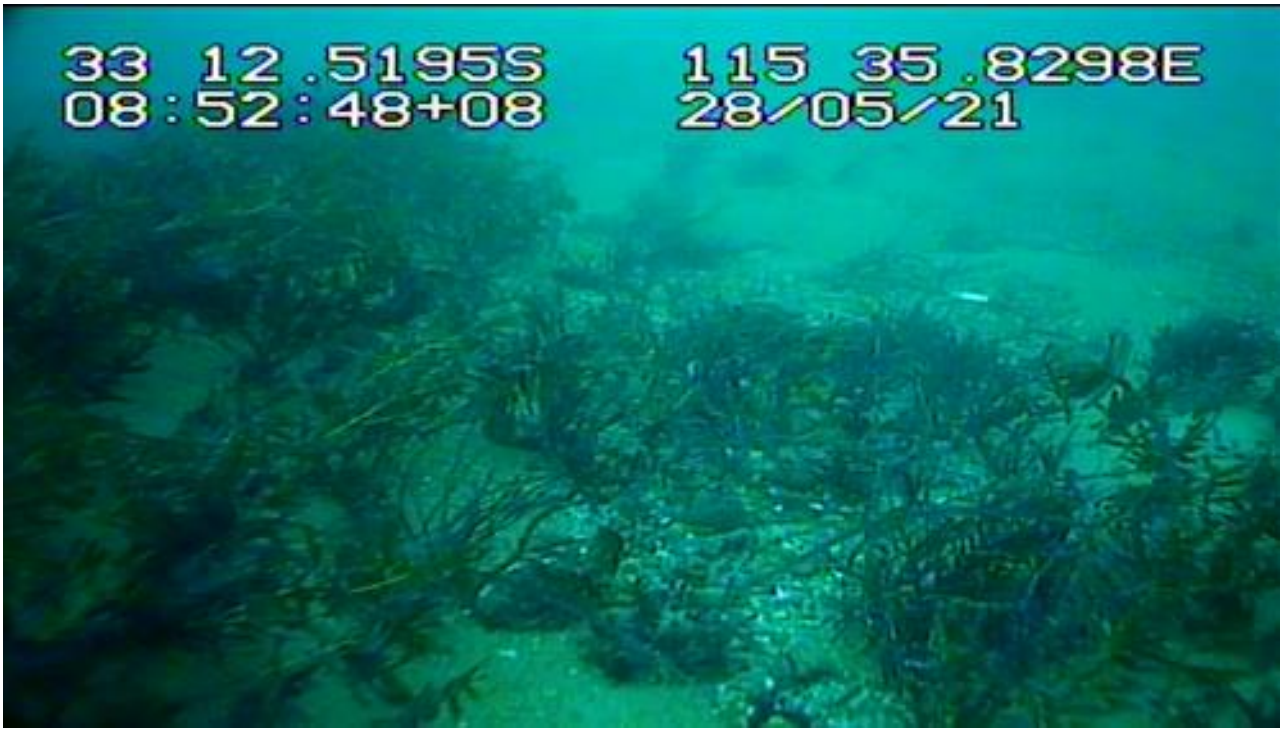
BCH SURVEY SNAPSHOTS

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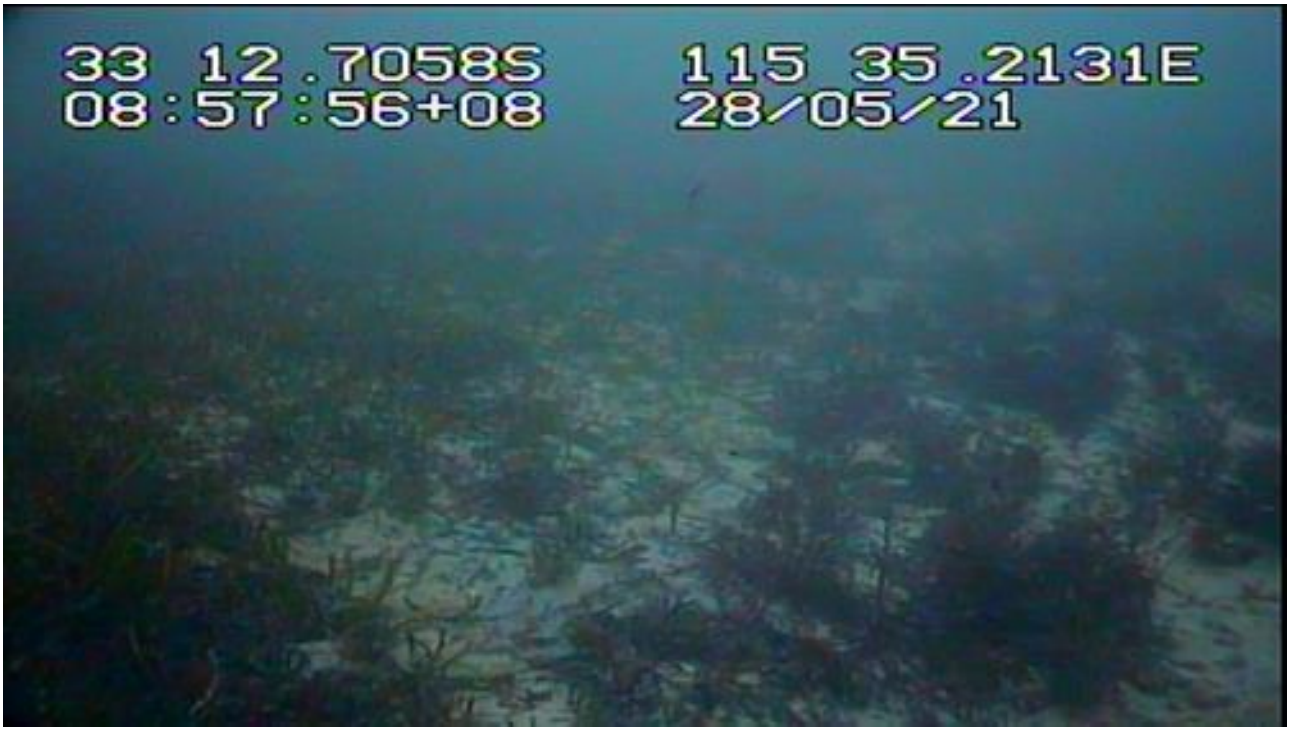
now

Stantec

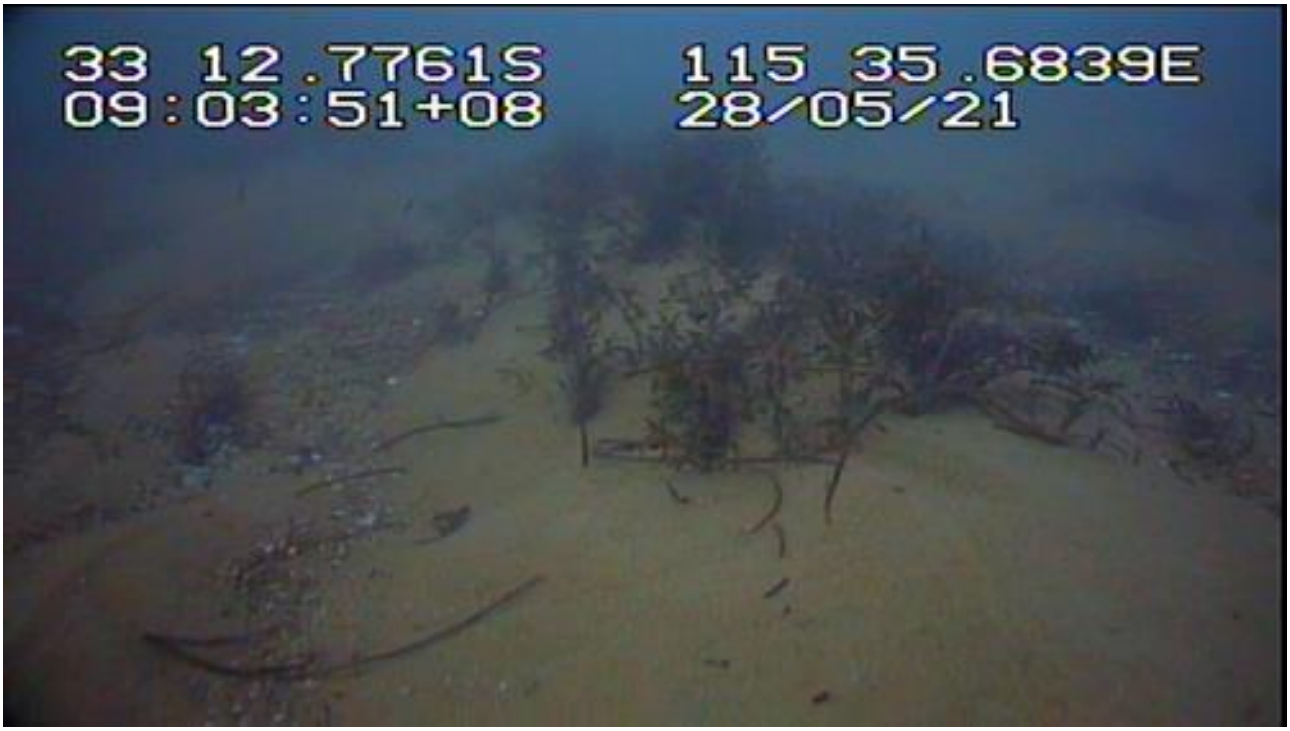
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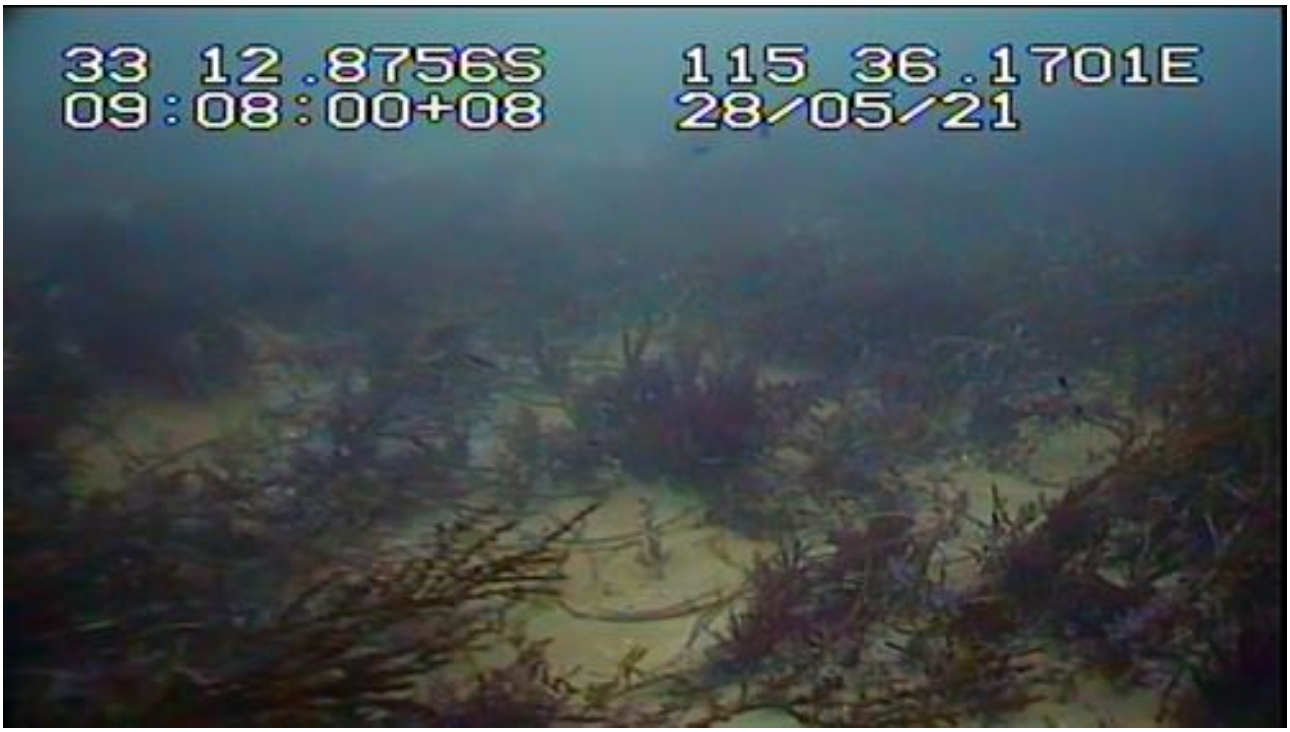
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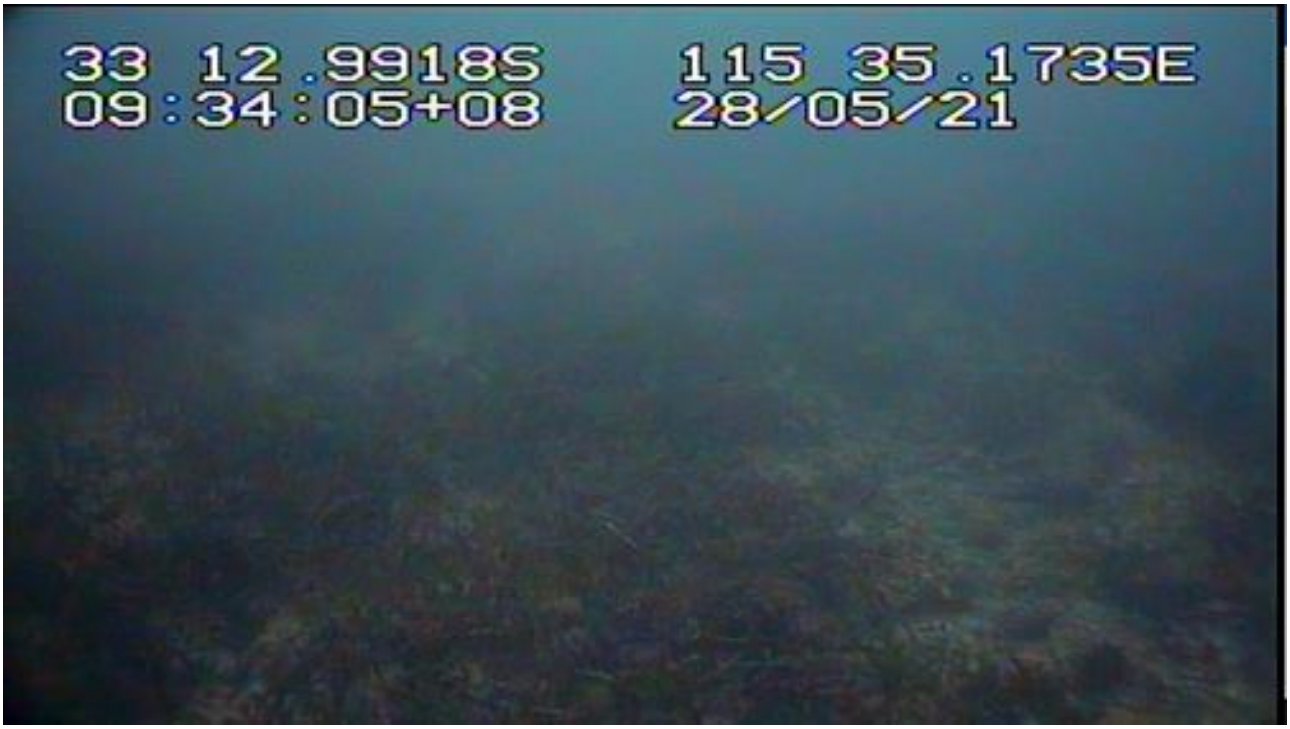
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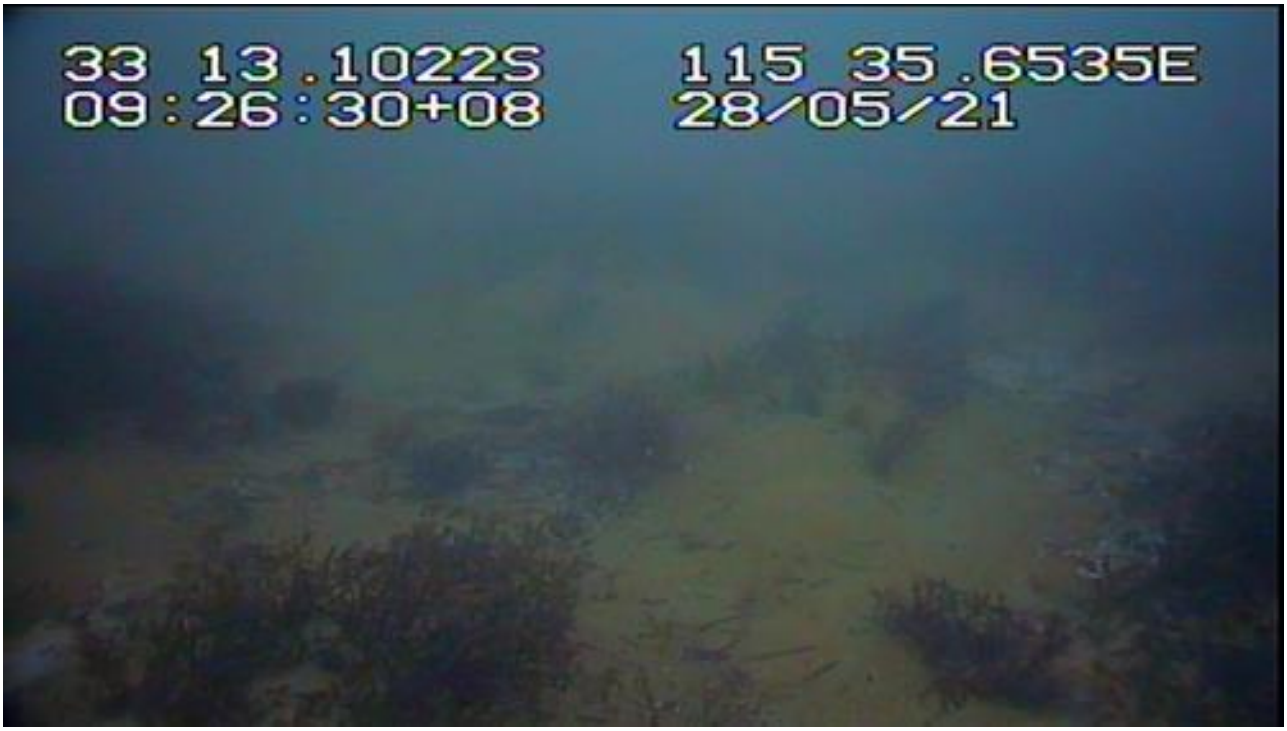
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Site: 6A



Site: 7



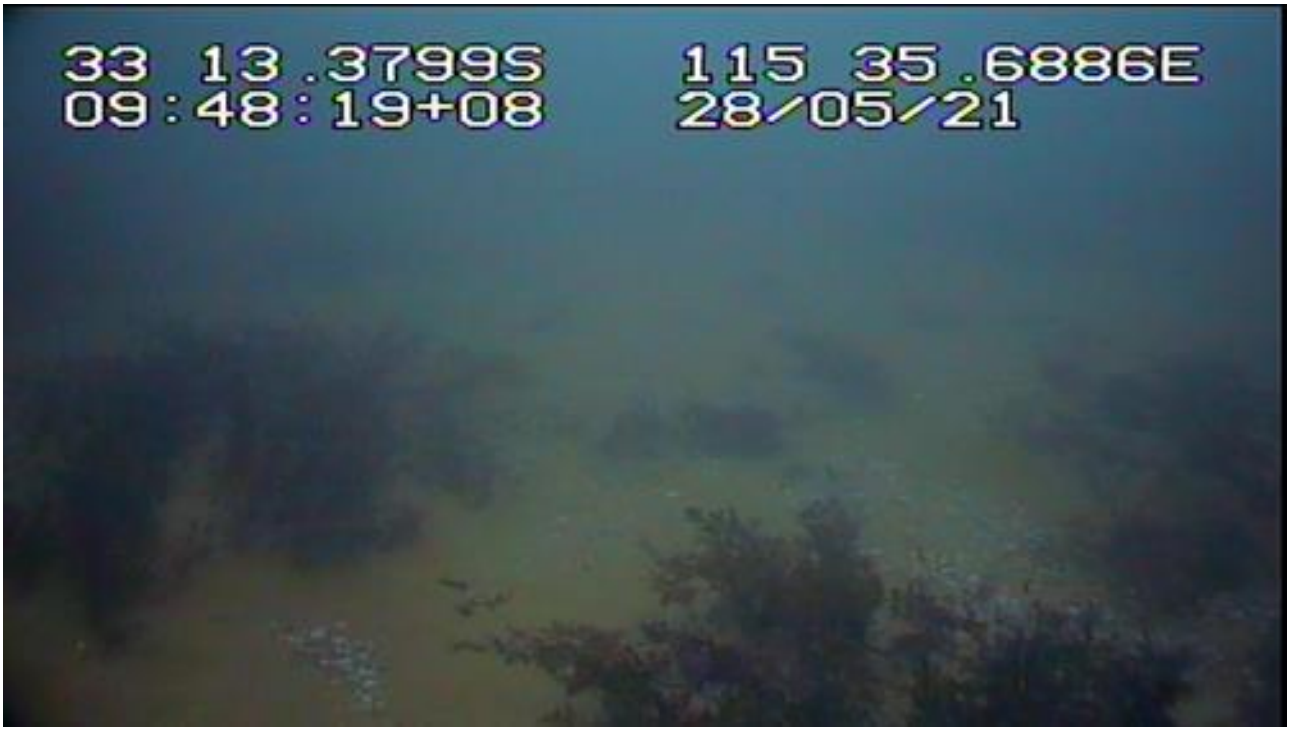
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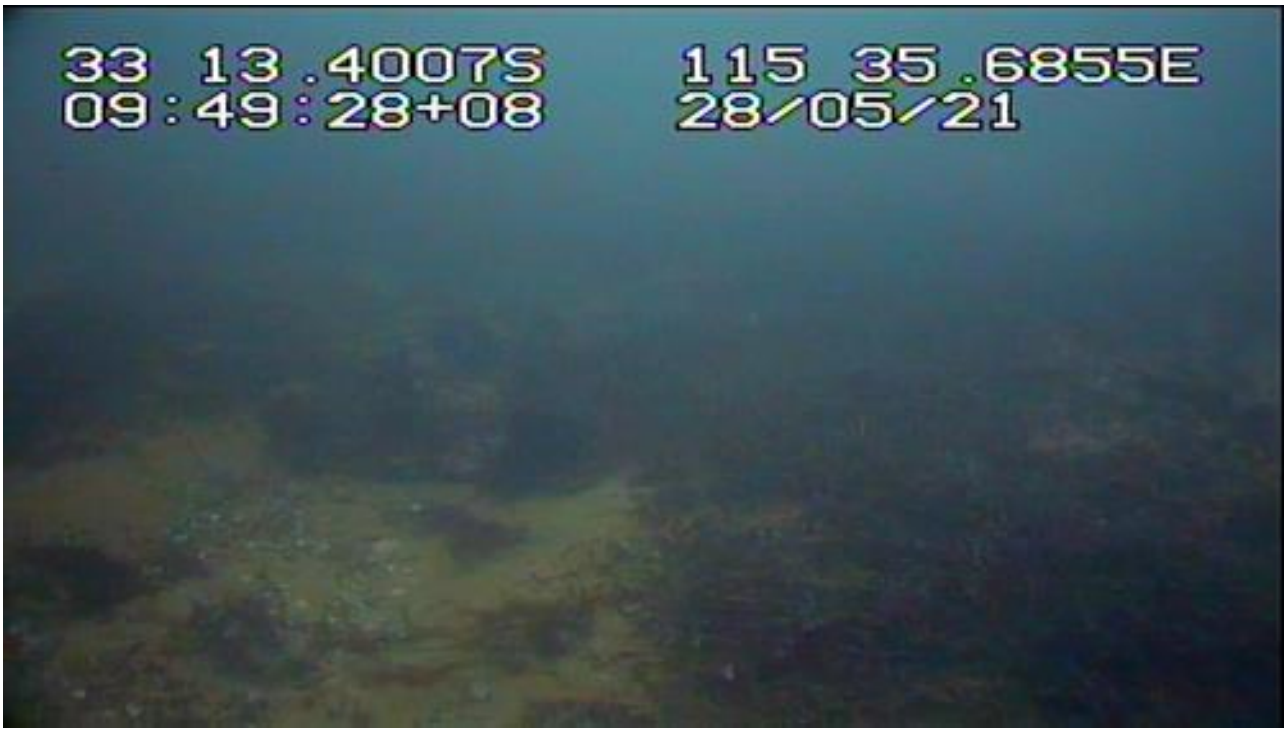
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Site: 10A



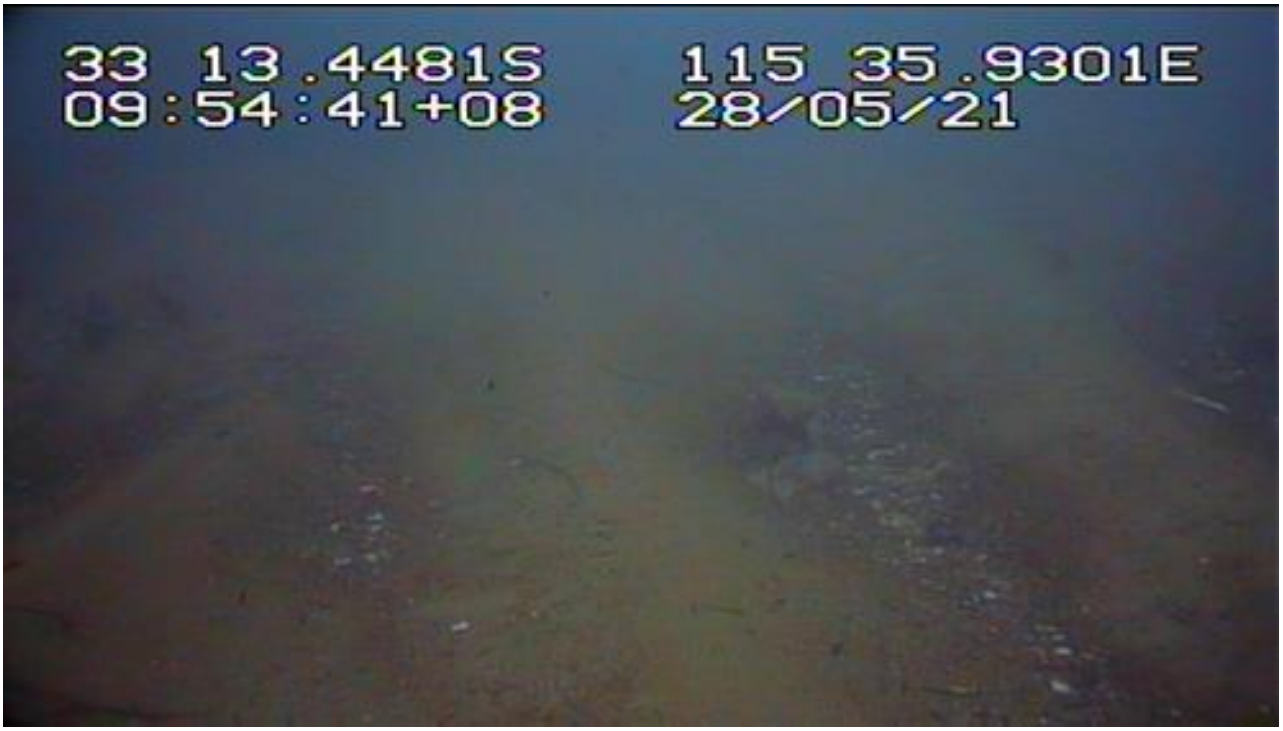
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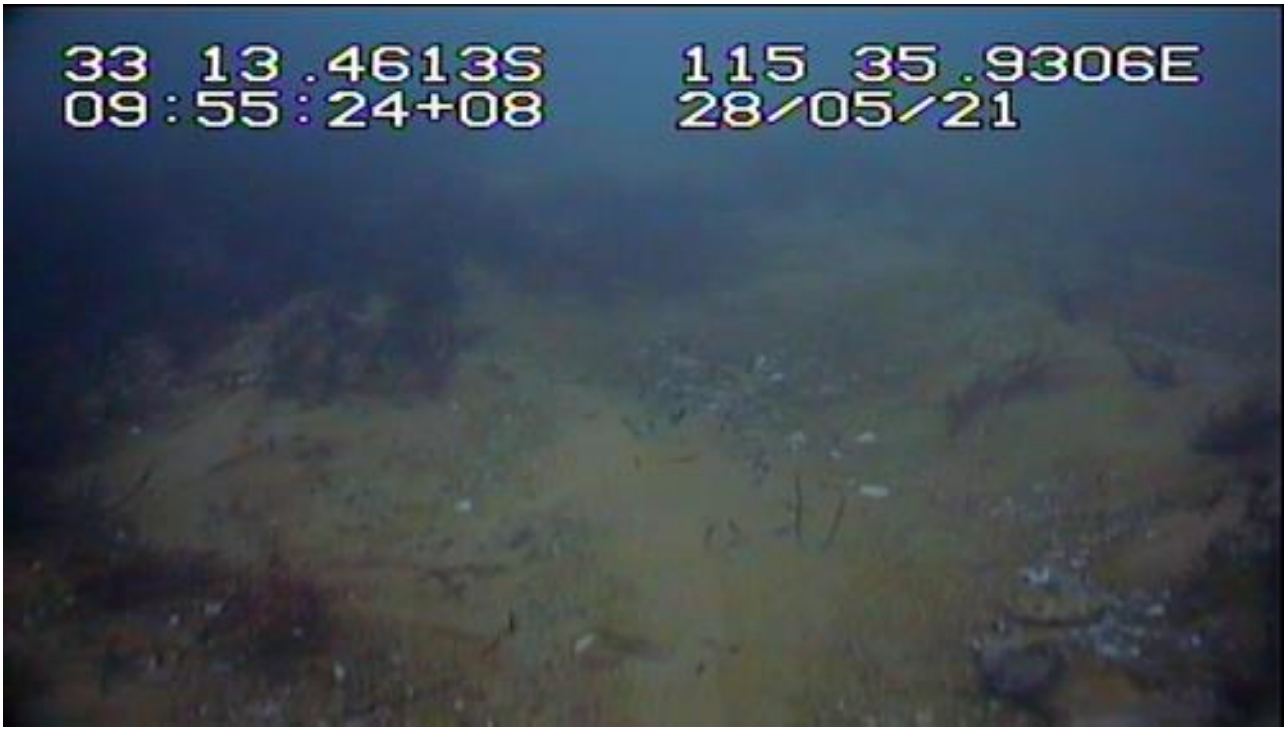
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Site: 11B



Site: 11C



Site: 12



Site: 13



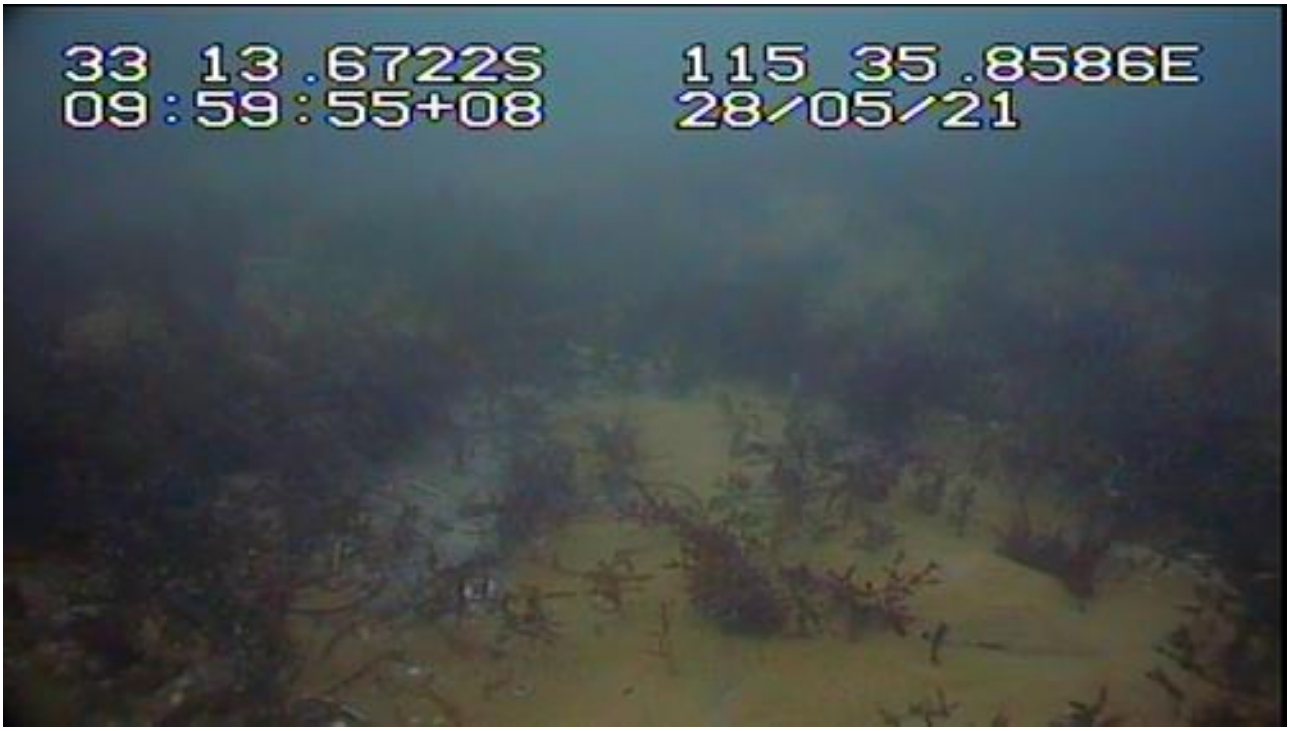
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Site: 14



Site: 15



Site: 16



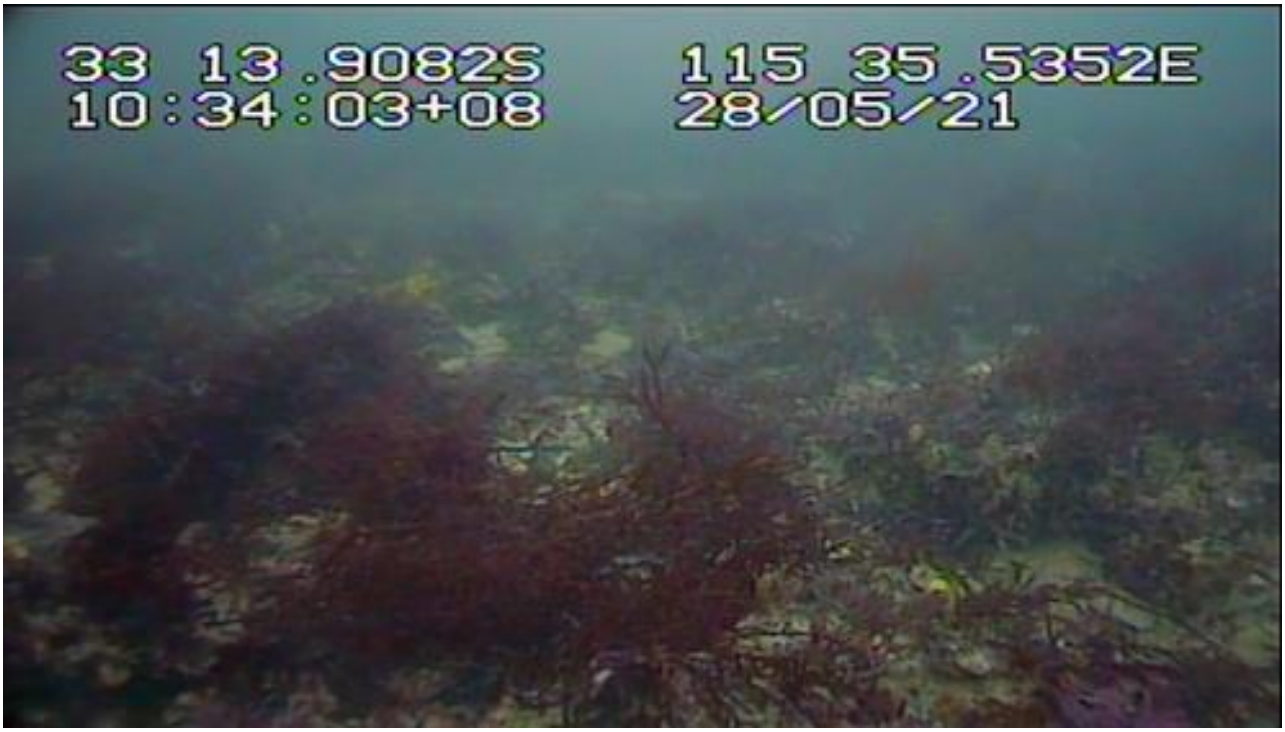
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Site: 18



Site: 18A



Site: 19



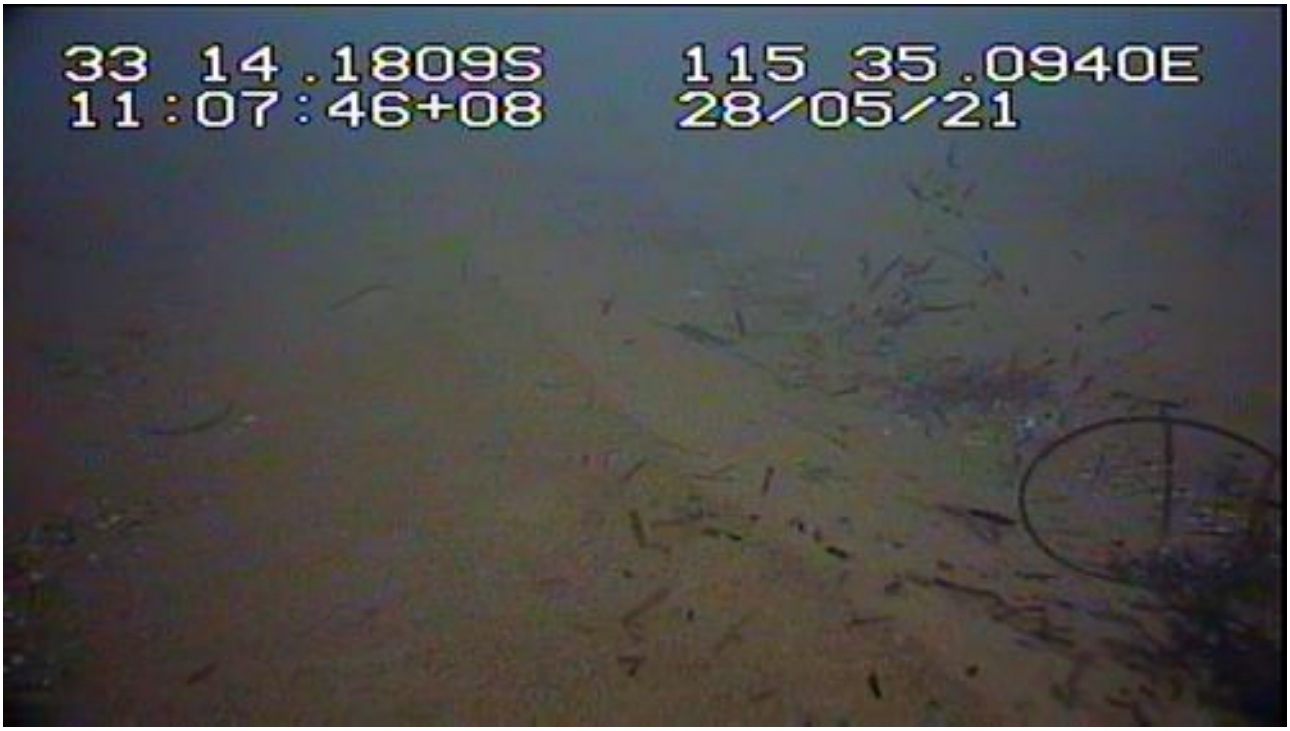
Site: 19A



Site: 20



Site: 21



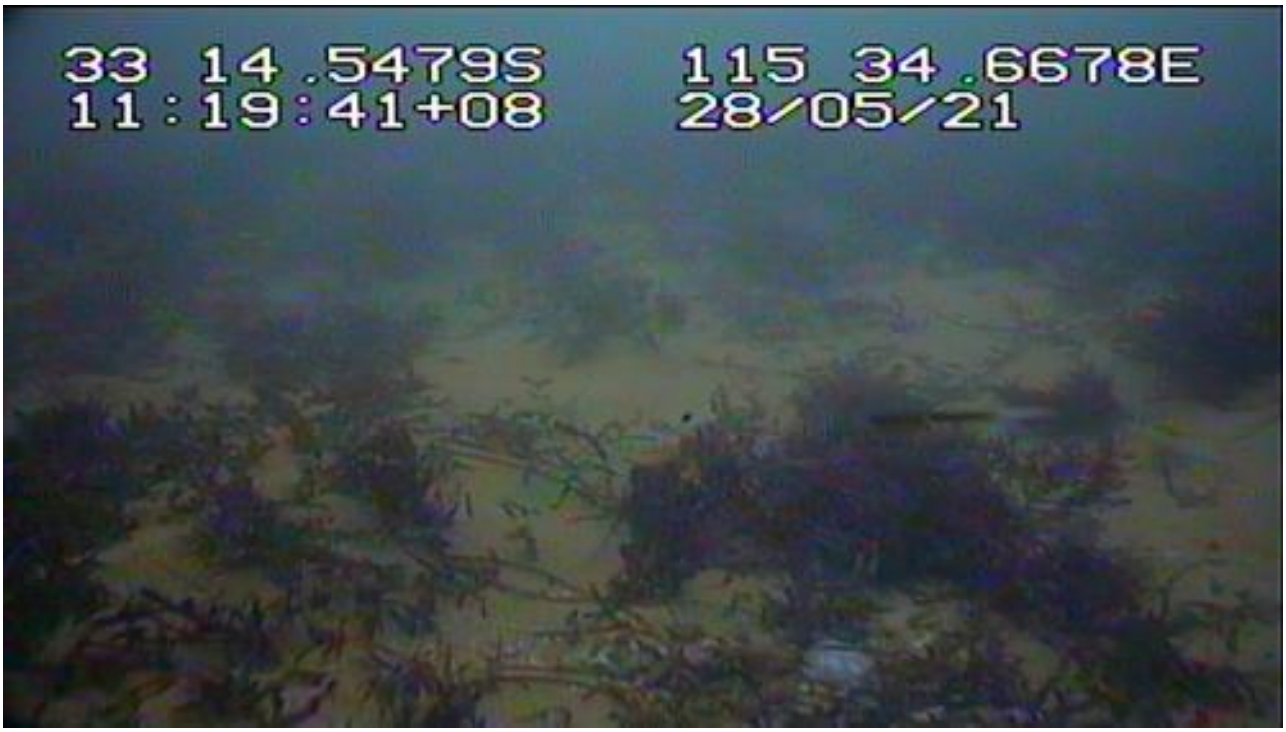
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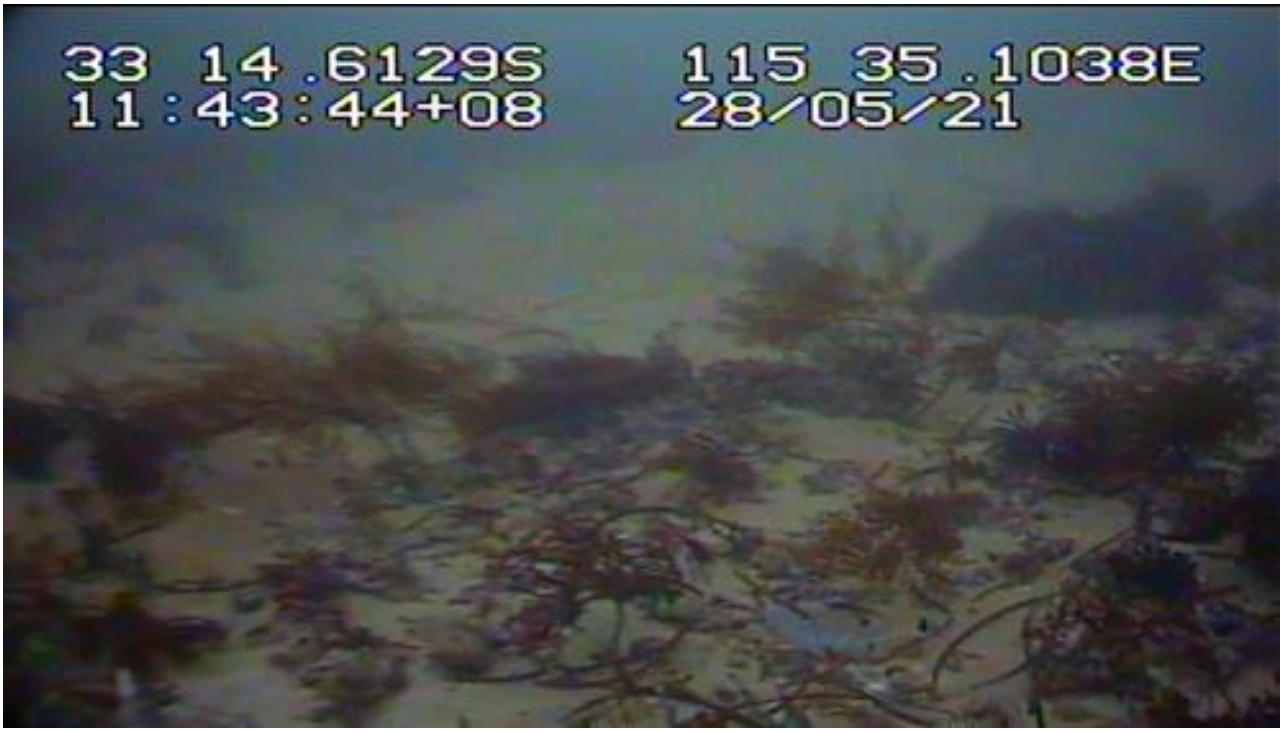
Site: 23



Site: 24



Site: 25



Site: 25A



Site: 25B



Site: 26



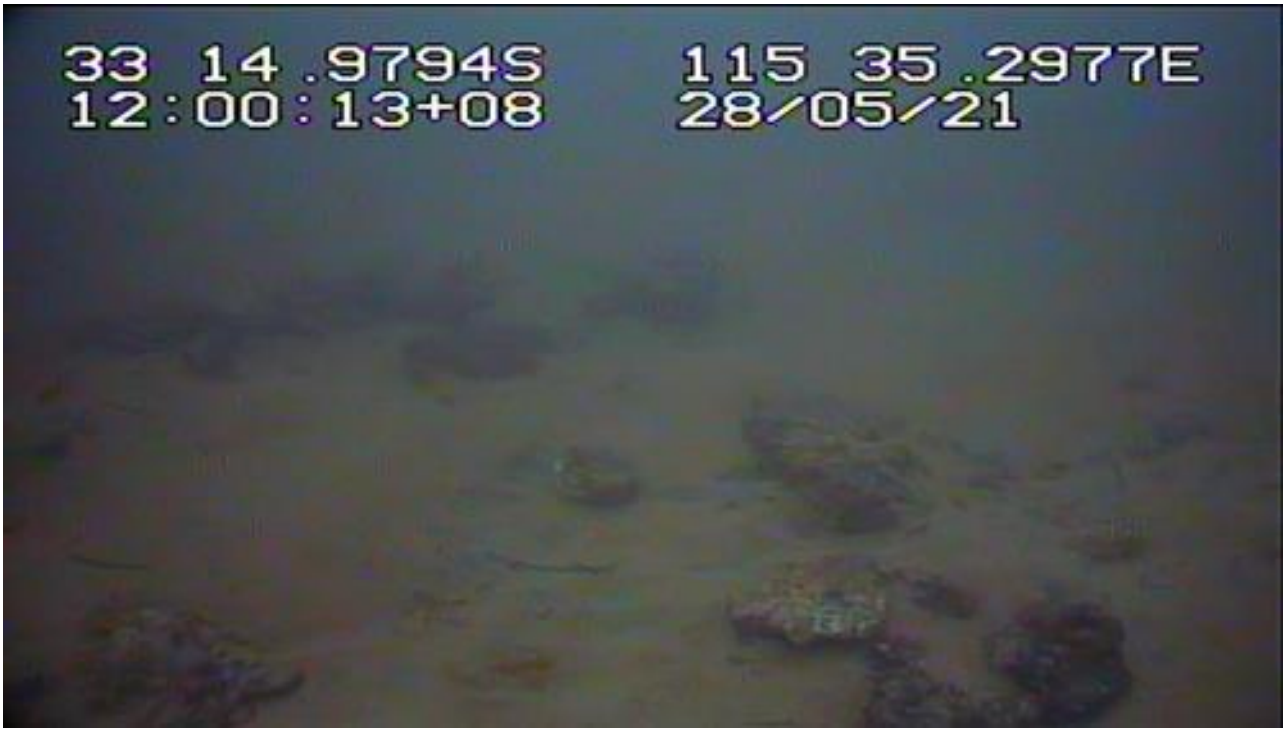
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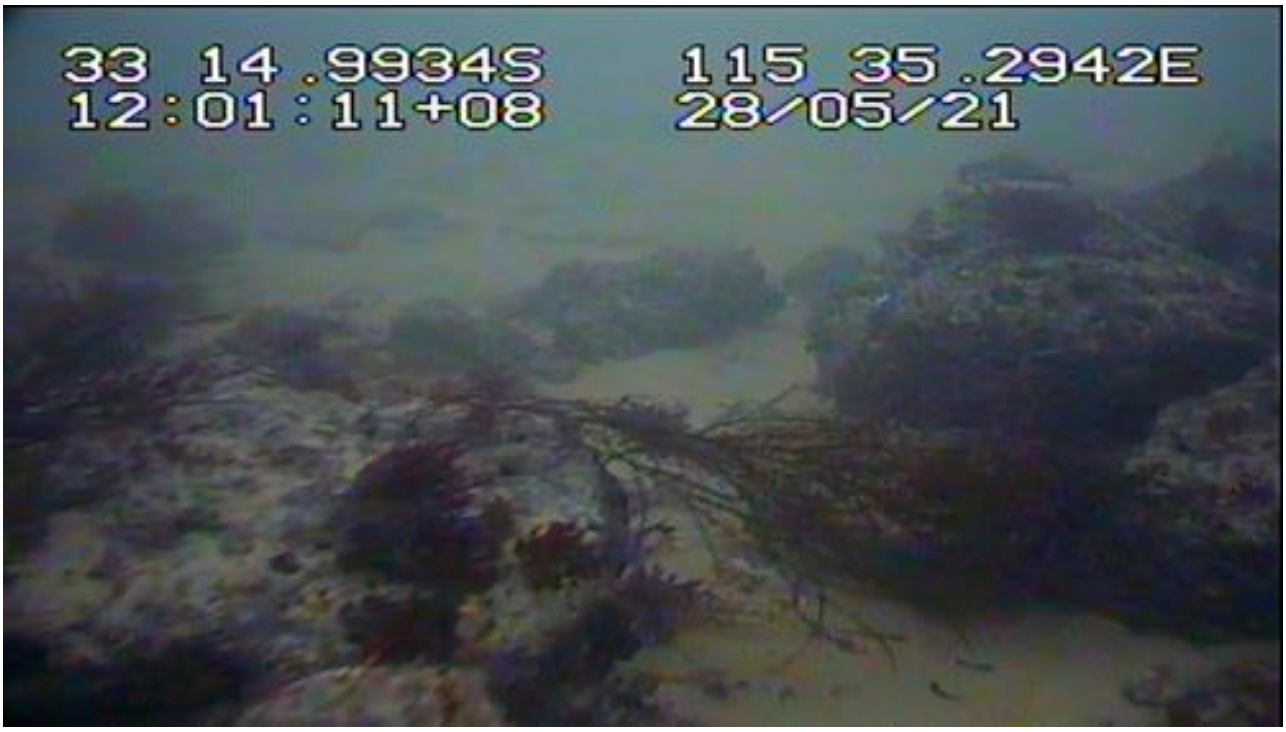
Site: 27A



Site: 28



Site: 28A



Site: 29



Site: 29A



APPENDIX

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FIELD SAMPLING BORE LOGS

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ENVIRONMENTAL BOREHOLE / TESTPIT CA01

PROJECT NUMBER CW1146500	**DRILLING DATE** 20/04/2021	**MAP REFERENCE** CA01
PROJECT NAME Cas Harbour Dredging Studies	**DRILLING COMPANY** Strataprobe	
CLIENT Department of Transport	**DRILLER** Les Metcalf	
ADDRESS 5 Newman Court, Fremantle WA 6160	**DRILLING METHOD** Vibracore	**LOGGED BY** JB
	TOTAL DEPTH 1m	**CHECKED BY** DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			CA01_0.5 CA01_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Some sand inclusions < 10%	
0.5			CA01_1.0		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Sand and shell grit inclusions < 10%.	
1						Termination Depth at:1.0 m	

ENVIRONMENTAL BOREHOLE / TESTPIT CA02

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 20/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 2m

MAP REFERENCE CA02
LOGGED BY JB
CHECKED BY DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CA02_0.5 CA01_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Some sand inclusions < 10%	
0.5			CA02_1.0			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity. Sand inclusions < 10%.	
1			CA02_1.5			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity. Sand inclusions < 10%.	
1.5			CA02_2.0 DUP3 SPLIT2			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity. Sand and shell grit inclusions < 10%.	
2						Termination Depth at:2.0 m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jun 2021

ENVIRONMENTAL BOREHOLE / TESTPIT CA03

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 20/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 1.5m

MAP REFERENCE CA03
LOGGED BY JB
CHECKED BY DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			CA03_0.5 CA03_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Some sand inclusions < 10%	
0.5			CA03_1.0			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity. Sand inclusions < 10%.	Organic inclusions (plant roots)
1			CA03_1.5			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity. Sand and shell grit inclusions < 10%.	
1.5						Termination Depth at:1.5 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT CA04

PROJECT NUMBER CW1146500	**DRILLING DATE** 20/04/2021	**MAP REFERENCE** CA04
PROJECT NAME Cas Harbour Dredging Studies	**DRILLING COMPANY** Strataprobe	
CLIENT Department of Transport	**DRILLER** Les Metcalf	
ADDRESS 5 Newman Court, Fremantle WA 6160	**DRILLING METHOD** Vibracore	**LOGGED BY** JB
	TOTAL DEPTH 1.7m	**CHECKED BY** DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CA04_0.5 CA04_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Fine grey sand Inclusions < 10%	
0.5			CA04_1.0 DUP1 SPLIT1			CLAYEY SILT: Very dark firm to soft silty clay, medium to high plasticity.	
1			CA04_1.5			CLAYEY SILT: Similar to above - very dark firm to soft silty clay, medium to high plasticity.	
1.5							
						Termination Depth at:1.7 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT CA05

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 22/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 2.0m

MAP REFERENCE CA05
LOGGED BY JB
CHECKED BY DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			CA05_0.5 CA05_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Sand Inclusions < 5%,	Organic inclusions (dead seagrass, plant roots) < 5%
0.5			CA05_1.0			CLAYEY SILT: Very dark grey firm silty clay, medium to high plasticity.	
1			CA05_1.5			CLAYEY SILT: Similar to above - Very dark grey firm silty clay, medium to high plasticity.	
1.5			CA05_2.0				
2						Termination Depth at:2.0 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT CA06

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 23/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 2.0m

MAP REFERENCE CA06
LOGGED BY JB
CHECKED BY DRS

COMMENTS Consistent with site CA05

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			CA06_0.5 CA06_EL		OH	CLAYEY SILT: very dark firm to soft silty clay, medium to high plasticity. Sand Inclusions < 5%,	Organic inclusions (dead seagrass, plant roots) < 5%
0.5			CA06_1.0			CLAYEY SILT: Very dark grey firm silty clay, medium to high plasticity.	
1			CA06_1.5			CLAYEY SILT: Similar to above - Very dark grey firm silty clay, medium to high plasticity.	
1.5			CA06_2.0 DUP2				
2						Termination Depth at:2.0 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT C02

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 20/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 1.5m

MAP REFERENCE C02
LOGGED BY JB
CHECKED BY DRS

COMMENTS Closely adjacent to industrial purpose jetty and maritime workshop

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			C02_0.5		SM	SILTY SAND: Black, fine silt layer overlaying grey/black medium to fine grain sand, dense.	
0.5			C02_1.0			SILTY SAND: grey/black medium to fine grain, dense sandy silt mixture. 10% Silt	
1			C02_1.5			SILTY SAND: Similar to above - grey/black medium grain, dense sandy silt mixture. 10% Silt	
1.5						Termination Depth at:1.5 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT C03

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 20/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 1.2m

MAP REFERENCE C03
LOGGED BY JB
CHECKED BY DRS

COMMENTS Closely adjacent to rock wall below industrial/maritime workshop

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			C03_0.5		SM	SILTY SAND: Black, fine silt layer overlaying grey/black medium to fine grain sand, dense.	
0.5			C03_1.0			SILTY SAND: grey/black medium to fine grain, dense sandy silt mixture. 10% Silt . 10% yellow medium/coarse sand inclusions	
1							
						Termination Depth at:1.2 m	

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ENVIRONMENTAL BOREHOLE / TESTPIT C04

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 20/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 1.3m

MAP REFERENCE C04
LOGGED BY JB
CHECKED BY DRS

COMMENTS Closely adjacent to industrial purpose jetty

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			C04_0.5		SM	SILTY SAND: Black, fine silt layer overlaying grey/black medium to fine grain sand, dense.	
0.5			C04_1.0			SILTY SAND: grey/black medium to fine grain, dense sandy silt mixture. 10% Silt .	
1							Organic inclusions (dead seaweed, plant detritus)
						Termination Depth at:1.3 m	

ENVIRONMENTAL BOREHOLE / TESTPIT C06

PROJECT NUMBER CW1146500
PROJECT NAME Cas Harbour Dredging Studies
CLIENT Department of Transport
ADDRESS 5 Newman Court, Fremantle WA 6160

DRILLING DATE 21/04/2021
DRILLING COMPANY Strataprobe
DRILLER Les Metcalf
DRILLING METHOD Vibracore
TOTAL DEPTH 1.6m

MAP REFERENCE C06
LOGGED BY JB
CHECKED BY DRS

COMMENTS

Depth (m)	PID	Penetration Resistance	Samples	Graphic Log	USCS	Material Description	Additional Observations
			C06_0.5 C06_EL		SM	SILTY SAND: Black, fine silt layer overlaying grey/black medium to fine grain sand, dense.	
0.5			C06_1.0			SILTY SAND: grey/black medium to fine grain, dense sandy silt mixture. 10% Silt .	
1			C06_1.5			SILTY SAND: Similar to above - grey/black medium to fine grain, dense sandy silt mixture. 20% Silt .	
1.5							Organic inclusions (dead seaweed, plant detritus)
						Termination Depth at:1.6 m	

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APPENDIX

J

CHAIN OF CUSTODY DOCUMENTATION

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CLIENT: Cardno (WA) Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT **(List due date):**✓		**FOR LABORATORY USE ONLY (Circle)**
OFFICE: 11 Harvest Terrace, West Perth. 6005				Custody Seal Intact? (Yes) No N/A
PROJECT: Casuarina Harbour	**QUOTE NO.: EP / 174 /21_V3**	**COC SEQUENCE NUMBER (Circle)**		Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
ORDER NUMBER: CW1146500	**COUNTRY OF ORIGIN: AUSTRALIA**	COC: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt: 12.8 °C
PROJECT MANAGER: Daniel Strickland	**CONTACT PH: 9273 3888, 0418830919**	OF: 1 2 3 4 5 6 7		Other comment:
SAMPLER: Julian Brown	**SAMPLER MOBILE: 0418830919**	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:** / **RECEIVED BY:**
COC Emailed to ALS? (YES / NO)	**EDD FORMAT (or default): Esdat**	*Julian Brown*	Caitlyn Gibson	
Email Reports to: daniel.strickland@cardno.com.au, julian.brown@cardno.com.au		DATE/TIME:	DATE/TIME: 3/5/21 12:35	DATE/TIME: / DATE/TIME:
Email Invoice to: claire.armstrong@cardno.com.au **(ref: CW1146500 / 002 / 001)**		*27/4/21*		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	**SAMPLE ID**	**DATE / TIME**	**MATRIX**	**TYPE & PRESERVATIVE** *(refer to codes below)*	**TOTAL**	EP090 (solids)	EP132B-SD	EK071G (solids)	NT-7S	TPH-SD	UTO-1S	UTN-4, EP090S-EP	EP090S-EP, EN68-G-4+	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	SPLIT1	**22/04/2021**	**s**	**3 x SGJ (150mL)**	**3**	x	x	x	x	x	x			**Please send to Eurofins for equivilent analysis**
	SPLIT2	**22/04/2021**	**s**	**3 x SGJ (150mL)**	**3**	x	x	x	x	x	x			**Please send to Eurofins for equivilent analysis**
				TOTAL	**6**	0	0	0	0	0	0	0	0	

Container Codes: SLB = Snap Lock Bag; SGJ = Soil Glass Jar; P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

Sediment

Casurina Harbour Dredging Studies - Analytical Schedule

		PSD	TOC	Total Metals																			TBT			Nutr		
		Sieve and hydrometer or laser diffraction		Total Metals in Sediments by ICPMS (Inductively Coupled Plasma-Mass-Spectrometry) (NODG). Ionisation via argon plasma allows elements to pass through spectrometer, detected via certain mass to charge ratios. Iron analysis: Total Iron and Aluminium in Sediments by ICPAES (Inductively Coupled Plasma Atomic Emission Spectroscopy) (NODG). The ICPAES technique ionises samples in plasma. Mercury in Sediments: by FIMS (Flow Injection Mercury System). Appropriate acid digestion procedure.																Sample analysed via GC/MS and high volume injection.			Quantification excecute		
		Particle size distribution	Total Organic Carbon	Aluminium	Antimony	Arsenic	Cadmium	Chromium (III+VI)	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Thorium	Uranium	Vanadium	Zinc	Iron	Mercury	Tributyltin as SN	Dibutyltin	Tributyltin	Total Phosphorous	Reactive Phosphorous	Total Nitrogen
		%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
PQL		1	0.02	50	0.5	1	0.1	1	0.5	1	1	10	1	0.1	0.1	0.1	0.1	2	1	50	0.01	0.0005	0.001	0.001	2	0.1	20
ANZG 2018 ISQG-High for 90% protection marine ecosystems		NA	NG	NG	25	70	10	370	NG	270	220	NG	52	NG	3.7	NG	NG	NG	410	NG	1	70	NG	70	NG	NG	NG
NAGD 2009 Screening Levels (ANZG 2018 - ISQG-Low)		NA	NG	NG	2	20	1.5	80	NG	65	50	NG	21	NG	1	NG	NG	NG	200	NG	0.15	0.009	NG	5	NG	NG	NG
Site ID	Target depth below seabed (m)	Sub-samples																										
			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
QA/QC Sample Summary																												
Total Samples		0	51	#REF!	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	51	39	39	39
Field Triplicates		5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4
Field Duplicate (inter lab refrence sample)		3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2
Field (Trip) blanks		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Laboratory blanks (per batch)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Laboratory Duplicate (per batch)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Laboratory SRM (per batch)				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Laboratory Surrogate Spike (per batch)			1																						1	1	1

ients	PAH																									BTEX								
:d via Discrete Analyser	Capillary GC/MS analyse executed on sample, with results compared against calibration curve.																									Purge and Trap, Capillary GC/FID analysis executed on samples.								Capillary GC/M
Total Kjeldahl Nitrogen	Ammonia (as N)	NOx	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benz(a)pyrene	Benzo(b+j)fluoranthene	Benz(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	LMW PAHs	HMW PAHs	Total PAH	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C10-C16	C16-C34
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
20	20	0.1	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.2	0.2	0.2	0.2	0.2	0.3	0.2	3	3
NG	NG	NG	NG	0.5	0.64	1.1	1.6	1.6	NG	NG	NG	NG	2.8	NG	0.26	5.1	0.54	NG	2.1	2.6	1.5	2.6	3.16	9.6	45	NG	NG	NG	NG	NG	NG	NG	NG	NG
NG	NG	NG	NG	0.016	0.044	0.085	0.261	0.43	NG	NG	NG	NG	0.384	NG	0.063	0.6	0.019	NG	0.16	665	0.24	0.665	0.552	1.7	4	NG	NG	NG	NG	NG	NG	NG	NG	NG
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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1	1	1																								1	1	1	1	1	1	1		
1	1	1																								1	1	1	1	1	1	1		

Sediment

Casurina Harbour Dredging Studies - Analytical Schedule

TPH / TRH									OCs																													
1S analyse executed on sample, with results compared against calibration curve.									Acid is introduced to dried and pulverised sample, followed by combustion, with quantiative measurements extracted via infra-red detection (CO2 during combustion).																													
C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)	C6-C10	Aldrin	Aldrin+Dieldrin	Alpha-BHC	Beta-BHC	Chlordane	cis-Chlordane	DDD	DDE	DDT	Delta-BHC	Dieldrin	Endosulfan (sum)	Endosulphan I	Endosulphan II	Endosulphan Sulfate	Endrin	Endrin Aldehyde	Endrin Ketone	gamma-BHC (Lindane)	HCB	Heptachlor	Heptachlor Epoxide	Methoxychlor	Oxychlordane	trans-Chlordane	Bromophos-ethyl
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
5	3	3	3	3	5	3	3	3	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.01
NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	0.006	0.006	0.02	0.027	0.046	NG	0.008	NG	NG	NG	NG	0.008	NG	NG	0.001	NG	NG	NG	NG	NG	0.006	NG
NG	NG	550	550	550	550	550	NG	NG	NG	NG	NG	NG	0.0005	0.0005	0.002	0.0022	0.0016	NG	2E-05	NG	NG	NG	NG	2E-05	NG	NG	0.0003	NG	NG	NG	NG	NG	0.0005	NG
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
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2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

OPs

Ultra-trace recordings of Organochroline Pesticides.

Carbophenothion	Chlorfenvinphos (E)	Chlorfenvinphos (Z)	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenarniphos	Fenthion	Malathion	Azinphos Methyl	Monocrotophos	Parathion	Parathion-methyl	Pirimphos-ethyl	Prothiofos
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Cardno (WA) Pty Ltd	Project №	CW1146500	Project Manager	Daniel Strickland
Address	11 Harvest Terrace, West Perth 6005, WA	Project Name	Casuarina Harbour Dredging Investigations	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Daniel Strickland				
Phone №	0431 245 369				
Special Directions					
Purchase Order					
Quote ID №					

| | | | | | | Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.) | | | | | |

CAR 21-1 , CAR21-2

The linked image cannot be displayed. The file may have been moved, renamed, or

CLIENT: Cardno (WA) Pty Ltd	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):✓ (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt °C; Other comment:
OFFICE: 11 Harvest Terrace, West Perth. 6005			
PROJECT: Casuarina Harbour	QUOTE NO.: EP / 174 /21_V3	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	
ORDER NUMBER: CW1146500	COUNTRY OF ORIGIN: AUSTRALIA	OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: Daniel Strickland	CONTACT PH: 9273 3888, 0418830919		
SAMPLER: Julian Brown	SAMPLER MOBILE: 0418830919	RELINQUISHED BY: Julian Brown	RECEIVED BY: K. Wenczyga
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat	DATE/TIME: 27/4/21	DATE/TIME: 23/4/21 1600
Email Reports to: daniel.strickland@cardno.com.au, julian.brown@cardno.com.au		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to: claire.armstrong@cardno.com.au (ref: CW1146500 / 002 / 001)		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL	EP080 (solids)	EP132B-SD	EX071G (solids)	NT-7S	TPH-SD	UTO-16	UTH-4, EP080S-EP	EP080S-EP, EN55-2-4+	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	CA01_0.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA01_1.0	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA02_0.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA02_1.0	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA02_1.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA02_2.0	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA03_0.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA03_1.0	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA03_1.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA04_0.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA04_1.0	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA04_1.5	20/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA05_0.5	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA05_1.0	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA05_1.5	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA05_2.0	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA06_0.5	23/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA06_1.0	23/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA06_1.5	23/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA06_2.0	23/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C02_0.5	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C02_1.0	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C02_1.5	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C03_0.5	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C03_1.0	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C04_0.5	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C04_1.0	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C06_0.5	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C06_1.0	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	C06_1.5	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			

CAR21-1

CAR21-2

CAR21-1

Elutriates
CA03
CA05
C06
C18

LAB USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
	SS01	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS02	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS03	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS04	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS05	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS06	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS07	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS08	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS09	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SS10	21/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	CA01_EL	20/04/21	S	2 x SGJ (150mL)	2								x	
	CA02_EL	20/04/21	S	2 x SGJ (150mL)	2								x	
✓	CA03_EL	20/04/21	S	2 x SGJ (150mL)	2								x	
	CA04_EL	20/04/21	S	2 x SGJ (150mL)	2								x	
✓	CA05_EL	22/04/21	S	2 x SGJ (150mL)	2								x	
	CA06_EL	23/04/21	S	2 x SGJ (150mL)	2								x	
	C03_EL	21/04/21	S	2 x SGJ (150mL)	2								x	
	C05_EL	21/04/21	S	2 x SGJ (150mL)	2								x	
✓	C06_EL	21/04/21	s	2 x SGJ (150mL)	2								x	
✓	C18_EL	22/04/21	S	2 x SGJ (150mL)	2								x	
	~~DUP1~~	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	~~DUP2~~	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	~~DUP3~~	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
	SPLIT1	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			Please send to Eurofins for equivilent analysis
	SPLIT2	22/04/21	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			Please send to Eurofins for equivilent analysis
	TRIP BLANK	22/04/21	s	1 x SGJ (150mL)	2		x			x	x			
	RINSATE1	20/04/21	w	2 x 60mL Clear Plastic Bottle, 1 x 500mL Amber Glass Bottle	3							x		
	RINSATE2	21/04/21	w	2 x 60mL Clear Plastic Bottle, 1 x 500mL Amber Glass Bottle	3							x		
	Elutriate Water	22/04/21	w	10L plastic container	2									For elutriate preparation
				TOTAL	165	0	0	0	0	0	0	0	0	

Container Codes: SLB = Snap Lock Bag; SGJ = Soil Glass Jar; P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CLIENT: Cardno (WA) Pty Ltd	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date): ✓	FOR LABORATORY USE ONLY (Circle)
OFFICE: 11 Harvest Terrace, West Perth. 6005			Custody Seal Intact? Yes No N/A
PROJECT: Casuarina Harbour	QUOTE NO.: EP / 174 /21_V3	COC SEQUENCE NUMBER (Circle)	Freeze / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: CW1146500	COUNTRY OF ORIGIN: AUSTRALIA	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Daniel Strickland	CONTACT PH: 9273 3888, 0418830919	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Julian Brown	SAMPLER MOBILE: 0418830919		
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat		
Email Reports to: daniel.strickland@cardno.com.au, julian.brown@cardno.com.au			
Email Invoice to: claire.armstrong@cardno.com.au (ref: CW1146500 / 002 / 001)			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Brown			
DATE/TIME: 27/4/21	DATE/TIME: 15:10 27/4/21	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL	EP090 (solids)	EP132B-SD	EK071G (solids)	NT-7S	TPH-SD	UTO-15	UTN-4, EP090S-EP	EP090S-EP, EN55-D-4+	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	CA01_0.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
2	CA01_1.0	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
3	CA02_0.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
4	CA02_1.0	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
5	CA02_1.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
6	CA02_2.0	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
7	CA03_0.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
8	CA03_1.0	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
9	CA03_1.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
10	CA04_0.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
11	CA04_1.0	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
12	CA04_1.5	20/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
13	CA05_0.5	22/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
14	CA05_1.0	22/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
15	CA05_1.5	22/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
16	CA05_2.0	22/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
17	CA06_0.5	23/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
18	CA06_1.0	23/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
19	CA06_1.5	23/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
20	CA06_2.0	23/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
21	C02_0.5	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
22	C02_1.0	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
23	C02_1.5	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
24	C03_0.5	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
25	C03_1.0	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			
26	C04_0.5	21/04/2021	S	3 x SGJ (150mL)	3	x	x	x	x	x	x			

Environmental Division
Perth
Work Order Reference
EP2104662

Telephone : +61-8-9406 1301

LAB USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
27	C04_1.0	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
28	C06_0.5	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
29	C06_1.0	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
30	C06_1.5	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
31	SS01	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
32	SS02	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
33	SS03	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
34	SS04	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
35	SS05	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
36	SS06	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
37	SS07	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
38	SS08	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
39	SS09	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
40	SS10	21/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
41	CA01_EL	20/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
42	CA02_EL	20/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
43	CA03_EL	20/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
44	CA04_EL	20/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
45	CA05_EL	22/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
46	CA06_EL	23/04/2021	S	2 x SGJ (150mL)	2								x	Please keep on cold hold
47	C03_EL	21/04/2021	S	2 x SGJ (150mL)	2								x	
48	C05_EL	21/04/2021	S	2 x SGJ (150mL)	2								x	
49	C06_EL	21/04/2021	s	2 x SGJ (150mL)	2								x	
50	C18_EL	22/04/2021	S	2 x SGJ (150mL)	2								x	
51	DUP1	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
52	DUP2	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
53	DUP3	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			
EUROF.	SPLIT1	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			Please send to Eurofins for equivilent analysis
EUROF.	SPLIT2	22/04/2021	s	3 x SGJ (150mL)	3	x	x	x	x	x	x			Please send to Eurofins for equivilent analysis
54	TRIP BLANK	22/04/2021	s	1 x SGJ (150mL)	2		x			x	x			
55	RINSATE1	20/04/2021	w	2 x 60mL Clear Plastic Bottle, 1 x 500mL Amber Glass Bottle	3							x		
56	RINSATE2	21/04/2021	w	2 x 60mL Clear Plastic Bottle, 1 x 500mL Amber Glass Bottle	3							x		
57	Elutriate Water	22/04/2021	w	10L plastic container	2									For elutriate preparation
				TOTAL	165	0	0	0	0	0	0	0	0	

Container Codes: SLB = Snap Lock Bag; SGJ = Soil Glass Jar; P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugol's Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CHAIN OF CUSTODY

ALS Laboratory — 26 Rigali Way, Wangara, 6065

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Daniel Strickland			
DATE/TIME: 22/09/21 - 14:00	DATE/TIME: 22/9/21 1625	DATE/TIME:	DATE/TIME:

Client: Department of Transport	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date): Fast Turnaround	FOR LABORATORY USE ONLY (Circle)
PROJECT: CW1146500			Custody Seal Intact? Yes No N/A
SITE: Casuarina Harbour			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PURCHASE ORDER NO.:		ALS QUOTE NO.: EP/742/21	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Daniel Strickland	CONTACT PH: 0431245369		Other comments: 20.1
SAMPLER: Daniel Strickland / Leo Reith	SAMPLER MOBILE: 431245369		
EMAIL REPORTS TO: daniel.strickland@cardno.com.au		EMAIL INVOICE TO: daniel.strickland@cardno.com.au	

SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS (Solid(S) Water(W))			CONTAINER INFORMATION		ANALYSIS REQUIRED										Additional Information
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	EN68-O-2/3 (Elutriate - TBT)	EP090S-EP (Elutriate - TBT)	EN68-P-4 (Elutriate - Metals)	EC093-T (Elutriate - Metals)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	CA02	S	22/09/2021		5			x	x							
2	CA04	S	22/09/2021		5			x	x							
3	CA05	S	22/09/2021		5			x	x							
4	CA06	S	22/09/2021		5			x	x							
5	C02	S	22/09/2021		5	x	x									
6	C03	S	22/09/2021		5	x	x									
7	DUP1	S	22/09/2021		5			x	x							
—	DUP2	S	22/09/2021		5			x	x							Triplicate to Eurofins for equivalent analysis (elutriate - metals)
8	DUP3	S	22/09/2021		5	x	x									
—	DUP4	S	22/09/2021		5	x	x									Triplicate to Eurofins for equivalent analysis (elutriate - TBT)
	Elutriate water	W	22/09/2021		6	x	x	x	x							
				TOTAL	58											

Environmental Division
Perth
Work Order Reference
EP2111318

Telephone : +61-8-9406 1301

APPENDIX

K

LABORATORY ANALYSIS REPORTS: SEDIMENT QUALITY

Cardno

now

Stantec

Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD	Sampling	2600	4500	6200	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002
SAMPLE CODE	Date	TKN	TOTAL P	TOC	Total Ext Al	Total Ext V	Total Ext Cr	Total Ext Mn	Total Ext Fe	Total Ext Co	Total Ext Ni	Total Ext Cu
		mg.N/g	mg.P/g	% C	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Reporting Limit		<0.1	<0.05	<0.1	<10	<0.2	<0.2	<0.2	<10	<0.1	<0.2	<0.2
Analysis Date		20/05/2021		13/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021
File		21052001		21051301	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101
CA01_0.5m	20/04/2021	1.2	0.63	1.5	4500	26	20	140	11000	2.0	4.1	12
CA01_1.0m	20/04/2021	2.3	0.44	3.7	12000	61	42	170	24000	6.5	13	15
CA02_0.5m	20/04/2021	3.9	0.73	4.8	13000	49	34	180	24000	4.3	10	26
CA02_1.0m	20/04/2021	4.0	0.67	4.9	16000	63	40	210	28000	5.6	13	24
CA02_1.5m	20/04/2021	3.2	1.3	3.9	15000	60	39	200	27000	5.8	13	24
CA02_2.0m	20/04/2021	3.1	1.9	3.9	17000	72	49	240	34000	7.8	16	28
CA03_0.5m	20/04/2021	4.0	0.68	4.8	14000	53	35	200	26000	4.7	11	30
CA03_1.0m	20/04/2021	4.3	0.75	5.2	16000	63	41	240	30000	5.9	14	23
CA03_1.5m	20/04/2021	4.4	0.74	5.2	16000	65	42	200	29000	5.8	13	29
CA04_0.5m	20/04/2021	4.5	0.77	5.6	12000	48	34	170	25000	4.1	10	32
CA04_1.0m	20/04/2021	4.4	0.72	5.2	15000	58	38	230	27000	5.5	13	24
CA04_1.5m	20/04/2021	4.2	0.78	4.8	17000	70	44	220	31000	6.3	14	28
CA05_0.5m	22/04/2021	4.0	0.75	4.9	16000	74	44	230	32000	6.9	15	22
CA05_1.0m	22/04/2021	3.7	0.77	4.8	16000	84	50	270	34000	8.6	17	24
CA05_1.5m	22/04/2021	4.9	0.88	5.9	17000	63	38	140	27000	5.2	13	17
CA05_2.0m	22/04/2021	5.1	0.69	7.1	11000	53	28	94	20000	3.8	10	11
CA06_0.5m	23/04/2021	3.8	0.77	4.5	16000	70	43	220	32000	6.4	14	22
CA06_1.0m	23/04/2021	4.2	0.74	5.2	18000	72	42	190	30000	6.1	14	18
CA06_1.5m	23/04/2021	4.5	0.69	5.6	16000	62	33	100	25000	4.9	12	15

Signatory: Jamie Woodward
Date: 26/07/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD	Sampling	2600	4500	6200	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002
SAMPLE CODE	Date	TKN	TOTAL P	TOC	Total Ext Al	Total Ext V	Total Ext Cr	Total Ext Mn	Total Ext Fe	Total Ext Co	Total Ext Ni	Total Ext Cu
		mg.N/g	mg.P/g	% C	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Reporting Limit		<0.1	<0.05	<0.1	<10	<0.2	<0.2	<0.2	<10	<0.1	<0.2	<0.2
Analysis Date		20/05/2021		13/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021
File		21052001		21051301	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101
CA06_2.0m	23/04/2021	4.8	0.71	5.5	17000	69	33	97	25000	5.1	12	14
C02_0.5m	21/04/2021	0.7	0.31	0.7	3800	19	15	67	8100	1.1	2.8	170
C02_1.0m	21/04/2021	0.7	0.30	0.7	3900	19	15	69	7800	1.1	2.6	160
C02_1.5m	21/04/2021	0.2	0.21	0.3	780	5.8	7.1	32	1900	0.3	0.8	2.0
C03_0.5m	21/04/2021	0.3	0.24	0.3	1300	9.2	8.3	44	3200	0.4	1.1	44
C03_1.0m	21/04/2021	0.6	0.22	0.9	730	7.5	6.5	30	2300	0.3	1.1	2.8
C04_0.5m	21/04/2021	1.6	0.44	2.4	5600	28	22	98	12000	1.8	4.1	24
C04_1.0m	21/04/2021	2.0	0.71	3.0	9300	41	42	120	17000	3.5	7.7	26
C06_0.5m	22/04/2021	0.7	0.33	0.8	2800	16	13	74	5900	1.0	2.1	7.9
C06_1.0m	22/04/2021	0.8	0.31	1.1	3300	20	14	77	6800	1.4	2.8	6.4
C06_1.5m	22/04/2021	0.5	0.27	0.8	2300	14	10	54	4500	1.0	2.0	3.6

Note: For results for compliance purposes uncertainity of measurement (MU) will sometimes affect the interpretation whether the result passes or fails the compliance limit.
Tables for measurement uncertainity are available online at www.mafrl.murdoch.edu.au

Signatory: Jamie Woodward
Date: 26/07/2021

The results only apply to the sample as received and to the sample tested.
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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
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Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD SAMPLE CODE	Sampling Date	MS002 Total Ext Zn mg/kg	MS002 Total Ext As mg/kg	MS002 Total Ext Se mg/kg	MS002 Total Ext Ag mg/kg	MS002 Total Ext Cd mg/kg	MS002 Total Ext Sb mg/kg	MS002 Total Ext Pb mg/kg	MS002 Total Ext Th mg/kg	MS002 Total Ext U mg/kg	ICP009 Hexavalent Cr mg/kg	ICP007 Total Ext Hg mg/kg
Reporting Limit		<0.5	<0.1	<0.1	<0.02	<0.02	<0.2	<0.1	<0.1	<0.1	<1	<0.01
Analysis Date		11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	12/05/2021	7/05/2021
File		21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051201	21050702
CA01_0.5m	20/04/2021	26	3.6	0.1	<0.02	0.14	0.5	15	18	2.4	<1	0.03
CA01_1.0m	20/04/2021	21	19	0.7	0.04	0.13	0.8	20	4.6	5.1	1	0.11
CA02_0.5m	20/04/2021	40	16	0.7	0.04	0.18	0.7	12	5.3	3.1	<1	0.04
CA02_1.0m	20/04/2021	39	17	0.7	0.05	0.16	1.5	15	6.7	4.4	1	0.04
CA02_1.5m	20/04/2021	45	14	0.5	0.06	0.32	2.3	18	7.0	5.6	1	0.05
CA02_2.0m	20/04/2021	59	19	0.6	0.08	0.47	5.2	26	7.7	2.9	2	0.09
CA03_0.5m	20/04/2021	47	18	0.6	0.05	0.15	1.1	14	6.0	3.3	1	0.05
CA03_1.0m	20/04/2021	39	19	0.8	0.05	0.16	1.7	16	6.2	3.1	2	0.04
CA03_1.5m	20/04/2021	47	16	0.8	0.07	0.16	1.7	18	6.8	4.6	2	0.06
CA04_0.5m	20/04/2021	46	19	0.7	0.05	0.16	0.8	14	5.2	2.6	<1	0.05
CA04_1.0m	20/04/2021	37	18	0.8	0.05	0.14	1.5	14	5.8	3.0	2	0.05
CA04_1.5m	20/04/2021	55	19	0.8	0.09	0.17	2.0	21	7.6	4.7	2	0.07
CA05_0.5m	22/04/2021	42	22	0.9	0.08	0.18	3.0	19	6.8	6.1	1	0.06
CA05_1.0m	22/04/2021	37	25	0.9	0.06	0.19	6.9	17	7.2	3.0	2	0.07
CA05_1.5m	22/04/2021	27	16	0.9	0.04	0.20	3.2	23	7.3	3.7	3	0.10
CA05_2.0m	22/04/2021	15	12	1.0	0.04	0.15	0.4	15	4.4	5.1	2	0.12
CA06_0.5m	23/04/2021	45	23	0.8	0.07	0.20	3.4	21	7.3	5.9	2	0.09
CA06_1.0m	23/04/2021	30	23	1.0	0.05	0.17	6.6	24	8.2	4.0	2	0.14
CA06_1.5m	23/04/2021	19	14	0.9	0.04	0.15	0.5	23	7.0	4.0	2	0.21

Signatory: Jamie Woodward
Date: 26/07/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD SAMPLE CODE	Sampling Date	MS002 Total Ext Zn mg/kg	MS002 Total Ext As mg/kg	MS002 Total Ext Se mg/kg	MS002 Total Ext Ag mg/kg	MS002 Total Ext Cd mg/kg	MS002 Total Ext Sb mg/kg	MS002 Total Ext Pb mg/kg	MS002 Total Ext Th mg/kg	MS002 Total Ext U mg/kg	ICP009 Hexavalent Cr mg/kg	ICP007 Total Ext Hg mg/kg
Reporting Limit		**<0.5**	**<0.1**	**<0.1**	**<0.02**	**<0.02**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<1**	**<0.01**
Analysis Date		**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**12/05/2021**	**7/05/2021**
File		**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051201**	**21050702**
CA06_2.0m	23/04/2021	15	16	0.9	0.03	0.12	0.4	16	7.2	3.6	2	0.12
C02_0.5m	21/04/2021	45	3.3	0.1	0.02	0.04	0.4	15	8.1	1.5	<1	0.02
C02_1.0m	21/04/2021	47	3.2	0.1	0.03	0.08	0.3	15	9.0	1.4	<1	0.02
C02_1.5m	21/04/2021	1.4	3.0	<0.1	<0.02	0.04	<0.2	1.1	0.8	1.4	<1	<0.01
C03_0.5m	21/04/2021	19	3.3	<0.1	<0.02	0.04	0.2	5.0	2.7	0.9	<1	<0.01
C03_1.0m	21/04/2021	2.6	3.5	0.1	<0.02	0.04	<0.2	2.8	0.7	1.9	<1	<0.01
C04_0.5m	21/04/2021	47	4.7	0.1	0.02	0.06	0.5	17	13	2.1	<1	0.03
C04_1.0m	21/04/2021	51	8.2	0.3	0.04	0.17	1.5	20	9.7	3.7	<1	0.05
C06_0.5m	22/04/2021	13	2.5	<0.1	<0.02	0.04	0.3	8.4	9.8	1.7	<1	<0.01
C06_1.0m	22/04/2021	13	3.3	0.1	<0.02	0.06	0.4	10	9.2	2.6	<1	0.03
C06_1.5m	22/04/2021	7.7	3.1	0.1	<0.02	0.06	0.5	5.1	4.8	3.0	<1	0.01

Note: Testing of Total Extractable Thorium is not covered under the scope of accreditation

Signatory: Jamie Woodward
Date: 26/07/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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Environmental Science
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Murdoch UNIVERSITY

1:4 SEDIMENT ELUTRIATION

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD SAMPLE CODE	Sampling Date	2000 AMMONIA µg.N/L	4100 ORTHO-P µg.P/L	2100 NO3+NO2 µg.N/L	MS001 Filtered Al µg/L	MS001 Filtered V µg/L	MS001 Filtered Cr µg/L	MS001 Filtered Mn µg/L	MS001 Filtered Fe µg/L	MS001 Filtered Co µg/L	MS001 Filtered Ni µg/L	MS001 Filtered Cu µg/L
Reporting Limit		**<3**	**<2**	**<2**	**<5**	**<0.3**	**<0.2**	**<0.5**	**<1**	**<0.05**	**<0.3**	**<0.2**
Analysis Date			**18/05/2021**		**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**
File			**21051802**		**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**
Elutriate Blank		7	3	2	<5	1.2	<0.2	2.9	<1	<0.05	<0.3	0.2
CA03_1.5m	20/04/2021	4500	280	<2	<5	20	<0.2	5.0	33	<0.05	0.4	<0.2
CA05_2.0m	22/04/2021	25000	1200	4	<5	13	0.3	5.4	5	<0.05	0.5	<0.2
C06_1.5m	22/04/2021	410	23	2	22	28	<0.2	9.9	2	0.17	0.6	<0.2
C18_EL	22/04/2021	400	110	3	8	68	<0.2	33	4	<0.05	0.5	<0.2

Note: Sediment elutration is not covered under the scope of accreditation

Signatory: Jamie Woodward
Date: 26/07/2021

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Environmental Science
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Murdoch UNIVERSITY

1:4 SEDIMENT ELUTRIATION

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 26/07/2021
Date Received: 23/04/2021
Our Reference: CAR21-1
Your Reference: CW1146500

METHOD SAMPLE CODE	Sampling Date	MS001 Filtered Zn µg/L	MS001 Filtered As µg/L	MS001 Filtered Se µg/L	MS001 Filtered Ag µg/L	MS001 Filtered Cd µg/L	MS001 Filtered Sb µg/L	MS001 Filtered Pb µg/L	MS001 Filtered Th µg/L	MS001 Filtered U µg/L	ICP006 Hg mg/L
Reporting Limit		**<1**	**<0.5**	**<1**	**<0.1**	**<0.1**	**<0.5**	**<0.1**	**<0.2**	**<0.2**	**<0.0001**
Analysis Date		**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**6/05/2021**	**11/05/2021**
File		**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21050602**	**21051102**
Elutriate Blank	20/04/2021	<1	1.6	<1	<0.1	<0.1	<0.5	<0.1	<0.2	3.4	<0.0001
CA03_1.5m	20/04/2021	<1	25	<1	<0.1	<0.1	3.2	<0.1	<0.2	16	<0.0001
CA05_2.0m	22/04/2021	<1	31	<1	<0.1	<0.1	3.1	<0.1	<0.2	12	<0.0001
C06_1.5m	22/04/2021	<1	8.9	<1	<0.1	<0.1	9.7	<0.1	<0.2	34	<0.0001
C18_EL	22/04/2021	<1	24	<1	<0.1	<0.1	3.8	<0.1	<0.2	33	<0.0001

Note: Sediment elutration is not covered under the scope of accreditation

Signatory: Jamie Woodward
Date: 26/07/2021

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SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2
Your Reference: CW1146500

METHOD	Sampling	2600	4500	6200	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002
SAMPLE CODE	Date	TKN	TOTAL P	TOC	Total Ext Al	Total Ext V	Total Ext Cr	Total Ext Mn	Total Ext Fe	Total Ext Co	Total Ext Ni	Total Ext Cu
		mg.N/g	mg.P/g	% C	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Reporting Limit		<0.1	<0.05	<0.1	<10	<0.2	<0.2	<0.2	<10	<0.1	<0.2	<0.2
Analysis Date		20/05/2021		19/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021
File		21052002		21051901	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101
SS01_0.5m	21/04/2021	<0.1	0.07	<0.1	360	9.8	7.2	7.1	1700	0.3	0.5	0.2
SS02_0.5m	21/04/2021	<0.1	0.12	<0.1	410	11	11	26	2100	0.4	0.5	0.3
SS03_0.5m	21/04/2021	<0.1	0.12	<0.1	350	8.8	9.9	15	1800	0.3	0.5	<0.2
SS04_0.5m	21/04/2021	<0.1	0.07	<0.1	350	10	7.0	15	1800	0.4	0.5	0.2
SS05_0.5m	21/04/2021	<0.1	0.06	<0.1	340	9.8	7.7	14	1700	0.4	0.5	0.2
SS06_0.5m	21/04/2021	<0.1	0.07	<0.1	430	12	7.3	15	2100	0.5	0.6	0.3
SS07_0.5m	21/04/2021	<0.1	0.06	<0.1	420	12	6.5	12	2100	0.5	0.6	0.3
SS08_0.5m	21/04/2021	<0.1	0.07	<0.1	400	11	8.1	11	2000	0.4	0.5	0.3
SS09_0.5m	21/04/2021	<0.1	0.07	<0.1	470	14	6.6	13	2400	0.5	0.7	0.4
SS10_0.5m	21/04/2021	<0.1	0.07	<0.1	290	12	10	7.3	1900	0.3	0.5	<0.2

Note: For results for compliance purposes uncertainity of measurement (MU) will sometimes affect the interpretation whether the result passes or fails the compliance limit.
Tables for measurement uncertainity are available online at www.mafrl.murdoch.edu.au
Results expressed on a dry weight basis

Signatory: Jamie Woodward
Date: 24/05/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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Environmental Science
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Accreditation Number: 10603
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Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2
Your Reference: CW1146500

METHOD	Sampling	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002	ICP009	ICP007
SAMPLE CODE	Date	Total Ext Zn mg/kg	Total Ext As mg/kg	Total Ext Se mg/kg	Total Ext Ag mg/kg	Total Ext Cd mg/kg	Total Ext Sb mg/kg	Total Ext Pb mg/kg	Total Ext Th mg/kg	Total Ext U mg/kg	Hexavalent Cr mg/kg	Total Ext Hg mg/kg
Reporting Limit		<0.5	<0.1	<0.1	<0.02	<0.02	<0.2	<0.1	<0.1	<0.1	<1	<0.01
Analysis Date		11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	12/05/2021	7/05/2021
File		21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051201	21050701
SS01_0.5m	21/04/2021	0.6	6.1	<0.1	<0.02	<0.02	<0.2	0.9	1.2	0.2	<1	<0.01
SS02_0.5m	21/04/2021	1.2	4.2	<0.1	<0.02	<0.02	0.2	3.2	6.6	0.5	<1	<0.01
SS03_0.5m	21/04/2021	0.8	4.0	<0.1	<0.02	<0.02	0.2	1.9	3.3	0.4	<1	<0.01
SS04_0.5m	21/04/2021	0.8	4.9	<0.1	<0.02	<0.02	<0.2	1.7	3.4	0.3	<1	<0.01
SS05_0.5m	21/04/2021	0.7	4.2	<0.1	<0.02	<0.02	<0.2	2.0	3.5	0.3	<1	<0.01
SS06_0.5m	21/04/2021	0.8	5.9	<0.1	<0.02	<0.02	0.2	1.6	2.5	0.2	<1	<0.01
SS07_0.5m	21/04/2021	0.6	9.2	<0.1	<0.02	<0.02	0.2	0.8	1.3	0.2	<1	<0.01
SS08_0.5m	21/04/2021	0.5	8.0	<0.1	<0.02	<0.02	<0.2	0.9	1.5	0.3	<1	<0.01
SS09_0.5m	21/04/2021	<0.5	10	<0.1	<0.02	<0.02	0.2	0.8	1.0	0.2	<1	<0.01
SS10_0.5m	21/04/2021	<0.5	8.9	<0.1	<0.02	<0.02	<0.2	0.6	0.8	0.2	<1	<0.01

Note: For results for compliance purposes uncertainity of measurement (MU) will sometimes affect the interpretation whether the result passes or fails the compliance limit.
Tables for measurement uncertainity are available online at www.mafrl.murdoch.edu.au
Results expressed on a dryweight basis
Thorium testing is not covered under the scope of NATA accreditation

Signatory: Jamie Woodward
Date: 24/05/2021

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Murdoch UNIVERSITY

SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 21/04/2022
Date Received: 23/04/2021
Our Reference: CAR21-1 QAQC
Your Reference: CW1146500

METHOD	Sampling	2600	4500	6200	MS002	MS002	MS002	MS002	MS002	MS002	MS002	MS002
SAMPLE CODE	Date	TKN	TOTAL P	TOC	Total Ext Al	Total Ext V	Total Ext Cr	Total Ext Mn	Total Ext Fe	Total Ext Co	Total Ext Ni	Total Ext Cu
		mg.N/g	mg.P/g	% C	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Reporting Limit		<0.1	<0.05	<0.1	<10	<0.2	<0.2	<0.2	<10	<0.1	<0.2	<0.2
Analysis Date		20/05/2021		13/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021	11/05/2021
File		21052001		21051301	21051101	21051101	21051101	21051101	21051101	21051101	21051101	21051101
Laboratory QA/QC	**Criteria**											
Duplicate	<20% or <RL	1%	2%	1%	2%	1%	0%	2%	1%	2%	1%	1%
Blank	<RL	<0.1	<0.05	<0.1%	<10	<0.2	<0.2	<0.2	<10	<0.1	<0.2	<0.2
Recovery	80-120%	102%	102%	96%	92%	96%	97%	95%	99%	94%	96%	97%

Signatory: Jamie Woodward
Date: 21/04/2022

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SEDIMENT DATA

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 21/04/2022
Date Received: 23/04/2021
Our Reference: CAR21-1 QAQC
Your Reference: CW1146500

METHOD SAMPLE CODE	Sampling Date	MS002 Total Ext Zn mg/kg	MS002 Total Ext As mg/kg	MS002 Total Ext Se mg/kg	MS002 Total Ext Ag mg/kg	MS002 Total Ext Cd mg/kg	MS002 Total Ext Sb mg/kg	MS002 Total Ext Pb mg/kg	MS002 Total Ext Th mg/kg	MS002 Total Ext U mg/kg	ICP009 Hexavalent Cr mg/kg	ICP007 Total Ext Hg mg/kg
Reporting Limit		**<0.5**	**<0.1**	**<0.1**	**<0.02**	**<0.02**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<1**	**<0.01**
Analysis Date		**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**11/05/2021**	**12/05/2021**	**7/05/2021**
File		**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051101**	**21051201**	**21050702**
Laboratory QA/QC	**Criteria**											
Duplicate	<20% or <RL	1%	3%	3%	5%	5%	1%	2%	1%	0%	3%	5%
Blank	<RL	<0.5	<0.1	<0.1	<0.02	<0.02	<0.2	<0.1	<0.1	<0.1	<1	<0.01
Recovery	80-120%	91%	103%	94%	98%	102%	95%	89%	100%	100%	97%	96%

Signatory: Jamie Woodward
Date: 21/04/2022

The results only apply to the sample as received and to the sample tested.
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2104662**	Page	: 1 of 45
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Contact	: Nick Courts
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: +61 08 9273 3888	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 27-Apr-2021 15:10
Order number	: CW1146500	Date Analysis Commenced	: 30-Apr-2021
C-O-C number	: ----	Issue Date	: 17-May-2021 15:51
Sampler	: JULIAN BROWN		
Site	: ----		
Quote number	: EP/174/21		
No. of samples received	: 57		
No. of samples analysed	: 51		

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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Diana Mesa	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Kinnin	Laboratory Technician	Perth Inorganics, Wangara, WA
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Vanessa Nguyen	Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP090S-EP and EN68-G-4+ conducted by ALS Brisbane, NATA Site No. 818.
- EP130 and EP131A conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP090 Organotins: Sample 'C02_0.5' shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EK271A-CM: Samples for Ultra-Trace Reactive Phosphorus by FIA should be frozen upon sampling. If not, low-level results (below 0.01 mg/L) may bias low.
- EP080-SD: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP131A: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EK271A-CM sample 55 positive result confirmed by re-preparation and re-analysis.
- EP132-SD: Poor matrix spike recovery for QC sample due to suspected matrix effects and interferences.
- EP132-SD: LOR has been raised due to suspected matrix effects and interferences.
- EP131A : Positive OC results for samples # C02_0.5 and # C02_1.0 are confirmed by re-extraction and re-analysis.
- EP090 Organotins: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly and surrogate values are not determined.
- EP090 Organotins: Samples 'CA01_1.0' and 'C02_1.0' show poor matrix spike recovery for MBT due to matrix interference. Confirmed by re-extraction and re-analysis.
- EP090 Organotins: The LOR has been raised for particular samples due to matrix interference.
- EN68: This analysis in accordance with National Ocean Disposal Guidelines, Commonwealth of Australia, 2002 - (modified). Results reported are those determined on a 1:4 sediment/seawater elutriate without blank correction.

Analytical Results

Sub-Matrix: **ELUTRIATE** (Matrix: **WATER**)			Sample ID	C03_EL	C05_EL	C06_EL	Elutriate Water	----
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**EP2104662-047**	**EP2104662-048**	**EP2104662-049**	**EP2104662-057**	**--------**
				Result	Result	Result	Result	----
EP090: Organotin Compounds (Soluble)								
Monobutyltin	78763-54-9	5	ngSn/L	**5**	<5	<5	<5	**----**
Dibutyltin	1002-53-5	5	ngSn/L	**13**	<5	<5	<5	**----**
Tributyltin	56573-85-4	2	ngSn/L	**16**	<2	<2	<2	**----**
EP090S: Organotin Surrogate								
Tripropyltin	----	5	%	**97.8**	**115**	**96.1**	**136**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA01_0.5	CA01_1.0	CA02_0.5	CA02_1.0	CA02_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-001	EP2104662-002	EP2104662-003	EP2104662-004	EP2104662-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	37.1	51.7	60.7	60.5	56.0
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	30	<20	<20	60
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	920	2850	3980	4310	3300
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	920	2850	3980	4310	3300
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.2	1.0	0.3	0.2	1.4
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	8	12	12	13	9
>C16 - C34 Fraction	----	3	mg/kg	29	82	65	72	103
>C34 - C40 Fraction	----	5	mg/kg	6	25	19	24	33
>C10 - C40 Fraction (sum)	----	3	mg/kg	43	119	96	109	145
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	8	12	12	13	9
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	9	16	20	19	14
C15 - C28 Fraction	----	3	mg/kg	20	50	40	42	58
C29 - C36 Fraction	----	5	mg/kg	13	45	35	42	60
^ C10 - C36 Fraction (sum)	----	3	mg/kg	42	111	95	103	132
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA01_0.5	CA01_1.0	CA02_0.5	CA02_1.0	CA02_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-001	EP2104662-002	EP2104662-003	EP2104662-004	EP2104662-005
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<2	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	**7.4**	<0.9	**11.2**	**6.0**	**9.8**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA01_0.5	CA01_1.0	CA02_0.5	CA02_1.0	CA02_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-001	EP2104662-002	EP2104662-003	EP2104662-004	EP2104662-005
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	<0.010	<0.010	<0.010	<0.005	<0.010
2-Methylnaphthalene	91-57-6	0.005	mg/kg	<0.005	**0.006**	<0.005	<0.005	**0.006**
Acenaphthylene	208-96-8	0.004	mg/kg	**0.007**	**0.013**	**0.009**	**0.011**	**0.011**
Acenaphthene	83-32-9	0.004	mg/kg	<0.004	<0.005	<0.005	<0.005	<0.005
Fluorene	86-73-7	0.004	mg/kg	**0.008**	<0.005	<0.005	**0.008**	<0.005
Phenanthrene	85-01-8	0.004	mg/kg	**0.022**	**0.027**	**0.016**	**0.030**	**0.020**
Anthracene	120-12-7	0.004	mg/kg	**0.012**	**0.016**	**0.009**	**0.011**	**0.011**
Fluoranthene	206-44-0	0.004	mg/kg	**0.044**	**0.059**	**0.032**	**0.036**	**0.038**
Pyrene	129-00-0	0.004	mg/kg	**0.046**	**0.070**	**0.036**	**0.041**	**0.050**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA01_0.5	CA01_1.0	CA02_0.5	CA02_1.0	CA02_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-001	EP2104662-002	EP2104662-003	EP2104662-004	EP2104662-005
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benz(a)anthracene	56-55-3	0.004	mg/kg	0.017	0.029	0.016	0.018	0.020
Chrysene	218-01-9	0.004	mg/kg	0.024	0.043	0.023	0.024	0.030
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg	0.014	0.038	0.020	0.023	0.022
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg	0.008	0.020	0.012	0.013	0.009
Benzo(e)pyrene	192-97-2	0.004	mg/kg	0.010	0.021	0.012	0.012	0.014
Benzo(a)pyrene	50-32-8	0.004	mg/kg	0.012	0.035	0.021	0.020	0.022
Perylene	198-55-0	0.004	mg/kg	0.005	0.146	0.009	0.009	0.019
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg	0.007	0.029	0.014	0.013	0.014
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg	<0.004	0.012	<0.005	<0.005	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg	0.005	0.024	0.012	0.011	0.012
Coronene	191-07-1	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg	0.241	0.588	0.241	0.280	0.298
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg	0.017	0.059	0.027	0.027	0.029
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg	0.019	0.059	0.029	0.029	0.031
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg	0.021	0.059	0.031	0.031	0.033
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	103	107	91.6	97.1	108
Toluene-D8	2037-26-5	0.2	%	85.3	87.9	80.2	84.8	91.3
4-Bromofluorobenzene	460-00-4	0.2	%	81.7	85.8	75.3	79.3	87.6
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	120	75.2	94.2	121	118
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	55.9	52.5	36.8	34.4	59.3
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	58.9	58.0	45.8	57.3	68.8
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	93.6	99.6	112	87.3	107
Anthracene-d10	1719-06-8	10	%	91.2	99.8	103	124	98.3
4-Terphenyl-d14	1718-51-0	10	%	95.5	99.6	100	122	97.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA02_2.0	CA03_0.5	CA03_1.0	CA03_1.5	CA04_0.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-006	EP2104662-007	EP2104662-008	EP2104662-009	EP2104662-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	59.8	64.4	60.9	60.6	66.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	140	<20	<20	60	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	4040	4140	4300	4400	4360
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	4040	4140	4300	4400	4360
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	5.7	0.3	0.7	1.4	0.7
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	14	12	15	16	15
>C16 - C34 Fraction	----	3	mg/kg	106	67	79	76	75
>C34 - C40 Fraction	----	5	mg/kg	40	24	26	25	22
>C10 - C40 Fraction (sum)	----	3	mg/kg	160	103	120	117	112
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	14	12	15	16	15
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	18	18	20	22	22
C15 - C28 Fraction	----	3	mg/kg	61	40	47	46	47
C29 - C36 Fraction	----	5	mg/kg	64	39	46	44	38
^ C10 - C36 Fraction (sum)	----	3	mg/kg	143	97	113	112	107
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA02_2.0	CA03_0.5	CA03_1.0	CA03_1.5	CA04_0.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-006	EP2104662-007	EP2104662-008	EP2104662-009	EP2104662-010
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	**2.0**	**3.8**	**10.6**	**7.7**	**3.6**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA02_2.0	CA03_0.5	CA03_1.0	CA03_1.5	CA04_0.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-006	EP2104662-007	EP2104662-008	EP2104662-009	EP2104662-010
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	<0.010	<0.005	<0.005	<0.005	<0.010
2-Methylnaphthalene	91-57-6	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg	**0.008**	**0.009**	**0.017**	**0.011**	**0.043**
Acenaphthene	83-32-9	0.004	mg/kg	<0.005	<0.005	<0.005	<0.004	<0.005
Fluorene	86-73-7	0.004	mg/kg	<0.005	<0.005	<0.005	<0.004	<0.005
Phenanthrene	85-01-8	0.004	mg/kg	**0.014**	**0.014**	**0.036**	**0.024**	**0.029**
Anthracene	120-12-7	0.004	mg/kg	**0.008**	**0.010**	**0.018**	**0.013**	**0.031**
Fluoranthene	206-44-0	0.004	mg/kg	**0.032**	**0.039**	**0.064**	**0.054**	**0.073**
Pyrene	129-00-0	0.004	mg/kg	**0.037**	**0.049**	**0.088**	**0.061**	**0.088**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CA02_2.0	CA03_0.5	CA03_1.0	CA03_1.5	CA04_0.5
				Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00	20-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-006	EP2104662-007	EP2104662-008	EP2104662-009	EP2104662-010
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.004	mg/kg		**0.016**	**0.023**	**0.042**	**0.029**	**0.047**
Chrysene	218-01-9	0.004	mg/kg		**0.025**	**0.031**	**0.059**	**0.040**	**0.063**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg		**0.020**	**0.023**	**0.043**	**0.028**	**0.060**
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg		**0.009**	**0.014**	**0.020**	**0.017**	**0.032**
Benzo(e)pyrene	192-97-2	0.004	mg/kg		**0.012**	**0.016**	**0.031**	**0.018**	**0.038**
Benzo(a)pyrene	50-32-8	0.004	mg/kg		**0.020**	**0.029**	**0.052**	**0.032**	**0.069**
Perylene	198-55-0	0.004	mg/kg		**0.053**	**0.011**	**0.018**	**0.017**	**0.019**
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg		**0.016**	**0.018**	**0.031**	**0.019**	**0.045**
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg		<0.005	<0.005	<0.005	<0.004	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg		**0.014**	**0.015**	**0.025**	**0.017**	**0.044**
Coronene	191-07-1	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg		**0.284**	**0.301**	**0.544**	**0.380**	**0.681**
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg		**0.026**	**0.037**	**0.066**	**0.042**	**0.088**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg		**0.028**	**0.039**	**0.068**	**0.044**	**0.090**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg		**0.030**	**0.041**	**0.070**	**0.046**	**0.092**
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**108**	**93.0**	**98.5**	**97.9**	**90.8**
Toluene-D8	2037-26-5	0.2	%		**93.3**	**83.0**	**87.1**	**86.3**	**79.9**
4-Bromofluorobenzene	460-00-4	0.2	%		**87.1**	**77.2**	**81.5**	**80.9**	**74.3**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**91.4**	**106**	**65.9**	**114**	**46.6**
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		**64.6**	**80.1**	**68.8**	**60.5**	**52.2**
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		**63.1**	**46.9**	**50.0**	**46.5**	**45.6**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		**115**	**100**	**90.8**	**78.8**	**85.9**
Anthracene-d10	1719-06-8	10	%		**105**	**100**	**101**	**99.9**	**96.5**
4-Terphenyl-d14	1718-51-0	10	%		**102**	**100**	**90.5**	**109**	**97.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA04_1.0	CA04_1.5	CA05_0.5	CA05_1.0	CA05_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-011	EP2104662-012	EP2104662-013	EP2104662-014	EP2104662-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	63.9	59.1	59.3	58.9	62.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	100	200
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	4440	3920	3740	3080	4980
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	4440	3920	3740	3080	4980
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.3	0.4	0.3	1.7	6.3
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	8	12	10	7	6
>C16 - C34 Fraction	----	3	mg/kg	14	60	67	87	61
>C34 - C40 Fraction	----	5	mg/kg	11	20	24	32	20
>C10 - C40 Fraction (sum)	----	3	mg/kg	33	92	101	126	87
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	8	12	10	7	6
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	9	16	18	14	12
C15 - C28 Fraction	----	3	mg/kg	7	38	38	47	35
C29 - C36 Fraction	----	5	mg/kg	10	34	40	55	36
^ C10 - C36 Fraction (sum)	----	3	mg/kg	26	88	96	116	83
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA04_1.0	CA04_1.5	CA05_0.5	CA05_1.0	CA05_1.5
			Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-011	EP2104662-012	EP2104662-013	EP2104662-014	EP2104662-015
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<2	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	**4.6**	**4.5**	**2.3**	**0.7**	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CA04_1.0	CA04_1.5	CA05_0.5	CA05_1.0	CA05_1.5
				Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-011	EP2104662-012	EP2104662-013	EP2104662-014	EP2104662-015
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
alpha-BHC	319-84-6	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.005	mg/kg		<0.010	**0.010**	<0.010	**0.011**	<0.005
2-Methylnaphthalene	91-57-6	0.005	mg/kg		<0.005	<0.005	**0.007**	**0.008**	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg		**0.023**	**0.021**	**0.013**	**0.011**	**0.005**
Acenaphthene	83-32-9	0.004	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	86-73-7	0.004	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
Phenanthrene	85-01-8	0.004	mg/kg		**0.028**	**0.019**	**0.041**	**0.020**	**0.008**
Anthracene	120-12-7	0.004	mg/kg		**0.019**	**0.016**	**0.017**	**0.011**	**0.006**
Fluoranthene	206-44-0	0.004	mg/kg		**0.062**	**0.050**	**0.069**	**0.038**	**0.030**
Pyrene	129-00-0	0.004	mg/kg		**0.072**	**0.059**	**0.076**	**0.049**	**0.032**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CA04_1.0	CA04_1.5	CA05_0.5	CA05_1.0	CA05_1.5
				Sampling date / time	20-Apr-2021 00:00	20-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-011	EP2104662-012	EP2104662-013	EP2104662-014	EP2104662-015
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.004	mg/kg		0.036	0.030	0.035	0.021	0.015
Chrysene	218-01-9	0.004	mg/kg		0.050	0.040	0.047	0.029	0.040
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg		0.047	0.034	0.036	0.018	0.049
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg		0.022	0.017	0.018	0.014	0.042
Benzo(e)pyrene	192-97-2	0.004	mg/kg		0.026	0.020	0.022	0.015	0.007
Benzo(a)pyrene	50-32-8	0.004	mg/kg		0.051	0.037	0.041	0.027	0.018
Perylene	198-55-0	0.004	mg/kg		0.017	0.014	0.014	0.012	0.143
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg		0.031	0.023	0.024	0.016	0.029
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg		<0.005	<0.005	<0.005	<0.005	0.035
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg		0.030	0.021	0.023	0.013	0.047
Coronene	191-07-1	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg		0.514	0.411	0.483	0.313	0.506
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg		0.065	0.048	0.053	0.034	0.069
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg		0.067	0.050	0.055	0.036	0.069
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg		0.069	0.052	0.057	0.038	0.069
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		98.0	100	102	100	97.1
Toluene-D8	2037-26-5	0.2	%		83.3	85.6	88.1	86.3	83.2
4-Bromofluorobenzene	460-00-4	0.2	%		74.9	80.0	82.8	82.8	79.6
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		81.4	70.6	104	74.2	67.0
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		67.0	49.2	62.9	56.0	63.3
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		43.7	52.9	74.8	56.0	40.9
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		79.1	104	114	109	111
Anthracene-d10	1719-06-8	10	%		108	102	109	102	109
4-Terphenyl-d14	1718-51-0	10	%		106	102	112	103	135

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA05_2.0	CA06_0.5	CA06_1.0	CA06_1.5	CA06_2.0
			Sampling date / time	22-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-016	EP2104662-017	EP2104662-018	EP2104662-019	EP2104662-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	59.2	62.4	60.4	60.6	59.7
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	270	<20	100	210	290
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	4370	3310	3500	3930	4350
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	4370	3310	3500	3930	4350
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	4.5	0.3	0.6	1.0	2.3
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	6	9	6	9	7
>C16 - C34 Fraction	----	3	mg/kg	88	65	30	62	76
>C34 - C40 Fraction	----	5	mg/kg	35	21	14	20	23
>C10 - C40 Fraction (sum)	----	3	mg/kg	129	95	50	91	106
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	6	9	6	9	7
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	13	17	16	17	14
C15 - C28 Fraction	----	3	mg/kg	45	40	17	36	44
C29 - C36 Fraction	----	5	mg/kg	57	35	19	36	44
^ C10 - C36 Fraction (sum)	----	3	mg/kg	115	92	52	89	102
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA05_2.0	CA06_0.5	CA06_1.0	CA06_1.5	CA06_2.0
			Sampling date / time	22-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-016	EP2104662-017	EP2104662-018	EP2104662-019	EP2104662-020
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	**1.8**	**0.8**	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA05_2.0	CA06_0.5	CA06_1.0	CA06_1.5	CA06_2.0
			Sampling date / time	22-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-016	EP2104662-017	EP2104662-018	EP2104662-019	EP2104662-020
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene	91-57-6	0.005	mg/kg	<0.005	**0.007**	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg	**0.018**	**0.024**	**0.008**	<0.005	**0.015**
Acenaphthene	83-32-9	0.004	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.004
Fluorene	86-73-7	0.004	mg/kg	**0.007**	<0.005	<0.005	<0.005	**0.008**
Phenanthrene	85-01-8	0.004	mg/kg	**0.046**	**0.043**	**0.012**	**0.022**	**0.038**
Anthracene	120-12-7	0.004	mg/kg	**0.025**	**0.025**	**0.007**	**0.010**	**0.017**
Fluoranthene	206-44-0	0.004	mg/kg	**0.106**	**0.085**	**0.035**	**0.060**	**0.094**
Pyrene	129-00-0	0.004	mg/kg	**0.122**	**0.089**	**0.042**	**0.063**	**0.099**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CA05_2.0	CA06_0.5	CA06_1.0	CA06_1.5	CA06_2.0
				Sampling date / time	22-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00	23-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-016	EP2104662-017	EP2104662-018	EP2104662-019	EP2104662-020
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.004	mg/kg		**0.061**	**0.040**	**0.020**	**0.027**	**0.043**
Chrysene	218-01-9	0.004	mg/kg		**0.080**	**0.057**	**0.027**	**0.040**	**0.060**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg		**0.055**	**0.043**	**0.019**	**0.038**	**0.041**
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg		**0.029**	**0.026**	**0.012**	**0.017**	**0.033**
Benzo(e)pyrene	192-97-2	0.004	mg/kg		**0.035**	**0.026**	**0.011**	**0.019**	**0.027**
Benzo(a)pyrene	50-32-8	0.004	mg/kg		**0.071**	**0.050**	**0.021**	**0.037**	**0.052**
Perylene	198-55-0	0.004	mg/kg		**0.016**	**0.025**	**0.125**	**0.176**	**0.272**
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg		**0.040**	**0.030**	**0.013**	**0.027**	**0.036**
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg		**0.012**	<0.005	<0.005	<0.005	<0.004
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg		**0.038**	**0.028**	**0.012**	**0.026**	**0.034**
Coronene	191-07-1	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg		**0.761**	**0.598**	**0.364**	**0.562**	**0.869**
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg		**0.102**	**0.064**	**0.028**	**0.048**	**0.068**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg		**0.102**	**0.066**	**0.030**	**0.050**	**0.070**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg		**0.102**	**0.068**	**0.032**	**0.052**	**0.072**
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**104**	**96.8**	**104**	**104**	**118**
Toluene-D8	2037-26-5	0.2	%		**87.8**	**81.1**	**88.4**	**88.3**	**101**
4-Bromofluorobenzene	460-00-4	0.2	%		**84.6**	**77.6**	**84.6**	**83.8**	**97.5**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**54.6**	**70.3**	**45.6**	**50.1**	**49.8**
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		**69.8**	**67.8**	**84.3**	**79.2**	**71.9**
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		**47.6**	**60.2**	**73.8**	**48.2**	**45.6**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		**87.4**	**130**	**119**	**97.1**	**85.5**
Anthracene-d10	1719-06-8	10	%		**90.9**	**121**	**113**	**100**	**107**
4-Terphenyl-d14	1718-51-0	10	%		**89.3**	**122**	**117**	**100**	**109**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C02_0.5	C02_1.0	C02_1.5	C03_0.5	C03_1.0
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-021	EP2104662-022	EP2104662-023	EP2104662-024	EP2104662-025
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	33.2	30.9	29.9	27.7	29.9
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	660	350	200	300	280
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	660	350	200	300	280
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.2	<0.1	<0.1	0.1	<0.1
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	4	<3	<3	4	3
>C16 - C34 Fraction	----	3	mg/kg	29	15	<3	26	7
>C34 - C40 Fraction	----	5	mg/kg	9	7	<5	9	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	42	22	<3	39	10
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	4	<3	<3	4	3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	6	3	<3	7	5
C15 - C28 Fraction	----	3	mg/kg	18	9	<3	15	6
C29 - C36 Fraction	----	5	mg/kg	15	9	<5	15	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg	39	21	<3	37	11
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C02_0.5	C02_1.0	C02_1.5	C03_0.5	C03_1.0
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-021	EP2104662-022	EP2104662-023	EP2104662-024	EP2104662-025
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	**2**	**26**	<1	**7**	**3**
Dibutyltin	1002-53-5	1	µgSn/kg	**45**	**122**	**1**	**7**	**5**
Tributyltin	56573-85-4	0.5	µgSn/kg	**165**	**126**	**5.3**	**22.6**	**5.0**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C02_0.5	C02_1.0	C02_1.5	C03_0.5	C03_1.0
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-021	EP2104662-022	EP2104662-023	EP2104662-024	EP2104662-025
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg	**0.00491**	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg	**0.00790**	**0.00118**	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg	**0.00356**	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.00050	mg/kg	**0.0164**	**0.00118**	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	**0.005**	<0.005	<0.005	<0.010	<0.005
2-Methylnaphthalene	91-57-6	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg	**0.006**	<0.004	<0.004	<0.004	<0.004
Acenaphthene	83-32-9	0.004	mg/kg	**0.005**	<0.004	<0.004	<0.004	<0.004
Fluorene	86-73-7	0.004	mg/kg	**0.005**	<0.004	<0.004	<0.004	<0.004
Phenanthrene	85-01-8	0.004	mg/kg	**0.022**	**0.004**	<0.004	**0.021**	<0.004
Anthracene	120-12-7	0.004	mg/kg	**0.005**	<0.004	<0.004	**0.007**	<0.004
Fluoranthene	206-44-0	0.004	mg/kg	**0.037**	**0.008**	<0.004	**0.027**	<0.004
Pyrene	129-00-0	0.004	mg/kg	**0.038**	**0.010**	<0.004	**0.042**	<0.004

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C02_0.5	C02_1.0	C02_1.5	C03_0.5	C03_1.0
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-021	EP2104662-022	EP2104662-023	EP2104662-024	EP2104662-025
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benz(a)anthracene	56-55-3	0.004	mg/kg	**0.015**	<0.004	<0.004	**0.019**	<0.004
Chrysene	218-01-9	0.004	mg/kg	**0.024**	**0.006**	<0.004	**0.026**	<0.004
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg	**0.021**	**0.005**	<0.004	**0.017**	<0.004
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg	**0.010**	<0.004	<0.004	**0.008**	<0.004
Benzo(e)pyrene	192-97-2	0.004	mg/kg	**0.012**	<0.004	<0.004	**0.013**	<0.004
Benzo(a)pyrene	50-32-8	0.004	mg/kg	**0.017**	<0.004	<0.004	**0.022**	<0.004
Perylene	198-55-0	0.004	mg/kg	**0.004**	<0.004	<0.004	<0.004	<0.004
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg	**0.012**	<0.004	<0.004	**0.011**	<0.004
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg	**0.005**	<0.004	<0.004	<0.004	<0.004
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg	**0.012**	<0.004	<0.004	**0.010**	**0.006**
Coronene	191-07-1	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg	**0.255**	**0.033**	<0.004	**0.223**	**0.006**
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg	**0.028**	<0.004	<0.004	**0.028**	<0.004
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg	**0.028**	**0.005**	**0.005**	**0.030**	**0.005**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg	**0.028**	**0.010**	**0.010**	**0.032**	**0.010**
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**114**	**128**	**118**	**113**	**129**
Toluene-D8	2037-26-5	0.2	%	**107**	**119**	**112**	**117**	**117**
4-Bromofluorobenzene	460-00-4	0.2	%	**125**	**94.8**	**88.6**	**93.6**	**94.0**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	**Not Determined**	**65.6**	**120**	**35.9**	**96.2**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	**80.8**	**58.8**	**67.1**	**61.6**	**50.4**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	**37.5**	**64.8**	**85.0**	**38.4**	**71.4**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	**99.5**	**106**	**110**	**111**	**80.6**
Anthracene-d10	1719-06-8	10	%	**108**	**101**	**105**	**112**	**83.2**
4-Terphenyl-d14	1718-51-0	10	%	**125**	**103**	**109**	**107**	**84.4**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C04_0.5	C04_1.0	C06_0.5	C06_1.0	C06_1.5
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-026	EP2104662-027	EP2104662-028	EP2104662-029	EP2104662-030
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	39.7	44.4	35.4	35.3	43.9
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1510	1630	700	720	830
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1510	1630	700	720	830
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.1	0.1	0.2	<0.1	<0.1
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	8	6	4	<3	10
>C16 - C34 Fraction	----	3	mg/kg	53	56	24	68	44
>C34 - C40 Fraction	----	5	mg/kg	14	20	6	10	10
>C10 - C40 Fraction (sum)	----	3	mg/kg	75	82	34	78	64
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	8	6	4	<3	10
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	11	8	6	4	10
C15 - C28 Fraction	----	3	mg/kg	36	34	17	53	30
C29 - C36 Fraction	----	5	mg/kg	25	31	10	19	23
^ C10 - C36 Fraction (sum)	----	3	mg/kg	72	73	33	76	63
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C04_0.5	C04_1.0	C06_0.5	C06_1.0	C06_1.5
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-026	EP2104662-027	EP2104662-028	EP2104662-029	EP2104662-030
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	**2**	<1	**1**	<1
Dibutyltin	1002-53-5	1	µgSn/kg	**2**	**12**	<1	**4**	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	**9.5**	**8.7**	**2.7**	**3.4**	**2.0**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	C04_0.5	C04_1.0	C06_0.5	C06_1.0	C06_1.5
				Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-026	EP2104662-027	EP2104662-028	EP2104662-029	EP2104662-030
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
alpha-BHC	319-84-6	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.005	mg/kg		<0.010	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene	91-57-6	0.005	mg/kg		**0.005**	**0.007**	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg		**0.005**	**0.012**	<0.004	<0.004	**0.016**
Acenaphthene	83-32-9	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Fluorene	86-73-7	0.004	mg/kg		**0.005**	<0.004	<0.004	<0.004	**0.011**
Phenanthrene	85-01-8	0.004	mg/kg		**0.012**	**0.024**	**0.006**	**0.007**	**0.057**
Anthracene	120-12-7	0.004	mg/kg		**0.006**	**0.011**	<0.004	<0.004	**0.027**
Fluoranthene	206-44-0	0.004	mg/kg		**0.024**	**0.040**	**0.013**	**0.013**	**0.080**
Pyrene	129-00-0	0.004	mg/kg		**0.030**	**0.046**	**0.014**	**0.015**	**0.077**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C04_0.5	C04_1.0	C06_0.5	C06_1.0	C06_1.5
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-026	EP2104662-027	EP2104662-028	EP2104662-029	EP2104662-030
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benz(a)anthracene	56-55-3	0.004	mg/kg	**0.010**	**0.017**	**0.007**	**0.006**	**0.038**
Chrysene	218-01-9	0.004	mg/kg	**0.017**	**0.025**	**0.010**	**0.010**	**0.046**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg	**0.018**	**0.025**	**0.009**	**0.010**	**0.033**
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg	**0.008**	**0.014**	**0.005**	**0.005**	**0.020**
Benzo(e)pyrene	192-97-2	0.004	mg/kg	**0.008**	**0.014**	**0.005**	**0.006**	**0.019**
Benzo(a)pyrene	50-32-8	0.004	mg/kg	**0.013**	**0.024**	**0.010**	**0.009**	**0.040**
Perylene	198-55-0	0.004	mg/kg	**0.005**	**0.008**	<0.004	<0.004	**0.015**
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg	**0.008**	**0.014**	**0.005**	**0.006**	**0.020**
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg	**0.008**	**0.014**	**0.005**	**0.006**	**0.020**
Coronene	191-07-1	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg	**0.182**	**0.295**	**0.089**	**0.093**	**0.519**
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg	**0.018**	**0.031**	**0.013**	**0.012**	**0.052**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg	**0.020**	**0.033**	**0.015**	**0.014**	**0.054**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg	**0.022**	**0.035**	**0.017**	**0.016**	**0.056**
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**129**	**115**	**127**	**130**	**130**
Toluene-D8	2037-26-5	0.2	%	**112**	**117**	**113**	**112**	**109**
4-Bromofluorobenzene	460-00-4	0.2	%	**88.8**	**92.8**	**90.6**	**89.3**	**87.6**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	**125**	**76.8**	**103**	**66.7**	**65.4**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	**52.6**	**44.0**	**63.9**	**79.2**	**83.0**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	**69.0**	**50.5**	**50.0**	**80.4**	**47.4**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	**98.4**	**99.5**	**108**	**94.6**	**99.6**
Anthracene-d10	1719-06-8	10	%	**85.9**	**90.0**	**100**	**93.0**	**97.6**
4-Terphenyl-d14	1718-51-0	10	%	**89.1**	**98.8**	**98.0**	**90.0**	**100**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS01	SS02	SS03	SS04	SS05
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-031	EP2104662-032	EP2104662-033	EP2104662-034	EP2104662-035
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	15.0	20.0	22.8	18.4	18.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	0.6	0.2	0.6	<0.1	0.6
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.6	0.2	0.6	<0.1	0.6
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	80	90	120	100	80
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	80	90	120	100	80
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.4	0.4	0.7	0.6	0.4
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	<3	<3	<3	4	<3
>C16 - C34 Fraction	----	3	mg/kg	<3	<3	<3	4	<3
>C34 - C40 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	<3	8	<3
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	<3	<3	<3	4	<3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	<3	3	6	4
C15 - C28 Fraction	----	3	mg/kg	<3	<3	<3	4	<3
C29 - C36 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg	<3	<3	3	10	4
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS01	SS02	SS03	SS04	SS05
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-031	EP2104662-032	EP2104662-033	EP2104662-034	EP2104662-035
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SS01	SS02	SS03	SS04	SS05
				Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-031	EP2104662-032	EP2104662-033	EP2104662-034	EP2104662-035
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
alpha-BHC	319-84-6	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg		<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
2-Methylnaphthalene	91-57-6	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Acenaphthene	83-32-9	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Fluorene	86-73-7	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Phenanthrene	85-01-8	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Anthracene	120-12-7	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	206-44-0	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Pyrene	129-00-0	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS01	SS02	SS03	SS04	SS05
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-031	EP2104662-032	EP2104662-033	EP2104662-034	EP2104662-035
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benz(a)anthracene	56-55-3	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Chrysene	218-01-9	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(e)pyrene	192-97-2	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	50-32-8	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Perylene	198-55-0	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Coronene	191-07-1	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**126**	**124**	**123**	**130**	**----**
Toluene-D8	2037-26-5	0.2	%	**122**	**114**	**116**	**120**	**119**
4-Bromofluorobenzene	460-00-4	0.2	%	**98.3**	**90.7**	**94.7**	**96.8**	**96.8**
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	**89.8**	**120**	**102**	**117**	**59.3**
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	**37.9**	**77.1**	**72.9**	**73.3**	**89.1**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	**47.1**	**59.4**	**70.9**	**58.2**	**88.0**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	**101**	**86.8**	**82.8**	**89.7**	**92.9**
Anthracene-d10	1719-06-8	10	%	**108**	**94.4**	**88.8**	**91.8**	**98.4**
4-Terphenyl-d14	1718-51-0	10	%	**142**	**104**	**92.5**	**96.0**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS06	SS07	SS08	SS09	SS10
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-036	EP2104662-037	EP2104662-038	EP2104662-039	EP2104662-040
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	17.8	14.1	13.4	13.7	19.4
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	0.5	0.4	0.6	0.2
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	0.5	0.4	0.6	0.2
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	100	40	60	60	80
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	100	40	60	60	80
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.8	0.4	0.4	0.4	0.6
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	<3	5	<3	<3	<3
>C16 - C34 Fraction	----	3	mg/kg	<3	4	<3	<3	<3
>C34 - C40 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	<3	9	<3	<3	<3
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	<3	5	<3	<3	<3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg	<3	7	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg	<3	5	<3	<3	<3
C29 - C36 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg	<3	12	<3	<3	<3
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS06	SS07	SS08	SS09	SS10
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-036	EP2104662-037	EP2104662-038	EP2104662-039	EP2104662-040
				Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued								
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS06	SS07	SS08	SS09	SS10
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-036	EP2104662-037	EP2104662-038	EP2104662-039	EP2104662-040
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
2-Methylnaphthalene	91-57-6	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	208-96-8	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Acenaphthene	83-32-9	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Fluorene	86-73-7	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Phenanthrene	85-01-8	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Anthracene	120-12-7	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	206-44-0	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004
Pyrene	129-00-0	0.004	mg/kg	<0.004	<0.004	<0.004	<0.004	<0.004

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SS06	SS07	SS08	SS09	SS10
				Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-036	EP2104662-037	EP2104662-038	EP2104662-039	EP2104662-040
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Chrysene	218-01-9	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(e)pyrene	192-97-2	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	50-32-8	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Perylene	198-55-0	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
Coronene	191-07-1	0.005	mg/kg		<0.005	<0.005	<0.005	<0.005	<0.005
^ Sum of PAHs	----	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg		<0.004	<0.004	<0.004	<0.004	<0.004
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg		**0.005**	**0.005**	**0.005**	**0.005**	**0.005**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg		**0.010**	**0.010**	**0.010**	**0.010**	**0.010**
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**130**	**130**	**128**	**124**	**130**
Toluene-D8	2037-26-5	0.2	%		**119**	**122**	**121**	**117**	**126**
4-Bromofluorobenzene	460-00-4	0.2	%		**96.0**	**97.3**	**96.1**	**94.1**	**114**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**118**	**124**	**101**	**139**	**147**
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		**43.8**	**51.8**	**67.5**	**70.9**	**58.2**
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		**50.4**	**63.2**	**59.7**	**48.8**	**64.8**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		**76.3**	**82.9**	**82.0**	**88.7**	**104**
Anthracene-d10	1719-06-8	10	%		**87.1**	**97.0**	**90.7**	**93.7**	**105**
4-Terphenyl-d14	1718-51-0	10	%		**92.0**	**103**	**94.4**	**98.5**	**117**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C03_EL	C05_EL	C06_EL	C18_EL	DUP1
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-047	EP2104662-048	EP2104662-049	EP2104662-050	EP2104662-051
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	----	----	----	----	63.6
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	----	----	----	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	----	----	----	----	<0.1
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	----	----	----	----	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	----	<0.1
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	----	4240
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	----	4240
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	----	----	----	----	1.6
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	1/05/21	1/05/21	1/05/21	1/05/21	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	----	----	----	----	16
>C16 - C34 Fraction	----	3	mg/kg	----	----	----	----	92
>C34 - C40 Fraction	----	5	mg/kg	----	----	----	----	37
>C10 - C40 Fraction (sum)	----	3	mg/kg	----	----	----	----	145
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	----	----	----	----	16
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	----	----	----	----	<3
C10 - C14 Fraction	----	3	mg/kg	----	----	----	----	22
C15 - C28 Fraction	----	3	mg/kg	----	----	----	----	52
C29 - C36 Fraction	----	5	mg/kg	----	----	----	----	56
^ C10 - C36 Fraction (sum)	----	3	mg/kg	----	----	----	----	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	----	----	----	----	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	----	----	----	----	<3.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	C03_EL	C05_EL	C06_EL	C18_EL	DUP1
			Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EP2104662-047	EP2104662-048	EP2104662-049	EP2104662-050	EP2104662-051
				Result	Result	Result	Result	Result
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons - Continued								
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	<0.2
Toluene	108-88-3	0.2	mg/kg	----	----	----	----	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	----	----	----	----	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	----	----	----	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	----	----	----	----	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	----	----	----	----	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	----	----	----	----	<0.2
Naphthalene	91-20-3	0.2	mg/kg	----	----	----	----	<0.2
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	----	----	----	----	**3**
Dibutyltin	1002-53-5	1	µgSn/kg	----	----	----	----	**8**
Tributyltin	56573-85-4	0.5	µgSn/kg	----	----	----	----	**87.4**
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	----	----	----	----	<0.010
Carbophenothion	786-19-6	0.010	mg/kg	----	----	----	----	<0.010
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	----	----	----	----	<0.0100
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	----	----	----	----	<0.010
Chlorpyrifos	2921-88-2	0.010	mg/kg	----	----	----	----	<0.010
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	----	----	----	----	<0.010
Demeton-S-methyl	919-86-8	0.010	mg/kg	----	----	----	----	<0.010
Diazinon	333-41-5	0.010	mg/kg	----	----	----	----	<0.010
Dichlorvos	62-73-7	0.010	mg/kg	----	----	----	----	<0.010
Dimethoate	60-51-5	0.010	mg/kg	----	----	----	----	<0.010
Ethion	563-12-2	0.010	mg/kg	----	----	----	----	<0.010
Fenamiphos	22224-92-6	0.010	mg/kg	----	----	----	----	<0.010
Fenthion	55-38-9	0.010	mg/kg	----	----	----	----	<0.010
Malathion	121-75-5	0.010	mg/kg	----	----	----	----	<0.010
Azinphos Methyl	86-50-0	0.010	mg/kg	----	----	----	----	<0.010
Monocrotophos	6923-22-4	0.010	mg/kg	----	----	----	----	<0.010
Parathion	56-38-2	0.010	mg/kg	----	----	----	----	<0.010
Parathion-methyl	298-00-0	0.010	mg/kg	----	----	----	----	<0.010
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	----	----	----	----	<0.010
Prothiofos	34643-46-4	0.010	mg/kg	----	----	----	----	<0.010

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	C03_EL	C05_EL	C06_EL	C18_EL	DUP1
				Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-047	EP2104662-048	EP2104662-049	EP2104662-050	EP2104662-051
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.00050	mg/kg		----	----	----	----	<0.00050
alpha-BHC	319-84-6	0.00050	mg/kg		----	----	----	----	<0.00050
beta-BHC	319-85-7	0.00050	mg/kg		----	----	----	----	<0.00050
delta-BHC	319-86-8	0.00050	mg/kg		----	----	----	----	<0.00050
4.4`-DDD	72-54-8	0.00050	mg/kg		----	----	----	----	<0.00050
4.4`-DDE	72-55-9	0.00050	mg/kg		----	----	----	----	<0.00050
4.4`-DDT	50-29-3	0.00050	mg/kg		----	----	----	----	<0.00050
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.00050	mg/kg		----	----	----	----	<0.00050
Dieldrin	60-57-1	0.00050	mg/kg		----	----	----	----	<0.00050
alpha-Endosulfan	959-98-8	0.00050	mg/kg		----	----	----	----	<0.00050
beta-Endosulfan	33213-65-9	0.00050	mg/kg		----	----	----	----	<0.00050
Endosulfan sulfate	1031-07-8	0.00050	mg/kg		----	----	----	----	<0.00050
^ Endosulfan (sum)	115-29-7	0.00050	mg/kg		----	----	----	----	<0.00050
Endrin	72-20-8	0.00050	mg/kg		----	----	----	----	<0.00050
Endrin aldehyde	7421-93-4	0.00050	mg/kg		----	----	----	----	<0.00050
Endrin ketone	53494-70-5	0.00050	mg/kg		----	----	----	----	<0.00050
Heptachlor	76-44-8	0.00050	mg/kg		----	----	----	----	<0.00050
Heptachlor epoxide	1024-57-3	0.00050	mg/kg		----	----	----	----	<0.00050
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg		----	----	----	----	<0.00050
gamma-BHC	58-89-9	0.00025	mg/kg		----	----	----	----	<0.00025
Methoxychlor	72-43-5	0.00050	mg/kg		----	----	----	----	<0.00050
cis-Chlordane	5103-71-9	0.00025	mg/kg		----	----	----	----	<0.00025
trans-Chlordane	5103-74-2	0.00025	mg/kg		----	----	----	----	<0.00025
^ Total Chlordane (sum)	----	0.00025	mg/kg		----	----	----	----	<0.00025
Oxychlordane	27304-13-8	0.00050	mg/kg		----	----	----	----	<0.00050
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.005	mg/kg		----	----	----	----	<0.010
2-Methylnaphthalene	91-57-6	0.005	mg/kg		----	----	----	----	**0.005**
Acenaphthylene	208-96-8	0.004	mg/kg		----	----	----	----	**0.014**
Acenaphthene	83-32-9	0.004	mg/kg		----	----	----	----	<0.005
Fluorene	86-73-7	0.004	mg/kg		----	----	----	----	<0.005
Phenanthrene	85-01-8	0.004	mg/kg		----	----	----	----	**0.020**
Anthracene	120-12-7	0.004	mg/kg		----	----	----	----	**0.015**
Fluoranthene	206-44-0	0.004	mg/kg		----	----	----	----	**0.045**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	C03_EL	C05_EL	C06_EL	C18_EL	DUP1
				Sampling date / time	21-Apr-2021 00:00	21-Apr-2021 00:00	21-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		EP2104662-047	EP2104662-048	EP2104662-049	EP2104662-050	EP2104662-051
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.004	mg/kg		----	----	----	----	**0.057**
Benz(a)anthracene	56-55-3	0.004	mg/kg		----	----	----	----	**0.026**
Chrysene	218-01-9	0.004	mg/kg		----	----	----	----	**0.036**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg		----	----	----	----	**0.034**
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg		----	----	----	----	**0.021**
Benzo(e)pyrene	192-97-2	0.004	mg/kg		----	----	----	----	**0.019**
Benzo(a)pyrene	50-32-8	0.004	mg/kg		----	----	----	----	**0.033**
Perylene	198-55-0	0.004	mg/kg		----	----	----	----	**0.019**
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg		----	----	----	----	**0.017**
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg		----	----	----	----	**0.006**
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg		----	----	----	----	**0.015**
Coronene	191-07-1	0.005	mg/kg		----	----	----	----	<0.005
^ Sum of PAHs	----	0.004	mg/kg		----	----	----	----	**0.382**
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg		----	----	----	----	**0.049**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg		----	----	----	----	**0.049**
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg		----	----	----	----	**0.049**
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	**128**
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	**82.4**
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	**74.6**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		----	----	----	----	**109**
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		----	----	----	----	**62.8**
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		----	----	----	----	**70.1**
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		----	----	----	----	**85.2**
Anthracene-d10	1719-06-8	10	%		----	----	----	----	**88.9**
4-Terphenyl-d14	1718-51-0	10	%		----	----	----	----	**88.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP2	DUP3	TRIP BLANK	Elutriate Water	----
			Sampling date / time	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	----
Compound	CAS Number	LOR	Unit	EP2104662-052	EP2104662-053	EP2104662-054	EP2104662-057	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	% (w/w)	**60.8**	**59.2**	<1.0	----	----
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	**320**	**140**	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	<0.1	<0.1	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	**4540**	**3750**	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	**4540**	**3750**	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	**9.4**	**6.3**	----	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	**----**	**----**	----	**1/05/21**	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	**18**	**14**	<3	----	----
>C16 - C34 Fraction	----	3	mg/kg	**107**	**130**	<3	----	----
>C34 - C40 Fraction	----	5	mg/kg	**45**	**54**	<5	----	----
>C10 - C40 Fraction (sum)	----	3	mg/kg	**170**	**198**	<3	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg	**18**	**14**	<3	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	3	mg/kg	<3	<3	<3	----	----
C10 - C14 Fraction	----	3	mg/kg	**25**	**18**	<3	----	----
C15 - C28 Fraction	----	3	mg/kg	**61**	**75**	<3	----	----
C29 - C36 Fraction	----	5	mg/kg	**68**	**79**	<5	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg	**154**	**172**	<3	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	<3	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	<3.0	<3.0	<3.0	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP2	DUP3	TRIP BLANK	Elutriate Water	----
			Sampling date / time	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	----
Compound	CAS Number	LOR	Unit	EP2104662-052	EP2104662-053	EP2104662-054	EP2104662-057	--------
				Result	Result	Result	Result	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons - Continued								
EP080-SD: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
EP090: Organotin Compounds								
Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	----	----	----
Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	----	----	----
Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	**2.6**	----	----	----
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Bromophos-ethyl	4824-78-6	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Carbophenothion	786-19-6	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Chlorfenvinphos (E)	18708-86-6	0.0100	mg/kg	<0.0100	<0.0100	<0.0100	----	----
Chlorfenvinphos (Z)	18708-87-7	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Chlorpyrifos	2921-88-2	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Chlorpyrifos-methyl	5598-13-0	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Demeton-S-methyl	919-86-8	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Diazinon	333-41-5	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Dichlorvos	62-73-7	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Dimethoate	60-51-5	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Ethion	563-12-2	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Fenamiphos	22224-92-6	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Fenthion	55-38-9	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Malathion	121-75-5	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Azinphos Methyl	86-50-0	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Monocrotophos	6923-22-4	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Parathion	56-38-2	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Parathion-methyl	298-00-0	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Pirimphos-ethyl	23505-41-1	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Prothiofos	34643-46-4	0.010	mg/kg	<0.010	<0.010	<0.010	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP2	DUP3	TRIP BLANK	Elutriate Water	----
			Sampling date / time	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	----
Compound	CAS Number	LOR	Unit	EP2104662-052	EP2104662-053	EP2104662-054	EP2104662-057	--------
				Result	Result	Result	Result	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
alpha-BHC	319-84-6	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
beta-BHC	319-85-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
delta-BHC	319-86-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
4.4`-DDD	72-54-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
4.4`-DDE	72-55-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
4.4`-DDT	50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Dieldrin	60-57-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
alpha-Endosulfan	959-98-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
beta-Endosulfan	33213-65-9	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Endosulfan sulfate	1031-07-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
^ **Endosulfan (sum)**	115-29-7	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Endrin	72-20-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Endrin aldehyde	7421-93-4	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Endrin ketone	53494-70-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Heptachlor	76-44-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Heptachlor epoxide	1024-57-3	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
Hexachlorobenzene (HCB)	118-74-1	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
gamma-BHC	58-89-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	----	----
Methoxychlor	72-43-5	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
cis-Chlordane	5103-71-9	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	----	----
trans-Chlordane	5103-74-2	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	----	----
^ **Total Chlordane (sum)**	----	0.00025	mg/kg	<0.00025	<0.00025	<0.00025	----	----
Oxychlordane	27304-13-8	0.00050	mg/kg	<0.00050	<0.00050	<0.00050	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.005	mg/kg	<0.010	<0.010	<0.005	----	----
2-Methylnaphthalene	91-57-6	0.005	mg/kg	**0.006**	**0.007**	<0.005	----	----
Acenaphthylene	208-96-8	0.004	mg/kg	**0.012**	**0.016**	<0.004	----	----
Acenaphthene	83-32-9	0.004	mg/kg	<0.005	<0.005	<0.004	----	----
Fluorene	86-73-7	0.004	mg/kg	<0.005	<0.005	<0.004	----	----
Phenanthrene	85-01-8	0.004	mg/kg	**0.023**	**0.030**	<0.004	----	----
Anthracene	120-12-7	0.004	mg/kg	**0.014**	**0.015**	<0.004	----	----
Fluoranthene	206-44-0	0.004	mg/kg	**0.060**	**0.049**	<0.004	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP2	DUP3	TRIP BLANK	Elutriate Water	----
			Sampling date / time	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	22-Apr-2021 00:00	----
Compound	CAS Number	LOR	Unit	EP2104662-052	EP2104662-053	EP2104662-054	EP2104662-057	--------
				Result	Result	Result	Result	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Pyrene	129-00-0	0.004	mg/kg	**0.064**	**0.056**	<0.004	----	----
Benz(a)anthracene	56-55-3	0.004	mg/kg	**0.027**	**0.025**	**0.004**	----	----
Chrysene	218-01-9	0.004	mg/kg	**0.038**	**0.035**	**0.006**	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.004	mg/kg	**0.035**	**0.036**	<0.004	----	----
Benzo(k)fluoranthene	207-08-9	0.004	mg/kg	**0.017**	**0.016**	**0.012**	----	----
Benzo(e)pyrene	192-97-2	0.004	mg/kg	**0.018**	**0.018**	<0.004	----	----
Benzo(a)pyrene	50-32-8	0.004	mg/kg	**0.035**	**0.032**	**0.006**	----	----
Perylene	198-55-0	0.004	mg/kg	**0.309**	**0.058**	<0.004	----	----
Benzo(g.h.i)perylene	191-24-2	0.004	mg/kg	**0.025**	**0.019**	**0.007**	----	----
Dibenz(a.h)anthracene	53-70-3	0.004	mg/kg	<0.005	<0.005	**0.014**	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.004	mg/kg	**0.024**	**0.016**	**0.008**	----	----
Coronene	191-07-1	0.005	mg/kg	<0.005	<0.005	<0.005	----	----
^ Sum of PAHs	----	0.004	mg/kg	**0.707**	**0.428**	**0.057**	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.004	mg/kg	**0.046**	**0.042**	**0.022**	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.004	mg/kg	**0.048**	**0.044**	**0.023**	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.004	mg/kg	**0.050**	**0.046**	**0.023**	----	----
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**127**	**81.2**	**88.2**	----	----
Toluene-D8	2037-26-5	0.2	%	**81.4**	**89.9**	**91.1**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**86.1**	**78.5**	**76.2**	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	0.5	%	**83.0**	**126**	----	----	----
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	**88.2**	**79.9**	**54.2**	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	**58.2**	**59.4**	**49.1**	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	**101**	**89.6**	**107**	----	----
Anthracene-d10	1719-06-8	10	%	**93.9**	**83.2**	**95.0**	----	----
4-Terphenyl-d14	1718-51-0	10	%	**93.4**	**90.7**	**105**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	C18_EL	RINSATE 1	RINSATE 2	----	----
				Sampling date / time	22-Apr-2021 00:00	20-Apr-2021 00:00	21-Apr-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2104662-050	EP2104662-055	EP2104662-056	--------	--------
					Result	Result	Result	----	----
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L		----	<0.005	<0.005	----	----
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L		----	<0.002	<0.002	----	----
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L		----	<0.002	<0.002	----	----
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L		----	<0.002	<0.002	----	----
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L		----	<0.01	<0.01	----	----
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.01	mg/L		----	<0.01	<0.01	----	----
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		----	<0.005	<0.005	----	----
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L		----	**0.001**	<0.001	----	----
EP090: Organotin Compounds (Soluble)									
Monobutyltin	78763-54-9	5	ngSn/L		<5	----	----	----	----
Dibutyltin	1002-53-5	5	ngSn/L		<5	----	----	----	----
Tributyltin	56573-85-4	2	ngSn/L		<2	<2	<2	----	----
EP090S: Organotin Surrogate									
Tripropyltin	----	5	%		**89.4**	**114**	**134**	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EP080-SD: TPH(V)/BTEX Surrogates		
EP080-SD: 1.2-Dichloroethane-D4	SS05 - 21-Apr-2021 00:00	326.4800319455

Surrogate Control Limits

Sub-Matrix: ELUTRIATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080-SD: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	130
Toluene-D8	2037-26-5	70	130
4-Bromofluorobenzene	460-00-4	70	130
EP090S: Organotin Surrogate			
Tripropyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	119
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	70	130
Anthracene-d10	1719-06-8	70	130
4-Terphenyl-d14	1718-51-0	70	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EP090: Organotin Compounds

(SOIL) EP090S: Organotin Surrogate

(WATER) EP090: Organotin Compounds (Soluble)

(WATER) EP090S: Organotin Surrogate

(SOIL) EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)

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

(SOIL) EP130A: Organophosphorus Pesticides (Ultra-trace)

(SOIL) EP130S: Organophosphorus Pesticide Surrogate

(SOIL) EP131A: Organochlorine Pesticides

(SOIL) EP131S: OC Pesticide Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2104662**	Page	: 1 of 34
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Contact	: Nick Courts
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: +61 08 9273 3888	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 27-Apr-2021
Order number	: CW1146500	Date Analysis Commenced	: 30-Apr-2021
C-O-C number	: ----	Issue Date	: 17-May-2021
Sampler	: JULIAN BROWN		
Site	: ----		
Quote number	: EP/174/21		
No. of samples received	: 57		
No. of samples analysed	: 51		

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*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Diana Mesa	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Kinnin	Laboratory Technician	Perth Inorganics, Wangara, WA
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Vanessa Nguyen	Organic Chemist	Perth Organics, Wangara, WA

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

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 (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3659971)									
EP2104662-001	CA01_0.5	EA055: Moisture Content	----	0.1	%	37.1 % (w/w)	36.1	2.92	0% - 20%
EP2104662-010	CA04_0.5	EA055: Moisture Content	----	0.1	%	66.1 % (w/w)	67.3	1.83	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3659972)									
EP2104662-021	C02_0.5	EA055: Moisture Content	----	0.1	%	33.2 % (w/w)	32.2	2.98	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3659974)									
EP2104662-022	C02_1.0	EA055: Moisture Content	----	0.1	%	30.9 % (w/w)	32.1	3.71	0% - 20%
EP2104662-031	SS01	EA055: Moisture Content	----	0.1	%	15.0 % (w/w)	15.0	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3659975)									
EP2104662-052	DUP2	EA055: Moisture Content	----	0.1	%	60.8 % (w/w)	61.0	0.444	0% - 20%
EK055: Ammonia as N (QC Lot: 3664358)									
EP2104662-001	CA01_0.5	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP2104662-010	CA04_0.5	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK055: Ammonia as N (QC Lot: 3664359)									
EP2104662-021	C02_0.5	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK055: Ammonia as N (QC Lot: 3664361)									
EP2104662-022	C02_1.0	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP2104662-031	SS01	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK055: Ammonia as N (QC Lot: 3664362)									
EP2104662-052	DUP2	EK055: Ammonia as N	7664-41-7	20	mg/kg	320	350	8.3	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3651927)									
EP2104662-017	CA06_0.5	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3659992)									
EP2104662-001	CA01_0.5	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3659992) - continued									
EP2104662-011	CA04_1.0	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3659995)									
EP2104662-025	C03_1.0	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP2104662-035	SS05	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3651928)									
EP2104662-017	CA06_0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3659991)									
EP2104662-001	CA01_0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP2104662-011	CA04_1.0	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3659996)									
EP2104662-025	C03_1.0	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP2104662-035	SS05	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.6	0.5	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3653519)									
EP2104662-028	C06_0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	700	700	0.0	0% - 20%
EP2104662-038	SS08	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	60	70	25.8	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3674295)									
EP2104662-001	CA01_0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	920	980	7.0	0% - 20%
EP2104662-011	CA04_1.0	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	4440	4460	0.3	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3674296)									
EP2104662-021	C02_0.5	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	660	720	8.5	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3651926)									
EP2104662-017	CA06_0.5	EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.3	0.2	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3659993)									
EP2104662-001	CA01_0.5	EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.2	0.2	0.0	No Limit
EP2104662-011	CA04_1.0	EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.3	0.3	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3659994)									
EP2104662-025	C03_1.0	EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP2104662-035	SS05	EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	0.4	0.3	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649912)									
EP2104662-001	CA01_0.5	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP2104662-011	CA04_1.0	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649913)									
EP2104662-021	C02_0.5	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP2104662-031	SS01	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649914)									
EP2104662-051	DUP1	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.00	0% - 3%
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649915)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649915) - continued									
EP2104662-001	CA01_0.5	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	9	9	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	20	17	14.8	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	42	37	12.7	0% - 50%
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	13	11	20.5	No Limit
EP2104662-011	CA04_1.0	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	9	12	30.6	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	7	13	59.8	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	26	42	47.1	0% - 50%
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	10	17	50.4	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649916)									
EP2104662-021	C02_0.5	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	6	9	31.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	18	20	6.0	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	39	43	9.8	0% - 50%
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	15	14	8.7	No Limit
EP2104662-031	SS01	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3649917)									
EP2104662-053	DUP3	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	18	19	7.9	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	75	80	5.8	0% - 20%
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	172	183	6.2	0% - 20%
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	79	84	6.4	0% - 50%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649912)									
EP2104662-001	CA01_0.5	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP2104662-011	CA04_1.0	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649913)									
EP2104662-021	C02_0.5	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP2104662-031	SS01	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649914)									
EP2104662-051	DUP1	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.00	0% - 3%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649915)									
EP2104662-001	CA01_0.5	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	8	7	0.0	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	29	24	18.3	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	43	37	15.0	0% - 50%
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	6	6	0.0	No Limit
EP2104662-011	CA04_1.0	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	8	11	32.7	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	14	25	56.8	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	33	51	42.9	0% - 50%
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	11	15	27.6	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 (%)*
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649916)									
EP2104662-021	C02_0.5	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	4	6	44.3	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	29	29	0.0	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	42	44	4.7	0% - 50%
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	9	9	0.0	No Limit
EP2104662-031	SS01	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3649917)									
EP2104662-053	DUP3	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	14	15	0.0	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	130	139	6.3	0% - 20%
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	198	210	5.9	0% - 20%
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	54	56	3.2	0% - 50%
EP080-SD: BTEXN (QC Lot: 3649912)									
EP2104662-001	CA01_0.5	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
EP2104662-011	CA04_1.0	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
EP080-SD: BTEXN (QC Lot: 3649913)									
EP2104662-021	C02_0.5	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	0% - .2%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080-SD: BTEXN (QC Lot: 3649913) - continued									
EP2104662-021	C02_0.5	EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
EP2104662-031	SS01	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
EP080-SD: BTEXN (QC Lot: 3649914)									
EP2104662-051	DUP1	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.00	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.00	0% - .2%
EP090: Organotin Compounds (QC Lot: 3653222)									
EP2104662-021	C02_0.5	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	165	# 69.1	81.9	0% - 20%
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	2	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	45	# 7	146	0% - 20%
EP090: Organotin Compounds (QC Lot: 3656322)									
EP2104662-001	CA01_0.5	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	7.4	5.8	24.3	0% - 50%
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<2	<1	0.0	No Limit
EP2104662-011	CA04_1.0	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	4.6	5.4	14.4	0% - 50%
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP090: Organotin Compounds (QC Lot: 3656331)									
EP2104662-031	SS01	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	<1	0.0	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	<1	0.0	No Limit
EP2104662-051	DUP1	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	87.4	89.0	1.8	0% - 20%
		EP090: Monobutyltin	78763-54-9	1	µgSn/kg	3	2	74.8	No Limit
		EP090: Dibutyltin	1002-53-5	1	µgSn/kg	8	4	65.5	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 (%)*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3654026)									
EP2104662-001	CA01_0.5	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<0.0100 mg/kg	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
EP2104662-011	CA04_1.0	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<0.0100 mg/kg	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<0.010 mg/kg	<10	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 (%)*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3654027)									
EP2104662-013	CA05_0.5	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<0.0100 mg/kg	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
EP2104662-030	C06_1.5	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<0.0100 mg/kg	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<0.010 mg/kg	<10	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 (%)*
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3654029)									
EP2104662-051	DUP1	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<0.0100 mg/kg	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<0.010 mg/kg	<10	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3654025)									
EP2104662-001	CA01_0.5	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 3654025) - continued									
EP2104662-001	CA01_0.5	EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
EP2104662-011	CA04_1.0	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3654028)									
EP2104662-013	CA05_0.5	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 3654028) - continued									
EP2104662-013	CA05_0.5	EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
EP2104662-030	C06_1.5	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	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 (%)*
EP131A: Organochlorine Pesticides (QC Lot: 3654028) - continued									
EP2104662-030	C06_1.5	EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3654030)									
EP2104662-051	DUP1	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.00025 mg/kg	<0.25	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.00050 mg/kg	<0.50	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649918)									
EP2104662-001	CA01_0.5	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	0.007 mg/kg	5	39.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	0.008 mg/kg	5	37.7	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	0.022 mg/kg	14	43.7	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	0.012 mg/kg	7	49.4	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	0.044 mg/kg	27	46.5	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	0.046 mg/kg	29	44.5	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	0.017 mg/kg	12	30.6	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	0.024 mg/kg	18	28.3	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	0.014 mg/kg	11	16.9	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 (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649918) - continued									
EP2104662-001	CA01_0.5	EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	0.008 mg/kg	7	0.0	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	0.010 mg/kg	8	21.7	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	0.012 mg/kg	13	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	0.005 mg/kg	<4	25.5	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	0.007 mg/kg	9	21.1	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	0.005 mg/kg	7	32.4	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	0.241 mg/kg	# 172	33.4	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<0.010 mg/kg	<5	66.7	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
EP2104662-011	CA04_1.0	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	0.023 mg/kg	16	34.6	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<0.005 mg/kg	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<0.005 mg/kg	<4	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	0.028 mg/kg	14	69.2	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	0.019 mg/kg	11	53.7	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	0.062 mg/kg	# 26	83.8	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	0.072 mg/kg	# 31	78.4	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	0.036 mg/kg	16	78.1	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	0.050 mg/kg	# 23	73.2	0% - 50%
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	0.047 mg/kg	# 20	81.8	0% - 50%
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	0.022 mg/kg	14	48.2	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	0.026 mg/kg	14	62.6	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	0.051 mg/kg	# 26	65.4	0% - 50%
		EP132B-SD: Perylene	198-55-0	4	µg/kg	0.017 mg/kg	11	42.4	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	0.031 mg/kg	18	50.9	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<0.005 mg/kg	8	53.5	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	0.030 mg/kg	17	53.3	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	0.514 mg/kg	# 276	60.3	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<0.010 mg/kg	11	0.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649919)									
EP2104662-021	C02_0.5	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	0.006 mg/kg	5	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	0.005 mg/kg	4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	0.005 mg/kg	5	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	0.022 mg/kg	17	25.6	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	0.005 mg/kg	5	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	0.037 mg/kg	31	20.1	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 (%)*
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649919) - continued									
EP2104662-021	C02_0.5	EP132B-SD: Pyrene	129-00-0	4	µg/kg	0.038 mg/kg	35	8.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	0.015 mg/kg	16	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	0.024 mg/kg	23	6.4	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	0.021 mg/kg	22	0.0	No Limit
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	0.010 mg/kg	8	19.6	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	0.012 mg/kg	12	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	0.017 mg/kg	18	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	0.004 mg/kg	5	0.0	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	0.012 mg/kg	13	0.0	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	0.005 mg/kg	<4	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	0.012 mg/kg	12	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	0.255 mg/kg	231	9.9	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	0.005 mg/kg	<10	61.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
EP2104662-031	SS01	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	<0.004 mg/kg	<4	0.0	No Limit
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649920)									
EP2104662-053	DUP3	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	0.016 mg/kg	14	8.2	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3649920) - continued									
EP2104662-053	DUP3	EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<0.005 mg/kg	5	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<0.005 mg/kg	9	59.6	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	0.030 mg/kg	42	34.4	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	0.015 mg/kg	19	22.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	0.049 mg/kg	68	32.6	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	0.056 mg/kg	79	33.4	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	0.025 mg/kg	35	34.6	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	0.035 mg/kg	53	40.7	0% - 50%
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	0.036 mg/kg	32	9.2	No Limit
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	0.016 mg/kg	21	28.7	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	0.018 mg/kg	24	25.1	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	0.032 mg/kg	38	17.9	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	0.058 mg/kg	64	10.0	0% - 50%
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	0.019 mg/kg	23	16.7	No Limit
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<0.005 mg/kg	<4	0.0	No Limit
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	0.016 mg/kg	20	23.5	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	0.428 mg/kg	# 567	27.9	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<0.010 mg/kg	13	25.4	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	0.007 mg/kg	8	13.7	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<0.005 mg/kg	<5	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EK255A: Ammonia (QC Lot: 3652793)									
EP2104632-001	Anonymous	EK255A-CM: Ammonia as N	7664-41-7	0.005	mg/L	0.040	0.040	0.00	No Limit
EP2104671-004	Anonymous	EK255A-CM: Ammonia as N	7664-41-7	0.005	mg/L	0.267	0.279	4.40	0% - 20%
EK257A: Nitrite (QC Lot: 3652791)									
EP2104632-001	Anonymous	EK257A-CM: Nitrite as N	14797-65-0	0.002	mg/L	0.003	0.003	0.00	No Limit
EP2104671-004	Anonymous	EK257A-CM: Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	0.00	No Limit
EK259A: Nitrite and Nitrate (NOx) (QC Lot: 3652790)									
EP2104632-001	Anonymous	EK259A-CM: Nitrite + Nitrate as N	----	0.002	mg/L	0.022	0.021	0.00	0% - 50%
EP2104671-004	Anonymous	EK259A-CM: Nitrite + Nitrate as N	----	0.002	mg/L	0.013	0.012	0.00	No Limit
EK262A: Total Nitrogen (QC Lot: 3649974)									
EP2104662-055	RINSATE 1	EK262PA-CM: Total Nitrogen as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK267A: Total Phosphorus (Persulfate Digestion) (QC Lot: 3649975)									
EP2104662-055	RINSATE 1	EK267PA-CM: Total Phosphorus as P	----	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EK271A: Reactive Phosphorus (QC Lot: 3652792)									
EP2104632-001	Anonymous	EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
EP2104671-004	Anonymous	EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.002	0.002	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP090: Organotin Compounds (Soluble) (QC Lot: 3656697)									
EP2104662-048	C05_EL	EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	<2	0.00	No Limit
		EP090S: Monobutyltin	78763-54-9	5	ngSn/L	<5	<5	0.00	No Limit
		EP090S: Dibutyltin	1002-53-5	5	ngSn/L	<5	<5	0.00	No Limit
EP2104662-049	C06_EL	EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	<2	0.00	No Limit
		EP090S: Monobutyltin	78763-54-9	5	ngSn/L	<5	<5	0.00	No Limit
		EP090S: Dibutyltin	1002-53-5	5	ngSn/L	<5	<5	0.00	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
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 3653532)								
EN68a-G: Seawater Sampling Date	----	----	-	1/05/21	----	----	----	----
EK055: Ammonia as N (QCLot: 3664358)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	50 mg/kg	88.9	70.0	116
EK055: Ammonia as N (QCLot: 3664359)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	50 mg/kg	88.0	70.0	116
EK055: Ammonia as N (QCLot: 3664361)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	50 mg/kg	94.3	70.0	116
EK055: Ammonia as N (QCLot: 3664362)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	50 mg/kg	91.0	70.0	116
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3651927)								
EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	2.5 mg/kg	102	94.7	106
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3659992)								
EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	2.5 mg/kg	101	94.7	106
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3659995)								
EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	2.5 mg/kg	102	94.7	106
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3651928)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	95.0	89.8	109
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3659991)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	99.0	89.8	109
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3659996)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	98.7	89.8	109
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3653519)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	85.0	78.0	112
				<20	100 mg/kg	92.6	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3674295)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	83.8	78.0	112
				<20	100 mg/kg	87.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3674296)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	80.3	78.0	112
				<20	100 mg/kg	77.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3651926)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	<0.1	2.5 mg/kg	98.0	89.7	108

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3659993)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	<0.1	2.5 mg/kg	100	89.7	108
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3659994)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.1	mg/kg	<0.1	2.5 mg/kg	102	89.7	108
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649912)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	32 mg/kg	103	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649913)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	32 mg/kg	118	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649914)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	32 mg/kg	106	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649915)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	252 mg/kg	96.6	75.9	145
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	634 mg/kg	89.6	70.9	140
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	99 mg/kg	73.6	60.2	132
EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649916)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	252 mg/kg	110	75.9	145
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	634 mg/kg	96.1	70.9	140
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	99 mg/kg	76.7	60.2	132
EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649917)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	252 mg/kg	105	75.9	145
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	634 mg/kg	89.5	70.9	140
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	99 mg/kg	80.0	60.2	132
EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649912)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	37 mg/kg	104	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649913)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	37 mg/kg	128	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649914)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	37 mg/kg	106	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649915)								
EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	404 mg/kg	98.9	76.1	147
EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	567 mg/kg	82.3	63.4	132
EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	33 mg/kg	57.7	54.9	130
EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649916)								
EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	404 mg/kg	110	76.1	147

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649916) - continued								
EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	567 mg/kg	87.5	63.4	132
EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	33 mg/kg	56.8	54.9	130
EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649917)								
EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	404 mg/kg	102	76.1	147
EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	567 mg/kg	83.2	63.4	132
EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	33 mg/kg	83.0	54.9	130
EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD: BTEXN (QCLot: 3649912)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	103	70.0	130
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	2 mg/kg	94.0	70.0	130
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	2 mg/kg	99.3	70.0	130
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	4 mg/kg	111	70.0	130
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	2 mg/kg	94.3	70.0	130
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	0.5 mg/kg	100	70.0	130
EP080-SD: BTEXN (QCLot: 3649913)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	125	70.0	130
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	2 mg/kg	121	70.0	130
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	2 mg/kg	112	70.0	130
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	4 mg/kg	119	70.0	130
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	2 mg/kg	120	70.0	130
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	0.5 mg/kg	98.7	70.0	130
EP080-SD: BTEXN (QCLot: 3649914)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	111	70.0	130
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	2 mg/kg	97.9	70.0	130
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	2 mg/kg	88.8	70.0	130
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	4 mg/kg	92.8	70.0	130
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	2 mg/kg	90.9	70.0	130
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.9	70.0	130

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP090: Organotin Compounds (QCLot: 3653222)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	86.6	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	70.9	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	90.8	52.0	139
EP090: Organotin Compounds (QCLot: 3656322)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	110	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	122	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	85.4	52.0	139
EP090: Organotin Compounds (QCLot: 3656331)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	87.8	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	99.9	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	85.3	52.0	139
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654026)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	84.0	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	81.9	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	77.2	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	82.7	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	80.8	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	82.1	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	92.8	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	78.2	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	79.9	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	88.2	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	90.6	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	76.3	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	78.0	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	77.4	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	81.2	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	80.2	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	79.7	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	81.4	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	76.8	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	83.8	51.0	117
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654027)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	88.8	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	83.4	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	75.0	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	91.0	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	85.7	54.0	112

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654027) - continued								
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	97.3	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	77.7	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	84.8	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	79.0	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	85.6	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	82.2	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	87.8	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	80.9	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	81.0	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	80.2	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	79.9	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	81.9	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	94.8	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	82.5	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	88.4	51.0	117
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654029)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	86.9	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	92.7	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	98.1	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	84.0	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	85.0	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	97.8	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	82.0	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	97.1	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	81.0	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	96.0	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	95.8	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	77.9	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	78.3	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	85.7	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	94.7	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	82.2	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	84.0	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	95.8	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	95.4	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	84.6	51.0	117
EP131A: Organochlorine Pesticides (QCLot: 3654025)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	121	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	93.6	17.6	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 3654025) - continued								
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	64.4	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	103	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	83.3	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	88.1	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	137	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	114	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	98.7	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	120	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	128	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	109	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	90.9	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	126	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	83.1	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	117	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	84.9	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	90.8	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	116	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	117	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	56.4	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3654028)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	84.2	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	73.8	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	50.4	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	77.4	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	56.2	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	71.8	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	88.4	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	92.7	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	88.2	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	67.1	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	83.5	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	95.5	25.8	158

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 3654028) - continued								
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	66.6	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	66.8	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	82.2	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	87.6	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	76.7	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	68.2	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	62.9	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	86.7	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	93.2	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3654030)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	84.0	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	74.0	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	50.7	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	77.8	37.0	140
EP131A: 4.4`-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	56.7	25.9	141
EP131A: 4.4`-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	77.4	35.0	129
EP131A: 4.4`-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	88.9	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	94.2	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	88.4	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	70.7	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	84.2	36.0	155
EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	----	----	----	----
EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	5 µg/kg	99.3	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	66.3	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	69.0	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	83.5	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	88.9	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	76.6	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	68.5	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	64.0	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	86.9	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	93.2	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649918)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	76.8	55.0	131
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649918) - continued								
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	76.0	64.0	110
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	80.4	62.0	112
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	84.1	64.0	118
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	82.7	59.0	117
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	102	69.0	111
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	68.5	66.0	118
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	75.7	70.0	116
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	59.9	59.0	121
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	83.5	68.0	116
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	<4	25 µg/kg	76.9	51.0	107
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	95.0	52.0	118
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	107	55.0	111
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	95.3	62.0	106
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	73.2	35.0	141
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	83.2	48.0	122
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	----	----	----	----
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649919)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	91.1	55.0	131
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	109	64.0	110
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	99.9	62.0	112
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	109	64.0	118
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	97.2	59.0	117
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	91.8	69.0	111
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	93.1	66.0	118
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	99.4	70.0	116
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	89.3	59.0	121
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	84.5	68.0	116
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	<4	25 µg/kg	88.6	51.0	107
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	102	52.0	118
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	98.3	55.0	111
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	86.0	62.0	106

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649919) - continued								
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	109	35.0	141
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	99.0	48.0	122
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	----	----	----	----
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649920)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	87.6	55.0	131
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	86.4	64.0	110
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	88.9	62.0	112
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	88.9	64.0	118
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	87.6	59.0	117
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	77.2	69.0	111
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	80.0	66.0	118
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	87.0	70.0	116
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	72.2	59.0	121
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	101	68.0	116
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	<4	25 µg/kg	86.7	51.0	107
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	107	52.0	118
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	73.4	55.0	111
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	----	----	----	----
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	89.8	62.0	106
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	72.4	35.0	141
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	78.7	48.0	122
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	----	----	----	----
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK255A: Ammonia (QCLot: 3652793)								
EK255A-CM: Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.1 mg/L	107	77.8	116
EK257A: Nitrite (QCLot: 3652791)								
EK257A-CM: Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.1 mg/L	106	90.7	123
EK259A: Nitrite and Nitrate (NOx) (QCLot: 3652790)								
EK259A-CM: Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.1 mg/L	107	84.4	111
EK262A: Total Nitrogen (QCLot: 3649974)								
EK262PA-CM: Total Nitrogen as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	80.0	120

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK267A: Total Phosphorus (Persulfate Digestion) (QCLot: 3649975)								
EK267PA-CM: Total Phosphorus as P	----	0.005	mg/L	<0.005	0.44 mg/L	96.4	80.0	120
EK271A: Reactive Phosphorus (QCLot: 3652792)								
EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.1 mg/L	104	81.8	116
EP090: Organotin Compounds (Soluble) (QCLot: 3656697)								
EP090S: Monobutyltin	78763-54-9	5	ngSn/L	<5	147 ngSn/L	60.9	30.7	134
EP090S: Dibutyltin	1002-53-5	5	ngSn/L	<5	147 ngSn/L	127	30.7	134
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	102	30.7	134

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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK055: Ammonia as N (QCLot: 3664358)							
EP2104662-002	CA01_1.0	EK055: Ammonia as N	7664-41-7	50 mg/kg	86.4	70.0	130
EK055: Ammonia as N (QCLot: 3664361)							
EP2104662-023	C02_1.5	EK055: Ammonia as N	7664-41-7	50 mg/kg	88.5	70.0	130
EK055: Ammonia as N (QCLot: 3664362)							
EP2104662-053	DUP3	EK055: Ammonia as N	7664-41-7	50 mg/kg	97.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3651927)							
EP2104662-018	CA06_1.0	EK057G: Nitrite as N (Sol.)	14797-65-0	2.5 mg/kg	99.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3659992)							
EP2104662-002	CA01_1.0	EK057G: Nitrite as N (Sol.)	14797-65-0	2.5 mg/kg	94.9	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3659995)							
EP2104662-026	C04_0.5	EK057G: Nitrite as N (Sol.)	14797-65-0	2.5 mg/kg	97.2	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3651928)							
EP2104662-018	CA06_1.0	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	100.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3659991)							
EP2104662-002	CA01_1.0	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3659996)							
EP2104662-026	C04_0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	98.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3653519)							
EP2104662-029	C06_1.0	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	97.7	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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3674295)							
EP2104662-002	CA01_1.0	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	102	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3674296)							
EP2104662-022	C02_1.0	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	124	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3651926)							
EP2104662-018	CA06_1.0	EK071G: Reactive Phosphorus as P	14265-44-2	2.5 mg/kg	93.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3659993)							
EP2104662-002	CA01_1.0	EK071G: Reactive Phosphorus as P	14265-44-2	2.5 mg/kg	92.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3659994)							
EP2104662-026	C04_0.5	EK071G: Reactive Phosphorus as P	14265-44-2	2.5 mg/kg	94.9	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649912)							
EP2104662-002	CA01_1.0	EP080-SD: C6 - C9 Fraction	----	24 mg/kg	83.8	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649913)							
EP2104662-022	C02_1.0	EP080-SD: C6 - C9 Fraction	----	24 mg/kg	114	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649914)							
EP2104662-052	DUP2	EP080-SD: C6 - C9 Fraction	----	24 mg/kg	83.2	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649915)							
EP2104662-002	CA01_1.0	EP071-SD: C10 - C14 Fraction	----	252 mg/kg	122	70.0	130
		EP071-SD: C15 - C28 Fraction	----	634 mg/kg	111	70.0	130
		EP071-SD: C29 - C36 Fraction	----	99 mg/kg	99.9	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649916)							
EP2104662-022	C02_1.0	EP071-SD: C10 - C14 Fraction	----	252 mg/kg	112	70.0	130
		EP071-SD: C15 - C28 Fraction	----	634 mg/kg	97.2	70.0	130
		EP071-SD: C29 - C36 Fraction	----	99 mg/kg	87.7	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3649917)							
EP2104662-052	DUP2	EP071-SD: C10 - C14 Fraction	----	252 mg/kg	81.6	70.0	130
		EP071-SD: C15 - C28 Fraction	----	634 mg/kg	78.2	70.0	130
		EP071-SD: C29 - C36 Fraction	----	99 mg/kg	71.9	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649912)							
EP2104662-002	CA01_1.0	EP080-SD: C6 - C10 Fraction	C6_C10	29 mg/kg	71.9	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649913)							
EP2104662-022	C02_1.0	EP080-SD: C6 - C10 Fraction	C6_C10	29 mg/kg	98.7	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649914)							
EP2104662-052	DUP2	EP080-SD: C6 - C10 Fraction	C6_C10	29 mg/kg	70.8	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649915)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649915) - continued							
EP2104662-002	CA01_1.0	EP071-SD: >C10 - C16 Fraction	----	404 mg/kg	121	70.0	130
		EP071-SD: >C16 - C34 Fraction	----	567 mg/kg	104	70.0	130
		EP071-SD: >C34 - C40 Fraction	----	33 mg/kg	97.8	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649916)							
EP2104662-022	C02_1.0	EP071-SD: >C10 - C16 Fraction	----	404 mg/kg	109	70.0	130
		EP071-SD: >C16 - C34 Fraction	----	567 mg/kg	90.9	70.0	130
		EP071-SD: >C34 - C40 Fraction	----	33 mg/kg	84.8	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3649917)							
EP2104662-052	DUP2	EP071-SD: >C10 - C16 Fraction	----	404 mg/kg	82.7	70.0	130
		EP071-SD: >C16 - C34 Fraction	----	567 mg/kg	73.8	70.0	130
		EP071-SD: >C34 - C40 Fraction	----	33 mg/kg	74.0	70.0	130
EP080-SD: BTEXN (QCLot: 3649912)							
EP2104662-002	CA01_1.0	EP080-SD: Benzene	71-43-2	2 mg/kg	103	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	91.8	70.0	130
EP080-SD: BTEXN (QCLot: 3649913)							
EP2104662-022	C02_1.0	EP080-SD: Benzene	71-43-2	2 mg/kg	117	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	118	70.0	130
EP080-SD: BTEXN (QCLot: 3649914)							
EP2104662-052	DUP2	EP080-SD: Benzene	71-43-2	2 mg/kg	103	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	89.9	70.0	130
EP090: Organotin Compounds (QCLot: 3653222)							
EP2104662-022	C02_1.0	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# Not Determined	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	# Not Determined	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	# Not Determined	20.0	130
EP090: Organotin Compounds (QCLot: 3656322)							
EP2104662-002	CA01_1.0	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 12.6	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	48.2	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	98.3	20.0	130
EP090: Organotin Compounds (QCLot: 3656331)							
EP2104662-032	SS02	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	115	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	121	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	116	20.0	130
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654026)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654026) - continued							
EP2104662-001	CA01_0.5	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	55.4	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	64.0	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	64.3	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	58.7	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	71.2	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	58.2	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	56.1	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	60.8	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	53.0	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	50.7	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	57.2	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	55.8	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	51.1	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	57.9	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	56.9	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	48.8	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	66.3	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	58.8	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	51.9	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	54.9	51.0	137
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654027)							
EP2104662-013	CA05_0.5	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	59.0	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.3	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	63.3	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	67.1	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	72.8	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	59.8	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	71.9	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	62.4	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	54.7	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	53.2	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	68.7	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	66.2	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	64.9	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	60.8	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	43.8	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	65.5	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	61.7	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	60.4	48.0	140

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654027) - continued							
EP2104662-013	CA05_0.5	EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	63.7	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	57.5	51.0	137
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3654029)							
EP2104662-051	DUP1	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	64.4	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	61.4	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	68.1	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	66.2	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	74.4	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	60.3	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	47.2	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	69.5	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	58.3	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	51.8	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	71.5	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	57.9	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	68.4	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	63.7	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	48.7	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	64.1	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	63.2	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	71.8	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	73.9	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	60.2	51.0	137
EP131A: Organochlorine Pesticides (QCLot: 3654025)							
EP2104662-001	CA01_0.5	EP131A: Aldrin	309-00-2	5 µg/kg	44.0	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	58.2	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	48.6	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	51.2	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	47.0	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	57.2	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	65.7	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	57.1	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	65.7	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	58.7	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	58.8	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	41.2	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	39.1	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	45.8	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	51.3	23.8	170

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 3654025) - continued							
EP2104662-001	CA01_0.5	EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	49.2	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	52.3	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	48.3	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	44.4	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	55.5	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	44.5	29.5	138
EP131A: Organochlorine Pesticides (QCLot: 3654028)							
EP2104662-013	CA05_0.5	EP131A: Aldrin	309-00-2	5 µg/kg	37.6	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	38.8	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	39.8	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	46.6	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	56.6	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	38.2	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	86.8	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	43.9	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	44.4	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	47.6	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	45.2	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	41.5	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	44.3	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	37.5	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	38.0	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	43.7	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	41.6	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	47.0	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	61.4	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	43.1	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	46.7	29.5	138
EP131A: Organochlorine Pesticides (QCLot: 3654030)							
EP2104662-051	DUP1	EP131A: Aldrin	309-00-2	5 µg/kg	47.4	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	72.8	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	71.1	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	75.3	25.2	147
		EP131A: 4.4`-DDD	72-54-8	5 µg/kg	56.0	25.9	150
		EP131A: 4.4`-DDE	72-55-9	5 µg/kg	50.2	31.2	125
		EP131A: 4.4`-DDT	50-29-3	5 µg/kg	89.3	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	79.4	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	81.7	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	70.2	22.6	141

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP131A: Organochlorine Pesticides (QCLot: 3654030) - continued							
EP2104662-051	DUP1	EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	43.0	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	72.9	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	55.5	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	70.2	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	66.0	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	88.5	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	76.9	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	84.5	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	40.2	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	98.2	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	80.6	29.5	138
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649918)							
EP2104662-002	CA01_1.0	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	75.4	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	92.9	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	92.9	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	111	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	82.9	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	# 69.1	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	71.3	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	# 68.9	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	72.8	70.0	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	87.9	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	25 µg/kg	# 61.8	70.0	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	# 63.0	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	71.2	70.0	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	# 46.8	70.0	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	# 52.4	70.0	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	# 61.4	70.0	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649919)							
EP2104662-022	C02_1.0	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	# 66.0	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	91.0	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	87.6	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	97.6	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	86.8	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	80.6	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	101	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	104	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	85.9	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
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649919) - continued							
EP2104662-022	C02_1.0	EP132B-SD: Chrysene	218-01-9	25 µg/kg	115	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	25 µg/kg	87.0	70.0	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	90.5	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	91.8	70.0	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	74.6	70.0	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	84.2	70.0	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	83.3	70.0	130
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3649920)							
EP2104662-052	DUP2	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	83.6	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	100	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	97.2	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	112	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	101	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	85.6	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	83.2	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	81.8	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	83.4	70.0	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	106	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2 205-82-3	25 µg/kg	# 36.9	70.0	130
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	# 59.9	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	# 51.1	70.0	130
		EP132B-SD: Benzo(g.h.i)perylene	191-24-2	25 µg/kg	# 46.5	70.0	130
		EP132B-SD: Dibenz(a.h)anthracene	53-70-3	25 µg/kg	86.3	70.0	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	# 57.6	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK255A: Ammonia (QCLot: 3652793)							
EP2104632-002	Anonymous	EK255A-CM: Ammonia as N	7664-41-7	0.1 mg/L	96.0	80.0	120
EK257A: Nitrite (QCLot: 3652791)							
EP2104632-002	Anonymous	EK257A-CM: Nitrite as N	14797-65-0	0.1 mg/L	103	80.0	120
EK259A: Nitrite and Nitrate (NOx) (QCLot: 3652790)							
EP2104632-002	Anonymous	EK259A-CM: Nitrite + Nitrate as N	----	0.1 mg/L	102	80.0	120
EK262A: Total Nitrogen (QCLot: 3649974)							
EP2104662-056	RINSATE 2	EK262PA-CM: Total Nitrogen as N	----	0.5 mg/L	96.0	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK267A: Total Phosphorus (Persulfate Digestion) (QCLot: 3649975)							
EP2104662-056	RINSATE 2	EK267PA-CM: Total Phosphorus as P	----	0.5 mg/L	106	70.0	130
EK271A: Reactive Phosphorus (QCLot: 3652792)							
EP2104632-002	Anonymous	EK271A-CM: Reactive Phosphorus as P	14265-44-2	0.1 mg/L	97.2	80.0	120
EP090: Organotin Compounds (Soluble) (QCLot: 3656697)							
EP2104662-050	C18_EL	EP090S: Monobutyltin	78763-54-9	147 ngSn/L	103	20.0	130
		EP090S: Dibutyltin	1002-53-5	147 ngSn/L	99.0	20.0	130
		EP090S: Tributyltin	56573-85-4	147 ngSn/L	61.7	20.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2104662**	Page	: 1 of 28
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 27-Apr-2021
Site	: ----	Issue Date	: 17-May-2021
Sampler	: JULIAN BROWN	No. of samples received	: 57
Order number	: CW1146500	No. of samples analysed	: 51

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 Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

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
Duplicate (DUP) RPDs							
EP090: Organotin Compounds	EP2104662--021	C02_0.5	**Dibutyltin**	1002-53-5	146 %	0% - 20%	**RPD exceeds LOR based limits**
EP090: Organotin Compounds	EP2104662--021	C02_0.5	**Tributyltin**	56573-85-4	81.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Fluoranthene**	206-44-0	83.8 %	0% - 50%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Pyrene**	129-00-0	78.4 %	0% - 50%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Chrysene**	218-01-9	73.2 %	0% - 50%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Benzo(b+j)fluoranthene**	205-99-2 205-82-3	81.8 %	0% - 50%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Benzo(a)pyrene**	50-32-8	65.4 %	0% - 50%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--001	CA01_0.5	**Sum of PAHs**	----	33.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--053	DUP3	**Sum of PAHs**	----	27.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--011	CA04_1.0	**Sum of PAHs**	----	60.3 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP090: Organotin Compounds	EP2104662--002	CA01_1.0	**Monobutyltin**	78763-54-9	12.6 %	20.0-130%	**Recovery less than lower data quality objective**
EP090: Organotin Compounds	EP2104662--022	C02_1.0	**Dibutyltin**	1002-53-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP090: Organotin Compounds	EP2104662--022	C02_1.0	**Tributyltin**	56573-85-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--022	C02_1.0	**Naphthalene**	91-20-3	66.0 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Anthracene**	120-12-7	69.1 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Pyrene**	129-00-0	68.9 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Benzo(b+j)fluoranthene**	205-99-2 205-82-3	61.8 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--052	DUP2	**Benzo(b+j)fluoranthene**	205-99-2 205-82-3	36.9 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Benzo(k)fluoranthene**	207-08-9	63.0 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--052	DUP2	**Benzo(k)fluoranthene**	207-08-9	59.9 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--052	DUP2	**Benzo(a)pyrene**	50-32-8	51.1 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Benzo(g.h.i)perylene**	191-24-2	46.8 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--052	DUP2	**Benzo(g.h.i)perylene**	191-24-2	46.5 %	70.0-130%	**Recovery less than lower data quality objective**

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Dibenz(a.h)anthracene**	53-70-3	52.4 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--002	CA01_1.0	**Indeno(1.2.3.cd)pyrene**	193-39-5	61.4 %	70.0-130%	**Recovery less than lower data quality objective**
EP132B: Polynuclear Aromatic Hydrocarbons	EP2104662--052	DUP2	**Indeno(1.2.3.cd)pyrene**	193-39-5	57.6 %	70.0-130%	**Recovery less than lower data quality objective**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP090S: Organotin Surrogate	EP2104662-039	SS09	**Tripropyltin**	----	139 %	35.0-130 %	**Recovery greater than upper data quality objective**
EP090S: Organotin Surrogate	EP2104662-040	SS10	**Tripropyltin**	----	147 %	35.0-130 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	EP2104662-031	SS01	**4-Terphenyl-d14**	1718-51-0	142 %	70.0-130 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	EP2104662-015	CA05_1.5	**4-Terphenyl-d14**	1718-51-0	135 %	70.0-130 %	**Recovery greater than upper data quality objective**

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP090S: Organotin Surrogate	EP2104662-057	Elutriate Water	**Tripropyltin**	----	136 %	24.0-116 %	**Recovery greater than upper data quality objective**
Samples Submitted							
EP090S: Organotin Surrogate	EP2104662-056	RINSATE 2	**Tripropyltin**	----	134 %	24.0-116 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / **Container** / Client Sample ID(s)		*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved							
CA01_0.5,	CA01_1.0,	----	----	----	05-May-2021	04-May-2021	**1**
CA02_0.5,	CA02_1.0,						
CA02_1.5,	CA02_2.0,						
CA03_0.5,	CA03_1.0,						
CA03_1.5,	CA04_0.5,						
CA04_1.0,	CA04_1.5						
EK057G: Nitrite as N by Discrete Analyser							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	06-May-2021	27-Apr-2021	**9**	----	----	----
Soil Glass Jar - Unpreserved C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	06-May-2021	28-Apr-2021	**8**	----	----	----
Soil Glass Jar - Unpreserved CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	06-May-2021	29-Apr-2021	**7**	----	----	----
Soil Glass Jar - Unpreserved CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	05-May-2021	30-Apr-2021	**5**	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser						
Soil Glass Jar - Unpreserved CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	06-May-2021	27-Apr-2021	**9**	----	----	----

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved						
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	06-May-2021	28-Apr-2021	**8**	----	----	----
Soil Glass Jar - Unpreserved						
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	06-May-2021	29-Apr-2021	**7**	----	----	----
Soil Glass Jar - Unpreserved						
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	05-May-2021	30-Apr-2021	**5**	----	----	----
EP090: Organotin Compounds						
Soil Glass Jar - Unpreserved						
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	06-May-2021	04-May-2021	**2**	----	----	----
Soil Glass Jar - Unpreserved						
SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	11-May-2021	05-May-2021	**6**	----	----	----
Soil Glass Jar - Unpreserved						
DUP1, DUP2, DUP3	11-May-2021	06-May-2021	**5**	----	----	----

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK255A: Ammonia						
Clear Plastic - Natural - for UT Nut. RINSATE 1	----	----	----	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic - Natural - for UT Nut. RINSATE 2	----	----	----	30-Apr-2021	22-Apr-2021	**8**
EK257A: Nitrite						
Clear Plastic - Natural - for UT Nut. RINSATE 1	----	----	----	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic - Natural - for UT Nut. RINSATE 2	----	----	----	30-Apr-2021	22-Apr-2021	**8**
EK259A: Nitrite and Nitrate (NOx)						
Clear Plastic - Natural - for UT Nut. RINSATE 1	----	----	----	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic - Natural - for UT Nut. RINSATE 2	----	----	----	30-Apr-2021	22-Apr-2021	**8**
EK262A: Total Nitrogen						
Clear Plastic Bottle - Natural (AS) RINSATE 1	30-Apr-2021	21-Apr-2021	**9**	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic Bottle - Natural (AS) RINSATE 2	30-Apr-2021	22-Apr-2021	**8**	30-Apr-2021	22-Apr-2021	**8**
EK267A: Total Phosphorus (Persulfate Digestion)						
Clear Plastic Bottle - Natural (AS) RINSATE 1	30-Apr-2021	21-Apr-2021	**9**	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic Bottle - Natural (AS) RINSATE 2	30-Apr-2021	22-Apr-2021	**8**	30-Apr-2021	22-Apr-2021	**8**
EK271A: Reactive Phosphorus						
Clear Plastic - Natural - for UT Nut. RINSATE 1	----	----	----	30-Apr-2021	21-Apr-2021	**9**
Clear Plastic - Natural - for UT Nut. RINSATE 2	----	----	----	30-Apr-2021	22-Apr-2021	**8**
EP090: Organotin Compounds (Soluble)						
Amber Glass Bottle - Unpreserved RINSATE 1	05-May-2021	27-Apr-2021	**8**	----	----	----
Amber Glass Bottle - Unpreserved RINSATE 2	05-May-2021	28-Apr-2021	**7**	----	----	----

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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**----**	----	----	**05-May-2021**	04-May-2021	×
Soil Glass Jar - Unpreserved (EA055)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**----**	----	----	**05-May-2021**	05-May-2021	✓
Soil Glass Jar - Unpreserved (EA055)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**----**	----	----	**05-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EA055)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**----**	----	----	**05-May-2021**	07-May-2021	✓

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
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved (EK055)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**----**	----	----	**07-May-2021**	18-May-2021	✓
Soil Glass Jar - Unpreserved (EK055)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**----**	----	----	**07-May-2021**	19-May-2021	✓
Soil Glass Jar - Unpreserved (EK055)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	**22-Apr-2021**	**----**	----	----	**07-May-2021**	20-May-2021	✓
Soil Glass Jar - Unpreserved (EK055)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**----**	----	----	**07-May-2021**	21-May-2021	✓

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
EK057G: Nitrite as N by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK057G)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**06-May-2021**	27-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK057G)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**06-May-2021**	28-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK057G)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	**22-Apr-2021**	**06-May-2021**	29-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK057G)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**05-May-2021**	30-Apr-2021	×	**05-May-2021**	07-May-2021	✓

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
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**06-May-2021**	18-May-2021	✓	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK059G)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**06-May-2021**	19-May-2021	✓	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK059G)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	**22-Apr-2021**	**06-May-2021**	20-May-2021	✓	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK059G)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**05-May-2021**	21-May-2021	✓	**05-May-2021**	07-May-2021	✓

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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**12-May-2021**	18-May-2021	✓	**13-May-2021**	09-Jun-2021	✓
Soil Glass Jar - Unpreserved (EK061G)							
SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**10-May-2021**	19-May-2021	✓	**12-May-2021**	07-Jun-2021	✓
Soil Glass Jar - Unpreserved (EK061G)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0	**21-Apr-2021**	**12-May-2021**	19-May-2021	✓	**13-May-2021**	09-Jun-2021	✓
Soil Glass Jar - Unpreserved (EK061G)							
C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	**22-Apr-2021**	**10-May-2021**	20-May-2021	✓	**12-May-2021**	07-Jun-2021	✓
Soil Glass Jar - Unpreserved (EK061G)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0	**22-Apr-2021**	**12-May-2021**	20-May-2021	✓	**13-May-2021**	09-Jun-2021	✓
Soil Glass Jar - Unpreserved (EK061G)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**12-May-2021**	21-May-2021	✓	**13-May-2021**	09-Jun-2021	✓

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
EK071G: Reactive Phosphorus as P by discrete analyser							
Soil Glass Jar - Unpreserved (EK071G)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**06-May-2021**	27-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK071G)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**06-May-2021**	28-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK071G)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3	**22-Apr-2021**	**06-May-2021**	29-Apr-2021	×	**06-May-2021**	08-May-2021	✓
Soil Glass Jar - Unpreserved (EK071G)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**05-May-2021**	30-Apr-2021	×	**05-May-2021**	07-May-2021	✓
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN68a-G)							
C03_EL, C05_EL, C06_EL	**21-Apr-2021**	**01-May-2021**	05-May-2021	✓	**----**	----	----
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN68a-G)							
C18_EL, Elutriate Water	**22-Apr-2021**	**01-May-2021**	06-May-2021	✓	**----**	----	----

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 (EP071-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**04-May-2021**	05-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**07-May-2021**	14-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**07-May-2021**	13-Jun-2021	✓

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-SD / EP071-SD: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**04-May-2021**	04-May-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**04-May-2021**	05-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**05-May-2021**	05-May-2021	✓	**05-May-2021**	05-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**04-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							

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-SD / EP071-SD: Total Petroleum Hydrocarbons - Continued							
C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**05-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**07-May-2021**	14-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**06-May-2021**	06-May-2021	✓	**06-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**04-May-2021**	07-May-2021	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**07-May-2021**	13-Jun-2021	✓

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-SD / EP071-SD: Total Recoverable Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**04-May-2021**	04-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**05-May-2021**	05-May-2021	✓	**05-May-2021**	05-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**04-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**05-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**06-May-2021**	06-May-2021	✓	**06-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**04-May-2021**	07-May-2021	✓

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-SD: BTEXN							
Soil Glass Jar - Unpreserved (EP080-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**04-May-2021**	04-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**05-May-2021**	05-May-2021	✓	**05-May-2021**	05-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**04-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**05-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**06-May-2021**	06-May-2021	✓	**06-May-2021**	06-May-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**04-May-2021**	07-May-2021	✓

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
EP090: Organotin Compounds							
Soil Glass Jar - Unpreserved (EP090) CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**06-May-2021**	04-May-2021	×	**12-May-2021**	15-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0	**21-Apr-2021**	**04-May-2021**	05-May-2021	✓	**05-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**11-May-2021**	05-May-2021	×	**13-May-2021**	20-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**05-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0	**22-Apr-2021**	**06-May-2021**	06-May-2021	✓	**12-May-2021**	15-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) DUP1, DUP2, DUP3	**22-Apr-2021**	**11-May-2021**	06-May-2021	×	**13-May-2021**	20-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP090) CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**06-May-2021**	07-May-2021	✓	**12-May-2021**	15-Jun-2021	✓

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
EP130A: Organophosphorus Pesticides (Ultra-trace)							
Soil Glass Jar - Unpreserved (EP130) CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**03-May-2021**	04-May-2021	✓	**12-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP130) SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**03-May-2021**	05-May-2021	✓	**10-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP130) C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01	**21-Apr-2021**	**03-May-2021**	05-May-2021	✓	**12-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP130) CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**03-May-2021**	06-May-2021	✓	**10-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP130) CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**03-May-2021**	07-May-2021	✓	**10-May-2021**	12-Jun-2021	✓

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
EP131A: Organochlorine Pesticides							
Soil Glass Jar - Unpreserved (EP131A) CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**03-May-2021**	04-May-2021	✓	**12-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP131A) SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**03-May-2021**	05-May-2021	✓	**10-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP131A) C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01	**21-Apr-2021**	**03-May-2021**	05-May-2021	✓	**12-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP131A) CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5, DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**03-May-2021**	06-May-2021	✓	**10-May-2021**	12-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP131A) CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**03-May-2021**	07-May-2021	✓	**10-May-2021**	12-Jun-2021	✓

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP132B-SD)							
CA01_0.5, CA01_1.0, CA02_0.5, CA02_1.0, CA02_1.5, CA02_2.0, CA03_0.5, CA03_1.0, CA03_1.5, CA04_0.5, CA04_1.0, CA04_1.5	**20-Apr-2021**	**04-May-2021**	04-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP132B-SD)							
C02_0.5, C02_1.0, C02_1.5, C03_0.5, C03_1.0, C04_0.5, C04_1.0, SS01, SS02, SS03, SS04, SS05, SS06, SS07, SS08, SS09, SS10	**21-Apr-2021**	**04-May-2021**	05-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP132B-SD)							
CA05_0.5, CA05_1.0, CA05_1.5, CA05_2.0, C06_0.5, C06_1.0, C06_1.5	**22-Apr-2021**	**04-May-2021**	06-May-2021	✓	**07-May-2021**	13-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP132B-SD)							
DUP1, DUP2, DUP3, TRIP BLANK	**22-Apr-2021**	**05-May-2021**	06-May-2021	✓	**07-May-2021**	14-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP132B-SD)							
CA06_0.5, CA06_1.0, CA06_1.5, CA06_2.0	**23-Apr-2021**	**04-May-2021**	07-May-2021	✓	**07-May-2021**	13-Jun-2021	✓

Matrix: **WATER**

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
EK255A: Ammonia							
Clear Plastic - Natural - for UT Nut. (EK255A-CM)							
RINSATE 1	**20-Apr-2021**	**----**	----	----	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic - Natural - for UT Nut. (EK255A-CM)							
RINSATE 2	**21-Apr-2021**	**----**	----	----	**30-Apr-2021**	22-Apr-2021	×
EK257A: Nitrite							
Clear Plastic - Natural - for UT Nut. (EK257A-CM)							
RINSATE 1	**20-Apr-2021**	**----**	----	----	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic - Natural - for UT Nut. (EK257A-CM)							
RINSATE 2	**21-Apr-2021**	**----**	----	----	**30-Apr-2021**	22-Apr-2021	×

Matrix: **WATER**

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
EK259A: Nitrite and Nitrate (NOx)							
Clear Plastic - Natural - for UT Nut. (EK259A-CM) RINSATE 1	**20-Apr-2021**	**----**	----	----	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic - Natural - for UT Nut. (EK259A-CM) RINSATE 2	**21-Apr-2021**	**----**	----	----	**30-Apr-2021**	22-Apr-2021	×
EK262A: Total Nitrogen							
Clear Plastic Bottle - Natural (AS) (EK262PA-CM) RINSATE 1	**20-Apr-2021**	**30-Apr-2021**	21-Apr-2021	×	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic Bottle - Natural (AS) (EK262PA-CM) RINSATE 2	**21-Apr-2021**	**30-Apr-2021**	22-Apr-2021	×	**30-Apr-2021**	22-Apr-2021	×
EK267A: Total Phosphorus (Persulfate Digestion)							
Clear Plastic Bottle - Natural (AS) (EK267PA-CM) RINSATE 1	**20-Apr-2021**	**30-Apr-2021**	21-Apr-2021	×	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic Bottle - Natural (AS) (EK267PA-CM) RINSATE 2	**21-Apr-2021**	**30-Apr-2021**	22-Apr-2021	×	**30-Apr-2021**	22-Apr-2021	×
EK271A: Reactive Phosphorus							
Clear Plastic - Natural - for UT Nut. (EK271A-CM) RINSATE 1	**20-Apr-2021**	**----**	----	----	**30-Apr-2021**	21-Apr-2021	×
Clear Plastic - Natural - for UT Nut. (EK271A-CM) RINSATE 2	**21-Apr-2021**	**----**	----	----	**30-Apr-2021**	22-Apr-2021	×
EP090: Organotin Compounds (Soluble)							
Amber Glass Bottle - Unpreserved (EP090S) C03_EL, C05_EL, C06_EL, C18_EL, Elutriate Water	**01-May-2021**	**05-May-2021**	08-May-2021	✓	**05-May-2021**	14-Jun-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) RINSATE 1	**20-Apr-2021**	**05-May-2021**	27-Apr-2021	×	**05-May-2021**	14-Jun-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) RINSATE 2	**21-Apr-2021**	**05-May-2021**	28-Apr-2021	×	**05-May-2021**	14-Jun-2021	✓

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)							
Buchi Ammonia	EK055	6	43	**13.95**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	6	44	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	5	43	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	5	43	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	5	43	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-Soluble By Discrete Analyser	EK071G	5	43	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	5	43	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	4	43	**9.30**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-Soluble By Discrete Analyser	EK071G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	6	43	**13.95**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Buchi Ammonia	EK055	4	43	**9.30**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-Soluble By Discrete Analyser	EK071G	3	43	**6.98**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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	
Method Blanks (MB) - Continued							
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Buchi Ammonia	EK055	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-Soluble By Discrete Analyser	EK071G	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	3	43	6.98	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	3	44	6.82	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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 Control Samples (LCS) - Continued							
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Buchi Ammonia	EK055	SOIL	In house: Referenced to APHA 4500-NH3 B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Nitrite as N - Soluble by Discrete Analyser	EK057G	SOIL	In house: Referenced to APHA 4500-NO3- B. Nitrite in a water extract is determined by direct colourimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	EK058G	SOIL	In house: Referenced to APHA 4500-NO3- F. Nitrate in the 1:5 soil:water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	In house: Thermo Scientific Method D08727 and NEMI (National Environmental Method Index) Method ID: 9171. This method covers the determination of total oxidised nitrogen (NOx-N) and nitrate (NO3-N) by calculation, Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	In house: Referenced to APHA 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Reactive Phosphorus as P-Soluble By Discrete Analyser	EK071G	SOIL	In house: Referenced to APHA 4500 P-F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3).
TPH - Semivolatile Fraction	EP071-SD	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX in Sediments	EP080-SD	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.
Organotin Analysis	EP090	SOIL	In house: Referenced to USEPA SW 846 - 8270 Prepared sample extracts are analysed by GC/MS coupled with high volume injection, and quanitified against an established calibration curve.
Organotin Compounds (Soluble)	EP090S	SOIL	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Organophosphorus Pesticides (Ultra-trace)	EP130	SOIL	In house: Referenced to USEPA Method 3640 (GPC cleanup), 8141 (GC/FPD - Capillary Column) This technique is compliant with NEPM Schedule B(3)
Organochlorine Pesticides (Ultra-trace)	EP131A	SOIL	In house: Referenced to USEPA Method 3640 (GPC cleanup),3620 (Florisil), 8081/8082 (GC/µECD/µECD) This technique is compliant with NEPM Schedule B(3)
PAHs in Sediments by GCMS(SIM)	EP132B-SD	SOIL	In house: Referenced to USEPA 8270 GCMS Capillary column, SIM mode using large volume programmed temperature vaporisation injection.

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N - Ultra-Trace for Catchment Monitoring	EK255A-CM	WATER	In house: Referenced to APHA 4500-NH3 H. Ammonia is determined by direct colorimetry by FIA. This method is compliant with NEPM Schedule B(3)
Nitrite as N - Ultra-Trace for Catchment Monitoring	EK257A-CM	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by FIA.
Nitrate as N - Ultra-Trace for Catchment Monitoring	EK258A-CM	WATER	In house: Referenced to APHA 4500-NO3- I Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by FIA. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx) - Ultra-Trace for Catchment M	EK259A-CM	WATER	In house: Referenced to APHA 4500-NO3- I. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colourimetry by FIA.
TKN (Total N - NOx-N). (FIA - UT) for Catchment Monitoring	EK261PA-CM	WATER	In house: Referenced to APHA 4500-P J. & 4500-NO3- I . Calculated by difference from total Nitrogen and NOx. Contributing method parameters are determined by FIA. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (Persulfate digestion)-Ultra-Trace - CM	EK262PA-CM	WATER	In house: Referenced to APHA 4500-P J. Persulfate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus. As sample is digested with persulfate under alkaline conditions yielding orthophosphate and nitrate. Following digestion, analytes are determined by flow injection analysis. This method is compliant with NEPM Schedule B(3)
Total Phosphorus(Persulfate Digestion) - Ultra-Trace for CM	EK267PA-CM	WATER	In house: Referenced to APHA 4500-P J. Persulfate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus. As sample is digested with persulfate under alkaline conditions yielding orthophosphate and nitrate. Following digestion, analytes are determined by flow injection analysis. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P - Ultra-Trace for Catchment M	EK271A-CM	WATER	In house: Referenced to APHA 4500-P E Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by FIA. This method is compliant with NEPM Schedule B(3)
Organotin Compounds (Soluble)	EP090S	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
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 (Option A - Concentrating)	ORG17A	SOIL	In house: Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Sample Cleanup	ORG17A-UTP	SOIL	In house: Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. Samples are extracted, concentrated (by KD) and exchanged into an appropriate solvent for GPC and florisil cleanup as required.
Tumbler Extraction of Solids for LVI (Non-concentrating)	ORG17D	SOIL	In house: 10g of sample, Na2SO4 and surrogate are extracted with 50mL 1:1 DCM/Acetone by end over end tumbling. An aliquot is concentrated by nitrogen blowdown to a reduced volume for analysis if required.
Organotin Sample Preparation	ORG34	SOIL	In house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.
Organotin Sample Preparation	ORG35	SOIL	In house: 20g sample is spiked with surrogate and leached in a methanol:acetic acid:UHP water mix and vacuum filtered. Reagents and solvents are added to the sample and the mixture tumbled. The butyltin compounds are simultaneously derivatised and extracted. The extract is further extracted with petroleum ether. The resultant extracts are combined and concentrated for analysis.
Persulfate Digestion for UT TN and TP for FIA finish.	EK262/267-PA Prep	WATER	In house: Referenced to APHA 4500 P - J. This method is compliant with NEPM Schedule B(3)
Organotin Sample Preparation	ORG34	WATER	In house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.

Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

NATA Accredited
Accreditation Number 1261
Site Number 23736

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: **Daniel Strickland**

Report **791998-S**
Project name CASUARINA HARBOUR
Project ID CW1146500
Received Date May 03, 2021

Client Sample ID			**SPLIT1**	**SPLIT2**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**P21-My02375**	**P21-My02376**
Date Sampled			**Apr 22, 2021**	**Apr 22, 2021**
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	142
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
Total Recoverable Hydrocarbons				
TRH C6-C9	20	mg/kg	< 20	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			SPLIT1	SPLIT2
Sample Matrix			Soil	Soil
Eurofins Sample No.			P21-My02375	P21-My02376
Date Sampled			Apr 22, 2021	Apr 22, 2021
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	72	73
p-Terphenyl-d14 (surr.)	1	%	97	88
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-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	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-BHC (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
Toxaphene	0.1	mg/kg	< 0.1	< 0.1
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	85
Tetrachloro-m-xylene (surr.)	1	%	87	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
Organochlorine Pesticides (Trace level)				
4.4'-DDD	0.005	mg/kg	< 0.005	< 0.005
4.4'-DDE	0.005	mg/kg	< 0.005	< 0.005
4.4'-DDT	0.005	mg/kg	< 0.005	< 0.005
a-BHC	0.005	mg/kg	< 0.005	< 0.005
Aldrin	0.005	mg/kg	< 0.005	< 0.005
b-BHC	0.005	mg/kg	< 0.005	< 0.005
Chlordanes - Total	0.01	mg/kg	< 0.01	< 0.01
d-BHC	0.005	mg/kg	< 0.005	< 0.005

Client Sample ID			SPLIT1	SPLIT2
Sample Matrix			Soil	Soil
Eurofins Sample No.			P21-My02375	P21-My02376
Date Sampled			Apr 22, 2021	Apr 22, 2021
Test/Reference	LOR	Unit		
Organochlorine Pesticides (Trace level)				
Dieldrin	0.005	mg/kg	< 0.005	< 0.005
Endosulfan I	0.005	mg/kg	< 0.005	< 0.005
Endosulfan II	0.005	mg/kg	< 0.005	< 0.005
Endosulfan sulphate	0.005	mg/kg	< 0.005	< 0.005
Endrin	0.005	mg/kg	< 0.005	< 0.005
Endrin aldehyde	0.005	mg/kg	< 0.005	< 0.005
Endrin ketone	0.005	mg/kg	< 0.005	< 0.005
g-BHC (Lindane)	0.005	mg/kg	< 0.005	< 0.005
Heptachlor	0.005	mg/kg	< 0.005	< 0.005
Heptachlor epoxide	0.005	mg/kg	< 0.005	< 0.005
Hexachlorobenzene	0.005	mg/kg	< 0.005	< 0.005
Methoxychlor	0.005	mg/kg	< 0.005	< 0.005
Toxaphene	0.1	mg/kg	< 0.1	< 0.1
DDT + DDE + DDD (Total)*	0.005	mg/kg	< 0.005	< 0.005
Aldrin and Dieldrin (Total)*	0.005	mg/kg	< 0.005	< 0.005
Vic EPA IWRG 621 OCP (Total)*	0.01	mg/kg	< 0.01	< 0.01
Vic EPA IWRG 621 Other OCP (Total)*	0.01	mg/kg	< 0.01	< 0.01
Ammonia (as N)	5	mg/kg	33	180
Chromium (hexavalent)	1	mg/kg	< 1	< 1
Chromium (trivalent)	5	mg/kg	40	56
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5
Phosphorus reactive (as P)	10	mg/kg	< 10	< 10
Total Kjeldahl Nitrogen (as N)	10	mg/kg	62	73
Total Nitrogen (as N)*	10	mg/kg	62	73
Total Organic Carbon	0.1	%	8.0	1.3
Cadmium	0.1	mg/kg	0.2	0.3
Phosphorus	5	mg/kg	900	1400
Dibutyltin (DBT)			[N06]See attached	[N06]See attached
Tributyl Tin (as Sn)			[N06]See attached	[N06]See attached
Tributyltin (TBT)			[N06]See attached	[N06]See attached
% Moisture	1	%	63	63
Particle Size Distribution			[N06]See attached	[N06]See attached
Heavy Metals				
Aluminium	20	mg/kg	18000	23000
Chromium	5	mg/kg	40	56
Cobalt	5	mg/kg	5.9	9.1
Iron	20	mg/kg	29000	39000
Manganese	5	mg/kg	220	280
Selenium	2	mg/kg	< 2	< 2
Thorium*	5	mg/kg	17	25
Uranium	10	mg/kg	< 10	< 10
Vanadium	10	mg/kg	57	92
Heavy Metals				
Antimony	0.5	mg/kg	1.6	9.7
Arsenic	1	mg/kg	21	28
Chromium	1	mg/kg	40	56
Copper	1	mg/kg	30	26
Lead	1	mg/kg	15	19

Client Sample ID			SPLIT1	SPLIT2
Sample Matrix			Soil	Soil
Eurofins Sample No.			P21-My02375	P21-My02376
Date Sampled			Apr 22, 2021	Apr 22, 2021
Test/Reference	LOR	Unit		
Heavy Metals				
Mercury	0.01	mg/kg	0.06	0.11
Nickel	1	mg/kg	13	19
Silver	0.1	mg/kg	< 0.1	< 0.1
Zinc	1	mg/kg	54	54

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 B4			
BTEX	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Organochlorine Pesticides	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organochlorine Pesticides (Trace level)	Melbourne	May 05, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270) trace			
Ammonia (as N)	Melbourne	May 05, 2021	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Phosphorus reactive (as P)	Melbourne	May 05, 2021	28 Days
- Method: APHA 4500-P			
Total Organic Carbon	Melbourne	May 06, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Cadmium	Melbourne	May 05, 2021	6 Months
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Phosphorus	Melbourne	May 05, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
Heavy Metals	Melbourne	May 05, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Thorium*	Melbourne	May 05, 2021	6 Months
- Method: LTM-MET-3030 by ICP-OES			
Chromium (speciated)			
Chromium (hexavalent)	Melbourne	May 05, 2021	28 Days
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	May 05, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	May 05, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
% Moisture	Melbourne	May 03, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: CASUARINA HARBOUR
Project ID: CW1146500

Order No.:
Report #: 791998
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: May 3, 2021 12:37 PM
Due: May 10, 2021
Priority: 5 Day
Contact Name: Daniel Strickland

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Aluminium	Ammonia (as N)	Antimony	Arsenic	Cadmium	Chromium	Cobalt	Copper	Dibutyltin (DBT)	Iron	Lead	Manganese	Mercury	Nickel	Particle Size Distribution	Phosphorus	Phosphorus reactive (as P)	Selenium	Silver	Thorium*	Total Organic Carbon	Tributyl Tin (as Sn)	Tributyltin (TBT)	Uranium	Vanadium	Zinc	Organochlorine Pesticides	Total Nitrogen Set (as N)	Chromium (speciated)	Moisture Set	Eurofins Suite B4	Organochlorine Pesticides (Trace level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																																						
Brisbane Laboratory - NATA Site # 20794																																						
Perth Laboratory - NATA Site # 23736																																						
Mayfield Laboratory - NATA Site # 25079																																						
External Laboratory														X						X								X	X								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																																	
1	SPLIT1	Apr 22, 2021		Soil	P21-My02375	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SPLIT2	Apr 22, 2021		Soil	P21-My02376	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - 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.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
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.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. 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.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. 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							
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							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
Method Blank							
Organochlorine Pesticides (Trace level)							
4.4'-DDD	mg/kg	< 0.005			0.005	Pass	
4.4'-DDE	mg/kg	< 0.005			0.005	Pass	
4.4'-DDT	mg/kg	< 0.005			0.005	Pass	
a-BHC	mg/kg	< 0.005			0.005	Pass	
Aldrin	mg/kg	< 0.005			0.005	Pass	
b-BHC	mg/kg	< 0.005			0.005	Pass	
Chlordanes - Total	mg/kg	< 0.01			0.01	Pass	
d-BHC	mg/kg	< 0.005			0.005	Pass	
Dieldrin	mg/kg	< 0.005			0.005	Pass	
Endosulfan I	mg/kg	< 0.005			0.005	Pass	
Endosulfan II	mg/kg	< 0.005			0.005	Pass	
Endosulfan sulphate	mg/kg	< 0.005			0.005	Pass	
Endrin	mg/kg	< 0.005			0.005	Pass	
Endrin aldehyde	mg/kg	< 0.005			0.005	Pass	
Endrin ketone	mg/kg	< 0.005			0.005	Pass	
g-BHC (Lindane)	mg/kg	< 0.005			0.005	Pass	
Heptachlor	mg/kg	< 0.005			0.005	Pass	
Heptachlor epoxide	mg/kg	< 0.005			0.005	Pass	
Hexachlorobenzene	mg/kg	< 0.005			0.005	Pass	
Methoxychlor	mg/kg	< 0.005			0.005	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Cadmium	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/kg	< 0.5			0.5	Pass	
Arsenic	mg/kg	< 1			1	Pass	
Chromium	mg/kg	< 1			1	Pass	
Copper	mg/kg	< 1			1	Pass	
Lead	mg/kg	< 1			1	Pass	
Mercury	mg/kg	< 0.01			0.01	Pass	
Nickel	mg/kg	< 1			1	Pass	
Silver	mg/kg	< 0.1			0.1	Pass	
Zinc	mg/kg	< 1			1	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	86			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
Xylenes - Total*	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	89			70-130	Pass	
TRH C6-C10	%	86			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	88			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides (Trace level)							
4.4'-DDD	%	74			70-130	Pass	
4.4'-DDE	%	100			70-130	Pass	
4.4'-DDT	%	83			70-130	Pass	
a-BHC	%	74			70-130	Pass	
Aldrin	%	99			70-130	Pass	
b-BHC	%	93			70-130	Pass	
Chlordanes - Total	%	102			70-130	Pass	
d-BHC	%	109			70-130	Pass	
Dieldrin	%	103			70-130	Pass	
Endosulfan I	%	101			70-130	Pass	
Endosulfan II	%	85			70-130	Pass	
Endosulfan sulphate	%	85			70-130	Pass	
Endrin	%	94			70-130	Pass	
Endrin aldehyde	%	101			70-130	Pass	
Endrin ketone	%	80			70-130	Pass	
g-BHC (Lindane)	%	83			70-130	Pass	
Heptachlor	%	89			70-130	Pass	
Heptachlor epoxide	%	97			70-130	Pass	
Hexachlorobenzene	%	98			70-130	Pass	
Methoxychlor	%	73			70-130	Pass	
LCS - % Recovery							
Cadmium	%	108			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	86			80-120	Pass	
Arsenic	%	86			80-120	Pass	
Chromium	%	89			80-120	Pass	
Copper	%	87			80-120	Pass	
Lead	%	85			80-120	Pass	
Mercury	%	103			80-120	Pass	
Nickel	%	84			80-120	Pass	
Silver	%	109			80-120	Pass	
Zinc	%	88			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	P21-My02376	CP	%	76			70-130	Pass	
Toluene	P21-My02376	CP	%	76			70-130	Pass	
Ethylbenzene	P21-My02376	CP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	P21-My02376	CP	%	88			70-130	Pass	
o-Xylene	P21-My02376	CP	%	73			70-130	Pass	
Xylenes - Total*	P21-My02376	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	P21-My02376	CP	%	77			70-130	Pass	
TRH C6-C10	P21-My02376	CP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	P21-My02376	CP	%	76			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	P21-My02375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	P21-My02375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	P21-My02375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	P21-My02375	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	P21-My02375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	P21-My02375	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	P21-My02375	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	P21-My02375	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	P21-My02375	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M21-My00272	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M21-My00272	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M21-My00272	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Acenaphthylene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Anthracene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Benz(a)anthracene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Benzo(a)pyrene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Benzo(b&j)fluoranthene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Benzo(g.h.i)perylene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Benzo(k)fluoranthene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Chrysene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Dibenz(a.h)anthracene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Fluoranthene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Fluorene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Naphthalene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Phenanthrene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	
Pyrene	M21-My03271	NCP	mg/kg	< 0.5	**	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M21-My03271	NCP	mg/kg	< 0.1	**	<1	30%	Pass	
4.4'-DDE	M21-My03271	NCP	mg/kg	< 0.05	**	<1	30%	Pass	
b-BHC	M21-My03271	NCP	mg/kg	< 0.05	**	<1	30%	Pass	
Endrin ketone	M21-My03271	NCP	mg/kg	< 0.05	**	<1	30%	Pass	
Toxaphene	M21-My03271	NCP	mg/kg	< 0.1	**	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M21-My08146	NCP	mg/kg	65	65	1.0	30%	Pass	
Chromium (hexavalent)	M21-My05969	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Nitrate & Nitrite (as N)	M21-My08146	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Cadmium	P21-My02375	CP	mg/kg	0.2	0.2	11	30%	Pass	
% Moisture	M21-My02540	NCP	%	7.9	9.2	15	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	M21-My02552	NCP	mg/kg	2200	2300	1.0	30%	Pass	
Chromium	M21-My02552	NCP	mg/kg	13	13	<1	30%	Pass	
Cobalt	M21-My02552	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Iron	M21-My02552	NCP	mg/kg	4400	4400	<1	30%	Pass	
Manganese	M21-My02552	NCP	mg/kg	25	26	<1	30%	Pass	
Selenium	M21-My02552	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Uranium	M21-My02552	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Vanadium	M21-My02552	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	P21-My02375	CP	mg/kg	1.6	1.7	7.0	30%	Pass	
Arsenic	P21-My02375	CP	mg/kg	21	21	4.0	30%	Pass	
Chromium	P21-My02375	CP	mg/kg	40	40	1.0	30%	Pass	
Copper	P21-My02375	CP	mg/kg	30	31	5.0	30%	Pass	
Lead	P21-My02375	CP	mg/kg	15	14	4.0	30%	Pass	
Mercury	P21-My02375	CP	mg/kg	0.06	0.06	5.0	30%	Pass	
Nickel	P21-My02375	CP	mg/kg	13	13	6.0	30%	Pass	
Silver	P21-My02375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Zinc	P21-My02375	CP	mg/kg	54	56	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	P21-My02376	CP	%	1.3	3.0	77	30%	Fail	Q15

Comments

Particle size distribution analysed by: Microanalysis, NATA accreditation no. 20283, report reference 21_0729.

Dioxins analysed by: NMI, Accreditation body accreditation no. 198, report reference 1314315.

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	Yes

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.
N06	This result has been obtained from a third-party laboratory. It is reported on the understanding that it does not fall within Eurofins Environment Testing's NATA accreditation. The client must review the other laboratory's analytical data to ensure the accuracy of this result and determine whether the test was performed according to NATAs requirements.
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
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Rhys Thomas	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)
Vivian Wang	Senior Analyst-Volatile (VIC)



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 shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

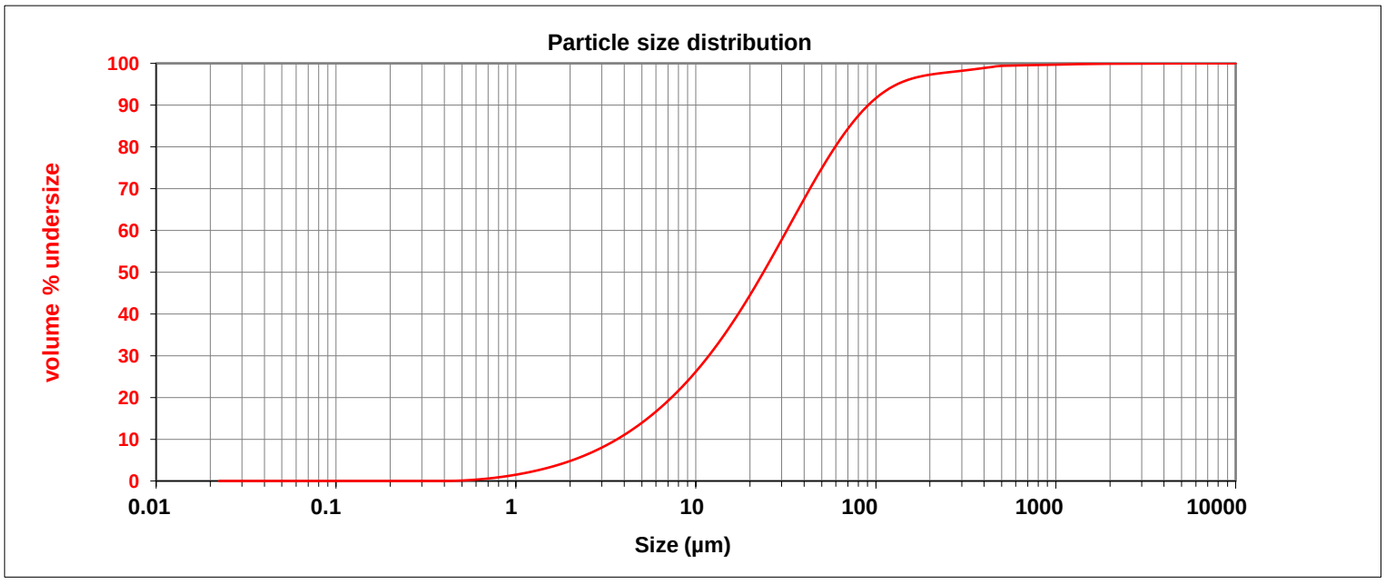
37 Kensington Street
East Perth
WA 6004

Client:	Eurofins Mgt	**Date received:**	4/5/2021
Client address:	6 Monterey Road DANDENONG SOUTH VIC 3175	**Date analysed**	11/5/2021
Client ID:	Split1 My02375	**Date reported:**	11/5/2021
Job ID:	21_0729		
Lab ID:	21_0729_01		
Revision No. :	0		

Comment: None

Analysis:	Laser diffraction size distribution following ISO13320-1:2020	**Result units:**	Volume
Dispersant:	Water	**Analysis model:**	General purpose
Additives:	10 millilitres sodium hexametaphosphate		
Sonication:	30 min sonication		

Span:	3.67	**Vol. Weighted mean D[4,3]:**	49.37 µm	**d(0.1)**	3.65 µm
		Surface Weighted mean D[3,2]	8.66 µm	**d(0.5)**	23.77 µm
				d(0.9)	90.98 µm



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.142	0.00	1.002	1.52	7.096	19.44	50.238	74.97	355.66	98.60
0.022	0.00	0.159	0.00	1.125	1.92	7.962	21.55	56.368	78.46	399.05	98.88
0.025	0.00	0.178	0.00	1.262	2.37	8.934	23.82	63.246	81.72	447.74	99.16
0.028	0.00	0.200	0.00	1.416	2.87	10.024	26.25	70.963	84.70	500.00	99.40
0.032	0.00	0.224	0.00	1.589	3.44	11.247	28.86	79.621	87.37	1000.00	99.68
0.036	0.00	0.252	0.00	1.783	4.08	12.619	31.65	89.337	89.70	2000.00	99.90
0.040	0.00	0.283	0.00	2.000	4.80	14.159	34.61	100.237	91.68		
0.045	0.00	0.317	0.00	2.244	5.59	15.887	37.76	112.468	93.31		
0.050	0.00	0.356	0.00	2.518	6.47	17.825	41.07	126.191	94.61		
0.056	0.00	0.399	0.00	2.825	7.45	20.000	44.55	141.589	95.60		
0.063	0.00	0.448	0.03	3.170	8.53	22.440	48.18	158.866	96.34		
0.071	0.00	0.502	0.11	3.557	9.72	25.179	51.93	178.250	96.89		
0.080	0.00	0.564	0.24	3.991	11.02	28.251	55.77	200.000	97.28		
0.089	0.00	0.632	0.41	4.477	12.44	31.698	59.68	224.404	97.59		
0.100	0.00	0.710	0.62	5.024	13.98	35.566	63.60	251.785	97.85		
0.112	0.00	0.796	0.87	5.637	15.66	39.905	67.49	282.508	98.09		
0.126	0.00	0.893	1.17	6.325	17.48	44.774	71.29	316.979	98.34	10000	100.00

Note: Data from 500µm to 10000µm by wet screening, from 0.02µm to 500µm by laser diffraction.

Analysed: James Nicolas, B.A.
Reported: James Nicolas, B.A.
Approved: Ian Davies, B.Sc.(Chemistry)

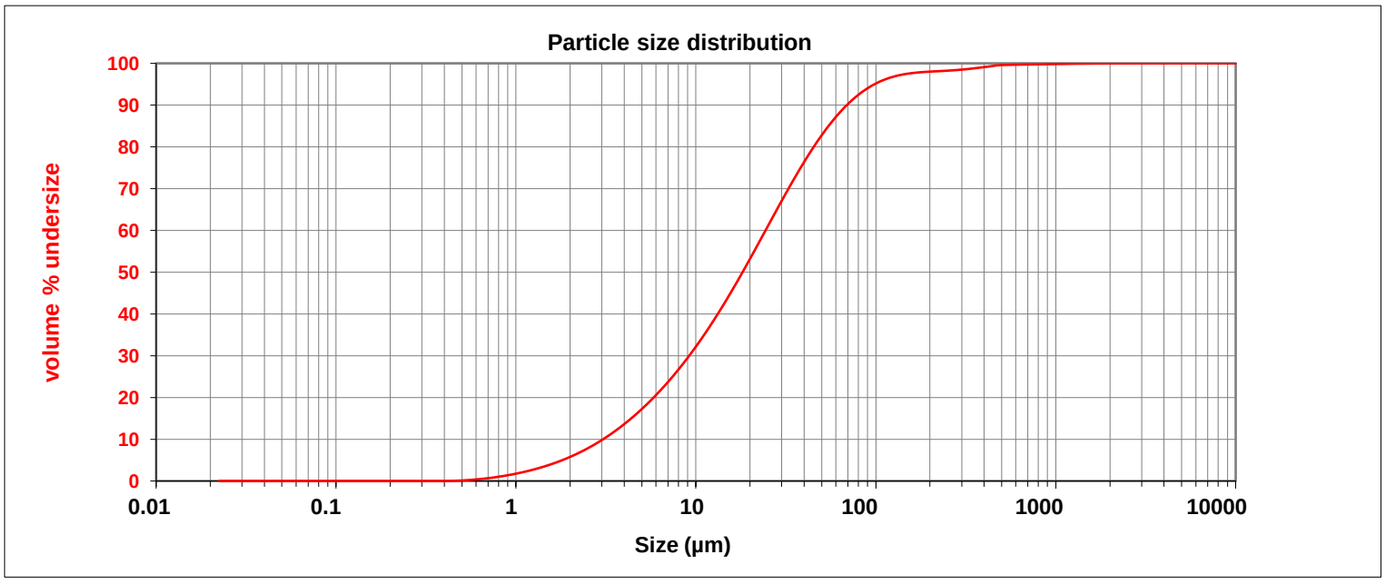
37 Kensington Street
East Perth
WA 6004

Client:	Eurofins Mgt	**Date received:**	4/5/2021
Client address:	6 Monterey Road DANDENONG SOUTH VIC 3175	**Date analysed**	11/5/2021
Client ID:	Split2 My02376	**Date reported:**	11/5/2021
Job ID:	21_0729		
Lab ID:	21_0729_02		
Revision No. :	0		

Comment: None

Analysis:	Laser diffraction size distribution following ISO13320-1:2020	**Result units:**	Volume
Dispersant:	Water	**Analysis model:**	General purpose
Additives:	10 millilitres sodium hexametaphosphate		
Sonication:	30 min sonication		

Span:	3.64	**Vol. Weighted mean D[4,3]:**	37.03 µm	**d(0.1)**	3.05 µm
		Surface Weighted mean D[3,2]	7.36 µm	**d(0.5)**	18.18 µm
				d(0.9)	69.16 µm



Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %	Size (µm)	Vol Under %
0.020	0.00	0.142	0.00	1.002	1.76	7.096	24.02	50.238	82.90	355.66	98.83
0.022	0.00	0.159	0.00	1.125	2.24	7.962	26.58	56.368	85.76	399.05	99.09
0.025	0.00	0.178	0.00	1.262	2.78	8.934	29.33	63.246	88.30	447.74	99.36
0.028	0.00	0.200	0.00	1.416	3.40	10.024	32.24	70.963	90.52	500.00	99.60
0.032	0.00	0.224	0.00	1.589	4.10	11.247	35.33	79.621	92.40	1000.00	99.82
0.036	0.00	0.252	0.00	1.783	4.89	12.619	38.60	89.337	93.95	2000.00	99.96
0.040	0.00	0.283	0.00	2.000	5.77	14.159	42.05	100.237	95.19		
0.045	0.00	0.317	0.00	2.244	6.77	15.887	45.64	112.468	96.14		
0.050	0.00	0.356	0.00	2.518	7.88	17.825	49.38	126.191	96.84		
0.056	0.00	0.399	0.00	2.825	9.11	20.000	53.23	141.589	97.33		
0.063	0.00	0.448	0.04	3.170	10.47	22.440	57.16	158.866	97.66		
0.071	0.00	0.502	0.13	3.557	11.96	25.179	61.12	178.250	97.87		
0.080	0.00	0.564	0.27	3.991	13.60	28.251	65.07	200.000	98.01		
0.089	0.00	0.632	0.46	4.477	15.37	31.698	68.96	224.404	98.13		
0.100	0.00	0.710	0.70	5.024	17.30	35.566	72.74	251.785	98.25		
0.112	0.00	0.796	1.00	5.637	19.38	39.905	76.36	282.508	98.40		
0.126	0.00	0.893	1.35	6.325	21.62	44.774	79.76	316.979	98.59	10000	100.00

Note: Data from 500µm to 10000µm by wet screening, from 0.02µm to 500µm by laser diffraction.

Analysed: James Nicolas, B.A.
Reported: James Nicolas, B.A.
Approved: Ian Davies, B.Sc.(Chemistry)

REPORT OF ANALYSIS

Report No. RN1314315

Client	: EUROFINS MGT	**Job No.**	: EURO26/210506/1
	6 Monterey Road	**Quote No.**	: QT-02018
	Dandenong South VIC 3175	**Order No.**	: 21-D29170791998
		Date Received	: 06-MAY-2021
Attention	: RHYS THOMAS	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Tim Reddan	**Phone**	: 03 9644 4854

Lab Reg No.	Sample Ref	Sample Description
N21/011455	My02375	SOIL SPLIT1 22/04/2021
N21/011456	My02376	SOIL SPLIT2 22/04/2021

Lab Reg No.		N21/011455	N21/011456			
Date Sampled		22-APR-2021	22-APR-2021			
Sample Reference	Units	My02375	My02376			Method
Organotins						
Monobutyltin as Sn	ng/g	1.9	1.3			NR_35
Dibutyltin as Sn	ng/g	8.5	4.2			NR_35
Tributyltin as Sn	ng/g	20	4.1			NR_35
Surrogate: Tripropyltin	%REC	106	106			NR_35
Dates						
Date extracted		7-MAY-2021	7-MAY-2021			
Date analysed		13-MAY-2021	13-MAY-2021			

Gabriela Saveluc, Analyst
Organics - NSW
Accreditation No. 198

17-MAY-2021

Lab Reg No.		N21/011455	N21/011456			
Date Sampled		22-APR-2021	22-APR-2021			
Sample Reference	Units	My02375	My02376			Method
Trace Elements						
Total Solids	%	35.6	41.1			NT2_49
Dates						
Date extracted		11-MAY-2021	11-MAY-2021			
Date analysed		12-MAY-2021	12-MAY-2021			

REPORT OF ANALYSIS

Report No. RN1314315

Lab Reg No.		N21/011455	N21/011456			
Date Sampled		22-APR-2021	22-APR-2021			
Sample Reference		My02375	My02376			
	Units					Method

Pankaj Barai, Analyst
Inorganics - NSW
Accreditation No. 198

17-MAY-2021

All results are expressed on a dry weight basis.

ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1314293* *RN1314303*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: EUROFINS MGT

NMI QA Report No: EURO26/210506/1 **Sample Matrix:** Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ng/g	ng/g	ng/g	ng/g	%	%	%
Organics Section								
Organotin								
Monobutyltin	NR_35	0.5	<0.5	NA	NA	NA	97	NA
Dibutyltin	NR_35	0.5	<0.5	NA	NA	NA	106	NA
Tributyltin	NR_35	0.5	<0.5	NA	NA	NA	101	NA
Organotin Surrogate								
Tripropyltin (%Rec)	NR_35	-	-	NA	NA	NA	100	NA

Results expressed in percentage (%) or ng/g wherever appropriate.
Acceptable Spike recovery is 30-150% (monobutyltin and Tripropyltin); 40-160% (dibutyltin and tributyltin)
Maximum acceptable RPDs on spikes and duplicates is 60%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference, LCS = Laboratory Control Spike, LOR = Limit of Reporting.
This report shall not be reproduced except in full.

Signed:

Danny Slee
Organics Manager, NMI-North Ryde

Date: **14/05/2021**

APPENDIX

L

LABORATORY ANALYSIS REPORTS: PARTICLE SIZE DISTRIBUTION

Cardno

now

Stantec

Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS01_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.00
Fine Silt % (8-16µm)	0.17
Medium Silt % (16-31µm)	0.15
Course Silt % (31-63µm)	0.32
Total Silt (4-63µm)	**0.65**
Very Fine sand % (63-125µm)	0.21
Fine sand % (125-250µm)	3.95
Medium sand % (250-500µm)	22.35
Coarse sand % (500-1000µm)	29.55
Very Coarse sand % (1000-2000µm)	38.60
Total Sand (63-2000µm)	**94.67**
Total Gravels (>2000µm)	**4.68**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	29.55
1000	38.60
2000	4.68
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	886.37
Minimum settling velocity of 50% of particles (mm s^1)	647.85
Time for 50% of particles to settle over 1 m (hours)	0.000
D10 (µm)	310.55
Minimum settling velocity of 90% of particles (mm s^1)	79.53
Time for 90% of particles to settle over 1 m (hours)	0.003

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some rock and shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Marine and Freshwater
Research Laboratory
Environmental Science
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Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS02_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.00
Fine Silt % (8-16µm)	0.00
Medium Silt % (16-31µm)	0.00
Course Silt % (31-63µm)	0.00
Total Silt (4-63µm)	**0.00**
Very Fine sand % (63-125µm)	0.00
Fine sand % (125-250µm)	14.47
Medium sand % (250-500µm)	77.49
Coarse sand % (500-1000µm)	7.57
Very Coarse sand % (1000-2000µm)	0.46
Total Sand (63-2000µm)	**99.99**
Total Gravels (>2000µm)	**0.01**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	7.57
1000	0.46
2000	0.01
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	359.96
Minimum settling velocity of 50% of particles (mm s^1)	106.85
Time for 50% of particles to settle over 1 m (hours)	0.003
D10 (µm)	230.83
Minimum settling velocity of 90% of particles (mm s^1)	43.94
Time for 90% of particles to settle over 1 m (hours)	0.006

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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PARTICLE SIZE ANALYSIS REPORT

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Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS03_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.00
Fine Silt % (8-16µm)	0.00
Medium Silt % (16-31µm)	0.00
Course Silt % (31-63µm)	0.92
Total Silt (4-63µm)	**0.92**
Very Fine sand % (63-125µm)	2.31
Fine sand % (125-250µm)	24.94
Medium sand % (250-500µm)	66.33
Coarse sand % (500-1000µm)	4.93
Very Coarse sand % (1000-2000µm)	0.41
Total Sand (63-2000µm)	**98.92**
Total Gravels (>2000µm)	**0.16**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	4.93
1000	0.41
2000	0.16
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	319.74
Minimum settling velocity of 50% of particles (mm s^1)	84.30
Time for 50% of particles to settle over 1 m (hours)	0.003
D10 (µm)	178.30
Minimum settling velocity of 90% of particles (mm s^1)	26.22
Time for 90% of particles to settle over 1 m (hours)	0.011

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS04_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.13
Fine Silt % (8-16µm)	0.24
Medium Silt % (16-31µm)	0.25
Course Silt % (31-63µm)	0.40
Total Silt (4-63µm)	**1.02**
Very Fine sand % (63-125µm)	0.49
Fine sand % (125-250µm)	6.11
Medium sand % (250-500µm)	17.23
Coarse sand % (500-1000µm)	51.40
Very Coarse sand % (1000-2000µm)	19.52
Total Sand (63-2000µm)	**94.74**
Total Gravels (>2000µm)	**4.24**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	51.40
1000	19.52
2000	3.51
4000	0.73
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	744.73
Minimum settling velocity of 50% of particles (mm s^1)	457.35
Time for 50% of particles to settle over 1 m (hours)	0.001
D10 (µm)	280.93
Minimum settling velocity of 90% of particles (mm s^1)	65.08
Time for 90% of particles to settle over 1 m (hours)	0.004

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some rock and shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS05_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.01
Fine Silt % (8-16µm)	0.12
Medium Silt % (16-31µm)	0.09
Course Silt % (31-63µm)	0.80
Total Silt (4-63µm)	**1.02**
Very Fine sand % (63-125µm)	1.29
Fine sand % (125-250µm)	12.04
Medium sand % (250-500µm)	44.28
Coarse sand % (500-1000µm)	36.13
Very Coarse sand % (1000-2000µm)	3.02
Total Sand (63-2000µm)	**96.76**
Total Gravels (>2000µm)	**2.22**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	36.13
1000	3.02
2000	0.74
4000	0.92
8000	0.56
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	441.19
Minimum settling velocity of 50% of particles (mm s^1)	160.51
Time for 50% of particles to settle over 1 m (hours)	0.002
D10 (µm)	221.85
Minimum settling velocity of 90% of particles (mm s^1)	40.58
Time for 90% of particles to settle over 1 m (hours)	0.007

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some shell and rock present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS06_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.11
Fine Silt % (8-16µm)	0.25
Medium Silt % (16-31µm)	0.26
Course Silt % (31-63µm)	0.40
Total Silt (4-63µm)	**1.02**
Very Fine sand % (63-125µm)	0.46
Fine sand % (125-250µm)	5.66
Medium sand % (250-500µm)	17.33
Coarse sand % (500-1000µm)	28.49
Very Coarse sand % (1000-2000µm)	37.72
Total Sand (63-2000µm)	**89.66**
Total Gravels (>2000µm)	**9.32**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	28.49
1000	37.72
2000	7.08
4000	2.23
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	948.08
Minimum settling velocity of 50% of particles (mm s^1)	741.20
Time for 50% of particles to settle over 1 m (hours)	0.000
D10 (µm)	287.90
Minimum settling velocity of 90% of particles (mm s^1)	68.35
Time for 90% of particles to settle over 1 m (hours)	0.004

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some rock and shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS07_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.03
Fine Silt % (8-16µm)	0.14
Medium Silt % (16-31µm)	0.15
Course Silt % (31-63µm)	0.20
Total Silt (4-63µm)	**0.51**
Very Fine sand % (63-125µm)	0.23
Fine sand % (125-250µm)	0.86
Medium sand % (250-500µm)	11.20
Coarse sand % (500-1000µm)	39.22
Very Coarse sand % (1000-2000µm)	25.81
Total Sand (63-2000µm)	**77.32**
Total Gravels (>2000µm)	**22.17**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	39.22
1000	25.81
2000	15.47
4000	6.71
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	974.35
Minimum settling velocity of 50% of particles (mm s^1)	782.84
Time for 50% of particles to settle over 1 m (hours)	0.000
D10 (µm)	441.82
Minimum settling velocity of 90% of particles (mm s^1)	160.97
Time for 90% of particles to settle over 1 m (hours)	0.002

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment

Sand with some rock and shell present.

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Date: 24/05/2021

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PARTICLE SIZE ANALYSIS REPORT

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Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS08_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.12
Fine Silt % (8-16µm)	0.21
Medium Silt % (16-31µm)	0.24
Course Silt % (31-63µm)	0.29
Total Silt (4-63µm)	**0.85**
Very Fine sand % (63-125µm)	0.48
Fine sand % (125-250µm)	2.59
Medium sand % (250-500µm)	11.07
Coarse sand % (500-1000µm)	31.03
Very Coarse sand % (1000-2000µm)	11.91
Total Sand (63-2000µm)	**57.08**
Total Gravels (>2000µm)	**42.06**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	31.03
1000	11.91
2000	23.00
4000	15.16
8000	3.90
16000	0.00

Settling Velocity calculations using Stokes Law

Parameters

Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074

*Liquid parameters based on seawater of 35ppt @ 20°C

Calculations

D50 (µm)	1333.58
Minimum settling velocity of 50% of particles (mm s^1)	1466.51
Time for 50% of particles to settle over 1 m (hours)	0.000
D10 (µm)	384.73
Minimum settling velocity of 90% of particles (mm s^1)	122.05
Time for 90% of particles to settle over 1 m (hours)	0.002

Settings

SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment

Rocky sand with some shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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PARTICLE SIZE ANALYSIS REPORT

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Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS09_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.01
Fine Silt % (8-16µm)	0.14
Medium Silt % (16-31µm)	0.14
Course Silt % (31-63µm)	0.21
Total Silt (4-63µm)	**0.49**
Very Fine sand % (63-125µm)	0.11
Fine sand % (125-250µm)	1.34
Medium sand % (250-500µm)	16.02
Coarse sand % (500-1000µm)	31.54
Very Coarse sand % (1000-2000µm)	30.88
Total Sand (63-2000µm)	**79.89**
Total Gravels (>2000µm)	**19.62**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	31.54
1000	30.88
2000	16.51
4000	3.11
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	1016.20
Minimum settling velocity of 50% of particles (mm s^1)	851.53
Time for 50% of particles to settle over 1 m (hours)	0.000
D10 (µm)	385.12
Minimum settling velocity of 90% of particles (mm s^1)	122.30
Time for 90% of particles to settle over 1 m (hours)	0.002

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some rock and shell present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Terrace, West Perth WA 6005

Date of Issue: 24/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-2

Sample Name:	SS10_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-2
Client Reference:	CW1146500
Analysis Date:	12/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.00**
Very Fine Silt % (4-8µm)	0.08
Fine Silt % (8-16µm)	0.30
Medium Silt % (16-31µm)	0.30
Course Silt % (31-63µm)	0.38
Total Silt (4-63µm)	**1.05**
Very Fine sand % (63-125µm)	1.00
Fine sand % (125-250µm)	2.54
Medium sand % (250-500µm)	22.85
Coarse sand % (500-1000µm)	66.36
Very Coarse sand % (1000-2000µm)	5.92
Total Sand (63-2000µm)	**98.67**
Total Gravels (>2000µm)	**0.28**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	66.36
1000	5.92
2000	0.28
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	669.96
Minimum settling velocity of 50% of particles (mm s^1)	370.12
Time for 50% of particles to settle over 1 m (hours)	0.001
D10 (µm)	322.57
Minimum settling velocity of 90% of particles (mm s^1)	85.80
Time for 90% of particles to settle over 1 m (hours)	0.003

Settings	
SOP Name	SOP-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some rock, shell and plant material present.

Signatory: Jamie Woodward
Date: 24/05/2021

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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C02_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**3.50**
Very Fine Silt % (4-8µm)	3.95
Fine Silt % (8-16µm)	6.38
Medium Silt % (16-31µm)	8.14
Course Silt % (31-63µm)	8.59
Total Silt (4-63µm)	**27.06**
Very Fine sand % (63-125µm)	9.50
Fine sand % (125-250µm)	22.20
Medium sand % (250-500µm)	26.21
Coarse sand % (500-1000µm)	9.70
Very Coarse sand % (1000-2000µm)	0.99
Total Sand (63-2000µm)	**68.60**
Total Gravels (>2000µm)	**0.84**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	9.70
1000	0.99
2000	0.57
4000	0.27
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	181.49
Minimum settling velocity of 50% of particles (mm s^1)	27.16
Time for 50% of particles to settle over 1 m (hours)	0.010
D10 (µm)	10.97
Minimum settling velocity of 90% of particles (mm s^1)	0.10
Time for 90% of particles to settle over 1 m (hours)	2.797

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Muddy sand with some shell present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C02_1.0m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**3.24**
Very Fine Silt % (4-8µm)	3.54
Fine Silt % (8-16µm)	5.69
Medium Silt % (16-31µm)	7.27
Course Silt % (31-63µm)	7.69
Total Silt (4-63µm)	**24.18**
Very Fine sand % (63-125µm)	8.64
Fine sand % (125-250µm)	22.35
Medium sand % (250-500µm)	28.59
Coarse sand % (500-1000µm)	10.51
Very Coarse sand % (1000-2000µm)	1.13
Total Sand (63-2000µm)	**71.23**
Total Gravels (>2000µm)	**1.34**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	10.51
1000	1.13
2000	0.64
4000	0.00
8000	0.71
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	204.13
Minimum settling velocity of 50% of particles (mm s^1)	34.36
Time for 50% of particles to settle over 1 m (hours)	0.008
D10 (µm)	12.29
Minimum settling velocity of 90% of particles (mm s^1)	0.12
Time for 90% of particles to settle over 1 m (hours)	2.231

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Muddy sand with some shell present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C02_1.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.27**
Very Fine Silt % (4-8µm)	0.72
Fine Silt % (8-16µm)	1.10
Medium Silt % (16-31µm)	1.80
Course Silt % (31-63µm)	2.54
Total Silt (4-63µm)	**6.16**
Very Fine sand % (63-125µm)	7.50
Fine sand % (125-250µm)	36.56
Medium sand % (250-500µm)	44.91
Coarse sand % (500-1000µm)	4.47
Very Coarse sand % (1000-2000µm)	0.12
Total Sand (63-2000µm)	**93.56**
Total Gravels (>2000µm)	**0.01**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	4.47
1000	0.12
2000	0.01
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	248.37
Minimum settling velocity of 50% of particles (mm s^1)	50.87
Time for 50% of particles to settle over 1 m (hours)	0.005
D10 (µm)	102.54
Minimum settling velocity of 90% of particles (mm s^1)	8.67
Time for 90% of particles to settle over 1 m (hours)	0.032

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some shell present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C03_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	10/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.77**
Very Fine Silt % (4-8µm)	1.10
Fine Silt % (8-16µm)	1.62
Medium Silt % (16-31µm)	2.27
Course Silt % (31-63µm)	2.60
Total Silt (4-63µm)	**7.60**
Very Fine sand % (63-125µm)	8.12
Fine sand % (125-250µm)	30.98
Medium sand % (250-500µm)	34.43
Coarse sand % (500-1000µm)	16.22
Very Coarse sand % (1000-2000µm)	1.52
Total Sand (63-2000µm)	**91.27**
Total Gravels (>2000µm)	**0.36**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	16.22
1000	1.52
2000	0.26
4000	0.10
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	261.57
Minimum settling velocity of 50% of particles (mm s^1)	56.42
Time for 50% of particles to settle over 1 m (hours)	0.005
D10 (µm)	82.87
Minimum settling velocity of 90% of particles (mm s^1)	5.66
Time for 90% of particles to settle over 1 m (hours)	0.049

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some mud, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C03_1.0m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.70**
Very Fine Silt % (4-8µm)	0.91
Fine Silt % (8-16µm)	1.62
Medium Silt % (16-31µm)	2.67
Course Silt % (31-63µm)	3.68
Total Silt (4-63µm)	**8.88**
Very Fine sand % (63-125µm)	8.32
Fine sand % (125-250µm)	25.59
Medium sand % (250-500µm)	31.73
Coarse sand % (500-1000µm)	21.51
Very Coarse sand % (1000-2000µm)	2.98
Total Sand (63-2000µm)	**90.13**
Total Gravels (>2000µm)	**0.30**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	21.51
1000	2.98
2000	0.30
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law

Parameters

Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074

*Liquid parameters based on seawater of 35ppt @ 20°C

Calculations

D50 (µm)	285.08
Minimum settling velocity of 50% of particles (mm s^1)	67.02
Time for 50% of particles to settle over 1 m (hours)	0.004
D10 (µm)	67.22
Minimum settling velocity of 90% of particles (mm s^1)	3.73
Time for 90% of particles to settle over 1 m (hours)	0.075

Settings

SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment

Sand with some mud, shell, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C04_0.5m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**4.56**
Very Fine Silt % (4-8µm)	5.31
Fine Silt % (8-16µm)	9.05
Medium Silt % (16-31µm)	12.39
Course Silt % (31-63µm)	14.13
Total Silt (4-63µm)	**40.89**
Very Fine sand % (63-125µm)	15.40
Fine sand % (125-250µm)	17.36
Medium sand % (250-500µm)	10.27
Coarse sand % (500-1000µm)	5.36
Very Coarse sand % (1000-2000µm)	2.47
Total Sand (63-2000µm)	**50.86**
Total Gravels (>2000µm)	**3.69**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.36
1000	2.47
2000	1.84
4000	1.85
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law

Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	78.57
Minimum settling velocity of 50% of particles (mm s^1)	5.09
Time for 50% of particles to settle over 1 m (hours)	0.055
D10 (µm)	8.11
Minimum settling velocity of 90% of particles (mm s^1)	0.05
Time for 90% of particles to settle over 1 m (hours)	5.122

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and rock present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C04_1.0m
Sampling Date:	21/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.94**
Very Fine Silt % (4-8µm)	6.12
Fine Silt % (8-16µm)	9.88
Medium Silt % (16-31µm)	13.19
Course Silt % (31-63µm)	14.55
Total Silt (4-63µm)	**43.74**
Very Fine sand % (63-125µm)	14.72
Fine sand % (125-250µm)	15.62
Medium sand % (250-500µm)	9.15
Coarse sand % (500-1000µm)	4.42
Very Coarse sand % (1000-2000µm)	1.92
Total Sand (63-2000µm)	**45.82**
Total Gravels (>2000µm)	**4.50**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	4.42
1000	1.92
2000	2.99
4000	1.51
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	64.08
Minimum settling velocity of 50% of particles (mm s^1)	3.39
Time for 50% of particles to settle over 1 m (hours)	0.082
D10 (µm)	6.56
Minimum settling velocity of 90% of particles (mm s^1)	0.04
Time for 90% of particles to settle over 1 m (hours)	7.833

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C06_0.5m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.24**
Very Fine Silt % (4-8µm)	2.34
Fine Silt % (8-16µm)	3.94
Medium Silt % (16-31µm)	5.76
Course Silt % (31-63µm)	7.67
Total Silt (4-63µm)	**19.71**
Very Fine sand % (63-125µm)	20.02
Fine sand % (125-250µm)	33.50
Medium sand % (250-500µm)	18.67
Coarse sand % (500-1000µm)	5.09
Very Coarse sand % (1000-2000µm)	0.62
Total Sand (63-2000µm)	**77.90**
Total Gravels (>2000µm)	**0.15**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.09
1000	0.62
2000	0.11
4000	0.03
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	148.17
Minimum settling velocity of 50% of particles (mm s^1)	18.10
Time for 50% of particles to settle over 1 m (hours)	0.015
D10 (µm)	19.32
Minimum settling velocity of 90% of particles (mm s^1)	0.31
Time for 90% of particles to settle over 1 m (hours)	0.902

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Muddy sand with some shell, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C06_1.0m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.39**
Very Fine Silt % (4-8µm)	2.32
Fine Silt % (8-16µm)	3.88
Medium Silt % (16-31µm)	5.77
Course Silt % (31-63µm)	7.78
Total Silt (4-63µm)	**19.75**
Very Fine sand % (63-125µm)	19.60
Fine sand % (125-250µm)	32.73
Medium sand % (250-500µm)	18.36
Coarse sand % (500-1000µm)	5.61
Very Coarse sand % (1000-2000µm)	1.12
Total Sand (63-2000µm)	**77.41**
Total Gravels (>2000µm)	**0.45**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.61
1000	1.12
2000	0.26
4000	0.19
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	149.59
Minimum settling velocity of 50% of particles (mm s^1)	18.45
Time for 50% of particles to settle over 1 m (hours)	0.015
D10 (µm)	19.14
Minimum settling velocity of 90% of particles (mm s^1)	0.30
Time for 90% of particles to settle over 1 m (hours)	0.920

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Muddy sand with some shell, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Marine and Freshwater
Research Laboratory
Environmental Science
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Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	C06_1.5m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	11/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**1.46**
Very Fine Silt % (4-8µm)	1.39
Fine Silt % (8-16µm)	2.34
Medium Silt % (16-31µm)	3.86
Course Silt % (31-63µm)	6.72
Total Silt (4-63µm)	**14.32**
Very Fine sand % (63-125µm)	21.07
Fine sand % (125-250µm)	35.49
Medium sand % (250-500µm)	20.33
Coarse sand % (500-1000µm)	5.92
Very Coarse sand % (1000-2000µm)	0.94
Total Sand (63-2000µm)	**83.75**
Total Gravels (>2000µm)	**0.47**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.92
1000	0.94
2000	0.47
4000	0.01
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	161.78
Minimum settling velocity of 50% of particles (mm s^1)	21.58
Time for 50% of particles to settle over 1 m (hours)	0.013
D10 (µm)	35.49
Minimum settling velocity of 90% of particles (mm s^1)	1.04
Time for 90% of particles to settle over 1 m (hours)	0.267

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Sand with some mud, shell, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA01_0.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**4.58**
Very Fine Silt % (4-8µm)	4.69
Fine Silt % (8-16µm)	8.20
Medium Silt % (16-31µm)	12.27
Course Silt % (31-63µm)	15.97
Total Silt (4-63µm)	**41.13**
Very Fine sand % (63-125µm)	20.15
Fine sand % (125-250µm)	19.64
Medium sand % (250-500µm)	8.04
Coarse sand % (500-1000µm)	1.68
Very Coarse sand % (1000-2000µm)	0.54
Total Sand (63-2000µm)	**50.06**
Total Gravels (>2000µm)	**4.23**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	1.68
1000	0.54
2000	1.07
4000	3.17
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	74.32
Minimum settling velocity of 50% of particles (mm s^1)	4.55
Time for 50% of particles to settle over 1 m (hours)	0.061
D10 (µm)	8.68
Minimum settling velocity of 90% of particles (mm s^1)	0.06
Time for 90% of particles to settle over 1 m (hours)	4.467

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some rock, shell, sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA01_1.0m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.42**
Very Fine Silt % (4-8µm)	6.65
Fine Silt % (8-16µm)	11.87
Medium Silt % (16-31µm)	17.77
Course Silt % (31-63µm)	22.16
Total Silt (4-63µm)	**58.45**
Very Fine sand % (63-125µm)	18.52
Fine sand % (125-250µm)	10.01
Medium sand % (250-500µm)	4.21
Coarse sand % (500-1000µm)	1.42
Very Coarse sand % (1000-2000µm)	0.64
Total Sand (63-2000µm)	**34.80**
Total Gravels (>2000µm)	**0.34**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	1.42
1000	0.64
2000	0.22
4000	0.12
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	39.30
Minimum settling velocity of 50% of particles (mm s^1)	1.27
Time for 50% of particles to settle over 1 m (hours)	0.218
D10 (µm)	6.07
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	9.145

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

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Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA02_0.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.14**
Very Fine Silt % (4-8µm)	6.42
Fine Silt % (8-16µm)	12.28
Medium Silt % (16-31µm)	19.04
Course Silt % (31-63µm)	23.28
Total Silt (4-63µm)	**61.03**
Very Fine sand % (63-125µm)	18.16
Fine sand % (125-250µm)	9.75
Medium sand % (250-500µm)	4.44
Coarse sand % (500-1000µm)	0.75
Very Coarse sand % (1000-2000µm)	0.24
Total Sand (63-2000µm)	**33.33**
Total Gravels (>2000µm)	**0.50**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.75
1000	0.24
2000	0.22
4000	0.28
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	38.49
Minimum settling velocity of 50% of particles (mm s^1)	1.22
Time for 50% of particles to settle over 1 m (hours)	0.227
D10 (µm)	7.00
Minimum settling velocity of 90% of particles (mm s^1)	0.04
Time for 90% of particles to settle over 1 m (hours)	6.870

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA02_1.0m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.24**
Very Fine Silt % (4-8µm)	8.68
Fine Silt % (8-16µm)	15.54
Medium Silt % (16-31µm)	21.92
Course Silt % (31-63µm)	23.12
Total Silt (4-63µm)	**69.26**
Very Fine sand % (63-125µm)	14.39
Fine sand % (125-250µm)	6.18
Medium sand % (250-500µm)	2.48
Coarse sand % (500-1000µm)	0.32
Very Coarse sand % (1000-2000µm)	0.09
Total Sand (63-2000µm)	**23.46**
Total Gravels (>2000µm)	**0.05**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.32
1000	0.09
2000	0.05
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	28.18
Minimum settling velocity of 50% of particles (mm s^1)	0.65
Time for 50% of particles to settle over 1 m (hours)	0.424
D10 (µm)	5.22
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	12.360

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA02_1.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.29**
Very Fine Silt % (4-8µm)	7.96
Fine Silt % (8-16µm)	14.05
Medium Silt % (16-31µm)	20.56
Course Silt % (31-63µm)	22.86
Total Silt (4-63µm)	**65.43**
Very Fine sand % (63-125µm)	15.18
Fine sand % (125-250µm)	7.55
Medium sand % (250-500µm)	3.55
Coarse sand % (500-1000µm)	0.53
Very Coarse sand % (1000-2000µm)	0.17
Total Sand (63-2000µm)	**26.99**
Total Gravels (>2000µm)	**0.29**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.53
1000	0.17
2000	0.29
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	31.14
Minimum settling velocity of 50% of particles (mm s^1)	0.80
Time for 50% of particles to settle over 1 m (hours)	0.347
D10 (µm)	5.28
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	12.077

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA02_2.0m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	30/04/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**8.17**
Very Fine Silt % (4-8µm)	8.63
Fine Silt % (8-16µm)	15.29
Medium Silt % (16-31µm)	22.05
Course Silt % (31-63µm)	23.58
Total Silt (4-63µm)	**69.56**
Very Fine sand % (63-125µm)	14.36
Fine sand % (125-250µm)	5.36
Medium sand % (250-500µm)	2.09
Coarse sand % (500-1000µm)	0.33
Very Coarse sand % (1000-2000µm)	0.13
Total Sand (63-2000µm)	**22.27**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.33
1000	0.13
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	27.63
Minimum settling velocity of 50% of particles (mm s^1)	0.63
Time for 50% of particles to settle over 1 m (hours)	0.441
D10 (µm)	4.78
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	14.735

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA03_0.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	5/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.01**
Very Fine Silt % (4-8µm)	7.23
Fine Silt % (8-16µm)	13.66
Medium Silt % (16-31µm)	20.55
Course Silt % (31-63µm)	23.59
Total Silt (4-63µm)	**65.02**
Very Fine sand % (63-125µm)	16.76
Fine sand % (125-250µm)	7.81
Medium sand % (250-500µm)	3.95
Coarse sand % (500-1000µm)	0.27
Very Coarse sand % (1000-2000µm)	0.10
Total Sand (63-2000µm)	**28.90**
Total Gravels (>2000µm)	**0.07**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.27
1000	0.10
2000	0.07
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	33.47
Minimum settling velocity of 50% of particles (mm s^1)	0.92
Time for 50% of particles to settle over 1 m (hours)	0.301
D10 (µm)	6.16
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	8.868

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA03_1.0m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	5/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.93**
Very Fine Silt % (4-8µm)	8.24
Fine Silt % (8-16µm)	15.00
Medium Silt % (16-31µm)	21.84
Course Silt % (31-63µm)	23.86
Total Silt (4-63µm)	**68.94**
Very Fine sand % (63-125µm)	15.09
Fine sand % (125-250µm)	6.31
Medium sand % (250-500µm)	2.26
Coarse sand % (500-1000µm)	0.20
Very Coarse sand % (1000-2000µm)	0.24
Total Sand (63-2000µm)	**24.09**
Total Gravels (>2000µm)	**0.04**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.20
1000	0.24
2000	0.04
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	29.33
Minimum settling velocity of 50% of particles (mm s^1)	0.71
Time for 50% of particles to settle over 1 m (hours)	0.392
D10 (µm)	5.43
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	11.410

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA03_1.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	5/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.62**
Very Fine Silt % (4-8µm)	9.08
Fine Silt % (8-16µm)	15.98
Medium Silt % (16-31µm)	22.23
Course Silt % (31-63µm)	23.24
Total Silt (4-63µm)	**70.53**
Very Fine sand % (63-125µm)	14.04
Fine sand % (125-250µm)	5.32
Medium sand % (250-500µm)	2.22
Coarse sand % (500-1000µm)	0.12
Very Coarse sand % (1000-2000µm)	0.07
Total Sand (63-2000µm)	**21.77**
Total Gravels (>2000µm)	**0.08**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.12
1000	0.07
2000	0.08
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	27.05
Minimum settling velocity of 50% of particles (mm s^1)	0.60
Time for 50% of particles to settle over 1 m (hours)	0.461
D10 (µm)	4.99
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	13.506

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA04_0.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	5/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**4.53**
Very Fine Silt % (4-8µm)	5.82
Fine Silt % (8-16µm)	11.11
Medium Silt % (16-31µm)	17.62
Course Silt % (31-63µm)	23.57
Total Silt (4-63µm)	**58.11**
Very Fine sand % (63-125µm)	20.37
Fine sand % (125-250µm)	10.67
Medium sand % (250-500µm)	5.06
Coarse sand % (500-1000µm)	0.83
Very Coarse sand % (1000-2000µm)	0.16
Total Sand (63-2000µm)	**37.09**
Total Gravels (>2000µm)	**0.26**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.83
1000	0.16
2000	0.26
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	43.44
Minimum settling velocity of 50% of particles (mm s^1)	1.56
Time for 50% of particles to settle over 1 m (hours)	0.178
D10 (µm)	7.75
Minimum settling velocity of 90% of particles (mm s^1)	0.05
Time for 90% of particles to settle over 1 m (hours)	5.604

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA04_1.0m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.95**
Very Fine Silt % (4-8µm)	8.16
Fine Silt % (8-16µm)	14.51
Medium Silt % (16-31µm)	20.39
Course Silt % (31-63µm)	21.95
Total Silt (4-63µm)	**64.99**
Very Fine sand % (63-125µm)	14.17
Fine sand % (125-250µm)	6.20
Medium sand % (250-500µm)	3.16
Coarse sand % (500-1000µm)	0.75
Very Coarse sand % (1000-2000µm)	0.99
Total Sand (63-2000µm)	**25.26**
Total Gravels (>2000µm)	**2.79**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.75
1000	0.99
2000	2.66
4000	0.13
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	31.00
Minimum settling velocity of 50% of particles (mm s^1)	0.79
Time for 50% of particles to settle over 1 m (hours)	0.351
D10 (µm)	5.44
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	11.395

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, rock and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA04_1.5m
Sampling Date:	20/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.86**
Very Fine Silt % (4-8µm)	9.24
Fine Silt % (8-16µm)	16.35
Medium Silt % (16-31µm)	22.69
Course Silt % (31-63µm)	23.41
Total Silt (4-63µm)	**71.70**
Very Fine sand % (63-125µm)	13.49
Fine sand % (125-250µm)	4.83
Medium sand % (250-500µm)	1.92
Coarse sand % (500-1000µm)	0.12
Very Coarse sand % (1000-2000µm)	0.09
Total Sand (63-2000µm)	**20.45**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.12
1000	0.09
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	26.21
Minimum settling velocity of 50% of particles (mm s^1)	0.57
Time for 50% of particles to settle over 1 m (hours)	0.490
D10 (µm)	4.88
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	14.137

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA05_0.5m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.42**
Very Fine Silt % (4-8µm)	8.02
Fine Silt % (8-16µm)	14.31
Medium Silt % (16-31µm)	21.27
Course Silt % (31-63µm)	24.05
Total Silt (4-63µm)	**67.65**
Very Fine sand % (63-125µm)	15.47
Fine sand % (125-250µm)	6.04
Medium sand % (250-500µm)	3.10
Coarse sand % (500-1000µm)	0.15
Very Coarse sand % (1000-2000µm)	0.17
Total Sand (63-2000µm)	**24.93**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.15
1000	0.17
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	30.14
Minimum settling velocity of 50% of particles (mm s^1)	0.75
Time for 50% of particles to settle over 1 m (hours)	0.371
D10 (µm)	5.21
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	12.401

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA05_1.0m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**8.08**
Very Fine Silt % (4-8µm)	7.95
Fine Silt % (8-16µm)	13.97
Medium Silt % (16-31µm)	21.07
Course Silt % (31-63µm)	24.01
Total Silt (4-63µm)	**67.00**
Very Fine sand % (63-125µm)	15.77
Fine sand % (125-250µm)	6.38
Medium sand % (250-500µm)	2.58
Coarse sand % (500-1000µm)	0.10
Very Coarse sand % (1000-2000µm)	0.09
Total Sand (63-2000µm)	**24.92**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.10
1000	0.09
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	30.09
Minimum settling velocity of 50% of particles (mm s^1)	0.75
Time for 50% of particles to settle over 1 m (hours)	0.372
D10 (µm)	4.88
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	14.155

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA05_1.5m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.78**
Very Fine Silt % (4-8µm)	7.20
Fine Silt % (8-16µm)	14.22
Medium Silt % (16-31µm)	22.23
Course Silt % (31-63µm)	25.37
Total Silt (4-63µm)	**69.02**
Very Fine sand % (63-125µm)	16.37
Fine sand % (125-250µm)	6.38
Medium sand % (250-500µm)	2.17
Coarse sand % (500-1000µm)	0.14
Very Coarse sand % (1000-2000µm)	0.13
Total Sand (63-2000µm)	**25.20**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.14
1000	0.13
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	31.50
Minimum settling velocity of 50% of particles (mm s^1)	0.82
Time for 50% of particles to settle over 1 m (hours)	0.339
D10 (µm)	6.31
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	8.452

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA05_2.0m
Sampling Date:	22/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.87**
Very Fine Silt % (4-8µm)	6.68
Fine Silt % (8-16µm)	12.84
Medium Silt % (16-31µm)	20.86
Course Silt % (31-63µm)	25.75
Total Silt (4-63µm)	**66.13**
Very Fine sand % (63-125µm)	17.30
Fine sand % (125-250µm)	6.59
Medium sand % (250-500µm)	2.99
Coarse sand % (500-1000µm)	0.19
Very Coarse sand % (1000-2000µm)	0.10
Total Sand (63-2000µm)	**27.17**
Total Gravels (>2000µm)	**0.82**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.19
1000	0.10
2000	0.11
4000	0.71
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	34.37
Minimum settling velocity of 50% of particles (mm s^1)	0.97
Time for 50% of particles to settle over 1 m (hours)	0.285
D10 (µm)	6.42
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	8.168

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA06_0.5m
Sampling Date:	23/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	6/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.63**
Very Fine Silt % (4-8µm)	8.80
Fine Silt % (8-16µm)	15.35
Medium Silt % (16-31µm)	21.41
Course Silt % (31-63µm)	22.95
Total Silt (4-63µm)	**68.52**
Very Fine sand % (63-125µm)	14.49
Fine sand % (125-250µm)	5.74
Medium sand % (250-500µm)	2.59
Coarse sand % (500-1000µm)	0.47
Very Coarse sand % (1000-2000µm)	0.23
Total Sand (63-2000µm)	**23.53**
Total Gravels (>2000µm)	**0.33**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.47
1000	0.23
2000	0.33
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	28.26
Minimum settling velocity of 50% of particles (mm s^1)	0.66
Time for 50% of particles to settle over 1 m (hours)	0.422
D10 (µm)	5.01
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	13.395

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA06_1.0m
Sampling Date:	23/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**8.80**
Very Fine Silt % (4-8µm)	9.44
Fine Silt % (8-16µm)	15.99
Medium Silt % (16-31µm)	21.91
Course Silt % (31-63µm)	22.81
Total Silt (4-63µm)	**70.16**
Very Fine sand % (63-125µm)	13.34
Fine sand % (125-250µm)	4.96
Medium sand % (250-500µm)	2.20
Coarse sand % (500-1000µm)	0.19
Very Coarse sand % (1000-2000µm)	0.07
Total Sand (63-2000µm)	**20.75**
Total Gravels (>2000µm)	**0.29**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.19
1000	0.07
2000	0.29
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	26.04
Minimum settling velocity of 50% of particles (mm s^1)	0.56
Time for 50% of particles to settle over 1 m (hours)	0.497
D10 (µm)	4.46
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	16.900

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, shell and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Murdoch UNIVERSITY

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA06_1.5m
Sampling Date:	23/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.29**
Very Fine Silt % (4-8µm)	7.20
Fine Silt % (8-16µm)	13.71
Medium Silt % (16-31µm)	21.72
Course Silt % (31-63µm)	25.72
Total Silt (4-63µm)	**68.36**
Very Fine sand % (63-125µm)	16.37
Fine sand % (125-250µm)	6.05
Medium sand % (250-500µm)	2.64
Coarse sand % (500-1000µm)	0.15
Very Coarse sand % (1000-2000µm)	0.07
Total Sand (63-2000µm)	**25.27**
Total Gravels (>2000µm)	**0.08**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.15
1000	0.07
2000	0.08
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	31.95
Minimum settling velocity of 50% of particles (mm s^1)	0.84
Time for 50% of particles to settle over 1 m (hours)	0.330
D10 (µm)	6.00
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	9.348

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

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Marine and Freshwater
Research Laboratory
Environmental Science
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.
The results of the tests, calibrations and/or measurements included is this document are traceable to Australian/national standards.

PARTICLE SIZE ANALYSIS REPORT

Contact: Daniel Strickland
Customer: Cardno (WA) Pty Ltd
Address: 11 Harvest Road, West Perth 6005

Date of Issue: 27/05/2021
Date Received: 23/04/2021
Our Reference: CAR21-1

Sample Name:	CA06_2.0m
Sampling Date:	23/04/2021
Sample Type:	Sediment
MAFRL Job Code:	CAR21-1
Client Reference:	CW1146500
Analysis Date:	7/05/2021
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.12**
Very Fine Silt % (4-8µm)	6.91
Fine Silt % (8-16µm)	13.19
Medium Silt % (16-31µm)	21.14
Course Silt % (31-63µm)	25.77
Total Silt (4-63µm)	**67.02**
Very Fine sand % (63-125µm)	17.20
Fine sand % (125-250µm)	6.81
Medium sand % (250-500µm)	2.65
Coarse sand % (500-1000µm)	0.12
Very Coarse sand % (1000-2000µm)	0.08
Total Sand (63-2000µm)	**26.86**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.12
1000	0.08
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	33.36
Minimum settling velocity of 50% of particles (mm s^1)	0.92
Time for 50% of particles to settle over 1 m (hours)	0.303
D10 (µm)	6.19
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	8.799

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Hexametaphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and plant material present.

Signatory: Jamie Woodward
Date: 27/05/2021

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

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APPENDIX

M

LABORATORY ANALYSIS REPORTS: ELUTRIATE TESTING

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2111318**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Contact	: Nick Courts
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: +61 08 9273 3888	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 22-Sep-2021 16:25
Order number	: CW1146500	Date Analysis Commenced	: 28-Sep-2021
C-O-C number	: ----	Issue Date	: 06-Oct-2021 15:56
Sampler	: DANIEL STRICKLAND, LEO RAITH		
Site	: Casuarina Harbour		
Quote number	: EP/742/21		
No. of samples received	: 10		
No. of samples analysed	: 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
Thomas Donovan	Senior Organic Chemist - PFAS	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

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

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

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

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

- EN68: This analysis in accordance with National Ocean Disposal Guidelines, Commonwealth of Australia, 2002 - (modified). Results reported are those determined on a 1:4 sediment/seawater elutriate without blank correction.
- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.
- EN68: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.

Analytical Results

Sub-Matrix: **ELUTRIATE** (Matrix: **WATER**)			Sample ID	CA02	CA04	CA05	CA06	C02
			Sampling date / time	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EP2111318-001**	**EP2111318-002**	**EP2111318-003**	**EP2111318-004**	**EP2111318-005**
				Result	Result	Result	Result	Result
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Antimony	7440-36-0	0.5	µg/L	**2.4**	**4.1**	**3.0**	**5.1**	**----**
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	**----**	**----**	**----**	**----**	**12**
EP090S: Organotin Surrogate								
Tripropyltin	----	5	%	**----**	**----**	**----**	**----**	**69.3**

Analytical Results

Sub-Matrix: **ELUTRIATE** (Matrix: **WATER**)				Sample ID	C03	DUP1	DUP3	Elutriate Water	----
				Sampling date / time	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2111318-006**	**EP2111318-007**	**EP2111318-008**	**EP2111318-009**	**--------**
					Result	Result	Result	Result	----
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Antimony	7440-36-0	0.5	µg/L		**----**	**3.7**	**----**	<0.5	**----**
EP090: Organotin Compounds (Soluble)									
Tributyltin	56573-85-4	2	ngSn/L		**4**	**----**	**9**	<2	**----**
EP090S: Organotin Surrogate									
Tripropyltin	----	5	%		**89.0**	**----**	**82.8**	**107**	**----**

Analytical Results

Sub-Matrix: **SEAWATER** (Matrix: **WATER**)				Sample ID	**Elutriate Water**	----	----	----	----
				Sampling date / time	22-Sep-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2111318-010**	--------	--------	--------	--------
					Result	----	----	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Antimony	7440-36-0	0.5	µg/L		<0.5	----	----	----	----
EP090: Organotin Compounds (Soluble)									
Tributyltin	56573-85-4	2	ngSn/L		<2	----	----	----	----
EP090S: Organotin Surrogate									
Tripropyltin	----	5	%		**68.6**	----	----	----	----

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)			Sample ID	**Elutriate Water**	**----**	**----**	**----**	**----**
			Sampling date / time	22-Sep-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EP2111318-009**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	**28/09/2021**	**----**	**----**	**----**	**----**
EN68: Seawater Elutriate Testing Procedure - Inorganics/PFAS (Plastic Vessel)								
Seawater Sampling Date	----	-	-	**28/09/2021**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA02	CA04	CA05	CA06	C02
			Sampling date / time	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111318-001	EP2111318-002	EP2111318-003	EP2111318-004	EP2111318-005
				Result	Result	Result	Result	Result
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	**----**	**----**	**----**	**----**	**28/09/2021**
EN68: Seawater Elutriate Testing Procedure - Inorganics/PFAS (Plastic Vessel)								
Seawater Sampling Date	----	-	-	**28/09/2021**	**28/09/2021**	**28/09/2021**	**28/09/2021**	**----**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**C03**	**DUP1**	**DUP3**	**----**	**----**
			Sampling date / time	22-Sep-2021 00:00	22-Sep-2021 00:00	22-Sep-2021 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EP2111318-006**	**EP2111318-007**	**EP2111318-008**	**--------**	**--------**
				Result	Result	Result	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	**28/09/2021**	**----**	**28/09/2021**	**----**	**----**
EN68: Seawater Elutriate Testing Procedure - Inorganics/PFAS (Plastic Vessel)								
Seawater Sampling Date	----	-	-	**----**	**28/09/2021**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **ELUTRIATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Sub-Matrix: **SEAWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP090S: Organotin Surrogate			
Tripropyltin	----	24	116

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EN68: Seawater Elutriate Testing Procedure - Inorganics/PFAS (Plastic Vessel)

(WATER) EG093T: Total Metals in Saline Water by ORC-ICPMS

(WATER) EP090: Organotin Compounds (Soluble)

(WATER) EP090S: Organotin Surrogate

(SOIL) EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2111318**	Page	: 1 of 3
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Contact	: Nick Courts
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: +61 08 9273 3888	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 22-Sep-2021
Order number	: CW1146500	Date Analysis Commenced	: 28-Sep-2021
C-O-C number	: ----	Issue Date	: 06-Oct-2021
Sampler	: DANIEL STRICKLAND, LEO RAITH		
Site	: Casuarina Harbour		
Quote number	: EP/742/21		
No. of samples received	: 10		
No. of samples analysed	: 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 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
Thomas Donovan	Senior Organic Chemist - PFAS	Brisbane Organics, Stafford, QLD

General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3932589)									
EB2127380-010	Anonymous	EG093A-T: Antimony	7440-36-0	0.5	µg/L	<2.6	<2.6	0.0	No Limit
EP090: Organotin Compounds (Soluble) (QC Lot: 3931769)									
EP2111439-001	Anonymous	EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	<2	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
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 3926119)								
EN68a-G: Seawater Sampling Date	----	----	-	28/09/2021	----	----	----	----

Sub-Matrix: **WATER**

				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
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3932589)								
EG093A-T: Antimony	7440-36-0	0.5	µg/L	<0.5	10 µg/L	85.1	83.0	116
EP090: Organotin Compounds (Soluble) (QCLot: 3925143)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	62.8	30.7	134
EP090: Organotin Compounds (Soluble) (QCLot: 3931769)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	91.6	30.7	134

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2111318**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: MR DANIEL STRICKLAND	Telephone	: +61-8-9406 1301
Project	: CW1146500 Casuarina Harbour	Date Samples Received	: 22-Sep-2021
Site	: Casuarina Harbour	Issue Date	: 06-Oct-2021
Sampler	: DANIEL STRICKLAND, LEO RAITH	No. of samples received	: 10
Order number	: CW1146500	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Matrix Spikes (MS)					
Organotin Compounds (Soluble)	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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 / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN68a-G)							
C02, C03, DUP3, Elutriate Water	**22-Sep-2021**	**28-Sep-2021**	06-Oct-2021	✓	**----**	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/PFAS (Plastic Vessel)							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN68a-P)							
CA02, CA04, CA05, CA06, DUP1, Elutriate Water	**22-Sep-2021**	**28-Sep-2021**	21-Mar-2022	✓	**----**	----	----

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EG093T: Total Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Unfiltered (EG093A-T)							
CA02, CA04, CA05, CA06, DUP1, Elutriate Water	**28-Sep-2021**	**01-Oct-2021**	27-Mar-2022	✓	**01-Oct-2021**	27-Mar-2022	✓
Miscellaneous Plastic bottle - Unpreserved (EG093A-T)							
Elutriate Water	**22-Sep-2021**	**01-Oct-2021**	21-Mar-2022	✓	**01-Oct-2021**	21-Mar-2022	✓
EP090: Organotin Compounds (Soluble)							
Amber Glass Bottle - Unpreserved (EP090S)							
C02, C03, DUP3, Elutriate Water	**28-Sep-2021**	**01-Oct-2021**	05-Oct-2021	✓	**01-Oct-2021**	10-Nov-2021	✓
Miscellaneous Plastic bottle - Unpreserved (EP090S)							
Elutriate Water	**22-Sep-2021**	**28-Sep-2021**	29-Sep-2021	✓	**28-Sep-2021**	07-Nov-2021	✓

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	
Method Blanks (MB)							
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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)							
Organotin Compounds (Soluble)	EP090S	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Organotin Compounds (Soluble)	EP090S	2	8	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Organotin Compounds (Soluble)	EP090S	2	8	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organotin Compounds (Soluble)	EP090S	0	8	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM Schedule B(3).
Organotin Compounds (Soluble)	EP090S	SOIL	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM Schedule B(3).
Organotin Compounds (Soluble)	EP090S	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by GC/MS coupled with high volume injection and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals - ORC	EN25-ORC	SOIL	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM Schedule B(3)
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Seawater Elutriate Testing Procedure - Plastic Leaching Vessel	EN68a-P	SOIL	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Organotin Sample Preparation	ORG34	SOIL	In house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	WATER	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Seawater Elutriate Testing Procedure - Plastic Leaching Vessel	EN68a-P	WATER	USEPA Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Guide, EPA-503/8-91/001, USEPA and US Army Corps of Engineers. ANZECC Interim Ocean Disposal Guidelines This Procedure outlines the preparation of leachate designed to simulate release of contaminants from sediment during the disposal of dredged material. Release can occur by physical processes or a variety of chemical changes such as oxidation of metal sulphides and release of contaminants adsorbed to particles or organic matter.
Organotin Sample Preparation	ORG34	WATER	In house. A specified volume of sample is spiked with surrogate, acidified and vacuum filtered. Reagents and solvent are added and the mixture tumbled. The butyltin compounds is derivitisated, extracted and the subtitution reaction completed. The extract is transferred to a separatory funnel and further extracted two times with petroleum ether. The resultant extracts are combined and concentrated for analysis.

Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

Attention: **Daniel Strickland**

Report **828220-L**
Project name CASUARINA HARBOUR DREDGING INVESTIGATIONS
Project ID CW1146500
Received Date Sep 28, 2021

Client Sample ID			**DUP2 / QC2**	**DUP4 / QC4**
Sample Matrix			**Leachate - Other**	**Leachate - Other**
Eurofins Sample No.			**M21-Se58101**	**M21-Se58102**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit		
Heavy Metals				
Antimony	0.0001	mg/L	0.0019	-
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	6	6
pH (Leachate fluid)	0.1	pH Units	7.6	7.6
pH (off)	0.1	pH Units	7.6	7.9
Organotins				
Tributyltin	0.0125	mg/L	-	

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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	Melbourne	Oct 28, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
AUS Leaching Procedure			
pH (Leachate fluid)	Melbourne	Sep 29, 2021	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
pH (off)	Melbourne	Sep 29, 2021	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Organotins	Melbourne	Oct 28, 2021	7 Days
- Method: LTM-ORG-2400 Determination of organotins in solid & aqueous samples by LC-ICP-MS			

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eurofins | Environment Testing

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Eurofins Environment Testing NZ Limited
NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Order No.:
Report #: 828220
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Sep 28, 2021 4:36 PM
Due: Oct 12, 2021
Priority: 10 Day
Contact Name: Daniel Strickland

Project Name: CASUARINA HARBOUR DREDGING INVESTIGATIONS
Project ID: CW1146500

Eurofins Analytical Services Manager : Rhys Thomas

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Sample Detail						Antimony	Antimony	HOLD	Tributyl Tin (TBT)	AUS Leaching Procedure
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X		X
Sydney Laboratory - NATA # 1261 Site # 18217						X				
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
Perth Laboratory - NATA # 2377 Site # 2370										
External Laboratory									X	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	DUP2 / QC2	Sep 22, 2021		Leachate - Other	M21-Se58101				X	X
2	DUP4 / QC4	Sep 22, 2021		Leachate - Other	M21-Se58102	X	X			X
3	ELUTRIATE SEAWATER	Sep 22, 2021		Seawater	M21-Se58103			X		
Test Counts						1	1	1	1	2

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
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - 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.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
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.
TEQ	Toxic Equivalency Quotient
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% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Antimony	mg/L	0.0001			0.0001	Pass	

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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	Yes

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
N06	This result has been produced by a third-party laboratory and is not covered by Eurofins | Environment Testing lab ISO/IEC 17025 accreditation.

Authorised by:

Emily Rosenberg	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

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- 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 shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

REPORT OF ANALYSIS

Report No. RN1331004

Client	: EUROFINS MGT	**Job No.**	: EURO26/211005
	6 Monterey Road	**Quote No.**	: QT-02018
	Dandenong South VIC 3175	**Order No.**	: 21-433-0766-828220
		Date Received	: 5-OCT-2021
Attention	: MICHAEL MORRISON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Tim Reddan	**Phone**	: 03 9644 4854

Lab Reg No.	Sample Ref	Sample Description
N21/022492	M21-SE58101	WATER DUP2 / QC2 21/09/2021

Lab Reg No.	Units	N21/022492				Method
Date Sampled		21-SEP-2021				
Sample Reference		M21-SE58101				
Organotins						
Monobutyltin as Sn	ng/L	<2				NR_35
Dibutyltin as Sn	ng/L	<2				NR_35
Tributyltin as Sn	ng/L	<2				NR_35
Surrogate: Tripropyltin	%REC	96				NR_35
Dates						
Date extracted		12-OCT-2021				
Date analysed		13-OCT-2021				

Luke Baker, Analyst
Organics - NSW
Accreditation No. 198

14-OCT-2021

ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1330992*

Measurement Uncertainty is available upon request.

REPORT OF ANALYSIS

Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: EUROFINS MGT

NMI QA Report No: EURO26/211005 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ng/L	ng/L	ng/L	ng/L	%	%	%
Organics Section								
Organotin								
Monobutyltin	NR_35	2	<2	NA	NA	NA	69	NA
Dibutyltin	NR_35	2	<2	NA	NA	NA	118	NA
Tributyltin	NR_35	2	<2	NA	NA	NA	82	NA
Organotin Surrogate								
Tripropyltin (%Rec)	NR_35	-	-	NA	NA	NA	120	NA

Results expressed in percentage (%) or ng/L wherever appropriate.
Acceptable Spike recovery is 30-150% (monobutyltin and Tripropyltin); 40-160% (dibutyltin and tributyltin).
Maximum acceptable RPDs on spikes and duplicates is 60%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference, LCS = Laboratory Control Spike, LOR = Limit of Reporting.
This report shall not be reproduced except in full.

Signed:

Danny Slee
Organics Manager, NMI-North Ryde

Date: **14/10/2021**