



Port of Brisbane Sediment Sampling and Analysis Plan Implementation Report - 2021

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Synopsis: A report describing the physio-chemical characteristics of sediments to be dredge during the maintenance dredging program at the Port of Brisbane (2021). The assessment was carried out in accordance with the project Sampling and Analysis Plan (SAP) and the National Assessment Guidelines for Dredging (2009).		

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Executive Summary

Executive Summary

Background

Port of Brisbane Pty Ltd (PBPL) undertakes annual maintenance dredging within the navigational areas of the Brisbane River and western Moreton Bay, primarily using the Trailer Suction Hopper Dredge 'Brisbane'. Sampling and analysis was undertaken in accordance with National Assessment Guidelines for Dredging (NAGD) in 2021 to assess the suitability of maintenance dredged material for unconfined ocean disposal.

The dredge area was divided into different dredging subareas based on existing contaminant data, comprising Zone 2 (Colmslie to Pinkenba), Zone 3 (within Port reaches) and Zone 4 (Entrance Channel). Zone 1 (upstream of the dredge area) is not part of the annual dredging and provide 'background' contextual data. Sediment was also sampled at the Mud Island Dredge Material Placement Area (MIDMPA) and reference sites in Bramble Bay north of the Port of Brisbane.

Assessments

Sediments within Zone 2, were variable characterised by a higher proportion of fines (clays and silts), whereas Zones 3 and 4 generally were comprised of sands and fines. The Moreton Bay reference sites were comprised mostly of fines, whereas the MIDMPA was similar to Zone 4. The 2021 results were consistent with previous sampling between 2013-20.

The sediments in the dredging zones were found to be suitable for ocean disposal in accordance with the NAGD based on the following results:

- The upper 95% confidence limits (95% UCL) of the mean concentrations of most analysed metals and metalloids (except nickel) were less than respective NAGD screening levels, and therefore considered suitable for ocean disposal in accordance with NAGD with respect to these metals and metalloids. In contrast to previous years, mercury concentrations were less than the screening level.
- The 95% UCL nickel concentrations for the overall dredge area (20 mg/kg) was less than the NAGD screening level of 21 mg/kg and similar to 2020 results (19.6 mg/kg). The 95% UCL for Zone 3 (21.4 mg/kg) exceeded the NAGD screening level, but Zone 2 (20.6 mg/kg) and Zone 4 (20.7 mg/kg) were below. The 80th percentile nickel concentration at the reference sites was 25.7 mg/kg, compared to the dredge site 95% UCL of 20 mg/kg and the median value of 18 mg/kg. These results indicate that dredged material was similar to reference site and therefore suitable for ocean disposal in accordance with NAGD.
- All organic contaminants including organotins, Total Petroleum Hydrocarbons (TPHs), Polyaromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs) and organochlorine pesticides (OCPs) had concentrations below the LOR in >70% of samples. This also indicates dredged sediments were suitable for ocean disposal in accordance with NAGD.
- Acid Sulfate Soil testing indicated that while sediments were characterised as potential acid sulfate soils (PASS), the acid neutralizing capacity at all sites was sufficient for neutralising acids upon oxidation.

The evaluation of laboratory and field QA/QC procedures and assessments indicated that all sampling, sample handling and storage and laboratory analysis was undertaken to a high standard providing scientific confidence that the presented results are valid to allow an assessment of sediment quality against the NAGD. <<Note – bioavailability test results are pending>>

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Introduction

1 Introduction

1.1 Background

Port of Brisbane Pty Ltd (PBPL) is required to maintain a minimum depth of clearance below the keel of vessels calling at the port to allow for effective shipping access to the port and ensure ship safety. PBPL undertakes an annual maintenance dredging program to ensure these minimum depths are maintained.

PBPL propose to undertake its annual maintenance dredging within the navigational areas of the Brisbane River and Moreton Bay, primarily using the Trailer Suction Hopper Dredge (TSHD) 'Brisbane'. Maintenance dredging works extend from the Hamilton Reach of the Brisbane River to the North West Channel located in northern Moreton Bay.

It is proposed that dredged material is placed at sea within the Mud Island Dredge Material Placement Area (MIDMPA) or on land in the Future Port Expansion (FPE) reclamation area. To assess suitability of dredged material for unconfined ocean placement, characterisation of the physical and chemical properties of proposed dredged sediment was required to be undertaken in accordance with the National Assessment Guidelines for Dredging (Commonwealth of Australia 2009; henceforth NAGD).

This report documents the findings of a sampling campaign conducted in June 2021. The overall aim of this study is to assess the physical and chemical properties of sediments to be dredged from the Port of Brisbane, and based on the approach set out in the NAGD, assess the suitability of dredged material for unconfined ocean disposal (if required). The specific objectives of the study were to:

- Describe and quantify the physical properties of sediments to be dredged;
- Quantify concentrations of potential contaminants in sediments to be dredged;
- Compare contaminant concentrations to screening levels set out in the NAGD to determine whether there is a need for further assessment; and
- Assess the bioavailability of contaminants and potential toxicity effects based on comparisons of contaminant concentrations to guideline values.

1.2 Proposed Dredging

PBPL's area of responsibility in relation to maintenance and capital dredging within port limits can be broadly divided into two locations based on the water body type, navigable depths and nature of dredged material:

- Moreton Bay dredge area (enclosed/open coastal waters); and
- Brisbane River dredge area, including the Port of Brisbane (middle/lower estuary).

This SAP specifically focusses on sediments in the Brisbane River dredge area, as well as the MIDMPA and 'reference' areas in western Moreton Bay. The Brisbane River dredge area extends from Hamilton Reach to the Outer Bar Cutting. Annual maintenance dredging is required to remove sediments accumulated by natural siltation processes within the catchment.

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To ensure that declared depths of navigational channels are maintained at all times, PBPL undertakes 'insurance' dredging of up to -0.5 metres below the declared depth. On average, PBPL dredges about 300,000 m³ to 350,000 m³ of material each year. Dredging volumes are predominantly driven by catchment rainfall events and subsequently additional dredging needs to be undertaken following major flood events, as occurred in 2011 and 2013.

The Brisbane River zone is divided into different dredging subareas based on existing contaminant data, comprising Zone 2, Zone 3 and Zone 4. It is noted that Zone 1 is not part of the annual dredging and samples from this zone have been used to collect reference samples upstream of the actual dredging areas.

The following average dredge volumes apply to the dredge subareas (Table 1-1).

Table 1-1 Approximate Maintenance Dredge Volumes

Dredging Subarea	Location	Average Dredge Volume (m ³)
Zone 2	Hamilton Reach to Lytton Rocks Cutting	83,000
Zone 3	Pelican Banks to Inner Bar Cutting	241,000
Zone 4	Outer Bar Cutting	26,000

The maintenance dredging program is structured to maximise efficiencies and utilisation of PBPL's largest dredger, the *TSHD Brisbane*. The *TSHD Brisbane* typically carries out the majority of the port's maintenance dredging over a two-month period between January and May (actual period varies depending on other commitments of the *TSHD Brisbane* and siltation patterns). The PBPL may also utilise smaller, more manoeuvrable dredging plant, such as grab dredgers and bed levellers, to maintain more confined areas within the Port Limits.

1.3 Offshore Disposal

The PBPL's policy with regard to dredged material is to maximise its beneficial reuse. In general, most of the material dredged by the PBPL from within Port Limits is used in reclamation works associated with development of the port. The reuse of this dredged material provides several benefits, including:

- Reduced pressure on sea disposal sites;
- The placement of any actual or potential acid sulphate material at depth beneath the water surface; and
- The containment of any contaminated material within a designated boundary, disconnected from the marine system and monitored to ensure the immobility of identified contaminants.

In 2009, the reclamation life of the FPE area was estimated to be approximately 30 years, based on the current level of port development at that time. Following extreme flood events in both 2011 and 2013 and the subsequent disposal of additional material in the FPE area, the estimated life of the FPE area was reduced by 20 years to 10 years. Given the importance of the FPE as an area to dispose of material unsuitable for ocean disposal, there has been a shift in thinking around the management of the FPE area.

Introduction

The current proposed management of dredged material is to, where practical, dispose at sea all dredged material deemed suitable for ocean disposal. This proposed management initiative will ensure the long-term viability of the FPE area for the disposal of material deemed unsuitable for ocean disposal.

In the past, significant quantities of dredged material from the Brisbane River have been placed offshore at the MIDMPA. In recent years, only smaller volumes of dredged material from boat harbours in southern Moreton Bay were placed at the MIDMPA. However, it is proposed that the MIDMPA will be utilised for material found suitable for ocean disposal in future PBPL maintenance dredging campaigns.

1.4 Marine Communities and Environmental Values

The loading (dredging) site is located within the lower Brisbane River. The foreshore of the lower Brisbane River is in a highly modified condition, but still retains isolated patches of mangrove forest and tidal flats. The river channel is comprised of muds and sands and supports a locally important trawl fishery (BMT WBM 2008c).

The Port of Brisbane port facilities are located at the Brisbane River mouth on land reclaimed over a shallow sub-tidal river delta containing a series of low-lying mangrove islands, collectively called the Fisherman Islands. Brisbane River and adjacent waters of Moreton Bay experiences freshwater flows and ongoing inputs of sediments and contaminants derived from human activities in its catchment. Two major sewage treatment plants also have their sewage discharges within kilometres of the Port facilities (Luggage Point and Wynnum North wastewater treatment plant).

Construction of the present-day port facilities over intertidal and subtidal areas has resulted in extensive changes to the environmental character of the Fisherman Islands area. However, significant areas of mangrove, saltmarsh and seagrass have also been retained, and form part of the Fisherman Islands wetland complex on the south eastern side of the Port of Brisbane (BMT WBM 2014). Moreton Bay Marine Park is situated to the south and east of the FPE seawall. This area contains one of the largest semi-contiguous seagrass beds in western Moreton Bay. A Ramsar listed wetland (Moreton Bay Ramsar site) is situated only kilometres to the south of the port facilities, comprising intertidal portions of the Fisherman Islands wetland complex. The seagrass and mudflats of the Ramsar site are recognised for their importance to dugong, marine turtles and migratory and resident shorebirds (BMT WBM 2008a).

MIDMPA is located between Mud Island and Fisherman Islands. Mud Island is an ancient coral reef that is no longer actively accreting coral skeletons, but still contains coral communities (Johnson and Neil 1998). MIDMPA is comprised of a mix of mud and sand substrates that provide habitat for a benthic invertebrate (BMT WBM 2008b) and fish assemblages.

2 Methodology

2.1 Compliance with SAP and Guidelines

All sampling and analysis of sediments was undertaken in accordance with the NAGD (Commonwealth of Australia 2009). All sampling and analysis procedures followed the approach outlined in the sampling and analysis plan (SAP) provided in Appendix A.

2.2 Timing of Sampling

Sampling was undertaken on the 15th and between the 24th and 25th of June 2021 during daylight hours.

2.3 Sampling Locations and Sample Numbers

2.3.1 Sampling Locations

A map showing the sampling locations is provided in Figure 2-1.

Thirty-five locations were sampled with a Van Veen grab sampler in accordance with the SAP and NAGD requirements. This included 26 sample locations within the proposed dredging area (Zones 2, 3 and 4) and nine reference locations (Zone 1, MIDMPA and Moreton Bay reference sites).

As per the SAP, all samples were analysed for the a basic suite with a detailed suite analysed at selected study locations (refer to Figure 2-1 and Section 2.5).

2.3.2 Additional Field QA/QC Samples

In accordance with NAGD requirements and based on the number of sample locations, the following field and laboratory quality control samples were taken:

- Three field triplicate samples at 10% of locations to determine the small scale (measured in metres) spatial variability of the sediment physical and chemical characteristics, i.e. two additional grab samples at locations 5-1 (Zone 2), 11-9 (Zone 3) and 13-4 (Zone 4);
- Two triplicate split samples (primary sample from 5% of locations thoroughly mixed and split into three sample container sets) to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis. Split samples were obtained at location 6-2 (Zone 2) and 10-6 (Zone 3); and
- Three trip blank containers (one per sampling day) filled with inert material (e.g. chromatographic sand) to be analysed concurrent with the analysis of volatile organic substances such as BTEX and TPH C6-C9.

All samples were submitted to the primary and secondary laboratories in one batch, so no inter-batch samples were required.

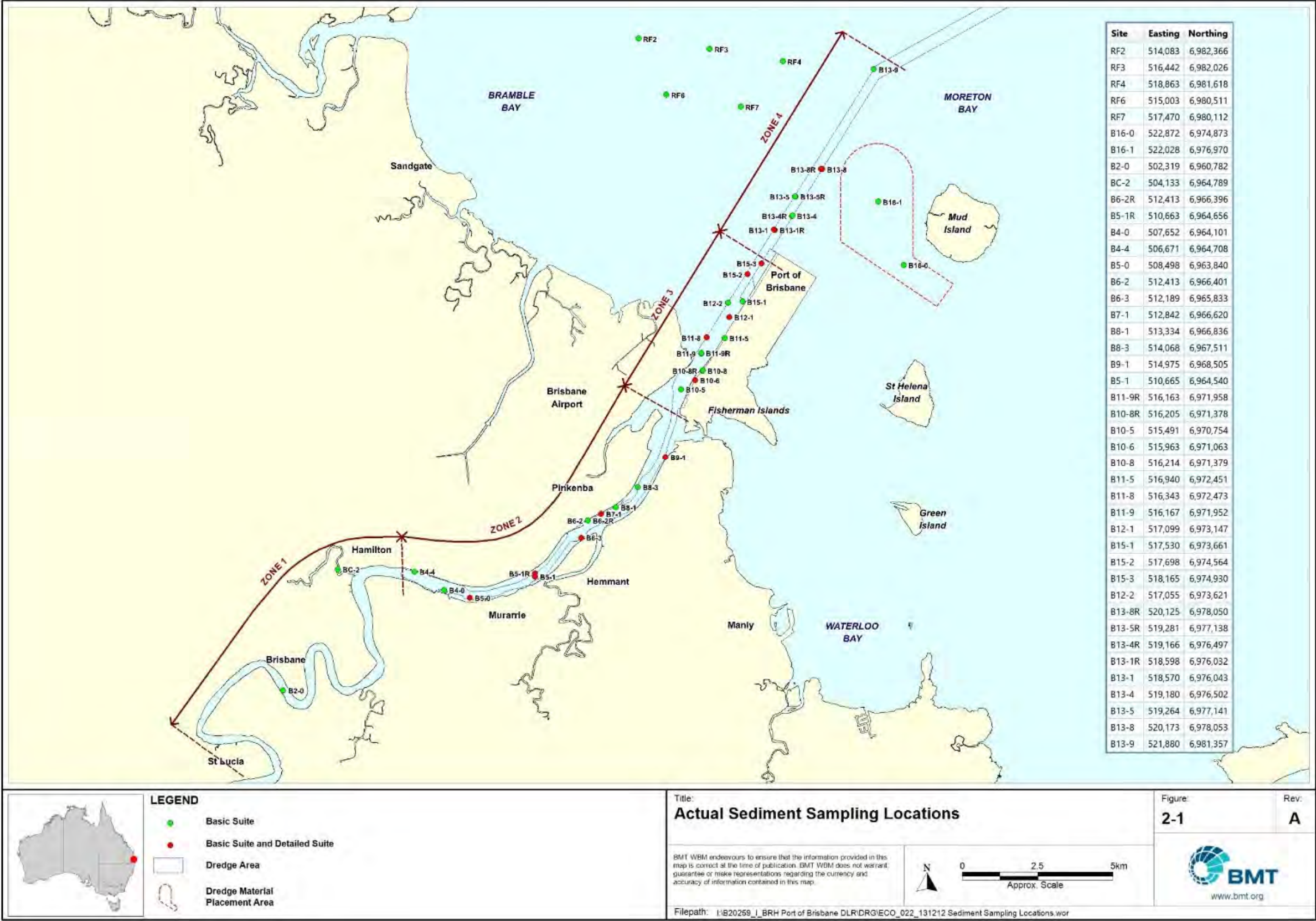


Figure 2-1 Sampling Locations

Methodology

2.3.3 Elutriate and Bioavailability Analyses

Phase III testing was undertaken for parameters which have frequently exceeded the NAGD screening levels in the past. Based on the review of historical data in the SAP this included:

- Metals and metalloids;
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

Phase III testing for metals/metalloids (and potential other metals/metalloids) was undertaken from the primary samples collected for the sediment quality assessment and based on the initial analysis results. Analysis was performed on the samples with the highest concentrations.

Bioavailability analysis for the organic contaminants (organotins and organochlorine pesticides) required porewater testing as per NAGD. Additional samples were collected for porewater testing at the locations which have historically shown the highest percentage of screening level exceedances. To meet required holding times, elutriate and bioavailability analysis for the organic contaminants was undertaken concurrent with the analysis of the primary samples.

As per the SAP, additional samples for porewater testing were obtained from five locations in Zone 2 and six locations in Zone 3.

2.4 Sample Collection and Handling

2.4.1 Survey Vessel, Sampling Equipment and Personnel

BMT's vessel "Resolution II" was used for sampling the sediments. A handheld GPS was used on the survey vessel for position fixing and navigation to each sampling location. All sediment sampling was undertaken by a team of two qualified marine scientists with experience in the implementation of sediment sampling and analysis programs.

2.4.2 Sampling Procedure

Sediment samples were collected using a stainless steel Van Veen grab sampler (0.14 m² grab). Only samples obtained with properly closed grab jaws were processed to ensure that the fine sediment fractions were retained.

In order to overcome issues with potential high variability at sampling locations, a minimum of two grabs were collected at each sampling location and pooled as one sample. An adequate number of grabs was obtained and pooled for each sample location ensuring that sufficient sediment was collected for all analyses.

2.4.3 Survey Vessel and Equipment

The vessel was thoroughly inspected and washed down prior to the beginning of sediment sampling each day. The workspace on the vessel was washed down regularly with ambient seawater to clean all surfaces and minimize the potential for dust contamination of samples. All sample processing was undertaken away from any potential contamination sources such as engine exhausts, fuels, oils, greases, lead weights, zinc anodes, antifouling paint etc.

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The grab sampler was thoroughly cleaned with De-con 90 solution prior to use and cleaned and rinsed with seawater between samples to prevent cross contamination between samples.

2.4.4 Sample Collection, Handling and Storage

Photographs of the grab samples were taken and grab samples were logged for its physical characteristics and variations in sediment type and texture (refer Appendix B). The grab samples from each location were carefully homogenized in a clean container prior to the filling of analytical laboratory-supplied clean sampling jars.

Nitrile gloves were worn by all field personnel handling the sediment, and gloves were disposed of after processing of each sample.

Sample bottles were labelled with a waterproof marker pen on the bottle label and lid. Sample bottles for organic analyses were filled with zero headspace to minimise volatilisation. A field trip blank sample container filled with clean chromatographic sand was placed with opened lid near the sample processing site while a sediment sample was completely processed.

All storage containers were chilled on ice immediately following sample collection. The samples were then transferred to BMT office in sealed eskies at the end of each sampling day. Acid Sulfate Soil samples were frozen at the end of each sampling day to minimise potential oxidation of the sediment material.

At the end of the sampling campaign, all samples were submitted to the primary and secondary analytical laboratories. All samples were submitted to the laboratories with Chain of Custody documentation (Appendices C and D).

2.5 Laboratory Analysis

As per the SAP, all samples were analysed for a basic suite with a detailed suite analysed at selected study locations (refer to Figure 2-1 and Appendix A).

2.5.1 Analytical Tests

Primary analysis of sediment samples was conducted by Australian Laboratory Services (ALS). The analysis of Particle Size Distribution was conducted by Microanalysis Australia. Symbio Laboratories was selected as the secondary (reference) laboratory for inter-laboratory quality testing.

A total of 35 locations were analysed for a basic suite of parameters. Of these, 12 locations were also analysed for a detailed list of contaminants. Furthermore, elutriate and bioavailability (porewater and dilute acid extraction) testing was undertaken at selected locations as per the SAP.

Basic List of Parameters:

- Analysis included contaminants of (potential) concern and supplementary parameters:
 - Metals/Metalloids (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn, Al, Fe);
 - Organotins (MBT, DBT, TBT);
 - Organochlorine pesticides (including DDT, DDD, DDE, chlordane);
 - Particle Size Distribution (PSD);

Methodology

- Moisture content; and
- Total Organic Carbon (TOC).

Detailed List of Parameters:

- Analysis included 'low risk' parameters that have been detected in the past but generally in concentrations below Limit of Reporting (LOR) or NAGD screening levels:
 - Polycyclic Aromatic Hydrocarbons (PAHs);
 - Total Petroleum Hydrocarbons (TPHs);
 - Polychlorinated Biphenyls (PCBs);
 - Acid Sulfate Soils;
 - Nutrients (TP, TN, NO_x, TKN); and
 - Radionuclides.

Elutriate and Bioavailability Testing:

- Metals/Metalloids;
- Organotins (TBT); and
- Organochlorine pesticides (DDT, DDD, DDE, chlordane).

2.5.2 Laboratory Quality Control

Both laboratories followed laboratory Quality Control (QC) procedures in accordance with requirements outlined in Appendix F of NAGD. This included analysis of laboratory blanks, duplicates, certified surrogate materials and spiked samples.

Validation of all laboratory QC analyses was conducted in accordance with Appendix A of NAGD to confirm suitable data quality for undertaking a rigorous characterisation of the proposed dredge material.

2.5.2.1 Laboratory Blanks

The purpose of this assessment is to monitor potential laboratory contamination of samples due to potential cross-contamination of samples during laboratory preparation, extraction or analysis. Blank sample concentrations should be at or near the LOR of the method used.

2.5.2.2 Laboratory Duplicates

This assessment refers to a randomly selected intra-laboratory split sample, which provides information regarding the method precision and sample heterogeneity. Results are presented as Relative Percent Difference (RPD) values of two sample concentrations for a specific contaminant.

NAGD recommends that duplicates should agree within a typical RPD of the method of $\pm 35\%$. This recommended RPD is typically not adopted by analytical laboratories as it does not account for the greater uncertainty for contaminant concentrations close to the method's LOR. NAGD also notes that

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RPDs may not always agree within these limits where sediments are very inhomogeneous or vary greatly in grain size.

The primary laboratory ALS uses the following approach to assess duplicate RPD's:

- Result <10 times LOR – no limit to RPD; and
- Result >10 times LOR – RPD between 0% and 50%.

The secondary laboratory Symbio follows this approach:

- Result <10 times LOR – no limit to RPD;
- Result between 10 and 20 times LOR – RPD between 0% and 50%; and
- Result >20 times LOR – RPD between 0% and 20%.

Refer to Appendices C and D for the acceptance criteria of subcontracted laboratories.

2.5.2.3 *Surrogate and Matrix Spikes*

Laboratory Control Samples are either certified reference materials or a blank sample spiked with known concentrations of the analytes of interest. The purpose of this measurement is to monitor method accuracy.

Matrix spikes refer to an intra-laboratory split sample spiked with a representative set of target analytes of known concentration. Matrix spikes are assessed to monitor potential sample matrix effects on analyte recoveries.

Surrogate spikes are used for organic analytes. Surrogates are known additions to samples which mimic the compounds of interest and are not normally expected to be present in the sample.

For both surrogate and matrix spikes, a calculation of the percent recovery of the spiked amount against the returned concentration is performed indicating analytical performance in terms of extraction efficiency.

NAGD states that recovery limits of 75% - 125% are generally acceptable. Analytical laboratories typically adopt specific surrogate and matrix spike recovery limits for the various contaminant compound groups. It is also noted that ideal recovery ranges may be waived in the event of sample matrix interference.

The primary laboratory AAA adopts the following acceptable surrogate and matrix spike recovery limits:

- Trace elements: 70-130%;
- Organic analyses: 50-150%;
- SVOC & speciated phenols: 10-140%; and
- Surrogates: 10-140%.

The secondary laboratory ALS adopts specific recovery limits for individual compounds.

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2.6 Data Analysis

2.6.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples were compared to screening levels listed in Table 2 of NAGD to determine whether the material is suitable for unconfined placement at sea or if further analyses, such as elutriate, bioavailability or toxicity testing, are required.

Specifically, mean concentrations of chemical parameters at the upper 95% confidence level (95% UCL) were compared against NAGD guideline levels. This involved the following steps.

Data pre-treatment

Analytical values below Limit of Reporting (LOR) were set to one-half of the LOR as per NAGD recommendation to facilitate 95% UCL calculation. This was only undertaken where there was greater than 30% detections within the dredge zone. Any replacement technique is a source of bias (Croghan and Egeghy 2003). Only parameters with greater than 30% detections were subject to analysis due to the high probability of bias created by the replacement technique.

Organic contaminant results were normalised to 1% TOC where the measured value is within the range of 0.2-10%. If TOC values were outside of this range, the highest (10%) or lowest (0.2%) value was adopted as appropriate. Organic parameters with concentrations below LORs were not normalised to 1% TOC but were included at half their LOR.

One assumption in the calculation of the 95% UCL is that the samples are statistically independent. Therefore, field triplicate samples and laboratory split samples were averaged for each location in the 95% UCL calculation.

Selection of appropriate 95% UCL Calculation Method

ProUCL Version 4.1.00 was used to calculate the 95% UCL (Singh *et al.* 2010). In accordance with NAGD, for normally distributed data, the arithmetic mean was calculated, and the 95% UCL was calculated using the one-tailed Student's *t* UCL test. For data that followed a log-normal distribution, the geometric mean was calculated and the 95% UCL was calculated using Chebyshev method. For data that did not follow either a normal or log-normal distribution, the 95% UCL was calculated using non-parametric techniques as per NAGD. Should 95% UCL values for all analysed parameters fall below NAGD screening levels, the sediment were considered chemically acceptable for ocean disposal.

In accordance with NAGD, ambient baseline concentrations of chemicals were determined by sampling of sediment at reference areas near the existing disposal site. The 80th percentile value was calculated from reference site data. The mean of the sediment concentrations at the dredge site was then compared with the 80th percentile of ambient baseline levels. Sediment was chemically acceptable for ocean disposal the mean concentration at the dredge site was less than or at the 80th percentile value.

If chemicals were found to be above ambient baseline levels and the screening level, they were considered a Contaminant of Potential Concern and Phase III testing was required.

Methodology

2.6.2 Elutriate and Bioavailability Testing

Elutriate and bioavailability testing was undertaken as per NAGD for a range of contaminants which have regularly exceeded screening levels in the past.

Elutriate Testing:

The elutriate test is designed to simulate release of contaminants from sediment during dredged material disposal. Testing was carried out using the USEPA's standard seawater elutriate test which involves shaking the sediment samples with four times the volume of seawater at room temperature for 30 minutes. The sample was allowed to settle for one hour and the supernatant was centrifuged or filtered (0.45 µm) within 60 minutes and analysed using analytical methods appropriate for determining ultra-trace levels in seawater.

Results were compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Bioavailability Testing:

The Dilute Acid Extraction (DAE) method was used to provide an estimate of the bioavailable fraction of metals/metalloids. The sediment samples were extracted using a weak acid and result compared against the respective NAGD screening levels.

For organic contaminants, analysis of pore water is the recommended bioavailability test as per NAGD. Porewater is assumed to represent the major route of exposure to sediment contaminants by benthic organisms. Porewater results were compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Should both elutriate and bioavailability tests result in values less than the respective guideline limits, the material would be considered clean and suitable for ocean disposal.

2.6.3 Acid Sulfate Soils

The results of the chromium-suite acid sulfate analysis were assessed against the Australian framework for Acid Sulfate Soil management in coastal systems (Ahern *et al.* 1998). The risk of acidification was determined by the acid-base accounting approach (Ahern *et al.* 2004). Net acidity was calculated from the results as a measure of the acid producing capacity of the sampled sediment upon complete oxidation.

The calculated net acidity was then compared to the QASSIT action criteria of 0.03% S or 18 mol H⁺/tonne to assess the need for acid sulfate soil management if the dredged sediments were to be placed on land. The liming rate indicates the amount of lime that needs to be added to the soil to manage its acid generating capacity.

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3 Results

Sediment logs of the sampled sediments are shown in Appendix B. Detailed laboratory results are provided in Appendices C and D for the primary and secondary laboratory, respectively.

3.1 Physical Sediment Characteristics

Table 3-1 presents sediment grain particle size distribution (PSD) results for each location.

Zone 2

Results were broadly consistent with previous years. The average sand content was 28% in 2020 and 20% in 2021. All sites had >50% of fine material (silts and clays). Gravel was present in small proportions, typically less than 3%.

Zone 3 and 4

The physical properties of sediments in Zones 3 and 4 were spatially variable but generally dominated by fines fractions (average Zone 3 = 57%, Zone 4 = 60%). These zones had a higher proportion of sand than Zone 2, with an average of 41% and 38% in Zones 3 and 4, respectively. These patterns were consistent with previous survey results.

MIDMPA and Reference/Background

The MIDMPA had a moderate sand fraction (35-53%), similar to previous years. Moreton Bay reference sites were characterised by a high proportion of fine sediment (83% on average). This was consistent with results from 2020 (76%), 2019 (85%), 2018 (89%), 2017 (84%), 2016 (90%), 2015 (85%), 2014 (86%) and 2013 (89%).

Results

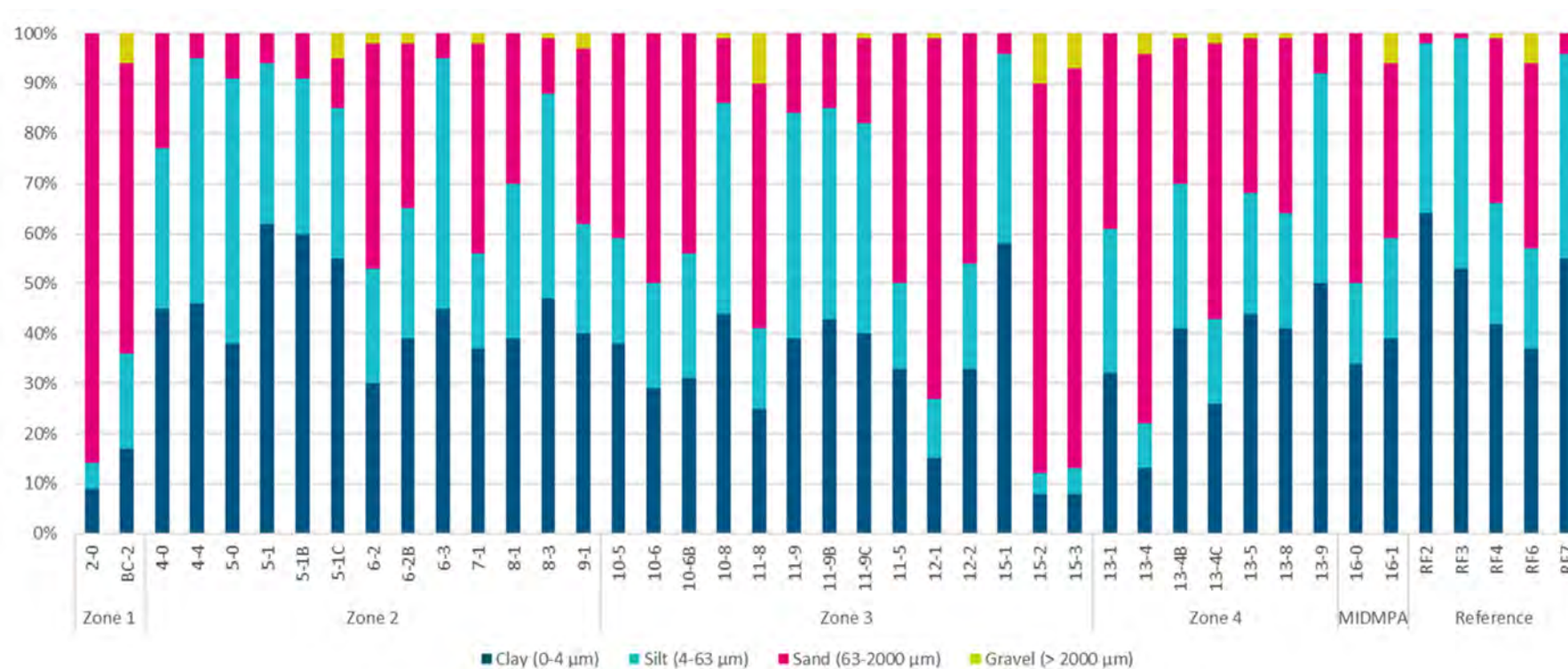


Figure 3-1 Sediment Particle Size Distribution Analysis – 2021

Results

3.2 Analytical Results

3.2.1 Metals and Metalloids

3.2.1.1 Bulk Sediment

Results for metal and metalloids are presented in Table 3-1. Consistent with previous survey results, cadmium and silver had concentrations less than the LOR (0.1 mg/kg) in several samples from zones 2, 3 and 4. All other metals and metalloids were detected in 100% of samples from zones 2, 3 and 4.

Concentrations of most metals and metalloids within individual locations or dredged areas were generally below NAGD screening levels across the study area, except nickel. The trace metal and metalloid concentrations recorded at reference locations followed similar trends to those at the dredge sites and were also consistent with trends observed in previous surveys.

Nickel

While nickel concentrations exceeded the screening level in individual samples, the 95% UCL of the mean for nickel was 20 mg/kg within the dredged areas (zones 2, 3 and 4 pooled), which was just below the NAGD screening level of 21 mg/kg. This is consistent with previous surveys, whereby concentrations have tended to decline between 2013-2018 and have stabilised in 2019-2021 (Figure 3-2).

At the dredge zone level, the 95% UCL concentration for nickel exceeded the NAGD screening level by 0.4 mg/kg at Zone 3 (21.4 mg/kg) while zones 2 and 4 had concentrations just below the screening level (20.6 mg/kg and 20.7 mg/kg, respectively). In accordance with NAGD, nickel concentrations at the dredge site were compared to reference sites. The 80th percentile nickel concentration at the reference sites was 25.7 mg/kg, compared to the dredge site 95% UCL of 20 mg/kg and the median value of 18 mg/kg. On this basis, sediments were considered suitable for ocean disposal in accordance with NAGD. While not required under NAGD, Phase III testing was conservatively undertaken to assess nickel bioavailability.

3.2.1.2 Bioavailability Testing

Of the samples analysed, there were no samples that reported a concentration of nickel above the NADG (2006) screening level and ANZG (2018) guideline value (Table 3-2). These results indicate that the bioavailable proportion of nickel is unlikely to result in adverse ecological impacts.

3.2.2 Nutrients and Carbon Content

Results for nutrients and total organic carbon (TOC) content of marine sediment samples are presented in Table 3-1. No screening values exist for TOC and nutrients in sediments within NAGD (2009).

Nutrient levels were sampled at 12 sites across zones 2, 3 and 4. Inorganic nitrogen (NO^x) was either below the laboratory LOR or were recorded at low concentrations. Levels above the LOR ranged from 0.1 to 0.6 mg/kg. Results for Total Nitrogen (TN) and Total Kjeldahl Nitrogen (TKN) concentrations across the dredge zones ranged from 180 and 2300 mg/kg, and the 95% UCL

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concentration was 1301 mg/kg. Total Phosphorus (TP) concentrations ranged from 183 to 929 mg/kg, with a 95% UCL concentration of 696 mg/kg. These results were similar to previous sampling events (BMT, 2020, 2019, 2018).

Total organic carbon content ranged between 0.17 and 1.74% across the dredge zones. The TOC 95% UCL for dredge zones was 1.14%, which was significantly lower than the reference sites (4.34%). The higher TOC was associated with BC-2 (7.29%), while samples from Moreton Bay and Mud Island had similar TOC concentrations to the dredge zones (ranging between 0.21 and 1.67%). TOC concentrations within the present survey were consistent with previous surveys (BMT 2014-2020).

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Table 3-1 Summary statistics and 95% UCLs for combined locations in Zones 2, 3, and 4 – trace metals/metalloids and nutrients (mg/L). Values highlighted in orange indicate exceedance of NAGD screening level

Parameter	LOR (mg/kg)	# Detects (%)	Screening Level	Statistical Distribution	95% UCL	Min	Max	Mean	Geometric Average
Moisture Content	1	34 (100%)	n/a	Normal	55	26	68	51	49
Aluminium	50	34 (100%)	n/a	Normal	11843	4100	20200	10570	9844
Arsenic	1	34 (100%)	20	Normal	8	5	10	7	7
Cadmium	0.1	2 (5%)	1.5	NC2	NC2	<0.1	0.3	0.3	0.3
Chromium	1	34 (100%)	80	Normal	29	13	43	27	26
Copper	1	34 (100%)	65	Normal	25	5	43	22	19
Iron	50	34 (100%)	n/a	Normal	29889	12300	47100	27153	25845
Lead	1	34 (100%)	50	Normal	18	5	30	15	14
Mercury	0.01	28 (100%)	0.15	Normal	0.08	0.01	0.12	0.07	0.06
Nickel	1	34 (100%)	21	Lognormal	20	9	40	18	17
Silver	0.1	15 (57%)	1	Non-Parametric	0.2	<0.1	0.3	0.1	0.1
Zinc	1	34 (100%)	200	Normal	91	30	145	80	73
Total Organic Carbon	0.02	34 (100%)	n/a	Normal	1.14	0.17	1.74	0.99	0.86
Total Kjeldahl Nitrogen	20	14 (100%)	n/a	Non-Parametric	1301	180	2300	966	768
Total Nitrogen	20	14 (100%)	n/a	Non-Parametric	1301	180	2300	966	768
Total Phosphorus	2	14 (100%)	n/a	Non-Parametric	676	183	929	545	491

Blue shading = parameter not detected; Yellow shading = UCL95% > screening level; ND = No Data, NC1 = not calculated due to no detections; NC2 = not calculated due to >30% of values being non-detects (applicable only to parameters with screening levels); n/a = no NAGD screening level

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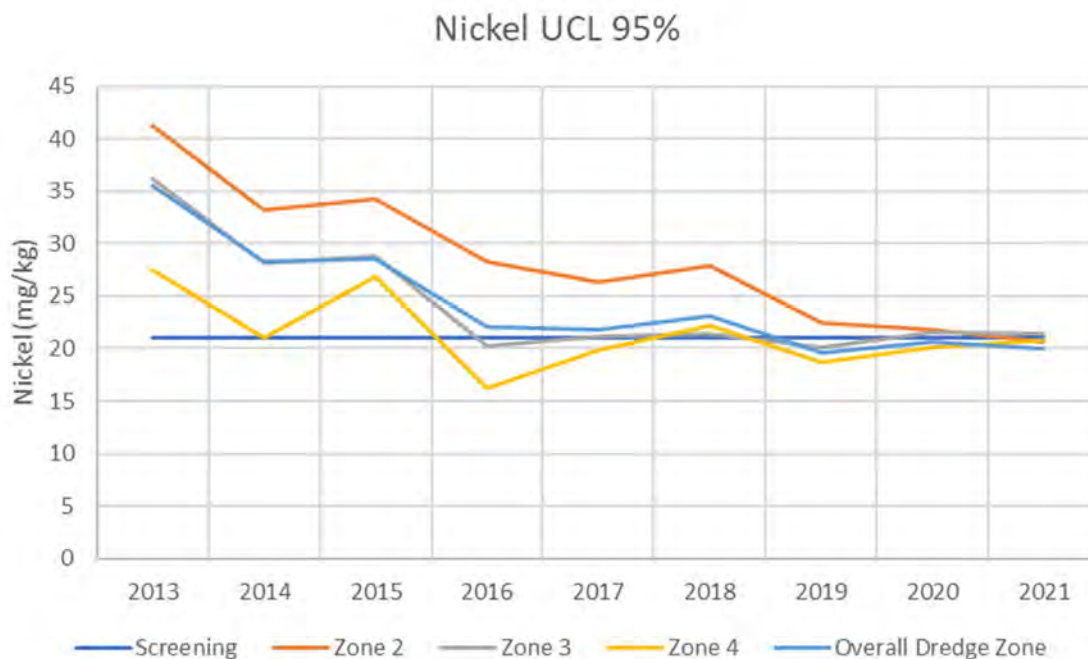


Figure 3-2 UCL 95% Nickel (mg/kg) in each dredge zone from 2013 to 2021

Table 3-2 Nickel Bioavailability Results - 2021

Zone	Sample	Bulk Sediment (mg/kg)	Nickel DAE (mg/kg)	Elutriate (µg/L)
Guideline Value		21*		7**
4	B13-9	21.3	5.6	0.6
3	B15-1	40.3	9.8	0.6
3	B10-8	21.4	6.6	0.8
2	B5-1	22.8	11.4	1.2
2	B9-1	22.4	5.5	<0.5
2	B6-3	21.1	7.2	1.5
2	B4-4	22.5	7.4	1.7

Yellow shading – sample exceeds NADG (2006) screening level; NM = not measured (concentration in bulk sediment less than screening level). * NAGD Screening Level; ** ANZG (2018) water quality guideline value (99% species protection)

3.2.3 Organotins

Monobutyltin (MBT), Dibutyltin (DBT) and Tributyltin (TBT) were analysed in all samples and the results are presented in Table 3-3. DBT and TBT was detected in zones 2 and 3, but at concentrations below the screening level of 9 µg Sn/kg. A very high TBT concentration was recorded in sample B4-0 (110 µg Sn/kg). As shown in Figure 3-3, this sample was an outlier and was therefore removed

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from the data set. Due to the low number of sample detections (9% of samples), the overall 95% UCL could not be reliably calculated¹. All reference locations recorded concentrations below the LOC for all three analytes.

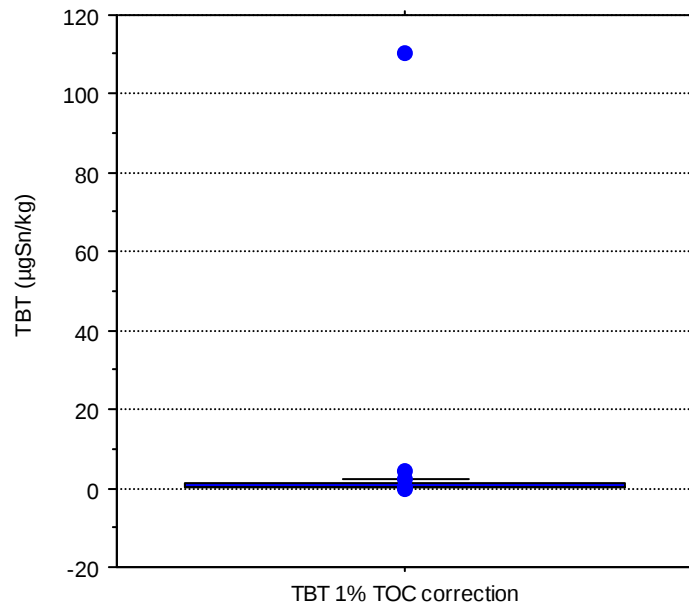


Figure 3-3 Box plot of TBT ($\mu\text{g Sn/kg}$) corrected to 1% TOC showing outlier values (blue point)

3.2.4 Total Petroleum Hydrocarbons (TPHs)

Detectable concentrations of TPHs within the C10-C14, C15-C28 and C29-C36 carbon fractions were recorded at most locations in the dredge zones. TPH fraction C6-C9 was below the LOR in all samples. The 95% UCL for total TPHs in the dredge zones was 108 (normalised to 1% TOC), which was below the NAGD screening level of 550 mg/kg (Table 3-3). These results are consistent with previous surveys undertaken by BMT.

3.2.5 Polyaromatic Hydrocarbons (PAHs)

PAHs were analysed in twelve samples across the dredge zones and detectable concentrations were recorded in all samples. Total PAHs concentrations (corrected to 1% TOC) ranged from 45 to 1535.7 $\mu\text{g/kg}$, well below the NAGD screening level of 10,000 $\mu\text{g/kg}$ in all samples. The 95% UCL for total PAHs across all dredge zones was 761 $\mu\text{g/kg}$, which was higher than 2020 (493.1 $\mu\text{g/kg}$) but within the range previously recorded (2017 – 524 $\mu\text{g/kg}$ and 2019 – 1261 $\mu\text{g/kg}$).

3.2.6 Organochlorine Pesticides (OCPs)

DDD (B15-1) and DDE (B7-1) were only detected in one sample, and where detected, only DDE exceeded the screening level. It is therefore not meaningful to calculate the 95% UCL or to undertake

¹ the derived overall 95% UCL for TBT in dredge zones was 1.3 $\mu\text{g Sn/kg}$. While this was calculated in accordance with the process is NAGD, from a statistical perspective it is considered to have low reliability due to large numbers of non detects

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Phase III analysis. Nonetheless, porewater analysis was undertaken on OCPs, and all samples had concentrations less than the laboratory detection limit ($<0.01 \mu\text{g/L}$).

There were no detections of any other OCPs.

3.2.7 Polychlorinated Biphenyls (PCBs)

All analyses for PCB compounds recorded concentrations below the detection limits.

3.2.8 Radionuclides

Gross alpha and gross beta activity ranged between <0.5 (LOR) to 1.07 Bq/kg dry weight and <0.5 (LOR) to 0.6 Bq/kg dry weight respectively. These values were similar to 2020 and within the range recorded in previous years.

Therefore, the NAGD screening level for the sum of gross alpha and beta (35 Bq/g) was not exceeded in any samples, and on this basis sediments within the dredge zones, are considered suitable for ocean disposal as per the NAGD guidelines with respect to radionuclides.

3.2.9 Acid Sulfate Soils

Acid sulfate soil test results are presented in Table 3-4. All samples recorded pH potassium chloride (pH KCl) values ranging from 8.2 to 9.4 (alkaline), indicating there was no existing acidity. Furthermore, all samples had sulfidic titratable actual acidity (sTAA) values less than the LOR ($<0.02\% \text{S}$).

All samples recorded Scr values above the LOR, in the range of 0.042 to $0.49 \text{ \%S}$, indicating a low to moderate presence of inorganic potential acidity in these samples.

Results of acid neutralising capacity (ANC) ranged from 2.03 to $25.2\% \text{ CaCO}_3$. The mean ANC in the current survey is $5.7\% \text{ CaCO}_3$ which indicate that sediments have a high capacity to self-neutralise if exposed to oxygen. Net acidity (excluding ANC) ranged from 0.04 to $0.49 \text{ \%S}$, relating directly to the potential acidity as no actual acidity was recorded. The inclusion of ANC significantly reduces net acidity with all samples recording a net acidity value less than the LOR ($<0.02\% \text{ S}$).

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Table 3-3 Summary Statistics and 95% UCLs (µg/kg) for Combined Locations in Zones 2, 3 and 4 - Organic Compounds (Normalised to 1% TOC). Values Highlighted in Orange Indicate Exceedance of NAGD Screening Levels

Parameter		LOR	No. Detects	Screening Level	Distribution	95% UCL	Min	Max	Mean	Geometric Average
<i>Organochlorine Pesticides (OPC)</i>	Aldrin	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	alpha-BHC	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	beta-BHC	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	gamma-BHC (Lindane)	0.25	0 (0%)	0.32	NC1	NC1	NC1	NC1	NC1	NC1
	delta-BHC	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	cis-Chlordane	0.5	0 (0%)	0.5	NC1	NC1	NC1	NC1	NC1	NC1
	trans-Chlordane	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	p-p'-DDD	0.5	1 (3%)	2	NC2	NC2	<0.5	4.2	4.2	4.2
	p-p'-DDE	0.5	1 (3%)	2.2	NC2	NC2	<0.5	0.9	0.9	0.9
	p-p'-DDT	0.5	0 (0%)	1.6	NC1	NC1	NC1	NC1	NC1	NC1
	Dieldrin	0.5	0 (0%)	280	NC1	NC1	NC1	NC1	NC1	NC1
	alpha-Endosulfan	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	beta-Endosulfan	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Endosulfan Sulphate	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Endrin	0.5	0 (0%)	10	NC1	NC1	NC1	NC1	NC1	NC1
	Endrin ketone	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Endrin aldehyde	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Heptachlor	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Heptachlor epoxide	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Hexachlorobenzene	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Methoxychlor	0.5	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
<i>Organotin compounds</i>	Monobutyltin as Sn	1	0 (0%)	n/a	NC1	NC1	NC1	NC1	NC1	NC1
	Dibutyltin as Sn	1	7 (21%)	n/a	NC2	NC2	<1	10	3	2
	Tributyltin as Sn	0.5	9 (9%)	9	NC2	NC2	<0.5	3.8*	0.68**	0.43**

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Parameter		LOR	No. Detects	Screening Level	Distribution	95% UCL	Min	Max	Mean	Geometric Average
<i>Total Petrol Hydrocarbons (TPH)</i>	TPH C10 - C14	3	11 (32%)	n/a	Normal	7	<3	9	6	6
	TPH C15 - C28	3	12 (35%)	n/a	Normal	49	<3	72	37	29
	TPH C29 - C36	5	11 (32%)	n/a	Normal	56	<5	78	41	32
	Total TPH	n/a	12 (35%)	550	Normal	108	<3	156	78	51
<i>Polynuclear Aromatic Hydrocarbons (PAHs)</i>	Naphthalene	5	10 (71%)	n/a	Normal	13	<5	15	11	10
	2-Methylnaphthalene	5	5 (36%)	n/a	Normal	10	<5	15	7	5
	Acenaphthylene	4	11 (79%)	n/a	Normal	15	<4	28	12	11
	Acenaphthene	4	1 (7%)	n/a	NC2	NC2	<4	4	4	4
	Fluorene	4	5 (36%)	n/a	Normal	7	<4	12	5	4
	Phenanthrene	4	10 (71%)	n/a	Normal	21	<4	38	16	13
	Anthracene	4	10 (71%)	n/a	Normal	12	<4	18	10	9
	Fluoranthene	4	14 (100%)	n/a	Lognormal	68	4	127	46	39
	Pyrene	4	14 (100%)	n/a	Lognormal	79	4	145	52	45
	Benz(a)anthracene	4	12 (86%)	n/a	Lognormal	57	<4	120	33	25
	Chrysene	4	12 (86%)	n/a	Lognormal	46	<4	90	28	23
	Indeno(1-2-3-cd)pyrene	4	12 (86%)	n/a	Lognormal	54	<4	101	31	26
	Dibenz(a-h)anthracene	4	9 (64%)	n/a	Lognormal	13	<4	35	8	6
	Benzo(g-h-i)perylene	4	12 (86%)	n/a	Lognormal	56	<4	124	34	26
	Coronene	5	10 (71%)	n/a	Normal	12	<5	21	9	8
	Benzo(e)pyrene	4	12 (86%)	n/a	Lognormal	50	<4	107	31	25
	Perylene	4	13 (93%)	n/a	Lognormal	341	<4	628	113	63
	Total PAHs (as above)	4	14 (100%)	10000	Normal	761	45	1521	519	360

Blue shading = parameter not detected; Yellow shading = UCL95% > screening level; ND = No Data, NC1 = not calculated due to no detections; NC2 = not calculated due to >30% of values being non-detects (applicable only to parameters with screening levels); n/a = no NAGD screening level, # detects is determined with original data with sub samples from dredged zones, while UCL is calculated with aggregated sub samples, * calculated excluding outlier sample, ** outlier sample excluded from analysis

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Table 3-4 Acid Sulfate Soil Results (Chromium Suite and SPOCAS)

Parameter	Units	QPL	Zone 2							Zone 3						Zone 4
			B5-0	B5-1	B5-1B	B5-1C	B7-1	B9-1	B6-3	B15-3	B15-2	B12-1	B10-6	B10-6B	B11-8	B13-8
Actual Acidity																
pH KCl	pH Unit	0.1	8.3	8.3	8.2	8.3	8.6	8.6	8.3	9.4	9.4	9.2	8.7	8.7	9	8.8
Titratable Actual Acidity	mole H+ / t	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
sulfidic - Titratable Actual Acidity	% pyrite S	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	<0.02
Potential Acidity																
Chromium Reducible Sulfur	% S	0.005	0.345	0.344	0.495	0.297	0.293	0.208	0.289	0.043	0.042	0.047	0.289	0.274	0.198	0.15
acidity - Chromium Reducible Sulfur)	mole H+ / t	10	215	214	308	185	183	130	180	27	26	29	180	171	124	93
Acid Neutralising Capacity																
Acid Neutralising Capacity	% CaCO3	0.01	2.03	2.61	2.08	4.16	4.05	3.87	3.09	8.06	10.2	2.69	3.5	3.72	25.2	5.35
acidity - Acid Neutralising Capacity)	mole H+ / t	10	406	522	415	832	810	773	617	1610	2040	537	699	744	5030	1070
sulfidic - Acid Neutralising Capacity	% pyrite S	0.01	0.65	0.84	0.66	1.33	1.3	1.24	0.99	2.58	3.27	0.86	1.12	1.19	8.06	1.71
Acid Base Accounting																
ANC Fineness Factor		0.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Net Acidity (acidity units)	mole H+ / t	10	<10	<10	32	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Liming Rate	kg CaCO3/t	1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Net Acidity excluding ANC (sulfur units)	% S	0.02	0.34	0.34	0.49	0.3	0.29	0.21	0.29	0.04	0.04	0.05	0.29	0.27	0.2	0.15
Net Acidity excluding ANC (acidity units)	mole H+ / t	10	215	214	308	185	183	130	180	27	26	29	180	171	124	93
Liming Rate excluding ANC	kg CaCO3/t	1	16	16	23	14	14	10	14	2	2	2	14	13	9	7

4 Data Validation

4.1 Laboratory QA/QC

Details of the laboratory QA/QC for the primary and secondary laboratories is provided in the following sections. Refer to Section 2.5.2 for a description of laboratory QA/QC procedures.

4.1.1 Limits of Reporting (LORs)

LOR was raised for PCB compounds in B13-8 due to high amount of moisture present within the sample. LORs for all other parameters were below the NAGD (2006) screening levels.

4.1.2 Sample Holding Times and Storage Conditions

All samples were received by the laboratories in appropriately pre-treated and preserved containers. Samples were chilled with ice whilst in the field and during delivery (ice packs). Laboratory holding times were breached OPC compounds in samples B13-8 and B4-0 due to internal laboratory issues.

4.1.3 Laboratory Blanks

Results indicated that the laboratory blank assessment was within the acceptable criteria.

4.1.4 Laboratory Duplicates

Results indicate that the laboratory duplicate assessment was within the acceptable criteria.

4.1.5 Surrogate and Matrix Spikes

The assessment of surrogate and matrix spike recoveries was satisfactory for all samples. The exception was matrix spike recovery for MBT in sample RF6 due to matrix interference and TP in sample B15-3 due to sample heterogeneity.

4.2 Field QA/QC

4.2.1 Field Trip Blank

No volatile Total Petroleum Hydrocarbons (TPH C6-C9) were detected in any trip blank samples, indicating that samples were not contaminated with volatile organic carbons during field sampling and processing of samples.

4.2.2 Field Triplicates and Splits

Analyses of field triplicate and field triplicate splits were within the $\pm 50\%$ NAGD criterion for RSDs or RPDs for most samples. The exceptions to this were:

- Silver at location B5-1,
- TOC at location B13-4,
- The PAH perylene at location B5-1 and most PAH compounds at location B10-C (difference associated with primary and secondary laboratory samples rather than the two primary samples), and

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- NOx at location B10-C.

4.3 Summary of Data Validation

Results from the present study indicated that the survey was undertaken to a high standard providing scientific confidence that the presented results are valid to allow an assessment of sediment quality against the NAGD guidelines.

References

5 References

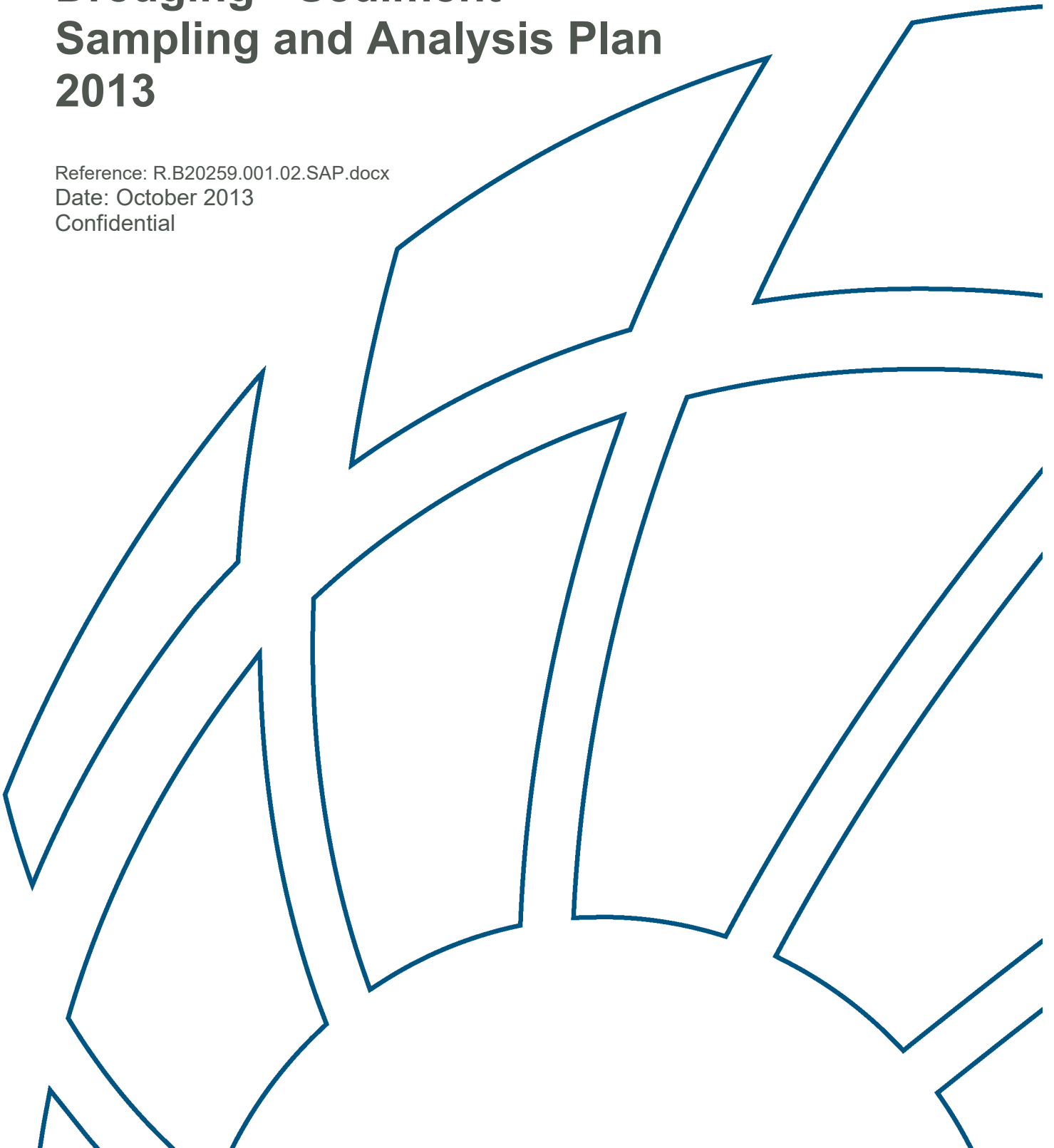
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Appendix A Sampling and Analysis Plan



Port of Brisbane Maintenance Dredging - Sediment Sampling and Analysis Plan 2013

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Port of Brisbane Maintenance Dredging - Sediment Sampling and Analysis Plan 2013

Prepared for: Port of Brisbane Pty Ltd

Prepared by: BMT WBM Pty Ltd (Member of the BMT group of companies)

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Introduction

1 Introduction

Port of Brisbane Pty Ltd (PBPL) is required to maintain a minimum depth of clearance below the keel of vessels calling at the port to allow for effective shipping access to the port and ensure ship safety. Channel depths are declared by the Harbour Master (Maritime Safety Queensland) and displayed on various shipping charts. PBPL undertakes an annual maintenance dredging program to ensure these minimum depths are maintained.

PBPL propose to undertake its annual maintenance dredging within the navigational areas of the Brisbane River and Moreton Bay, primarily using the Trailer Suction Hopper Dredge (TSHD) 'Brisbane'. Maintenance dredging works extend from the Hamilton Reach of the Brisbane River to the North West Channel located in northern Moreton Bay.

PBPL aims to ensure that all dredging activities, including extraction and placement of material, are undertaken in accordance with existing legislation and with minimal environmental harm. A key component of achieving this aim is to undertake a contaminant assessment of the material proposed for dredging prior to the commencement of the dredging program.

1.1 Sediment Sampling and Analysis Plan (SAP) Objectives

The aim of this SAP is to provide a set of procedures that will allow a statistically valid evaluation of the physical and chemical sediment properties of the sediments to be dredged. The results of this assessment will assist in determining the likely impacts of unconfined offshore disposal of the dredged sediment.

The assessment of physico-chemical sediment properties will be undertaken on the basis of the approach set out in the National Assessment Guidelines for Dredging (Commonwealth of Australia 2009; henceforth NAGD).

The specific SAP objectives are to:

- Provide a summary of proposed dredging and disposal operations for the project;
- Identify a list of contaminants based on a review of existing data and potential contaminant sources;
- Determine the number of samples required to provide an adequate characterisation of the physical and chemical sediment properties;
- Develop procedures for adequate field collection and handling of sediment samples;
- Outline adequate quality assurance and quality control (QA/QC) procedures for field sampling and laboratory analysis;
- Provide a description of statistical procedures used to determine the contaminant status of the dredged material;
- Describe procedures for validating the analytical data to assess whether the sample collection, handling and laboratory analysis was undertaken to a standard allowing assessment of sediment quality against the NAGD guidelines; and

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- Outline the proposed reporting framework for the sediment quality results that will address the requirements of the Determining Authority.

1.2 Proposed Dredging

PBPL's area of responsibility in relation to maintenance and capital dredging within port limits can be broadly divided into two zones on the basis of the water body type, navigable depths and nature of dredged material:

- Moreton Bay zone (enclosed/open coastal waters); and
- Brisbane River zone including the Port of Brisbane (middle/lower estuary).

This SAP only considers assessment of sediments for the Brisbane River zone. The Brisbane River zone extends from Hamilton Reach to the Outer Bar Cutting. Annual maintenance dredging is required to remove sediments accumulated by natural siltation processes within the catchment and sediment loads from residential and commercial developments.

To ensure that declared depths of navigational channels are maintained at all times, PBPL undertakes 'insurance' dredging of up to -0.5 metres below the declared depth.

On average, PBPL dredges about 400,000 m³ to 450,000 m³ of material each year. Additional dredging needs to be undertaken following major flood events, i.e. in 2011 and 2013.

The Brisbane River zone is divided into different dredging subareas based on existing contaminant data (Figure 2-1), comprising Zone 2, Zone 3 and Zone 4. It is noted that Zone 1 is not part of the annual dredging and samples from this zone have been used to collect control samples upstream of the actual dredging areas.

The following average dredge volumes apply to the dredge subareas (Table 1-1):

Table 1-1 Approximate Maintenance Dredge Volumes

Dredging Subarea	Extents	Average Dredge Volume (m ³)
Zone 2	Colmslie to Pinkenba	150,000
Zone 3	Within port reaches	250,000
Zone 4	Moreton Bay entrance channel	30,000

The maintenance dredging program is structured to maximise efficiencies and utilisation of PBPL's largest dredger, the trailing suction hopper dredge *TSHD Brisbane*. The *TSHD Brisbane* typically carries out the majority of the ports maintenance dredging over a two month period between January and May (actual period varies depending on other commitments of the *TSHD Brisbane* and siltation patterns). The PBPL may also utilise smaller, more manoeuvrable dredging plant, such as grab dredgers and bed levellers, to maintain more confined areas within the Port Limits.

1.3 Offshore Disposal

The PBPL's policy with regard to dredged material is to maximise its beneficial reuse. In general, most of the material dredged by the PBPL from within Port Limits is used in reclamation works

Introduction

associated with development of the port. The reuse of this dredged material provides several benefits, including:

- Reduced pressure on sea disposal sites;
- The placement of any actual or potential acid sulphate material at depth beneath the water surface; and
- The containment of any contaminated material within a designated boundary, disconnected from the marine system and monitored to ensure the immobility of identified contaminants.

In 2009, the reclamation life of the Future Port Expansion (FPE) area was estimated to be approximately 30 years, based on the current level of port development at that time. Following extreme flood events in both 2011 and 2013 and the subsequent disposal of additional material in the FPE area, the estimated life of the FPE area was reduced by 20 years to 10 years. Given the importance of the FPE as an area to dispose of material unsuitable for ocean disposal, there has been a shift in thinking around the management of the FPE area.

The current proposed management of dredged material is to, where practical, dispose at sea all dredged material deemed suitable for ocean disposal. This proposed management initiative will ensure the long term viability of the FPE area for the disposal of material deemed unsuitable for ocean disposal.

In the past, significant quantities of dredged material from the Brisbane River have been placed offshore at the Mud Island Dredge Material Placement Area (DMPA) (Figure 2-1). In recent years only smaller volumes of dredged material from boat harbours in southern Moreton Bay were placed at the Mud Island DMPA. However, it is proposed that the Mud Island DMPA will be utilised for material found suitable for ocean disposal in future PBPL maintenance dredging campaigns.

2 Review of Existing Information

Prior to each annual maintenance dredging campaign, PBPL undertook assessments of sediment quality at 45 sampling locations within the dredging zones 2 to 4 (Figure 2-1).

Additional samples were obtained from three locations in Zone 1 and Breakfast Creek upstream of the dredging area in order to assess potential sediment quality impacts from the upstream catchment. The sediment quality results for the annual sampling program between 2000 and 2013 are summarised in Section 2.1.

Due to major flooding in the Brisbane River catchment in early January 2011 and late January 2013, emergency dredging was required to maintain declared depths. Twelve to twenty locations were sampled within the port and three to four locations within the Mud Island DMPA for the 2011 and 2013 flood sampling campaigns, respectively. The sediment quality assessments included elutriate and bioavailability analyses for selected trace metals and organic contaminants.

Additionally, a comparison of sediment quality (organochlorine pesticides and dioxins) at 14 sampling locations at the Mud Island DMPA and seven reference sites in Moreton Bay (Sites RF1 to RF7 in Figure 2-1) was undertaken in 2013 to assess if the emergency dredging and disposal activities impacted on sediment and water quality in Moreton Bay. The sediment quality results for the 2011 and 2013 flood sampling are summarised in Section 2.2.

Conclusions based on the review of the annual and flood sampling data are provided in Section 2.3.

2.1 Annual Sediment Quality Data 2000 – 2013

Detailed sediment quality studies have been undertaken within the Port of Brisbane since 1998. This review considers sediment quality data collected between 2000 and 2012. This comprises the studies detailed in Table 2-1.

In addition to the routine monitoring documented in Table 2-1, further sampling was carried in 2011 and 2013 (Worley Parsons 2011b, 2013b, 2013c, 2013d) to assess the effects of floods on sediment quality. Refer to Section 2.2 for a description of these studies.

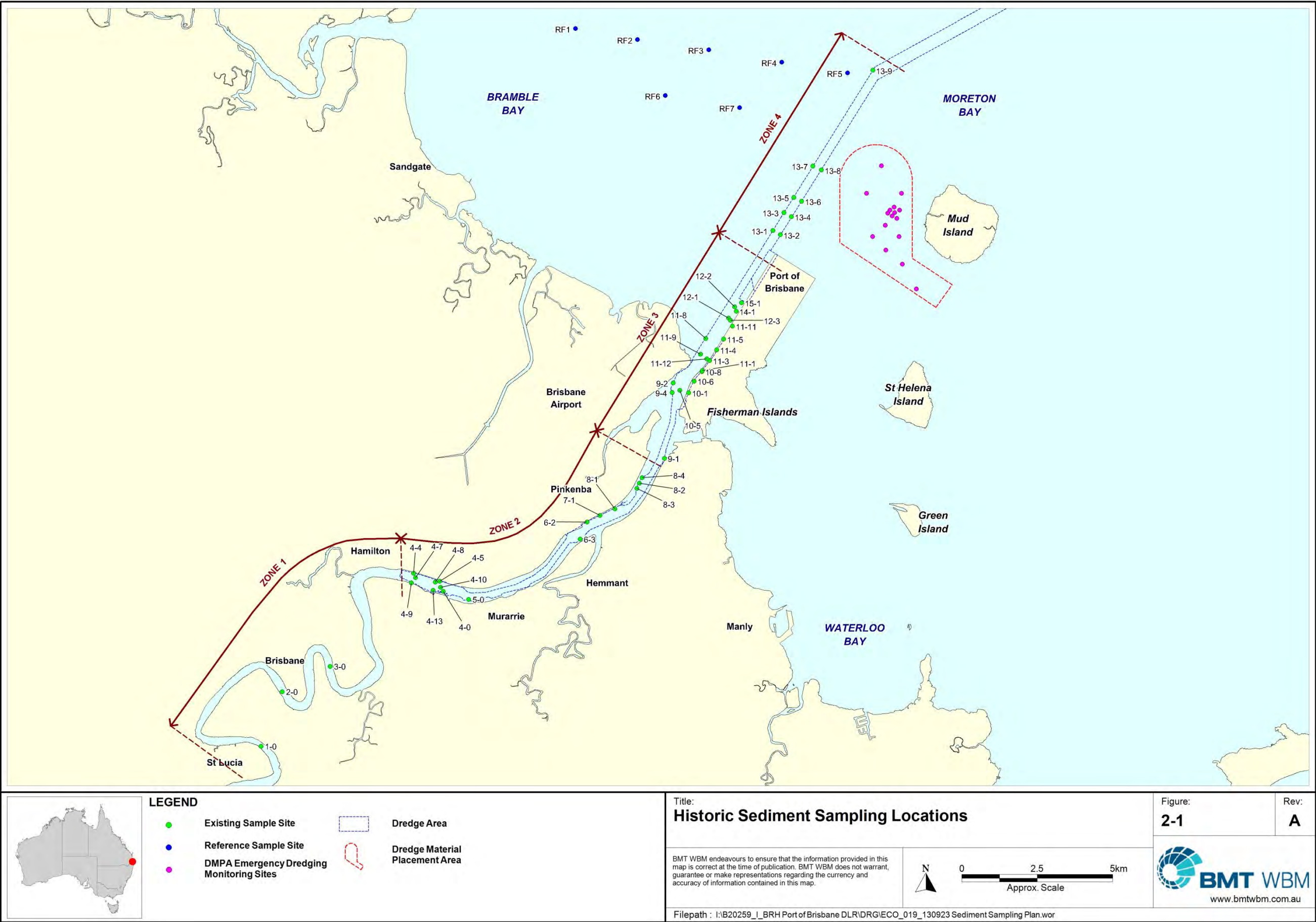
Table 2-1 Previous Routine Annual Sediment Quality Studies

Reference	Sampling Date
Maunsell McIntyre (2001)	November 2000
Butler Partners (2002)	November 2001
Hydrobiology (2003)	November 2002
Hydrobiology (2004)	November 2003
SKM (2005)	November 2004
SKM (2006)	January 2006
SKM (2007)	February 2007
Worley Parsons (2008)	January 2008
Worley Parsons (2009)	February 2009
GHD (2010)	January 2010
Worley Parsons (2011a)	December 2010
Worley Parsons (2012)	December 2011
Worley Parsons (2013a)	December 2012

A wide range of analytical parameters have been measured between 2000 and 2012 as summarised in Table 2-2. Analysis was undertaken at a total of 45 locations within the dredge areas. Additional samples were collected from three control locations upstream of the dredging areas as well as from Breakfast Creek (these locations are not within the dredge areas).

Table 2-2 Summary of Sediment Quality Data 2000 - 2012

Analytical Parameter	Measurement Events
Inorganics	
Metals & Metalloids	2000-2012
Organics	
Organotins	2000-2012
Total Petroleum Hydrocarbons (TPHs)	2000-2012
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	2000-2012
Polycyclic Aromatic Hydrocarbons (PAHs)	2000-2012 (30% of locations)
Organophosphate and Organochlorine Pesticides (OPPs and OCPs)	2000-2012 (40% of locations between 2000 and 2006)
Polychlorinated Biphenyls (PCBs)	2000-2012 (30% of locations)
Radionuclides	2010-2012
Acid Sulfate Soils	2000-2012



Review of Existing Information

2.1.1 Metals and Metalloids

Testing for metals and metalloids has included analysis of arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc between 2000 and 2012. Antimony and silver were also tested between 2001 and 2004.

The main contaminants of potential concern in terms of metals and metalloids were mercury and nickel. Mercury and nickel concentrations frequently exceeded the NAGD screening level at the 95% Upper Confidence Limit of the mean (95% UCL). Silver exceeded the NAGD screening level at the 95% UCL between 2002 and 2004. All other metals and metalloid 95% UCL concentrations were generally below the 95% UCL between 2000 and 2013.

The temporal and spatial trends observed for trace metals between 2000 and 2012 are detailed in the following sections.

2.1.1.1 Mercury

The NAGD screening level for mercury (0.15 mg/kg) was exceeded on numerous occasions in the Brisbane River dredge zones, particularly in Zone 2. Figure 2-2 shows the number of occasions when the screening level was exceeded between 2000 and 2012 and the number of sites for dredge zones 2 to 4 where exceedances were noted.

For Zone 2, mercury concentrations exceeded the screening level on 61 - 70% of occasions at 25% of locations. At a similar number of sites in Zone 2 exceedances were noted on 20 - 40% of occasions between 2000 and 2012.

Some exceedances of the mercury screening level were noted also for Zone 3 and Zone 4. However, those exceedances occurred only at a limited number of sites whilst no screening level exceedances were noted at 70 - 80% of locations in Zone 3 and Zone 4 between 2000 and 2012.

In Zone 3 most exceedances of the mercury screening level occurred at three sites (9-2, 10-6 and 11-8) occurring on 31 - 69% of occasions. In Zone 4, exceedances were only noted at two sites (13-5 and 13-6) on 8 - 23% of occasions.

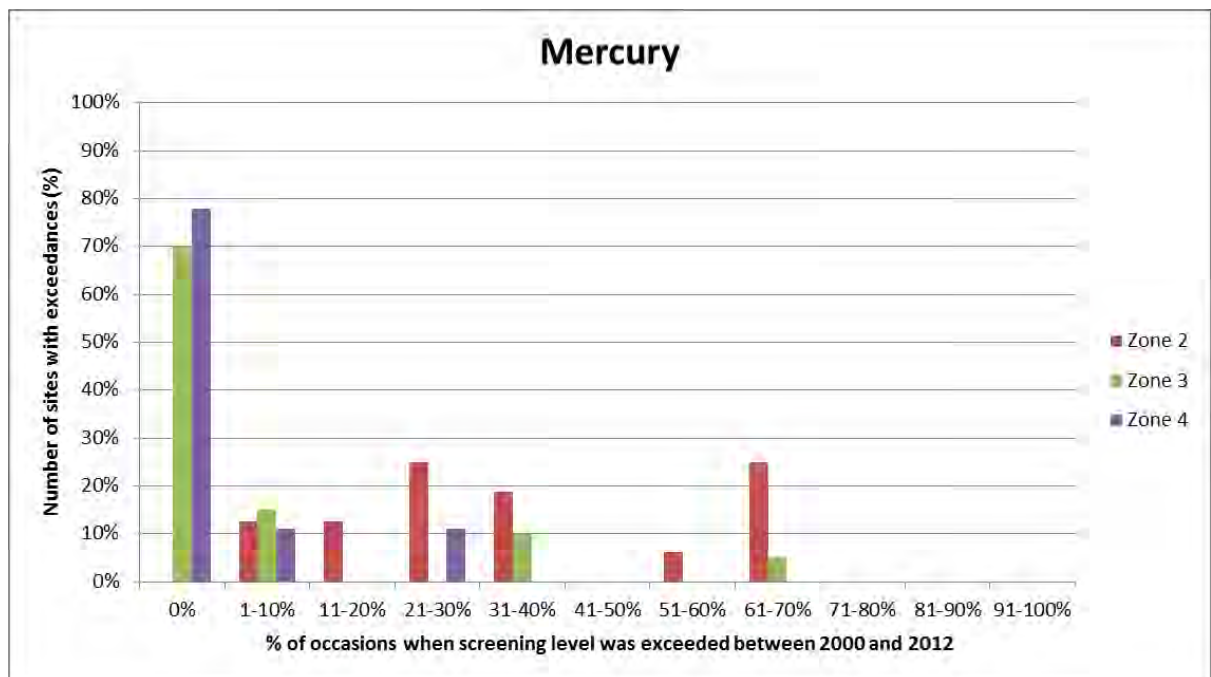


Figure 2-2 Exceedances of the NAGD Screening Level for Mercury between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.2 Nickel

Exceedances of the nickel screening level (21 mg/kg) were noted for most locations across all dredge zones (Figure 2-3). Exceedances of the screening level on more than 80% of occasions were noted at a cumulative 56% of sites in Zone 2, 20% of sites in Zone 3 and 11% of sites in Zone 4. Average Nickel concentrations were 24.2 mg/kg for Zone 2, 20.1 mg/kg for Zone 3 and 21.4 mg/kg for Zone 4, i.e. close to the nickel screening level of 21 mg/kg.

Given the widespread exceedances of the nickel screening level across all dredge zones and that exceedances were also commonly noted for the upstream control sites, it appears likely that the elevated nickel concentrations are of natural origin. It is recognised that sediments in Australia including South-East Queensland commonly have high natural levels of nickel (NAGD 2009 and Preda & Cox 2002).

Review of Existing Information

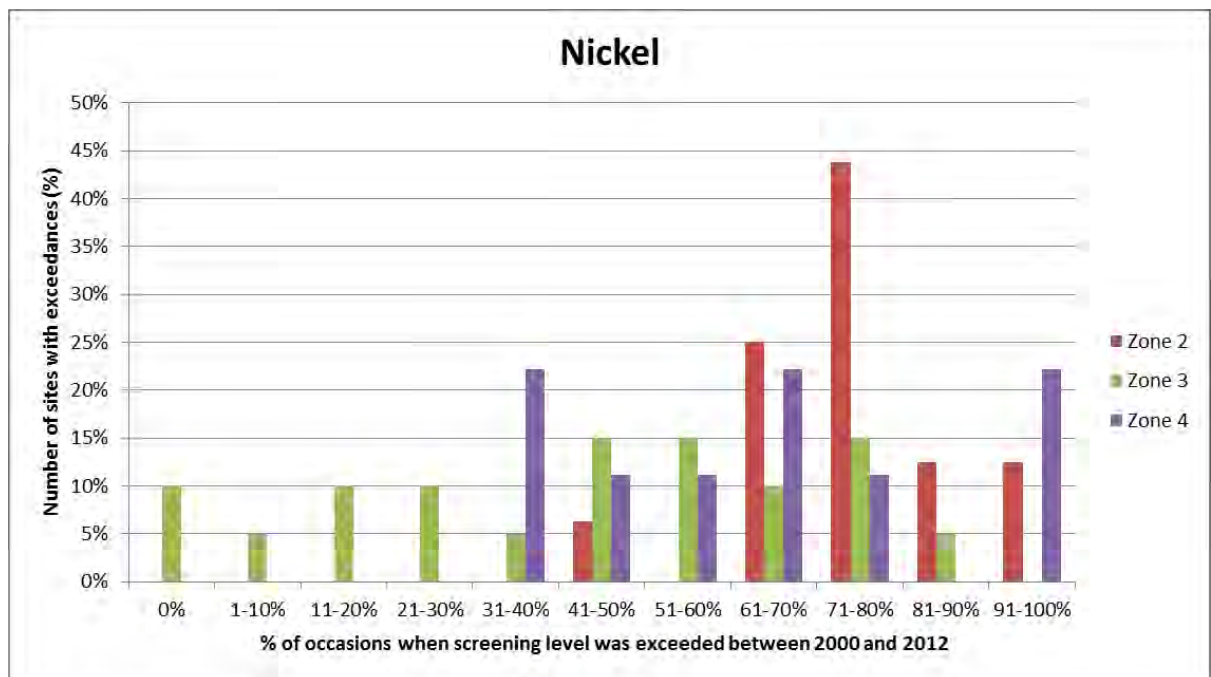


Figure 2-3 Exceedances of the NAGD Screening Level for Nickel between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.3 Arsenic

Concentrations for arsenic were below the NAGD screening level of 20 mg/kg at all locations and dredge zones between 2000 and 2012.

2.1.1.4 Cadmium

Cadmium concentrations were below the NAGD screening level of 1.5 mg/kg with the exception of one site in Zone 2 (Site 6-2) where the screening level was met or exceeded between 2007 and 2009 with concentrations ranging between 1.5 – 6.3 mg/kg.

However, cadmium concentrations were below screening level at all locations between 2010 and 2012. The 95% UCL for cadmium was below the screening level between 2000 and 2013 for all dredge zones.

Average cadmium concentrations between 2000 and 2012 were 0.30 mg/kg for Zone 2, 0.20 mg/kg for Zone 3 and 0.17 mg/kg for Zone 4, i.e. well below the screening level across all dredge zones.

2.1.1.5 Chromium

Chromium concentrations were mostly below the screening level of 80 mg/kg. The only exceptions were noted at site 9-1 in Zone 3 where the screening level was exceeded in 2002 and 2012 with concentrations ranging between 94 – 100 mg/kg. However, the 95% UCL remained below the screening level. Furthermore, exceedances of the chromium screening level were noted at four sites in Zone 2 in 2000 with concentrations ranging between 88.6 – 101 mg/kg.

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2.1.1.6 Copper

Copper concentrations exceeded the NAGD screening level of 65 mg/kg on a few occasions in Zone 2 and Zone 3. No exceedances of the copper screening level were noted for Zone 4 (Figure 2-4).

In Zone 2 exceedances were noted at five out of sixteen locations, with only one to two detections noted at four of these locations between 2000 and 2012. At site 6-2 in Zone 2 exceedances of the screening level occurred on 46% of occasions. However, in 2011 and 2012 copper concentrations were below the screening level at this site.

The only exceedances of the copper screening level in Zone 3 were noted for site 9-1 in 2000 and 2008.

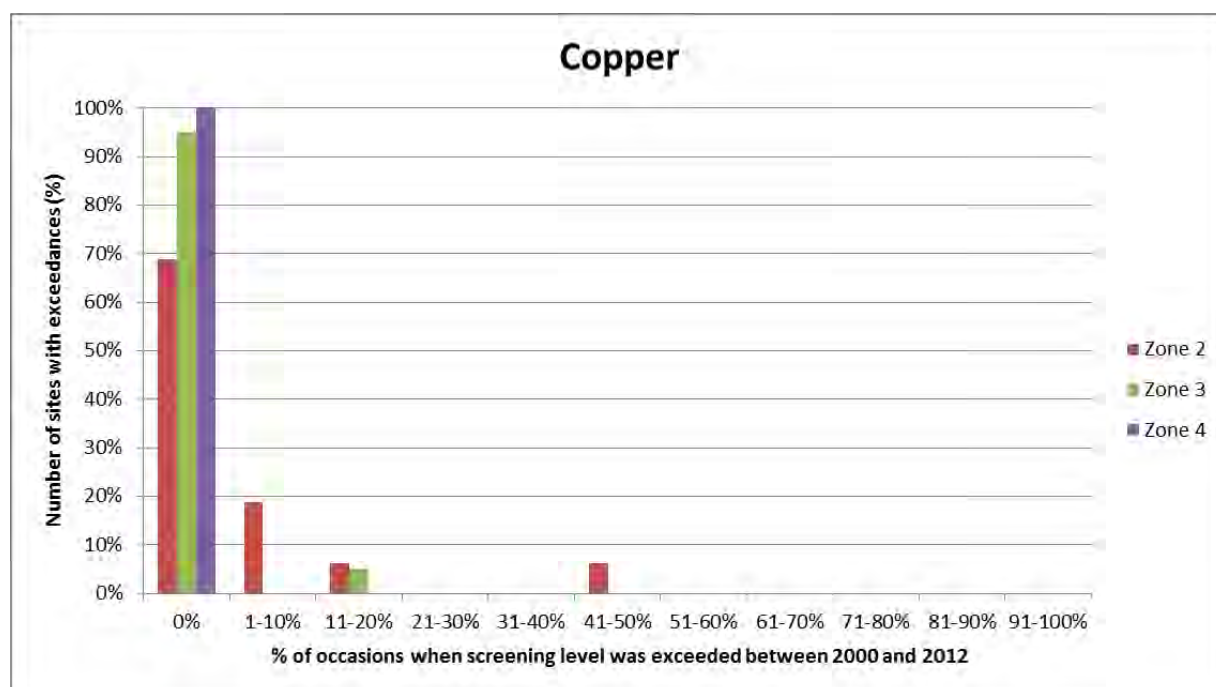


Figure 2-4 Exceedances of the NAGD Screening Level for Copper between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.7 Lead

Some individual exceedances of the lead screening level (50 mg/kg) were noted, in particular in Zone 2 where exceedances were noted at seven locations (Figure 2-5). Since 2001 there were only single detections of lead above the screening level noted per annual sampling event. The 95% UCL for lead was below the NAGD screening level since 2001.

Exceedances on individual sites were noted on less than 20% of occasions, i.e. only once or twice between 2000 and 2012 in Zone 2. In Zone 3 and Zone 4, the only exceedances of the lead screening level were noted at single sites (9-1 in Zone 3 and 13-4 in Zone 4) and only on one or two occasions between 2000 and 2012.

The last screening level exceedance was noted in 2009 for Zone 2, in 2000 for Zone 3 and in 2010 for Zone 4. The average concentrations of lead between 2000 and 2012 were 26.9 mg/kg for Zone

Review of Existing Information

2, 13.7 mg/kg for Zone 3 and 12.3 mg/kg for Zone 4, i.e. well below the screening level across all dredge zones.

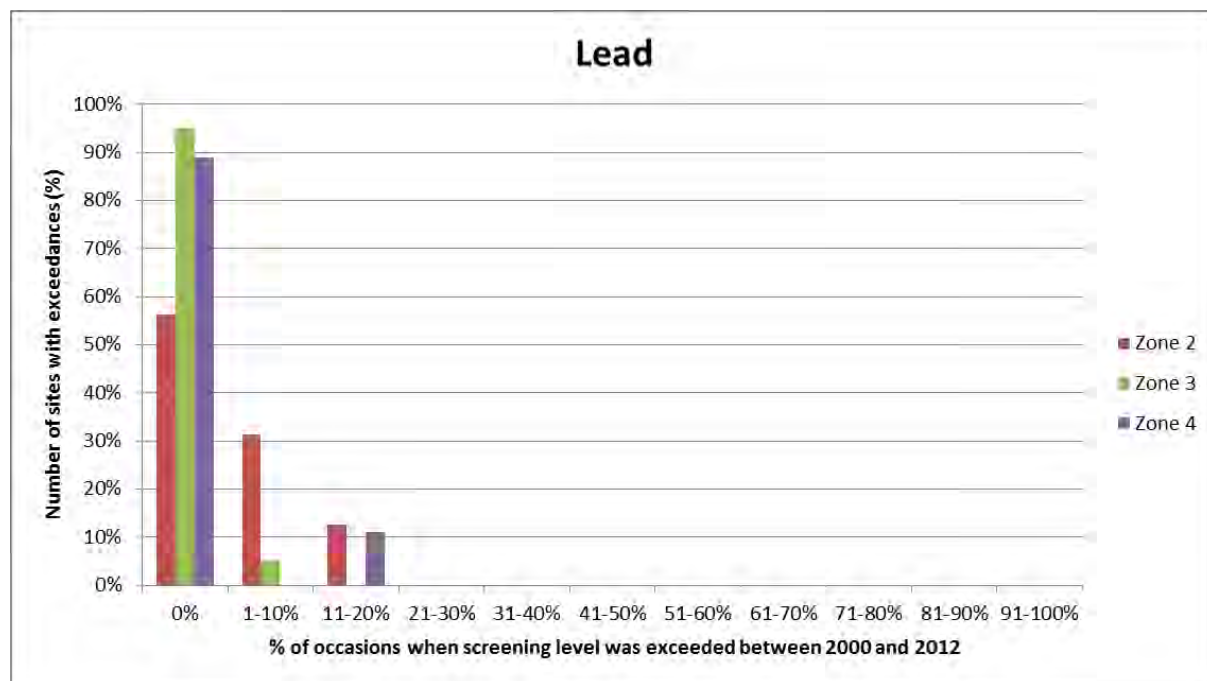


Figure 2-5 Exceedances of the NAGD Screening Level for Lead between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.8 Zinc

Individual exceedances of the zinc screening level (200 mg/kg) were noted at eight locations in Zone 2. However, most of these exceedances occurred only once or twice (<15% occurrence) between 2000 and 2012 (Figure 2-6). Only at location 6-2 exceedances occurred on more than 30% of occasions (four times between 2000 and 2012). It is noted that the last exceedance of the zinc screening level in Zone 2 occurred in 2010.

In Zone 3 only a single exceedance was noted at location 9-1 in 2000. No exceedances of the zinc screening level were noted in Zone 4.

The average zinc concentration between 2000 and 2012 was 130.3 mg/kg for Zone 2, 74.0 mg/kg for Zone 3 and 57.1 mg/kg for Zone 4, i.e. well below the NAGD screening level across all dredge zones.

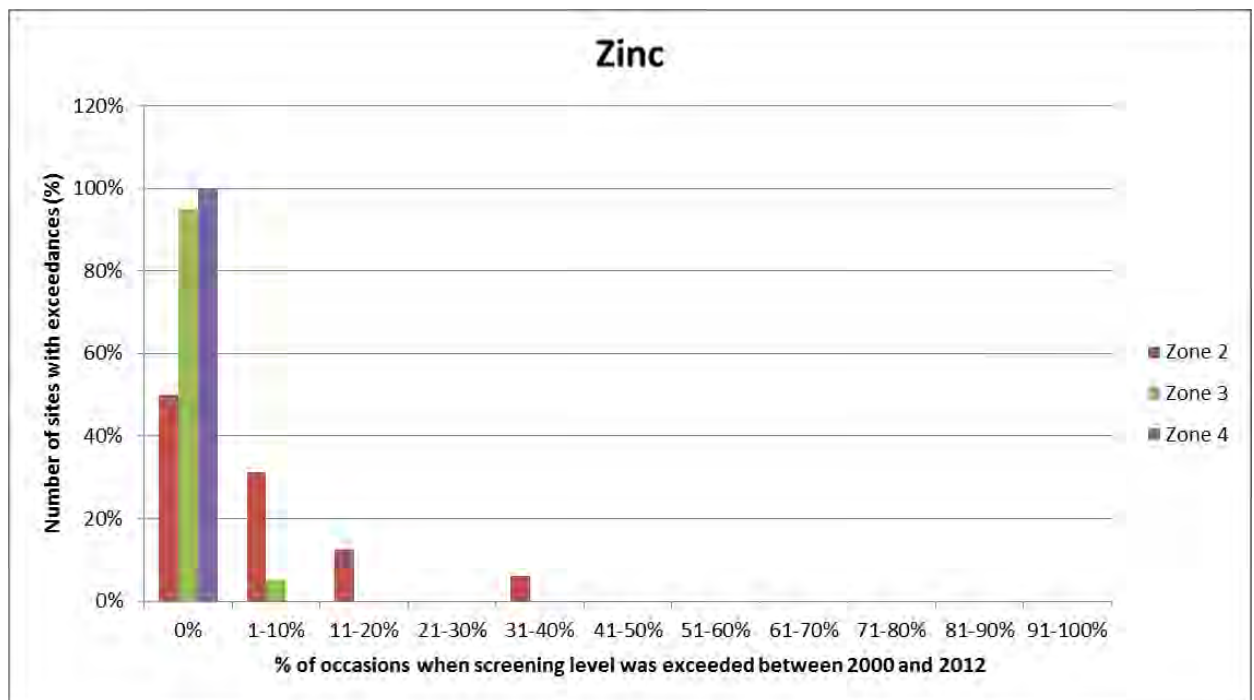


Figure 2-6 Exceedances of the NAGD Screening Level for Zinc between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.1.9 Antimony and Silver

In addition to the metals and metalloids outlined above, antimony and silver were tested between 2001 and 2004. While antimony concentrations remained below the Limit of Reporting (LOR) for all sampling events, silver was detected at several locations and concentrations exceeded the screening level at one site in Zone 3 (11-8) between 2002 and 2004.

2.1.2 Organotins

Concentrations of TBT at the 95% UCL frequently exceeded the NAGD screening level ($9 \mu\text{g Sn/kg}$) between 2000 and 2012, particularly in dredge zones 2 and 3.

Exceedances of the TBT screening level were noted predominantly in Zone 2, including several exceedances of the NAGD high level of $70 \mu\text{g Sn/kg}$ (Figure 2-7). At sampling site 4-4 in Zone 2, the screening level was exceeded during all sampling events except in 2001, including six exceedances of the NAGD high level. At several other locations in Zone 2, screening level exceedances were noted between 20 to 70% of occasions.

In Zone 3, exceedances of the TBT screening level were typically only noted once or twice between 2000 and 2013, corresponding to 8% and 15% of occasions in Figure 2-7. The only exception was site 9-1, where exceedances of the screening level were noted on 69% of occasions. This included five sampling events where the NAGD high level was exceeded. This corresponds to a generally higher occurrence of metal/metalloid exceedances at this site as outlined in Section 1.1.1. It is noted that site 9-1 is the site located closest to Zone 2.

Only a single exceedance of the TBT screening level was noted at site 13-1 in Zone 4 in 2006.

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The average normalised TBT concentration between 2000 and 2012 was 28.8 µg Sn/kg for Zone 2, 21.8 µg Sn/kg for Zone 3 and 0.7 µg Sn/kg for Zone 4. If site 9-1 is excluded from Zone 3, the average concentration is 4.4 µg Sn/kg, i.e. less than the NAGD screening level.

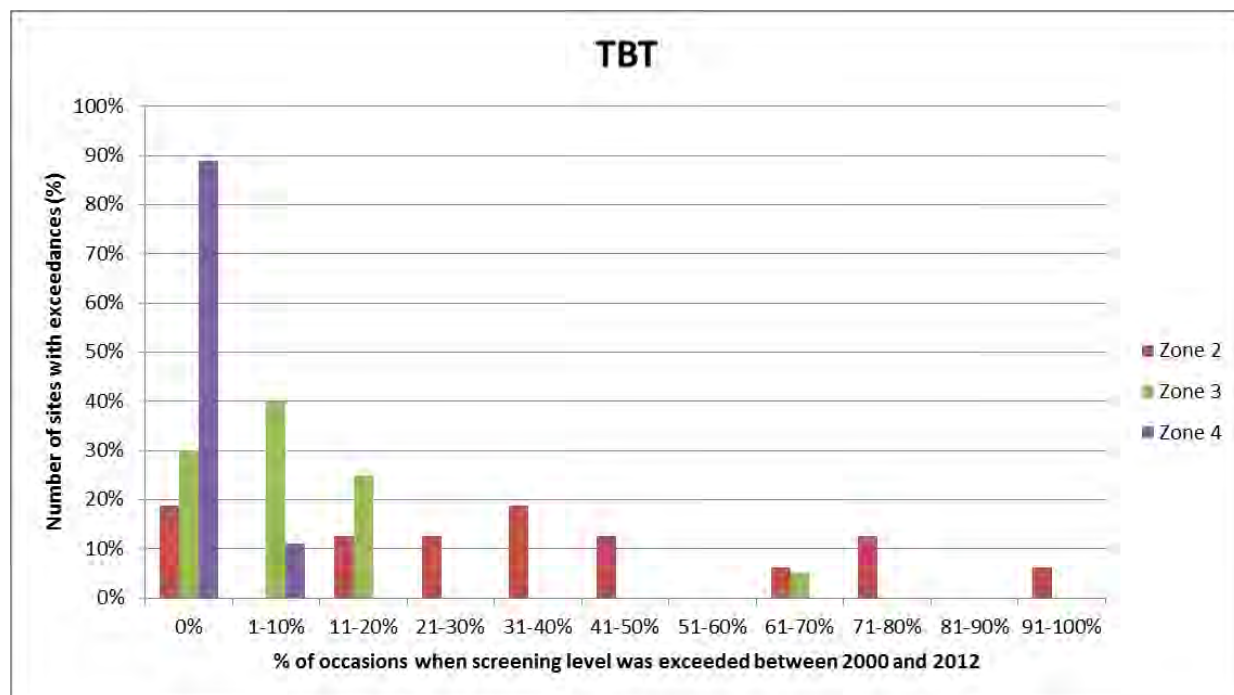


Figure 2-7 Exceedances of the NAGD Screening Level for TBT between 2000 and 2012 in Dredge Zones 2, 3 and 4

2.1.3 Benzene, Toluene, Ethylbenzene and Xylene (BTEX)

BTEX concentrations were below LOR in all samples and all zones between 2000 and 2012.

2.1.4 Total Petroleum Hydrocarbons (TPHs)

While TPHs were detected on several occasions across all dredge zones, the total TPH concentration was below the NAGD screening level of 550 mg/kg at all sampling locations between 2000 and 2012. Most detections of TPHs were noted in Zone 2, with less detections noted for Zone 3 and only some isolated detections recorded in Zone 4.

2.1.5 Polycyclic Aromatic Hydrocarbons (PAHs)

Total PAHs concentrations were mostly below the NAGD screening level of 10,000 µg/kg except for two individual detections above screening level in Zone 2 and Zone 3 in 2001. The 95% UCL for PAHs exceeded the screening level in 2011. However, since 2001, the total PAHs concentrations remained well below the screening level for all dredge zones.

2.1.6 Polychlorinated Biphenyls (PCBs)

Total PCBs concentrations were mostly well below the NAGD screening level of 23 µg/kg or below LOR. The only exceptions were site 10-6 in Zone 3 where detections above the screening level were noted in 2001 and 2012 and site 13-1 in Zone 4, where a detection above screening level was noted in 2011.

Review of Existing Information

2.1.7 Organochlorine Pesticides (OCPs)

The 95% UCL concentrations of the OCPs dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and Dichlorodiphenyldichloroethylene (DDE) frequently exceeded the NAGD screening level between 2000 and 2013. In some cases the 95% UCL concentrations of chlordane also exceeded the NAGD screening level.

Total DDT concentrations and its metabolites DDD and DDE exceeded their respective screening levels (1.6, 2 and 2.2 µg/kg for DDT, DDD and DDE, respectively) on numerous occasions across all dredge zones (). This includes some exceedances of the NAGD high levels for DDT (46 µg/kg) and DDD (20 µg/kg), but DDE concentrations did not exceed the NADG high level of 27 µg/kg.

Most of these screening level exceedances for DDT, DDD and DDE were recorded at Zone 2, occasional exceedances of all three parameters were also recorded in Zone 3 and 4 between 2000 and 2012. The DDT breakdown product DDE was generally detected more frequently than DDT and DDD (Figure 2-8).

The presence of DDT and its metabolites across all dredge zones and consistent detections over the last decade demonstrates the long term environmental persistence of DDT and its metabolites.

Furthermore, several exceedances of the chlordane NAGD screening level of 0.5 µg/kg and the NAGD high level of 6 µg/kg were noted between 2000 and 2012.

In 2002, chlordane concentrations exceeded the screening level at all tested sampling locations in Zone 2, 3 and 4. Whilst no screening level exceedances were noted between 2003 and 2007, one to three locations in Zone 2 had concentrations higher than the screening level in 2008, 2009 and 2011 (sites 4-0, 4-4, 4-5, 4-7 and 4-8). One exceedance of the chlordane screening level was also noted in 2011 in Zone 3 (site 11-8).

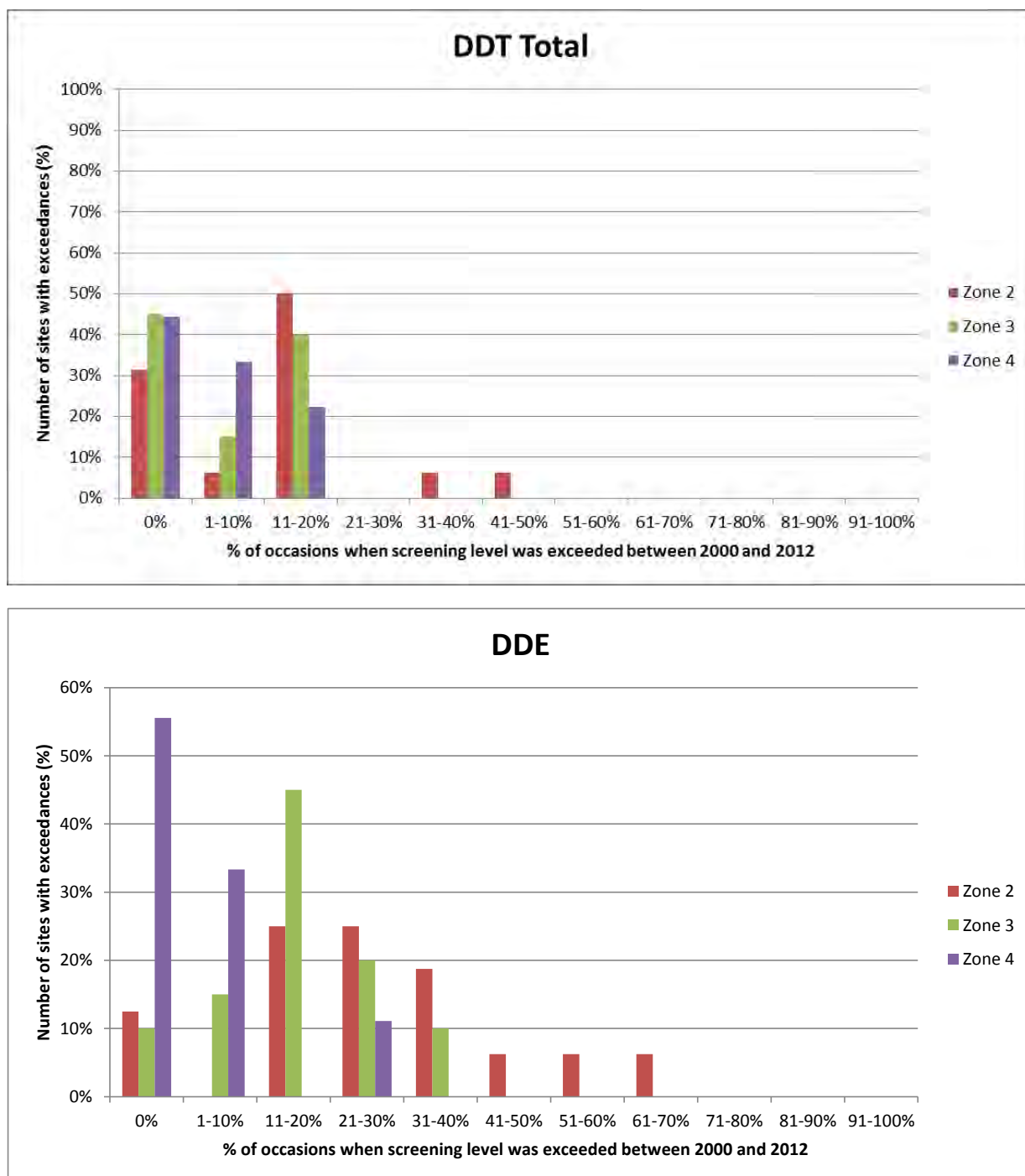


Figure 2-8 Exceedances of the NAGD Screening Level for total DDT (upper plot) and DDE (lower plot) between 2000 and 2012 in Dredge Zones 2, 3 and 4. Similar Trends for DDD.

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2.1.9 Organophosphorus Pesticides (OPPs)

Concentrations of OPPs were below LOR for all sampled locations between 2000 and 2012.

2.1.10 Radionuclides

Radionuclides (gross alpha and beta) were analysed at eight sites across all dredge zones between 2010 and 2012.

Concentrations of radionuclides were detected in the January 2010 sampling but in concentrations well below the NAGD screening level of 35 Bq/g (maximum concentration 0.97 Bq/g). Radionuclide concentrations were below the LOR at all sites in all following sampling campaigns.

2.1.11 Acid Sulfate Potential

Acid sulfate soil testing indicates that the sediments in the dredge zone have no actual acidity but are generally considered to be Potential Acid Sulfate Soils (PASS). Assessments of the buffer capacity indicate that the sediments in all dredge zones have sufficient acid neutralizing capacity to buffer any acid potentially generated through onshore disposal.

Acid Sulfate Soil test results were generally consistent between 2000 and 2012.

2.2 Flood Sampling 2011 and 2013

The review of flood sampling sediment quality results included Worley Parsons (2011b, 2013b, 2013c, 2013d).

The 2011 and 2013 sampling campaigns (Worley Parsons 2011b and 2013b) included all parameters as per Table 1 of the NAGD. Additionally, porewater ammonium concentrations were measured and acid sulfate soils assessed in 2011. For both studies elutriate and bioavailability testing for nickel and mercury was undertaken.

Further testing for DDT, DDD, DDE and dioxins/furans was undertaken in 2013 including a comparison of 14 sampling locations at the Mud Island DMPA against seven Moreton Bay reference locations to assess whether the emergency dredging and disposal has affected sediment quality in Moreton Bay (Worley Parsons 2013c and 2013d).

2.2.1 Metals and Metalloids

In 2011, nickel (9 of 15 locations), mercury (3 of 15 locations) and lead (1 location) were the only metals to exceed their respective NAGD screening levels. In 2013, nickel was the only metal to exceed screening levels at 18 of the 24 locations sampled. All other metals/metalloids were below their respective screening levels.

Elutriate and bioavailability testing was undertaken for nickel and mercury in 2011 and 2013. For both sampling events, the elutriate concentrations for mercury were below LOR and nickel elutriate concentrations were well below the ANZECC/AMRCANZ (2000) 95% species protection level of 70 µg/L or below LOR. Furthermore, dilute acid extraction results for mercury and nickel indicated low bioavailability of these metals with concentrations below their respective NAGD screening level in all samples in 2011 and 2013.

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These results indicated low likelihood for adverse water quality and sediment quality impacts during dredging and disposal for mercury and nickel.

2.2.1.1 Comparison to Annual Sampling

Consistent with the annual sampling undertaken between 2000 and 2012, nickel and mercury concentrations were the main contaminants of concern within the dredge areas with concentrations similar to the annual sampling events. Lead was detected above the screening level on some occasions during the annual sampling. Similar to the flood sampling, detections were noted only at single locations per annual event and 95% UCL concentrations were below the NAGD screening level.

2.2.2 Organochlorine Pesticides (OCPs)

DDT and its metabolites were detected in 2011 with DDE detected in nine of 15 locations. Whilst normalised DDD and DDE concentrations remained below their respective screening levels, normalised DDT concentrations exceeded the NAGD screening level at two locations. All other OCPs were below LOR at all locations in 2011.

In 2013, DDD was detected in one sample with a concentration exceeding the NAGD screening level. DDE exceeded the NAGD screening level of 2.2 µg/kg in all samples with a 95% UCL of 5.25 µg/kg.

2.2.2.1 Comparison to Annual Sampling

Similar to the annual sampling events, DDT and its metabolites were detected above the NAGD screening level in the flood sampling. Concentrations were similar to those detected in the annual sampling.

2.2.2.2 Comparison to Background Concentrations (2013)

Total DDT concentrations were below the LOR at all locations, including those at Mud Island DMPA and reference locations.

Sampling carried out prior to the 2013 emergency dredged material disposal event detected DDE at all 20 sampling locations within the dredged area, and one of the four locations within the DMPA. DDD was above the LOR in one sample within the dredged area (10µg/kg normalised to % TOC), and was also above the NAGD Screening level of 2 µg/kg.

Further more detailed sampling was carried out to compare contaminant concentrations at 14 locations in the DMPA and seven reference locations, following the 2013 emergency dredged material disposal event. The results of this sampling indicated that:

- DDT was again below the LOR at all locations, including those at Mud Island DMPA and reference locations.
- DDE was detected at all sampling locations with 95% UCL concentrations exceeding the NAGD screening level at both the DMPA and reference locations. This indicates that DDE was widespread throughout the study area.
- A comparison of the 80th percentile DDE of the reference locations was higher than historical levels of DDE in the Brisbane River. This indicates that the Brisbane River flood plume in

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January 2013 impacted on the Brisbane River, Bramble Bay and the wider Moreton Bay region and the maintenance dredging operations undertaken by PBPL were not likely to have caused or spread this contamination.

- Additional elutriate and pore water analyses for OCPs indicated that DDD and DDE are likely adsorbed to the clay fraction of the sediment and thus not bioavailable.

2.2.3 Dioxins

Dioxins and furans were detected in the 2011 and 2013 flood sampling events. A toxic effect factor is allocated to each compounds which allows the total toxicity of combined dioxins and furans to be determined using the toxic equivalence (TEQ).

In 2011, the WHO-TEQ_(0.5 LOR) value (concentrations below LOR are assigned a concentration equal to half the LOR) was elevated at one location in Zone 3 with a concentration of 25.36 pg/g. All other sampling locations, including at the DMPA had concentrations between 6.02 and 10.89 pg/g WHO-TEQ.

In 2013, the WHO-TEQ concentrations were generally lower ranging between 0.5 pg/g to 5.3 pg/g.

There are no sediment quality guideline values for comparison that would apply to Australian sediments.

2.2.3.1 Comparison to Background Concentrations (2013)

The WHO-TEQ concentrations at the Mud Island DMPA sites ranged between 4.24 to 4.94 pg/g. The WHO-TEQ concentrations were higher at the reference site in comparison ranging between 7.87 to 7.97 pg/g. Approximately 99% of the sediment concentrations at all sampling locations comprised of 99% dioxins and 1% furans.

Pore water WHO-TEQs ranged between 0.5 and 7.3 pg/g at the DMPA and between 3.1 and 8.0 pg/g at the reference sites. Mean values and 95% UCL concentrations were lower than the 80th percentile of dioxins/furans at the reference area.

A comparison with historical data (Hermanussen et al. 2004; Mueller et al. 2004) shows that dioxins/furans have been historically present within Moreton Bay in elevated concentrations and that their concentrations are not directly related to dredging activities.

2.2.4 Organotins

Organotin concentrations were below the NAGD screening level or below LOR in 2011 and 2013.

2.2.4.1 Comparison to Annual Sampling

The relatively low concentrations of organotins in the flood sampling of 2011 and 2013 appear to be different to the pattern observed in the annual sampling campaigns. However, it should be noted that TBT was only detected at three locations above the NAGD screening for the annual 2010 and 2012 sampling events.

The overall low organotin concentrations across the dredge area after the 2011 and 2013 floods may be due to burial and mixing with sediments from the catchment.

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2.2.5 Polychlorinated Biphenyls (PCBs)

PCB concentrations were below LOR at all sampling locations in 2011. In 2013, one location in Zone 3 had a normalised total PCB concentration (38.9 µg/kg) exceeding the NAGD screening level of 23 µg/kg. PCB concentrations were below LOR at all other locations in 2013.

2.2.5.1 Comparison to Annual Sampling

Similar to the annual sampling events, PCBs exceeded the NAGD screening level at only one location or were not detected.

2.2.6 Other Organic Contaminants

Concentrations of BTEX, TPHs, PAHs, OPPs, Phenols, Chlorobenzenes, halogenated compounds and non-organochlorine pesticides were either below LOR or below their respective screening levels in 2011 and 2013.

2.2.6.1 Comparison to Annual Sampling

The pattern observed for BTEX, TPHs, PAHs, OPPs were similar to the those observed in the annual sampling events, i.e. BTEX and OPPs were below their laboratory LORs whereas TPHs and PAHs were typically detected but at concentrations well below the respective NAGD screening levels.

2.2.7 Porewater Ammonia

Sediments at all locations had porewater concentrations below the literature derived guideline level of 11 mg/L (Batley and Simpson 2009). The only exception was one site in Zone 2 where the guideline level was marginally exceeded (16.6 mg/L).

2.2.8 Acid Sulfate Soil

Acid sulfate soils were tested in the 2011 flood sampling. Actual acidity was below the laboratory LOR for all samples, but potential acidity exceeded the QASSIT guideline limit identifying the samples as potential acid sulfate soils (PASS).

The acid neutralising capacity was sufficient in all samples resulting in a net acidity less than the LOR indicating that no liming would be required if the material would be placed on land.

2.2.8.1 Comparison to Annual Sampling

Results for the flood sampling were consistent with the annual maintenance dredge sampling.

2.3 Summary of Annual and Flood Sampling Data

Consistent across the annual and flood sampling events, the main contaminants of concern in the Brisbane River dredge area were the metals nickel and mercury, and DDT metabolites. TBT was also found above screening levels during routine annual monitoring, but was below screening levels in the 2011 and 2013 post-flood sampling episodes. This could suggest that the flood events had dispersed, diluted or buried TBT contaminated material.

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Exceedances of the NAGD screening level for mercury, organochlorine pesticides and organotins were most frequently detected upstream of the Port area, i.e. in Zone 2 with a lower occurrence of screening level exceedances in the Port area (Zone 3) and the Entrance Channel area (Zone 4).

The similar spatial patterns of contaminant distribution observed between the regular annual sampling and the flood sampling indicates that catchment runoff from the urbanised and industrialised area upstream of the Port and not the Port of Brisbane is likely the main contributor of contaminants in the dredge area.

Organochlorine pesticides may be present due to broad non-point catchment sources or as legacy material. TBT is mainly originating from local marine industry sources and ships. Mercury may be introduced to the system via sewage treatment plant discharges (including trade waste) or other industrial point sources along the river.

The wide distribution of high nickel concentrations across the entire dredge area and upstream reference locations indicates that nickel is of natural origin (due to local mineralogy) across the broader catchment.

3 Sampling and Analysis

3.1 Sampling Rationale

3.1.1 Number of Sampling Locations

As per NAGD, the number of sample locations for medium sized projects (up to 500,000 m³) should be divided into distinct sites based on their chemical characteristics. Based on the review of historical data (Section 2) and consistent with previous sampling campaigns, the dredge area was divided into three zones (Table 3-1).

Table 6 of NAGD was used to determine the number of sampling locations for each dredging subarea. Given that current, good quality data were available to support the classification, the number of sampling locations was halved and rounded up as per NAGD. Table 3-1 also shows the required number of sampling locations for Phase III testing (elutriate and bioavailability).

In addition to the required samples to be obtained from the dredge areas, samples will be collected also from upstream and downstream 'reference' areas. This includes two locations from Zone 1 which were sampled in previous sampling campaigns and five locations from Moreton Bay which were sampled as part of additional sediment sampling following the 2011 and 2013 flooding. Furthermore, two samples will be collected from the Mud Island DMPA.

Table 3-1 Number of Sampling Locations as per NAGD

Dredging Subarea	Classification	Dredge Volume (m ³)	# Locations – Phase II	# Locations – Phase III
Zone 2	Probably contaminated	150,000	10	5 + 1 replicate
Zone 3	Probably clean	250,000	11	6 + 2 replicates
Zone 4	Probably clean	30,000	5	3 + 1 replicate
Additional Samples				
Zone 1	Upstream Reference	N/A	2	N/A
Moreton Bay	Downstream Reference	N/A	5	N/A
Mud Island	DMPA	N/A	2	N/A

3.1.2 QA/QC Samples

In accordance with NAGD requirements, the following field and laboratory quality control samples will be obtained:

- Field triplicate samples (two additional grab samples at 10% of sample locations) to determine the small scale variability of the sediment physical and chemical characteristics. Based on a total of 26 primary locations in dredged areas (Zones 2, 3 and 4), field triplicate samples would be required at three locations. Two additional samples would therefore be collected at location 5-1 (Zone 2), 11-9 (Zone 3) and 13-4 (Zone 4).
- Triplicate split samples (primary sample from 5% of locations thoroughly mixed and split into three sample container sets) to assess laboratory variation, with one of the three samples sent to a second (reference) laboratory for analysis. Based on a total of 26 primary locations in dredged areas (Zones 2, 3 and 4), field split samples would be required at two locations. Split samples would be undertaken at location 6-2 (Zone 2) and 10-6 (Zone 3).

- One trip blank container per sampling day filled with inert material (e.g. chromatographic sand) to be analysed concurrent with the analysis of volatile organic substances such as; and
- One inter-batch sample from a previous batch of samples if more than one batch is submitted to the laboratory, to determine the analytical variation between batches. However, it is anticipated that all samples will be submitted in one batch.

Table 3-2 provides a summary of QA/QC samples to be obtained for the three dredging subareas.

Table 3-2 Number of Primary and QA/QC Samples

Dredging Subarea	Primary Samples	Field Triplicate Samples	Triplicate Split Samples	Trip blanks
Zone 2	10	2	2	1 per sampling day
Zone 3	11	2	2	
Zone 4	5	2		

3.1.3 Sampling for Elutriate and Bioavailability Testing

The sediment sampling will include additional sediment samples for Phase III testing (elutriate and bioavailability). Phase III testing will be undertaken for parameters which have frequently exceeded the NAGD screening levels in the past. Based on the review of historical data (Section 2) this will include:

- Metals and metalloids (nickel and mercury);
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

Exceedances of NAGD screening levels were predominantly detected in Zone 2 and Zone 3. In accordance with Table 7 of NAGD, five locations would need to be sampled for Zone 2 and six locations for Zone 3 (Table 3-1).

In order to allow elutriate analysis, 20 L of seawater will be collected from the Mud Island DMPA.

Phase III testing for nickel and mercury (and potential other metals/metalloids) can be undertaken from the primary samples collected for the sediment quality assessment. The bioavailability analysis for nickel and mercury will involve dilute acid extraction as per NAGD. Analysis will be performed on the samples with the highest concentrations.

Bioavailability analysis for the organic contaminants (organotins and organochlorine pesticides) will require porewater testing as per NAGD. Additional samples will be collected for porewater testing at the locations which have historically shown the highest percentage of screening level exceedances. The proposed sampling locations for this testing are provided in Section 3.2.1. In order to meet required holding times, elutriate and bioavailability analysis for the organic contaminants will be undertaken concurrent with the analysis of the primary samples.

3.2 Sampling Locations

A map with the proposed sampling locations is provided in Figure 3-1. In order to provide consistency with previous sampling and to facilitate comparisons with historical data, most of the proposed sampling locations were selected from the set of historical sampling locations, and to

also focus on areas that are most frequently dredged. Additionally, sampling locations were added to close spatial gaps in sediment quality data. These include sampling locations 5-1 in Zone 2 as well as locations 9-5 and 9-6 in Zone 3 (Figure 3-1).

As outlined in more detail in Section 3.5, samples from all locations will be analysed for a basic suite of parameters. A selection of these sites will also be analysed for a detailed suite in addition to the basic suite including 'low risk' parameters that have been detected in the past but were typically below their respective NAGD screening levels.

3.2.1 Sampling Locations for Porewater Testing

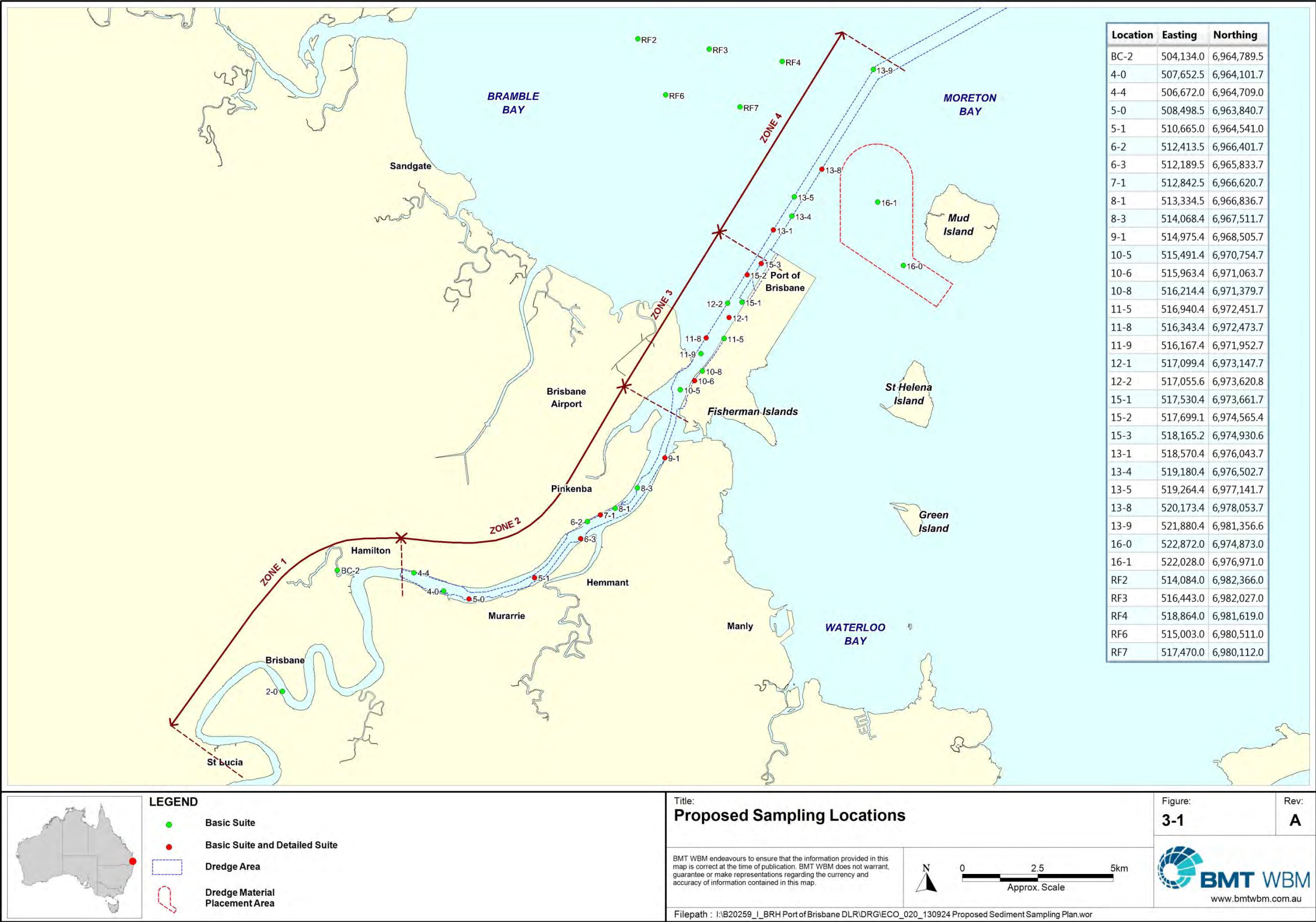
Additional sediment samples will be collected at selected locations for pore water testing of organic contaminants as part of the Phase III elutriate and bioavailability assessments (refer to Section 3.1.3).

Exceedances of NAGD screening levels were predominantly detected in Zone 2 and Zone 3. Five additional pore water samples (plus one replicate) and six samples (plus two replicates) will be collected from zones 2 and 3, respectively (see also Table 3-1). Four samples will be collected from Zone 4 however based on the historical data samples will only be analysed if contaminants exceed screening levels during Phase II sampling.

Based on the review of historical data, sample locations with the highest percentage of screening level exceedances between 2000 and 2012 were chosen for the additional pore water testing:

Zone 2: Locations 4-0, 5-0, 6-2, 7-1 and 8-3.

Zone 3: Locations 10-5, 10-6, 10-8, 11-8, 11-9 and 12-1.



3.3 Sample Collection Methodology

3.3.1 Survey Vessel and Positioning

A suitable sampling vessel will be used to undertake sediment sampling. Navigation to the sampling locations will be undertaken using a differentially corrected global positioning system (GPS) with an accuracy of approximately ± 1 m.

3.3.2 Sediment Grab Sampling

NAGD Appendix D states that:

'grab samplers may be used, i.e., for maintenance dredging surveys in frequently dredged areas with substantial shipping traffic. Here, because the sediments are mixed continually, samples taken with a grab sampler can be representative as long as the grab is designed to retain the entire sample.'

It is also noted that the one metre long sediment cores obtained in all previous sampling campaigns were always composited to single samples. Furthermore, highest contamination levels are typically expected in the top sediment layer, which would be sampled using a grab sampler. It is therefore proposed that a grab sampler will be used to obtain representative sediment samples.

All sediment sampling will be undertaken by experienced personnel. A Van Veen grab sampler (0.14 m² gape) will be used to collect surface sediments from all sample locations. Only samples obtained with properly closed grab jaws will be processed to ensure that the fine sediment fractions are retained.

The grab sampler will be thoroughly cleaned with De-con 90 solution prior to use and cleaned and rinsed with seawater to prevent cross contamination between samples.

In order to overcome issues with potential high variability at sampling locations, a minimum of two grabs will be collected at each sampling location and pooled as one sample. An adequate number of grabs will be obtained and pooled for each sample location to ensure that sufficient sediment is collected for all analyses.

3.3.3 Sample Handling

3.3.3.1 Sample Processing

Sample management procedures on the sampling vessel will include the careful processing of sediment samples following the recovery of the sediment grab sample from the seabed.

Photographs of the grab samples will be taken and field personnel will log each sample for its physical characteristics and variations in sediment type and texture. The grab samples from each location will be carefully homogenized in a clean container prior to the filling of analytical laboratory-supplied clean sampling jars.

Sample bottles will be labelled with a waterproof marker pen on the bottle label and lid. Sample bottles for organic analyses will be filled with zero headspace to prevent volatilisation. QA/QC samples will be blind-labelled to ensure that the laboratories cannot relate the QA sample back to the primary sample.

3.3.3.2 Sample Log

All sediment samples will be geotechnically logged upon collection on a standardised pro-forma. The following information will be recorded:

- Project name and number;
- The name of the sample collector;
- Date and Time of sampling;
- Type of grab sampler used;
- Field sample number;
- Northing and Easting of sample location (from onboard DGPS);
- Sediment colour;
- Sediment odour;
- Field texture (fine sand, silt, clay, sand, clayey sand);
- Tidal predictions and water depth at sample location (derived from onboard depth sounder);
- Weather and sea state conditions at the time of sampling; and
- General comments pertaining to the sample (e.g. presence of organic matter or benthic organisms, etc).

3.3.3.3 Sample Processing QA/QC

All sample handling and processing will be performed to minimise contamination and sample mix-ups. All sample equipment will be cleaned prior to sample collection using a scrub with decontamination solution followed by a rinse with seawater.

The workspace on the vessel will be washed down regularly with ambient seawater to clean all surfaces and minimize the potential for dust contamination of samples. All sample processing will be undertaken away from any potential contamination sources such as engine exhausts, fuels, oils, greases, lead weights, zinc anodes, antifouling paint etc.

Nitrile gloves will be worn by all field personnel handling the sediment, and gloves will be disposed of after processing of each sample.

Utmost care will be maintained in ensuring that cross-contamination between samples is not possible. Samples collected from each location will be placed into appropriately cleaned and preserved containers (labelled prior to filling) provided by the analytical laboratories.

Following sample processing and filling of sample containers, all samples will be immediately chilled on ice following sample collection. All acid sulfate soil samples will be transferred to a freezer at the end of each sampling day to minimise potential oxidation of the samples.

3.3.3.4 Sample Submission and Chain of Custody

All samples will be traced using Chain of Custody (COC) documentation submitted to the laboratory. This will ensure that sample possession and processing can be traced from sample collection to reporting of results.

The COC record may include, but is not limited to, the following information:

- Project name and number;
- Name(s) of sampler(s);
- Sample type, identification number and location;
- Date of collection;
- Number and types of containers;
- Required analyses;
- Preservatives (if any) and storage conditions; and
- Signatures documenting change of sample custody.

At the conclusion of the sampling program the sediment samples will be submitted to the analytical laboratories for processing and analysis in a single batch within prescribed holding times.

3.4 Health & Safety and Contingency Plan

3.4.1 Health and Safety

The vessel skipper will keep in close contact with Brisbane VTS/Harbour Control during sampling. Grab sampling can be completed at each location in around 20 minutes with logging and processing undertaken in locations out of the path of large vessels (as necessary and dependent upon shipping movements).

A single anchor may be used to anchor the vessel. The anchor would be placed upstream and upwind of the vessel. A marker buoy may be placed on the anchor if required.

The sampling vessel will display appropriate flags (R over Y) for the work being carried out at all times. Interactions with other vessel traffic will be minimised by being mindful of approaching vessels.

3.4.2 Adverse Weather

The planning of field sampling will involve regular checking of available weather forecast services for the study area. There are no unusual hazards in operating the grab sampler in wet weather.

In case of adverse weather conditions that would make sampling unacceptable due to strong winds and high waves, the sampling team and vessel operator would remain on stand-by until weather conditions improve to allow rigorous and safe collection of sediment samples.

3.4.3 Equipment Failure

The grab sampler and lifting arrangement is sufficiently robust and no failure of the equipment is expected to occur during the sampling. Prior to sampling, all equipment will be thoroughly checked and repaired if necessary.

In the unlikely event of equipment failure during sampling, repairs to any equipment would be undertaken as soon as possible to minimise delays as far as practical.

3.5 Contaminants List

3.5.1 Rationale for Selection of Sampling Parameters

In accordance with NAGD, the contaminants to be investigated should include:

- Toxic substances known, from previous investigations, to occur in dredge area sediments at levels greater than one-tenth of the screening levels; or
- Based on the historical review, substances potentially present at such levels in the sediments to be dredged.

Based on the review of existing sediment quality data (Section 2), samples will be analysed as follows:

Basic List of Parameters:

- Analysis undertaken at all sampling locations;
- Analysis includes contaminants of (potential) concern and supplementary parameters:
 - Metals/Metalloids (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, Zn, Al, Fe);
 - Organotins (MBT, DBT, TBT);
 - Organochlorine Pesticides (including DDT, DDD, DDE, chlordane);
 - Particle size distribution;
 - Moisture content; and
 - Total Organic Carbon.

Detailed List of Parameters:

- Analysis undertaken at 30% of sampling locations and new sampling locations (i.e. 5-1, 9-5 and 9-6).
- Analysis includes 'low risk' parameters that have been detected in the past but generally in concentrations below LOR or NAGD screening levels:
 - Polycyclic Aromatic Hydrocarbons (PAHs);
 - Total Petroleum Hydrocarbons (TPHs);
 - Polychlorinated Biphenyls (PCBs);
 - Acid Sulfate Soils;
 - Nutrients (TP, TN, NO_x, TKN); and

- Radionuclides.

Elutriate and Bioavailability Testing:

- Metals/Metalloids (Hg and Ni);
- Organotins (TBT); and
- Organochlorine Pesticides (DDT, DDD, DDE, chlordane).

3.6 Laboratory Analysis

3.6.1 Analytical Laboratories

Primary analysis of the sediment samples will be conducted by Advanced Analytical Australia Pty Ltd (AAA). Australian Laboratory Services (ALS) will be used as the secondary (reference) laboratory for inter-laboratory quality testing.

Both analytical laboratories are fully accredited by the National Association of Testing Authorities (NATA). AAA will subcontract some of the analyses to specialised NATA accredited laboratories, i.e. Sydney Analytical Laboratories (ammonia, Total Organic Carbon) and Microanalysis (Particle Size Distribution).

3.6.2 Analytical Tests

The primary laboratory Advanced Analytical Australia will perform all analyses in accordance with NAGD and will meet or provide better practical quantitation limits (PQL) than the target PQL's (Table 3-3).

Table 3-3 Analytical Parameters and Practical Quantitation Limits

Parameter	Target Practical Quantitation Limit (required)	Practical Quantitation Limit (Advanced Analytical Australia)
Moisture Content	0.1%	0.1%
Particle Size (sieve and sedigraph)	Size distribution (sieve + hydrometer or equivalent) and rates of settlement after 50% and 90% of settlement in seawater if possible.	10 to 0.001mm Settling velocities in m/s for all particle size fractions
Total Organic Carbon	0.1%	0.01%
Total Petroleum Hydrocarbons	100 mg/kg	10-50 mg/kg
Polychlorinated Biphenyls	5 µg/kg	5 µg/kg
PAHs (naphthalene, acenaphthalene, acenaphthene, fluorene, phenanthrene, anthracene, total fluoranthene, benzo [a]anthracene, benzo [a] pyrene, chrysene, dibenz[a,h] anthracene, pyrene, 2-methylnaphthalene)	Individual - 5 µg/kg; Sum of PAHs - 100 µg/kg	Individual - 5 µg/kg; Sum of PAHs - 100 µg/kg

Parameter	Target Practical Quantitation Limit (required)	Practical Quantitation Limit (Advanced Analytical Australia)
Trace Metals and Metalloids (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc)	0.1 – 100 mg/kg, Hg- 0.01 mg/kg	0.1 – 5 mg/kg, Hg – 0.01 mg/kg
Organotins (MBT, DBT, TBT)	1 µg Sn/kg	0.5 µg Sn/kg
OCP Pesticides	1 µg/kg	OCP-1 µg/kg
Total Nitrogen	N/A	20 mg/kg
Total Kjeldahl Nitrogen	N/A	20 mg/kg
Nitrate & Nitrite as N	0.1 mg/kg	0.1 mg/kg
Total Phosphorus	N/A	1 mg/kg
Acid Sulfate Soils	N/A	2 mole H ⁺ /tonne
Radionuclides	N/A	35 Bq/g

3.6.3 Sample Containers

Based on the proposed analyses, the following sample containers would be required per sample:

- 2 x 250 mL glass jar – organic/inorganic chemical analysis;
- 1 x 125 mL glass jar – nutrient analyses;
- 1 x medium plastic clipseal bag (50-100 g) – particle size distribution; and
- 1 x small clipseal bag (200 g) – acid sulfate soil.

3.6.4 Quality Control – Laboratory Analysis

Both laboratories will follow laboratory QC procedures in accordance with requirements outlined in Appendix F of NAGD. This includes analysis of laboratory blanks, duplicates, certified reference materials and spiked samples.

3.6.4.1 Laboratory Blanks

The purpose of this assessment is to monitor a potential laboratory contamination of samples due to potential cross-contamination of samples during laboratory preparation, extraction or analysis. Blank sample concentrations should be at or near the detection limit of the method used.

3.6.4.2 Laboratory Duplicates

This assessment refers to a randomly selected intra-laboratory split sample, which provides information regarding the method precision and sample heterogeneity. Results are presented as Relative Percent Difference (RPD) values of two sample concentrations for a specific contaminant.

NAGD recommends that duplicates should agree within a typical RPD of the method of $\pm 35\%$. This recommended RPD is typically not adopted by analytical laboratories as it does not account for the greater uncertainty for contaminant concentrations close to the method's detection limit.

The primary laboratory AAA uses the following approach to assess duplicate RPD's:

- Result < 10 times LOR – no limit to RPD; and
- Result > 10 times LOR – RPD between 0% and 50%.

The secondary laboratory ALS adopts specific RPDs for individual compounds.

3.6.4.3 *Surrogate and Matrix Spikes*

Laboratory Control Samples are either certified reference materials or a blank sample spiked with known concentrations of the analytes of interest. The purpose of this measurement is to monitor method accuracy.

Matrix spikes refer to an intra-laboratory split sample spiked with a representative set of target analytes of known concentration. Matrix spikes are assessed to monitor potential sample matrix effects on analyte recoveries.

Surrogate spikes are used for organic analytes. Surrogates are known additions to samples which mimic the compounds of interest and are not normally expected to be present in the sample.

For both surrogate and matrix spikes, a calculation of the percent recovery of the spiked amount against the returned concentration is performed indicating analytical performance in terms of extraction efficiency.

NAGD states that recovery limits of 75% - 125% are generally acceptable. Analytical laboratories typically adopt specific surrogate and matrix spike recovery limits for the various contaminant compound groups. It is also noted that ideal recovery ranges may be waived in the event of sample matrix interference.

The primary laboratory AAA adopts the following acceptable surrogate and matrix spike recovery limits:

- Trace elements: 70-130%;
- Organic analyses: 50-150%;
- SVOC & speciated phenols: 10-140%; and
- Surrogates: 10-140%.

The secondary laboratory ALS adopts specific recovery limits for individual compounds.

3.7 Data Analysis

3.7.1 Sediment Contaminants

Concentrations of chemicals measured in sediment samples at each dredging sub-area (or reference area) will be compared to screening levels listed in Table 2 of NAGD. This will provide a basis for determining whether dredged material is suitable for unconfined placement at sea or if further analyses, such as elutriate, bioavailability or toxicity testing, are required.

For each dredging sub-area, the mean concentrations of chemical parameters at the upper 95% confidence level (95% UCL) will be calculated and compared against NAGD guideline levels. This involves the following steps.

Data pre-treatment

Analytical values below detection limit will be set to one-half of the laboratory Limit of Reporting (LOR) as per NAGD recommendation to facilitate 95% UCL calculation. Organic contaminant results will be normalised to 1% Total Organic Carbon (TOC) where the measured value is within the range of 0.2-10%. If TOC values are outside of this range, the highest (10%) or lowest (0.2%) value will be adopted as appropriate. Organic parameters with concentrations below detection limits will not be normalised to 1% TOC but included at half their LOR.

One assumption in the calculation of the 95% UCL is that the samples are statistically independent. Therefore, field triplicate samples and laboratory split samples will not be included in the 95% UCL calculation.

Outliers

Outliers will be treated in accordance with the procedure in NAGD. In summary this will involve:

- (a) Outliers (for all parameters) will be identified as any data points greater than two standard deviations.
- (b) For TBT, where outliers are detected, the stored portion of the sample will be analysed in triplicate.
- (c) If the original result is not confirmed through the re-analysis, it will be discarded in favour of the mean of the three triplicate samples.

NAGD does not provide guidance on treatment of outliers for other parameters. Outliers for other parameters will be noted in the report but included in calculation of the 95% UCL.

Selection of appropriate 95% UCL Calculation Method

The methodology for calculating the 95% UCL follows the approach recommended in Appendix A of NAGD. A Shapiro-Wilk test will be used to determine whether data followed a normal distribution. The ProUCL (Version 4.1.00) software package will be used for these calculations (Singh et al. 2010).

Calculation of 95% UCL and Comparison to Screening Levels

ProUCL Version 4.1.00 will be used to calculate the 95% UCL. For normally distributed data, the arithmetic mean and standard deviation will be calculated, and the 95% UCL calculated using the one-tailed Student's *t* UCL test. For data that follows a log-normal (or other) distribution, the geometric mean will be calculated, and the 95% UCL analysed using non-parametric Jack-Knife analysis as per NAGD recommendation.

In cases where an insufficient number of discrete values in the dataset would not allow calculation of the 95% UCL (e.g. most values below LOR), the maximum recorded value of the dataset will be conservatively used instead for comparison against NAGD trigger levels.

Should 95% UCL values for all analysed parameters fall below NAGD screening levels, the sediment would be considered clean and suitable for unconfined disposal at sea.

3.7.2 Baseline Concentrations

NAGD states that ambient baseline concentrations can be determined by sampling of sediment at reference areas in the vicinity of an existing disposal site. Similar to the approach followed in Worley Parsons (2013c, d), the data collected from the five reference locations in Moreton Bay would be used to derive ambient baseline concentrations if required (RF2, 3, 4, 6 and 7 in Figure 3-1).

3.8 Elutriate and Bioavailability Testing

As outlined on Section 3.1.3, elutriate and bioavailability testing will be undertaken as per NAGD for a range of contaminants which have regularly exceeded screening levels in the past.

Elutriate Testing:

The elutriate test is designed to simulate release of contaminants from sediment during dredged material disposal. Testing will be carried out using the USEPA's standard seawater elutriate test which involves shaking the sediment samples with four times the volume of seawater at room temperature for 30 minutes. The sample will be allowed to settle for one hour and the supernatant centrifuged or filtered (0.45 µm) within sixty minutes, and analysed using analytical methods appropriate for determining ultra-trace levels in seawater.

Results will be compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% or 99% protection of species, as appropriate).

Bioavailability Testing:

The Dilute Acid Extraction (DAE) method will be used to provide an estimate of the bioavailable fraction of the contaminant of concern in case of metal/metalloid analysis. The sediment samples will be extracted using a weak acid and the results compared against the respective NAGD screening levels.

Porewater analysis would be undertaken for organic contaminants such as TBT. Porewater is assumed to represent the major route of exposure to sediment contaminants by benthic organisms and is the recommended bioavailability test for organic contaminants as per NAGD. Porewater results would be compared to the respective ANZECC/ARMCANZ (2000) marine water quality trigger value (for 95% protection of species).

Should both elutriate and bioavailability tests result in values less than the respective guideline limits, the material would be considered clean and suitable for ocean disposal.

3.8.1 Acid Sulfate Soils

The results of the chromium-sulfate acid sulfate analysis will be assessed against the Australian framework for Acid Sulfate Soil management in coastal systems (Ahern et al. 1998). The risk of acidification will be determined by the acid-base accounting approach (Ahern et al. 2004). Net acidity will be calculated from the results as a measure of the acid producing capacity of the sampled sediment upon complete oxidation.

The calculated net acidity will then be compared to the QASSIT action criteria of 0.03% S or 18 mol H⁺/tonne to assess the need for acid sulfate soil management if the dredged sediments were to be placed on land.

The liming rate will indicate the amount of lime that needs to be added to the soil to manage its acid generating capacity.

3.9 Data Validation

All laboratory analyses will be validated in accordance with Appendix A of NAGD to confirm suitable data quality for undertaking a rigorous characterisation of the proposed dredge material.

Data Validation will involve assessment of the following:

- Sample holding times and storage conditions;
- Laboratory blanks, duplicates and surrogate/matrix spikes; and
- Field triplicate samples, triplicate sample splits and trip blank.

The proposed data quality objectives for data validation are outlined in Table 3-4.

Table 3-4 Data Quality Objectives for Data Validation

Parameter	Data Quality Objective
Holding Time	Samples received within specified holding time (NAGD Appendix H)
Field Triplicate Samples	Relative Standard Deviation <50%
Triplicate Split Samples, including inter-laboratory samples	Relative Standard Deviation <50%
Laboratory Blanks	At or near the Limit of Reporting (LOR)
Laboratory Duplicate Samples	Relative Percent Difference (RPD) <35% or as per laboratory requirements
Laboratory Matrix Spikes	Recovery as per laboratory requirements
Surrogate Spikes	Recovery as per laboratory requirements

3.10 Reporting

The reporting of sediment quality results will be undertaken in a SAP Implementation Report in accordance with NAGD including the following components:

- Summary of the SAP, or SAP appended to the report;
- Outline of potential problems encountered and deviations from the SAP, including justification;
- Description of the sampling carried out, along with the actual sampling locations, sample numbers (including replicates and QA samples), completed COC forms, field logs and description of sediments;
- Comparison of the 95% UCL of mean chemical concentrations of sediments in the dredge subareas;
- Assessment of QA/QC procedures for both field and laboratory data;

- Data validation including comparison to data quality objectives;
- Appendices including all laboratory and field data; and
- Conclusions as to the acceptability or otherwise of the dredge material for unconfined ocean disposal and recommendations as to further work required.

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4 References

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References

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Worley Parsons (2013a) Brisbane River and Moreton Bay – Annual Sediment Characterisation Report 2013. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013b) Emergency Dredging Sediment Sampling Results 2013. Report prepared for Port of Brisbane Pty Ltd.

Worley Parsons (2013c) Emergency Dredging Sediment Sampling – Round 2 Organochlorine Pesticides Results. Report prepared for Port of Brisbane Pty Ltd.

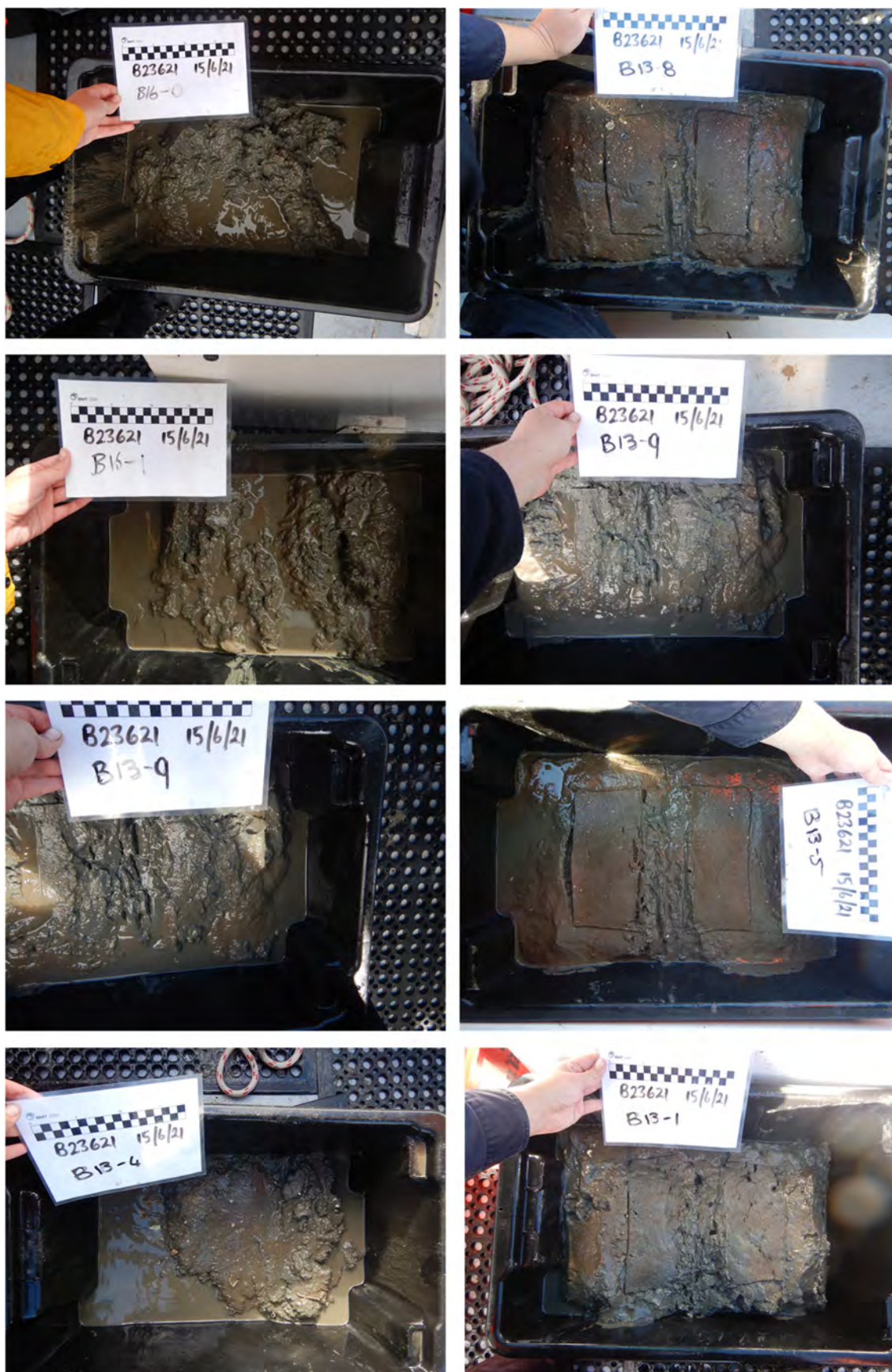
Worley Parsons (2013d) Emergency Dredging Sediment Sampling – Round 2 Dioxin Results. Report prepared for Port of Brisbane Pty Ltd.



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Appendix B Appendix B Sediment Photos













Appendix C Appendix C Sediment Quality Results – Primary Laboratory

CERTIFICATE OF ANALYSIS

Work Order	: EB2116770	Page	: 1 of 35
Amendment	: 1		
Client	: BMT COMMERCIAL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DARREN RICHARDSON	Contact	: Andrew Epps
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8639
Project	: Port of Brisbane SAP	Date Samples Received	: 15-Jun-2021 19:11
Order number	: ----	Date Analysis Commenced	: 17-Jun-2021
C-O-C number	: ----	Issue Date	: 21-Jul-2021 17:16
Sampler	: BRAD HILES		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 21		
No. of samples analysed	: 21		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Dave Gitsham	Metals Instrument Chemist	Brisbane Inorganics, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Sarah Ashworth	Laboratory Manager - Brisbane	Brisbane External Subcontracting, 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.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- EP080: 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.
- 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.
- EP131B : Particular sample raised LOR due to high amount of moistures is present.
- **Ultratrace Pesticides analysis is conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- EK067G (Total Phosphorus as P): Sample EB2116770_015 (B15-3) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP090 Organotins: Sample 'RF6' shows poor matrix spike recovery for MBT due to matrix interference.
- Amendment (21/07/2021): This report has been amended following changes to EG020-SD (Total Metals in Sediments by ICPMS) results. All details are recorded in client query 21BNCC284 and the quality system is being utilised to resolve this issue under corrective action 21BNC100.
- ASS: EA029 (SPOCAS): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.
- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. PR2156750. NATA and CAI accreditations' are both recognised under ILAC.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m³ in-situ soil, multiply reported results x wet bulk density of soil in t/m³.



Analytical Results

Sub-Matrix: PORE WATER
 (Matrix: WATER)

Sample ID

				B13-5	B13-4B	B13-4	B13-1	B12-1
Sampling date / time				15-Jun-2021 13:10	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 16:20
Compound	CAS Number	LOR	Unit	EB2116770-010	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-019
				Result	Result	Result	Result	Result
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	<2	<2	<2	<2
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
gamma-BHC	58-89-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	72-43-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Total Chlordane (sum)	----	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
EP090S: Organotin Surrogate								
Tripolytin	----	5	%	61.2	57.5	73.7	48.5	59.7
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.010	%	101	99.2	101	102	114



Analytical Results

Sub-Matrix: PORE WATER
 (Matrix: WATER)

Sample ID

				B10-8	----	----	----	----
Sampling date / time				15-Jun-2021 16:45	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2116770-020	-----	-----	-----	-----
Result				----	----	----	----	----
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.010	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.010	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.010	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.010	µg/L	<0.010	----	----	----	----
4,4'-DDD	72-54-8	0.010	µg/L	<0.010	----	----	----	----
4,4'-DDE	72-55-9	0.010	µg/L	<0.010	----	----	----	----
4,4'-DDT	50-29-3	0.010	µg/L	<0.010	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.010	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.010	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.010	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.010	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.010	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	----	----	----	----
^ Total Chlordane (sum)	----	0.010	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.010	µg/L	<0.010	----	----	----	----
EP090S: Organotin Surrogate								
Tripropyltin	----	5	%	68.5	----	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.010	%	97.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	RF7	RF6	RF2	RF3	B16-0
Sampling date / time					15-Jun-2021 08:16	15-Jun-2021 08:44	15-Jun-2021 09:08	15-Jun-2021 09:36	15-Jun-2021 11:00
Compound	CAS Number	LOR	Unit		EB2116770-001	EB2116770-002	EB2116770-003	EB2116770-004	EB2116770-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		60.1	46.8	64.6	64.7	46.4
EA150: Particle Sizing									
+75µm	----	1	%		4	42	2	<1	48
+150µm	----	1	%		1	36	1	<1	40
+300µm	----	1	%		<1	27	<1	<1	18
+425µm	----	1	%		<1	19	<1	<1	5
+600µm	----	1	%		<1	11	<1	<1	1
+1180µm	----	1	%		<1	7	<1	<1	<1
+2.36mm	----	1	%		<1	6	<1	<1	<1
+4.75mm	----	1	%		<1	5	<1	<1	<1
+9.5mm	----	1	%		<1	<1	<1	<1	<1
+19.0mm	----	1	%		<1	<1	<1	<1	<1
+37.5mm	----	1	%		<1	<1	<1	<1	<1
+75.0mm	----	1	%		<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		55	37	64	53	34
Silt (2-60 µm)	----	1	%		41	20	34	46	16
Sand (0.06-2.00 mm)	----	1	%		4	37	2	1	50
Gravel (>2mm)	----	1	%		<1	6	<1	<1	<1
Cobbles (>6cm)	----	1	%		<1	<1	<1	<1	<1
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		2.97	2.77	2.73	2.77	2.71
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		11700	10100	14600	15900	8680
Iron	7439-89-6	50	mg/kg		27100	26400	34200	37600	22600
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1	mg/kg		----	----	7.8	----	----
Arsenic	7440-38-2	1.00	mg/kg		7.82	6.35	----	10.1	6.85
Cadmium	7440-43-9	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1	mg/kg		----	----	47.6	----	----
Chromium	7440-47-3	1.0	mg/kg		37.9	25.7	----	44.3	25.6
Copper	7440-50-8	1	mg/kg		----	----	20.8	----	----
Copper	7440-50-8	1.0	mg/kg		16.9	12.1	----	21.4	12.4
Lead	7439-92-1	1	mg/kg		----	----	21.7	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	RF7	RF6	RF2	RF3	B16-0
Sampling date / time					15-Jun-2021 08:16	15-Jun-2021 08:44	15-Jun-2021 09:08	15-Jun-2021 09:36	15-Jun-2021 11:00
Compound	CAS Number	LOR	Unit		EB2116770-001	EB2116770-002	EB2116770-003	EB2116770-004	EB2116770-005
					Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued									
Lead	7439-92-1	1.0	mg/kg		17.0	12.4	----	20.4	10.2
Nickel	7440-02-0	1	mg/kg		----	----	25.7	----	----
Nickel	7440-02-0	1.0	mg/kg		21.7	16.1	----	25.8	15.0
Silver	7440-22-4	0.1	mg/kg		0.1	<0.1	0.1	0.1	<0.1
Zinc	7440-66-6	1	mg/kg		----	----	98.2	----	----
Zinc	7440-66-6	1.0	mg/kg		74.6	54.2	----	91.4	53.2
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg		0.08	0.05	0.07	0.08	0.03
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		1.02	0.67	1.01	1.08	0.67
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	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	RF7	RF6	RF2	RF3	B16-0
Sampling date / time				15-Jun-2021 08:16	15-Jun-2021 08:44	15-Jun-2021 09:08	15-Jun-2021 09:36	15-Jun-2021 11:00	
Compound	CAS Number	LOR	Unit	EB2116770-001	EB2116770-002	EB2116770-003	EB2116770-004	EB2116770-005	
				Result	Result	Result	Result	Result	
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued									
Prothiofos	34643-46-4	10	µg/kg	<10	<10	<10	<10	<10	
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	78.5	82.0	91.9	92.6	92.9	
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%	50.3	51.2	62.0	56.6	76.8	
EP131S: OC Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	RF7	RF6	RF2	RF3	B16-0
Sampling date / time					15-Jun-2021 08:16	15-Jun-2021 08:44	15-Jun-2021 09:08	15-Jun-2021 09:36	15-Jun-2021 11:00
Compound	CAS Number	LOR	Unit		EB2116770-001	EB2116770-002	EB2116770-003	EB2116770-004	EB2116770-005
					Result	Result	Result	Result	Result
EP131S: OC Pesticide Surrogate - Continued									
Dibromo-DDE	21655-73-2	0.50	%		74.4	64.9	67.5	60.4	75.7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time					15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit		EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		----	----	----	8.8	----
pH OX (23B)	----	0.1	pH Unit		----	----	----	8.2	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		----	----	----	<2	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		----	----	----	<2	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		----	----	----	<2	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		----	----	----	<0.020	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		----	----	----	<0.020	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		----	----	----	<0.020	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		----	----	----	0.109	----
Peroxide Sulfur (23De)	----	0.020	% S		----	----	----	0.262	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		----	----	----	0.153	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		----	----	----	96	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		----	----	----	0.260	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		----	----	----	1.65	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		----	----	----	1.39	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		----	----	----	694	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		----	----	----	1.11	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		----	----	----	0.142	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		----	----	----	0.282	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		----	----	----	0.141	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		----	----	----	116	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		----	----	----	0.186	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		----	----	----	4.62	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		----	----	----	923	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		----	----	----	1.48	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time					15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit		EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
					Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	----	1.5	----
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	----	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	----	<10	----
Liming Rate	----	1	kg CaCO3/t	----	----	----	----	<1	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	----	0.15	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	----	96	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	----	7	----
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	----	----	----	8.8	----
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	----	----	----	----	<2	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	----	----	----	<0.02	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	----	----	----	0.150	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	----	----	----	93	----
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	----	----	----	5.35	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	----	----	----	1070	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	----	----	----	1.71	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	----	1.5	----
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	----	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	----	<10	----
Liming Rate	----	1	kg CaCO3/t	----	----	----	----	<1	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	----	0.15	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	----	93	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	----	7	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		50.1	64.8	52.4	53.1	49.5
EA150: Particle Sizing									
+75µm	----	1	%		40	8	33	34	30

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time				15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10	
Compound	CAS Number	LOR	Unit	EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010	
				Result	Result	Result	Result	Result	
EA150: Particle Sizing - Continued									
+150µm	----	1	%	31	7	27	25	12	
+300µm	----	1	%	17	2	14	4	2	
+425µm	----	1	%	11	<1	6	2	1	
+600µm	----	1	%	8	<1	3	1	1	
+1180µm	----	1	%	7	<1	2	<1	<1	
+2.36mm	----	1	%	6	<1	1	<1	<1	
+4.75mm	----	1	%	5	<1	<1	<1	<1	
+9.5mm	----	1	%	<1	<1	<1	<1	<1	
+19.0mm	----	1	%	<1	<1	<1	<1	<1	
+37.5mm	----	1	%	<1	<1	<1	<1	<1	
+75.0mm	----	1	%	<1	<1	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	39	50	42	41	44	
Silt (2-60 µm)	----	1	%	20	42	24	23	24	
Sand (0.06-2.00 mm)	----	1	%	35	8	33	35	31	
Gravel (>2mm)	----	1	%	6	<1	1	1	1	
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.62	2.83	2.69	2.71	2.75	
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg	9160	15000	11700	10500	10200	
Iron	7439-89-6	50	mg/kg	23400	36400	29400	27800	28800	
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg	6.75	9.96	7.33	8.26	10.4	
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium	7440-47-3	1.0	mg/kg	25.4	37.3	29.8	25.7	28.7	
Copper	7440-50-8	1.0	mg/kg	12.8	15.6	13.3	12.3	13.4	
Lead	7439-92-1	1.0	mg/kg	10.7	14.5	13.3	12.0	14.0	
Nickel	7440-02-0	1.0	mg/kg	15.2	21.3	17.9	15.4	17.4	
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
Zinc	7440-66-6	1.0	mg/kg	53.5	66.9	58.8	54.3	62.8	
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg	0.04	0.05	0.06	0.05	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time					15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit		EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
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		----	----	----	1010	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		----	----	----	1010	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		----	----	----	474	----
EN82: Porewater Extraction									
Volume	----	1	mL		----	----	----	----	1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.72	1.01	1.67	0.81	0.85
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		----	----	----	<3	----
C10 - C14 Fraction	----	3	mg/kg		----	----	----	4	----
C15 - C28 Fraction	----	3	mg/kg		----	----	----	9	----
C29 - C36 Fraction	----	5	mg/kg		----	----	----	6	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		----	----	----	19	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		----	----	----	<3	----
>C10 - C16 Fraction	----	3	mg/kg		----	----	----	5	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		----	----	----	<3.0	----
>C16 - C34 Fraction	----	3	mg/kg		----	----	----	12	----
>C34 - C40 Fraction	----	5	mg/kg		----	----	----	<5	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		----	----	----	17	----
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time					15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit		EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
					Result	Result	Result	Result	Result
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	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time				15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit	EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1016	12674-11-2	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	----	<6.2	----
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	----	<6.2	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	----	----	----	<5	----
2-Methylnaphthalene	91-57-6	5	µg/kg	----	----	----	<5	----
Acenaphthylene	208-96-8	4	µg/kg	----	----	----	6	----
Acenaphthene	83-32-9	4	µg/kg	----	----	----	<5	----
Fluorene	86-73-7	4	µg/kg	----	----	----	<5	----
Phenanthrene	85-01-8	4	µg/kg	----	----	----	<5	----
Anthracene	120-12-7	4	µg/kg	----	----	----	<5	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time				15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit	EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	4	µg/kg	----	----	----	22	----
Pyrene	129-00-0	4	µg/kg	----	----	----	24	----
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	----	15	----
Chrysene	218-01-9	4	µg/kg	----	----	----	12	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	----	----	20	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	----	7	----
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	----	13	----
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	----	21	----
Perylene	198-55-0	4	µg/kg	----	----	----	14	----
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	----	----	----	14	----
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	----	----	----	<5	----
Indeno(1,2,3-cd)pyrene	193-39-5	4	µg/kg	----	----	----	11	----
Coronene	191-07-1	5	µg/kg	----	----	----	<5	----
^ Sum of PAHs	----	4	µg/kg	----	----	----	179	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	----	----	----	26	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	----	----	----	28	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	----	----	----	30	----
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	----	----	----	590	----
Gross beta	----	500	Bq/kg DW	----	----	----	<500	----
EP080-SD: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	78.6	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	72.9	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	76.4	----
EP090S: Organotin Surrogate								
Tripopyltin	----	0.5	%	90.4	93.7	88.4	98.1	114
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	68.9	43.1	54.2	58.3	57.0
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	59.3	41.3	66.1	62.1	47.1
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	----	----	----	55.6	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	----	----	----	62.2	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B16-1	B13-9	RF4	B13-8	B13-5
Sampling date / time					15-Jun-2021 11:40	15-Jun-2021 12:07	15-Jun-2021 12:16	15-Jun-2021 12:48	15-Jun-2021 13:10
Compound	CAS Number	LOR	Unit		EB2116770-006	EB2116770-007	EB2116770-008	EB2116770-009	EB2116770-010
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		----	----	----	105	----
4-Terphenyl-d14	1718-51-0	10	%		----	----	----	94.9	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time					15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit		EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		----	----	----	----	9.4
pH OX (23B)	----	0.1	pH Unit		----	----	----	----	8.9
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		----	----	----	----	<2
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		----	----	----	----	<2
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		----	----	----	----	<2
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		----	----	----	----	<0.020
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		----	----	----	----	<0.020
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		----	----	----	----	<0.020
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		----	----	----	----	0.044
Peroxide Sulfur (23De)	----	0.020	% S		----	----	----	----	0.086
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		----	----	----	----	0.042
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		----	----	----	----	26
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		----	----	----	----	0.169
Peroxide Calcium (23Wh)	----	0.020	% Ca		----	----	----	----	2.80
Acid Reacted Calcium (23X)	----	0.020	% Ca		----	----	----	----	2.63
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		----	----	----	----	1310
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		----	----	----	----	2.11
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		----	----	----	----	0.050
Peroxide Magnesium (23Tm)	----	0.020	% Mg		----	----	----	----	0.134
Acid Reacted Magnesium (23U)	----	0.020	% Mg		----	----	----	----	0.084
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		----	----	----	----	69
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		----	----	----	----	0.111
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		----	----	----	----	7.75
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		----	----	----	----	1550
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		----	----	----	----	2.48



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time					15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit		EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
					Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	----	----	1.5
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	----	----	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	----	----	<10
Liming Rate	----	1	kg CaCO3/t	----	----	----	----	----	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	----	----	0.04
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	----	----	26
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	----	----	2
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	----	----	----	----	9.4
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	----	----	----	----	----	<2
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	----	----	----	----	<0.02
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	----	----	----	----	0.043
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	----	----	----	----	27
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	----	----	----	----	8.06
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	----	----	----	----	1610
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	----	----	----	----	2.58
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	----	----	1.5
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	----	----	<0.02
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	----	----	<10
Liming Rate	----	1	kg CaCO3/t	----	----	----	----	----	<1
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	----	----	0.04
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	----	----	27
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	----	----	2
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		34.2	48.5	26.5	48.2	27.6
EA150: Particle Sizing									
+75µm	----	1	%		56	29	77	36	86

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time				15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15	
Compound	CAS Number	LOR	Unit	EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015	
				Result	Result	Result	Result	Result	
EA150: Particle Sizing - Continued									
+150µm	----	1	%	47	18	67	18	76	
+300µm	----	1	%	30	9	41	2	33	
+425µm	----	1	%	20	6	28	1	16	
+600µm	----	1	%	10	4	15	<1	10	
+1180µm	----	1	%	3	2	5	<1	8	
+2.36mm	----	1	%	1	<1	4	<1	7	
+4.75mm	----	1	%	<1	<1	3	<1	4	
+9.5mm	----	1	%	<1	<1	<1	<1	<1	
+19.0mm	----	1	%	<1	<1	<1	<1	<1	
+37.5mm	----	1	%	<1	<1	<1	<1	<1	
+75.0mm	----	1	%	<1	<1	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	26	41	13	32	8	
Silt (2-60 µm)	----	1	%	17	29	9	29	5	
Sand (0.06-2.00 mm)	----	1	%	55	29	74	39	80	
Gravel (>2mm)	----	1	%	2	1	4	<1	7	
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.71	2.80	2.75	2.68	2.72	
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg	6510	9480	4680	10800	4500	
Iron	7439-89-6	50	mg/kg	17500	24400	14800	27200	13900	
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg	3.98	8.39	5.33	7.27	5.93	
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium	7440-47-3	1.0	mg/kg	17.8	26.0	14.0	29.9	14.1	
Copper	7440-50-8	1.0	mg/kg	8.5	12.9	5.5	16.2	4.9	
Lead	7439-92-1	1.0	mg/kg	7.7	12.7	5.8	15.4	5.2	
Nickel	7440-02-0	1.0	mg/kg	11.8	16.8	9.4	20.1	10.6	
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
Zinc	7440-66-6	1.0	mg/kg	39.6	56.9	30.1	68.5	31.2	
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg	0.04	----	----	----	0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time					15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit		EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
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		----	----	----	----	290
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		----	----	----	----	290
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		----	----	----	----	286
EN82: Porewater Extraction									
Volume	----	1	mL		----	1	1	1	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.36	0.81	0.27	0.86	0.20
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		----	----	----	----	<3
C10 - C14 Fraction	----	3	mg/kg		----	----	----	----	<3
C15 - C28 Fraction	----	3	mg/kg		----	----	----	----	<3
C29 - C36 Fraction	----	5	mg/kg		----	----	----	----	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg		----	----	----	----	<3
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		----	----	----	----	<3
>C10 - C16 Fraction	----	3	mg/kg		----	----	----	----	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		----	----	----	----	<3.0
>C16 - C34 Fraction	----	3	mg/kg		----	----	----	----	3
>C34 - C40 Fraction	----	5	mg/kg		----	----	----	----	<5
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		----	----	----	----	3
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time					15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit		EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
					Result	Result	Result	Result	Result
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	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time				15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit	EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1016	12674-11-2	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	----	----	<5.0
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	----	----	<5.0
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	----	----	----	----	<5
2-Methylnaphthalene	91-57-6	5	µg/kg	----	----	----	----	<5
Acenaphthylene	208-96-8	4	µg/kg	----	----	----	----	<4
Acenaphthene	83-32-9	4	µg/kg	----	----	----	----	<4
Fluorene	86-73-7	4	µg/kg	----	----	----	----	<4
Phenanthrene	85-01-8	4	µg/kg	----	----	----	----	<4
Anthracene	120-12-7	4	µg/kg	----	----	----	----	<4



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time				15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit	EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	4	µg/kg	----	----	----	----	4
Pyrene	129-00-0	4	µg/kg	----	----	----	----	5
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	----	----	<4
Chrysene	218-01-9	4	µg/kg	----	----	----	----	<4
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	----	----	----	<4
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	----	----	<4
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	----	----	<4
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	----	----	<4
Perylene	198-55-0	4	µg/kg	----	----	----	----	<4
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	----	----	----	----	<4
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	----	----	----	----	<4
Indeno(1,2,3-cd)pyrene	193-39-5	4	µg/kg	----	----	----	----	<4
Coronene	191-07-1	5	µg/kg	----	----	----	----	<5
^ Sum of PAHs	----	4	µg/kg	----	----	----	----	9
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	----	----	----	----	<4
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	----	----	----	----	5
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	----	----	----	----	10
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	----	----	----	----	640
Gross beta	----	500	Bq/kg DW	----	----	----	----	<500
EP080-SD: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	88.8
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	77.9
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	86.2
EP090S: Organotin Surrogate								
Tripopyltin	----	0.5	%	113	73.2	104	89.6	101
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	51.2	51.9	68.5	51.8	69.7
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	49.1	58.0	72.2	57.2	83.2
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	----	----	----	----	86.2
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	----	----	----	----	56.9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-4C	B13-4B	B13-4	B13-1	B15-3
Sampling date / time					15-Jun-2021 13:25	15-Jun-2021 13:31	15-Jun-2021 13:35	15-Jun-2021 13:55	15-Jun-2021 15:15
Compound	CAS Number	LOR	Unit		EB2116770-011	EB2116770-012	EB2116770-013	EB2116770-014	EB2116770-015
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		----	----	----	----	91.3
4-Terphenyl-d14	1718-51-0	10	%		----	----	----	----	79.9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time					15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit		EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		9.4	----	----	9.2	----
pH OX (23B)	----	0.1	pH Unit		8.9	----	----	8.6	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		<2	----	----	<2	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	----	----	<2	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	----	----	<2	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		<0.020	----	----	<0.020	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		<0.020	----	----	<0.020	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		<0.020	----	----	<0.020	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.044	----	----	0.042	----
Peroxide Sulfur (23De)	----	0.020	% S		0.088	----	----	0.081	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		0.044	----	----	0.039	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		27	----	----	24	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		0.158	----	----	0.144	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		3.68	----	----	0.875	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		3.52	----	----	0.731	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		1760	----	----	365	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		2.82	----	----	0.585	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.047	----	----	0.061	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.113	----	----	0.118	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		0.066	----	----	0.057	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		54	----	----	47	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		0.087	----	----	0.076	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		9.66	----	----	2.82	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		1930	----	----	564	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		3.09	----	----	0.904	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time					15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit		EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
					Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	----	----	1.5	----
Net Acidity (sulfur units)	----	0.02	% S		<0.02	----	----	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t		<10	----	----	<10	----
Liming Rate	----	1	kg CaCO3/t		<1	----	----	<1	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.04	----	----	0.04	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		27	----	----	24	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		2	----	----	2	----
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit		9.4	----	----	9.2	----
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	----	----	<2	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	----	----	<0.02	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S		0.042	----	----	0.047	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t		26	----	----	29	----
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3		10.2	----	----	2.69	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t		2040	----	----	537	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S		3.27	----	----	0.86	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	----	----	1.5	----
Net Acidity (sulfur units)	----	0.02	% S		<0.02	----	----	<0.02	----
Net Acidity (acidity units)	----	10	mole H+ / t		<10	----	----	<10	----
Liming Rate	----	1	kg CaCO3/t		<1	----	----	<1	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.04	----	----	0.05	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		26	----	----	29	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		2	----	----	2	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		26.0	63.0	45.1	28.8	65.7
EA150: Particle Sizing									
+75µm	----	1	%		87	4	44	72	13



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time				15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit	EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+150µm	----	1	%	71	2	25	67	6
+300µm	----	1	%	40	<1	10	33	2
+425µm	----	1	%	22	<1	3	14	2
+600µm	----	1	%	15	<1	<1	6	1
+1180µm	----	1	%	12	<1	<1	2	1
+2.36mm	----	1	%	9	<1	<1	1	<1
+4.75mm	----	1	%	5	<1	<1	<1	<1
+9.5mm	----	1	%	<1	<1	<1	<1	<1
+19.0mm	----	1	%	<1	<1	<1	<1	<1
+37.5mm	----	1	%	<1	<1	<1	<1	<1
+75.0mm	----	1	%	<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	8	58	33	15	44
Silt (2-60 µm)	----	1	%	4	38	21	12	42
Sand (0.06-2.00 mm)	----	1	%	78	4	46	72	13
Gravel (>2mm)	----	1	%	10	<1	<1	1	1
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.74	2.86	2.71	2.69	2.67
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	4110	20200	8110	4100	13700
Iron	7439-89-6	50	mg/kg	12700	47100	21600	12300	34200
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1	mg/kg	----	----	----	----	9.6
Arsenic	7440-38-2	1.00	mg/kg	6.38	8.85	5.80	5.34	----
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1	mg/kg	----	----	----	----	35.7
Chromium	7440-47-3	1.0	mg/kg	13.0	43.2	22.3	15.0	----
Copper	7440-50-8	1	mg/kg	----	----	----	----	23.8
Copper	7440-50-8	1.0	mg/kg	4.9	32.1	12.8	8.6	----
Lead	7439-92-1	1	mg/kg	----	----	----	----	15.7
Lead	7439-92-1	1.0	mg/kg	5.5	23.8	9.4	5.9	----
Nickel	7440-02-0	1	mg/kg	----	----	----	----	21.4
Nickel	7440-02-0	1.0	mg/kg	9.3	40.3	14.7	10.9	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time					15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit		EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
					Result	Result	Result	Result	Result
EG020-SD: Total Metals in Sediments by ICPMS - Continued									
Silver	7440-22-4	0.1	mg/kg		<0.1	0.1	<0.1	<0.1	0.1
Zinc	7440-66-6	1	mg/kg		----	----	----	----	104
Zinc	7440-66-6	1.0	mg/kg		30.2	102	51.5	32.3	----
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg		0.01	0.07	0.04	----	----
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		330	----	----	180	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		330	----	----	180	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		283	----	----	183	----
EN82: Porewater Extraction									
Volume	----	1	mL		----	----	----	1	1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.17	1.10	0.66	0.22	1.34
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	----	----	<3	----
C10 - C14 Fraction	----	3	mg/kg		<3	----	----	<3	----
C15 - C28 Fraction	----	3	mg/kg		<3	----	----	4	----
C29 - C36 Fraction	----	5	mg/kg		<5	----	----	<5	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		<3	----	----	4	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	----	----	<3	----
>C10 - C16 Fraction	----	3	mg/kg		<3	----	----	<3	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	----	----	<3.0	----
>C16 - C34 Fraction	----	3	mg/kg		4	----	----	5	----
>C34 - C40 Fraction	----	5	mg/kg		<5	----	----	<5	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		4	----	----	5	----
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Toluene	108-88-3	0.2	mg/kg		<0.2	----	----	<0.2	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time					15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit		EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
					Result	Result	Result	Result	Result
EP080-SD: BTEXN - Continued									
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	----	----	<0.2	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	----	----	<0.2	----
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	----	----	<0.2	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	<0.2	----
Naphthalene	91-20-3	0.2	mg/kg		<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	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time				15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45	
Compound	CAS Number	LOR	Unit	EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020	
				Result	Result	Result	Result	Result	
EP131A: Organochlorine Pesticides - Continued									
beta-BHC	319-85-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	µg/kg	<0.50	0.96	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	<0.50	0.96	<0.50	<0.50	<0.50	
Dieldrin	60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	
EP131B: Polychlorinated Biphenyls (as Aroclors)									
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<5.0	----	----	<5.0	----	
Aroclor 1016	12674-11-2	5.0	µg/kg	<5.0	----	----	<5.0	----	
Aroclor 1221	11104-28-2	5.0	µg/kg	<5.0	----	----	<5.0	----	
Aroclor 1232	11141-16-5	5.0	µg/kg	<5.0	----	----	<5.0	----	
Aroclor 1242	53469-21-9	5.0	µg/kg	<5.0	----	----	<5.0	----	
Aroclor 1248									

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time				15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45	
Compound	CAS Number	LOR	Unit	EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020	
				Result	Result	Result	Result	Result	
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Naphthalene	91-20-3	5	µg/kg	<5	----	----	<5	----	
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	<5	----	
Acenaphthylene	208-96-8	4	µg/kg	<4	----	----	<4	----	
Acenaphthene	83-32-9	4	µg/kg	<4	----	----	<4	----	
Fluorene	86-73-7	4	µg/kg	<4	----	----	<4	----	
Phenanthrene	85-01-8	4	µg/kg	<4	----	----	<4	----	
Anthracene	120-12-7	4	µg/kg	<4	----	----	<4	----	
Fluoranthene	206-44-0	4	µg/kg	4	----	----	9	----	
Pyrene	129-00-0	4	µg/kg	4	----	----	10	----	
Benzo(a)anthracene	56-55-3	4	µg/kg	<4	----	----	5	----	
Chrysene	218-01-9	4	µg/kg	<4	----	----	5	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	4	----	----	8	----	
Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	----	----	<4	----	
Benzo(e)pyrene	192-97-2	4	µg/kg	<4	----	----	5	----	
Benzo(a)pyrene	50-32-8	4	µg/kg	4	----	----	8	----	
Perylene	198-55-0	4	µg/kg	5	----	----	16	----	
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	<4	----	----	6	----	
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	<4	----	----	<4	----	
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	----	----	5	----	
Coronene	191-07-1	5	µg/kg	<5	----	----	<5	----	
^ Sum of PAHs	----	4	µg/kg	21	----	----	77	----	
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	4	----	----	10	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	7	----	----	12	----	
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	10	----	----	14	----	
Radionuclides / Activity									
Gross alpha	----	500	Bq/kg DW	560	----	----	660	----	
Gross beta	----	500	Bq/kg DW	510	----	----	<500	----	
EP080-SD: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	89.0	----	----	94.7	----	
Toluene-D8	2037-26-5	0.2	%	78.2	----	----	87.6	----	
4-Bromofluorobenzene	460-00-4	0.2	%	83.9	----	----	91.2	----	
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%	97.5	93.0	96.8	53.8	60.4	
EP130S: Organophosphorus Pesticide Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B15-2	B15-1	B12-2	B12-1	B10-8
Sampling date / time					15-Jun-2021 15:30	15-Jun-2021 15:50	15-Jun-2021 16:05	15-Jun-2021 16:20	15-Jun-2021 16:45
Compound	CAS Number	LOR	Unit		EB2116770-016	EB2116770-017	EB2116770-018	EB2116770-019	EB2116770-020
				Result	Result	Result	Result	Result	Result
EP130S: Organophosphorus Pesticide Surrogate - Continued									
DEF	78-48-8	10	%		63.8	52.0	68.0	61.6	53.1
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		70.2	66.8	63.4	57.8	52.1
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		66.2	----	----	63.2	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		61.8	----	----	78.7	----
Anthracene-d10	1719-06-8	10	%		100	----	----	99.5	----
4-Terphenyl-d14	1718-51-0	10	%		83.9	----	----	119	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Trip Blank 040702	----	----	----	----
Sampling date / time					15-Jun-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2116770-021	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		104	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		91.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		97.1	----	----	----	----



Surrogate Control Limits

Sub-Matrix: PORE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP090S: Organotin Surrogate			
Tripopyltin	----	24	116
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127
EP080-SD: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	145
Toluene-D8	2037-26-5	42	144
4-Bromofluorobenzene	460-00-4	58	142
EP090S: Organotin Surrogate			
Tripopyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	119
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	106
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	55	135
Anthracene-d10	1719-06-8	70	136
4-Terphenyl-d14	1718-51-0	57	127



Inter-Laboratory Testing

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

(SOIL) EP131A: Organochlorine Pesticides
(SOIL) EP131S: OC Pesticide Surrogate
(SOIL) EP130A: Organophosphorus Pesticides (Ultra-trace)
(SOIL) EP130S: Organophosphorus Pesticide Surrogate
(SOIL) EP131B: Polychlorinated Biphenyls (as Aroclors)
(SOIL) EP131T: PCB Surrogate
(SOIL) EP132B: Polynuclear Aromatic Hydrocarbons
(SOIL) EP132T: Base/Neutral Extractable Surrogates
(WATER) EP131A: Organochlorine Pesticides
(WATER) EP131S: OC Pesticide Surrogate

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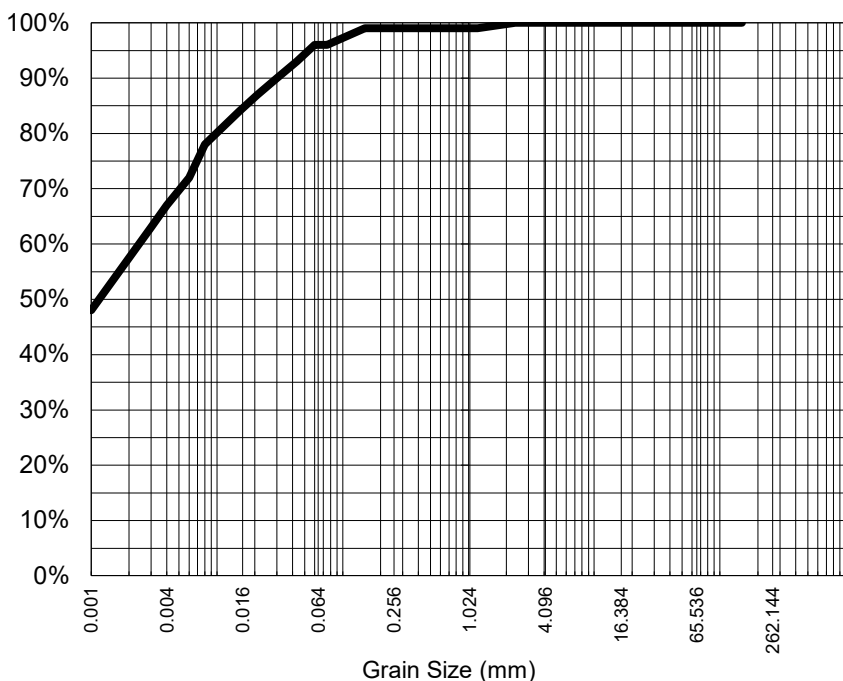
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pH 07 3243 7222
samples.brisbane@alsenviro.com

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REPORT NO: EB2116770-001 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: RF7

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	99%
0.300	99%
0.150	99%
0.075	96%
Particle Size (microns)	
43	93%
30	90%
21	87%
15	84%
11	81%
8	78%
6	72%
4	67%
1	48%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.97 (2.85)*

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

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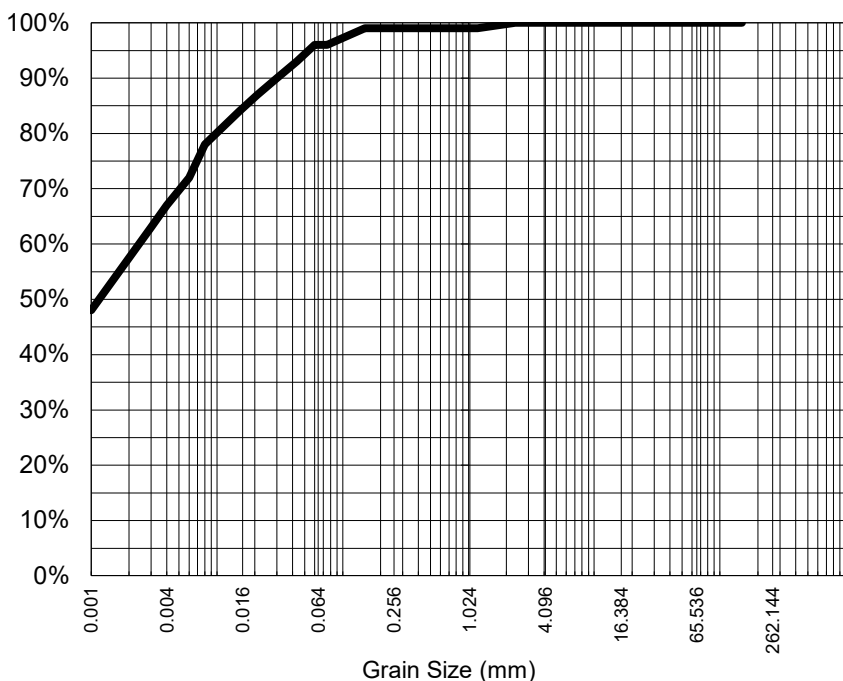
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REPORT NO: EB2116770-001DUP / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: RF7

Particle Size Distribution



Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.97 (2.85)*

Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	99%
0.300	99%
0.150	99%
0.075	96%
Particle Size (microns)	
43	93%
30	90%
21	87%
15	84%
11	81%
8	78%
6	72%
4	67%
1	48%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Analysed: 21-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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Soil Senior Chemist
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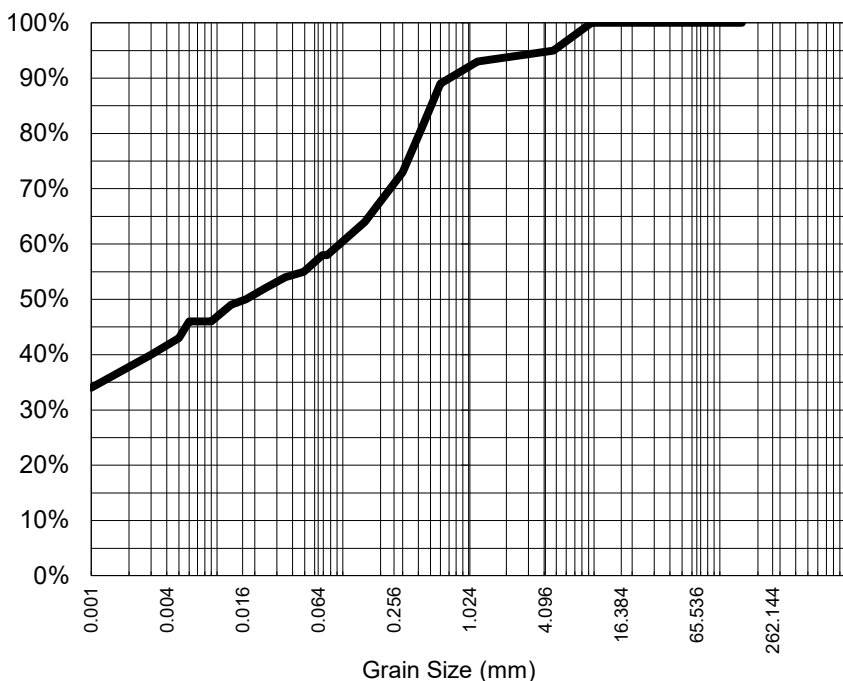
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** RF6

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	95%
2.36	94%
1.18	93%
0.600	89%
0.425	81%
0.300	73%
0.150	64%
0.075	58%
Particle Size (microns)	
49	55%
35	54%
24	52%
17	50%
13	49%
9	46%
6	46%
5	43%
1	34%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.017
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.77

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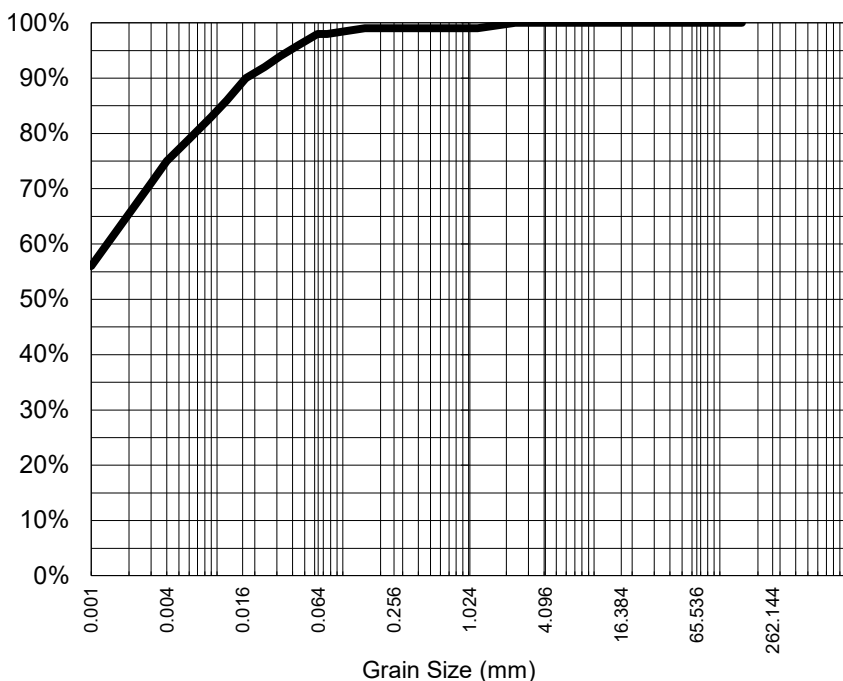
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** RF2

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	99%
0.300	99%
0.150	99%
0.075	98%
Particle Size (microns)	
45	96%
32	94%
24	92%
17	90%
12	86%
9	83%
6	79%
4	75%
1	56%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.73

Analysed: 21-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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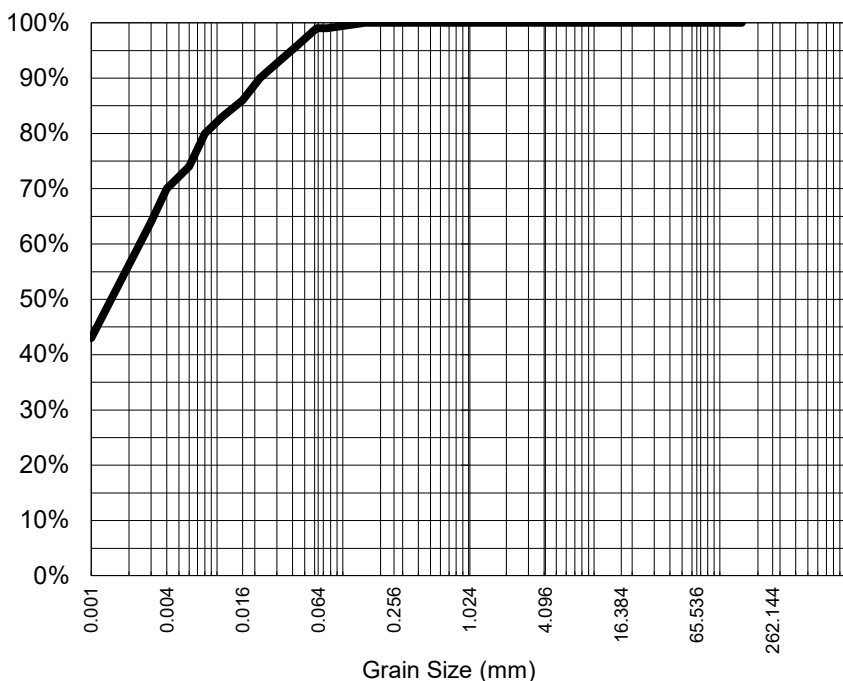
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** RF3

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
0.150	100%
0.075	99%
Particle Size (microns)	
44	96%
31	93%
22	90%
16	86%
11	83%
8	80%
6	74%
4	70%
1	43%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.77

Analysed: 21-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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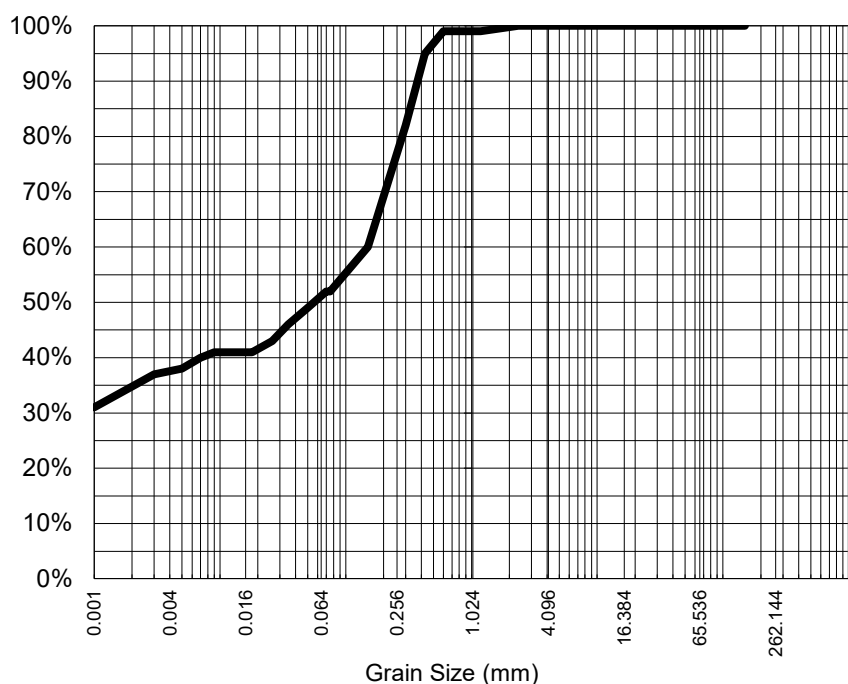
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PROJECT: Port of Brisbane SAP
SAMPLE ID: B16-0

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	95%
0.300	82%
0.150	60%
0.075	52%
Particle Size (microns)	
50	49%
35	46%
26	43%
18	41%
13	41%
9	41%
7	40%
5	38%
1	31%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.057
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

Satish

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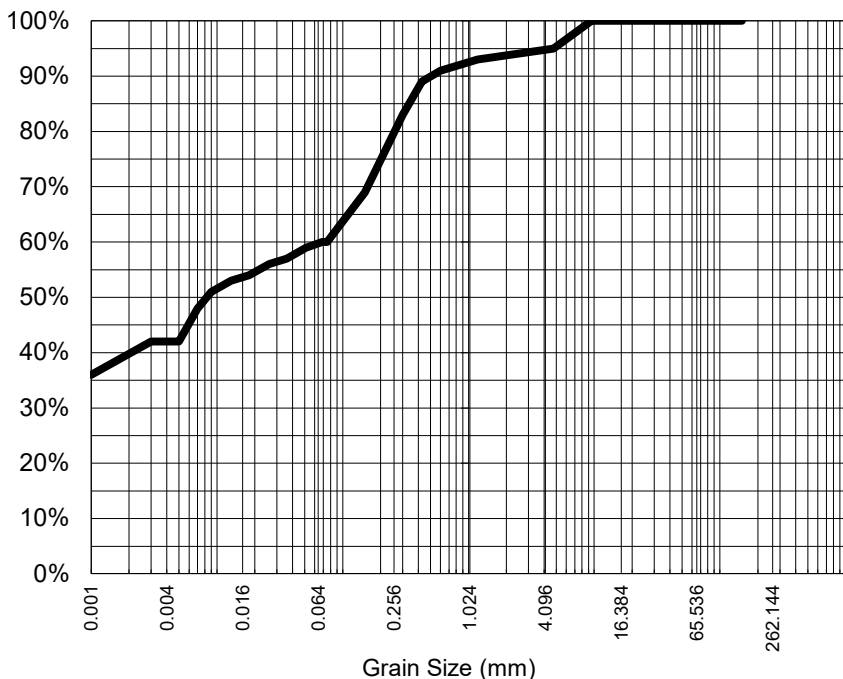
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B16-1

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	95%
2.36	94%
1.18	93%
0.600	91%
0.425	89%
0.300	83%
0.150	69%
0.075	60%
Particle Size (microns)	
51	59%
36	57%
26	56%
18	54%
13	53%
9	51%
7	48%
5	42%
1	36%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.008
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.62

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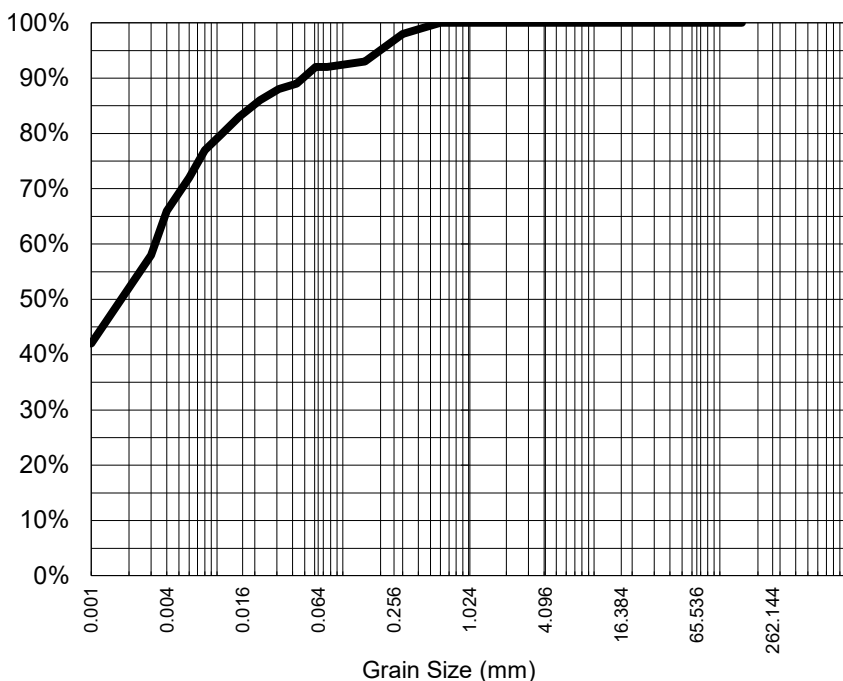
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B13-9

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	98%
0.150	93%
0.075	92%
Particle Size (microns)	
43	89%
31	88%
22	86%
15	83%
11	80%
8	77%
6	72%
4	66%
1	42%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.83

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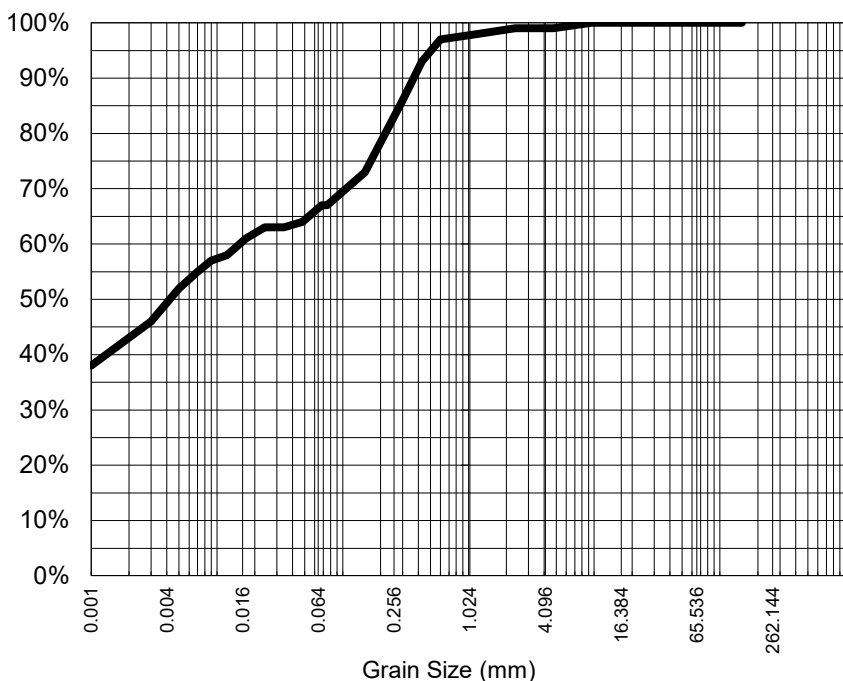
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** RF4

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	99%
2.36	99%
1.18	98%
0.600	97%
0.425	93%
0.300	86%
0.150	73%
0.075	67%
Particle Size (microns)	
48	64%
34	63%
24	63%
17	61%
12	58%
9	57%
7	55%
5	52%
1	38%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.69

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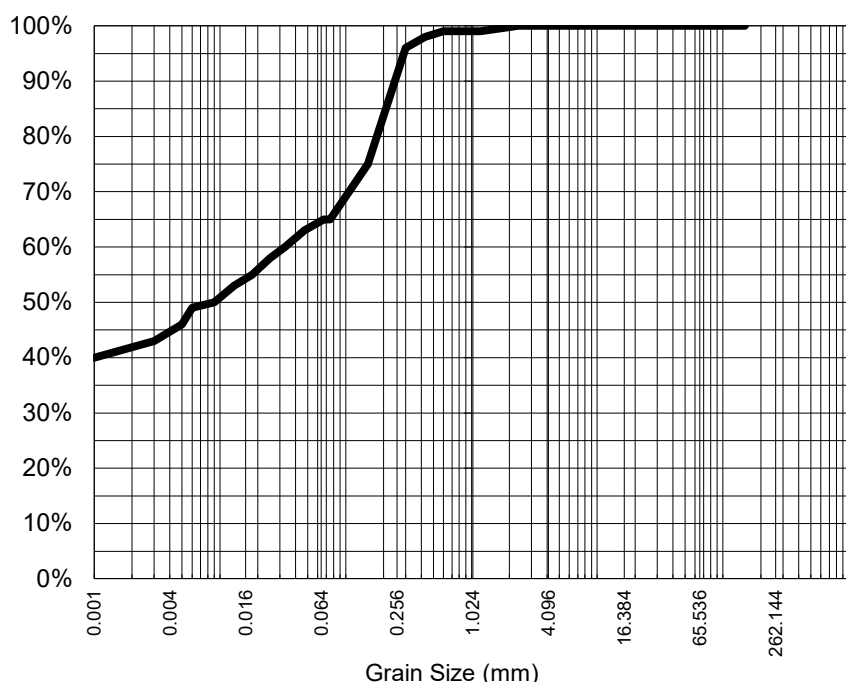
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REPORT NO: EB2116770-009 / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B13-8

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	98%
0.300	96%
0.150	75%
0.075	65%
Particle Size (microns)	
47	63%
33	60%
25	58%
18	55%
13	53%
9	50%
6	49%
5	46%
1	40%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.009
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

Satish

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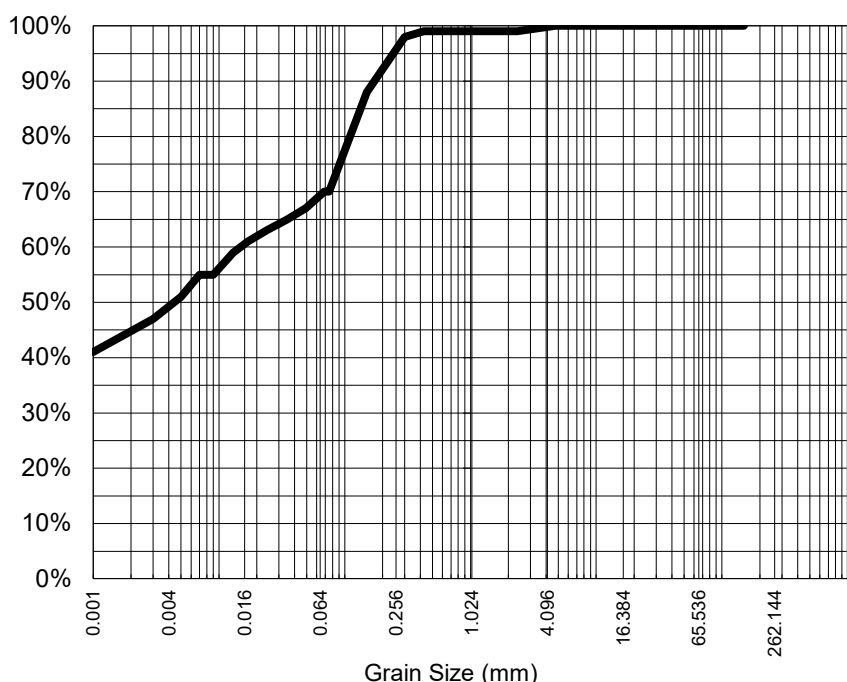
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REPORT NO: EB2116770-010 / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B13-5

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	99%
0.600	99%
0.425	99%
0.300	98%
0.150	88%
0.075	70%
Particle Size (microns)	
49	67%
35	65%
24	63%
17	61%
13	59%
9	55%
7	55%
5	51%
1	41%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.75

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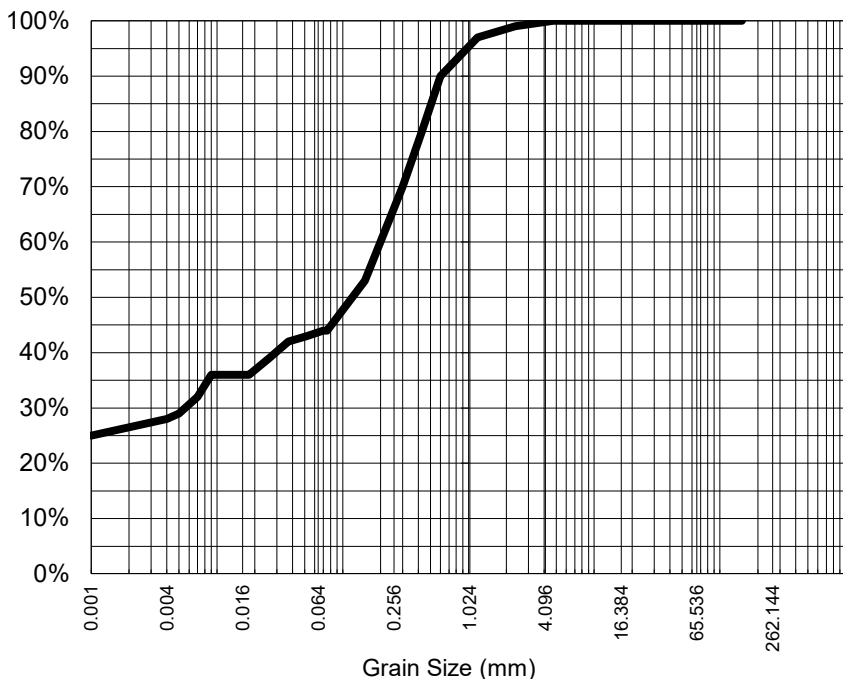
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B13-4C

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	97%
0.600	90%
0.425	80%
0.300	70%
0.150	53%
0.075	44%
Particle Size (microns)	
52	43%
37	42%
26	39%
18	36%
13	36%
9	36%
7	32%
5	29%
1	25%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.125
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

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AUSTRALIA PTY LTD

DATE RECEIVED: 15-Jun-2021

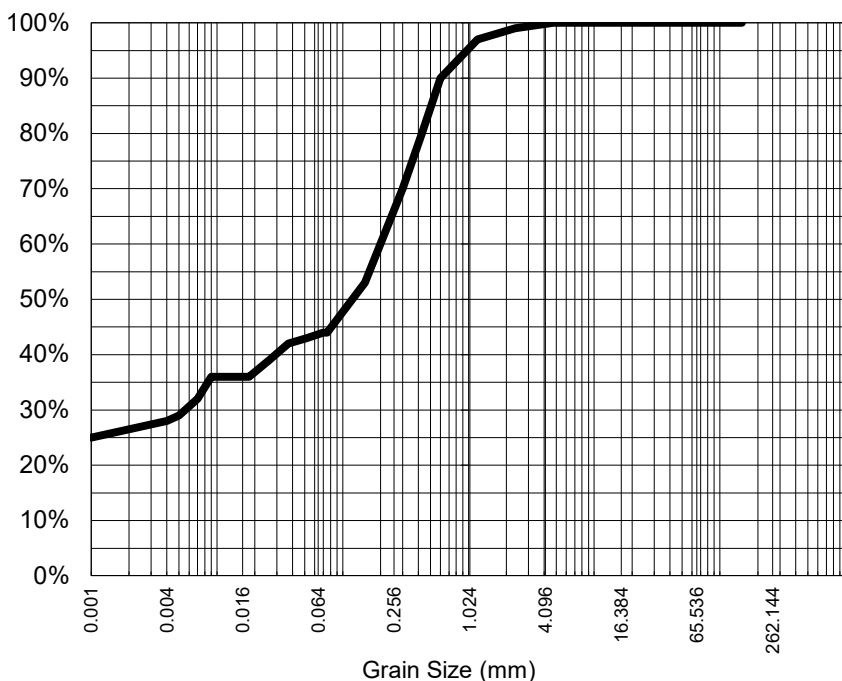
ADDRESS: Po Box 203
Spring Hill
Brisbane Qld

REPORT NO: EB2116770-011DUP / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B13-4C

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	97%
0.600	90%
0.425	80%
0.300	70%
0.150	53%
0.075	44%
Particle Size (microns)	
52	43%
37	42%
26	39%
18	36%
13	36%
9	36%
7	32%
5	29%
1	25%

Median Particle Size (mm)*	0.125
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

NATA Accreditation: 825 Site: Brisbane
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Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

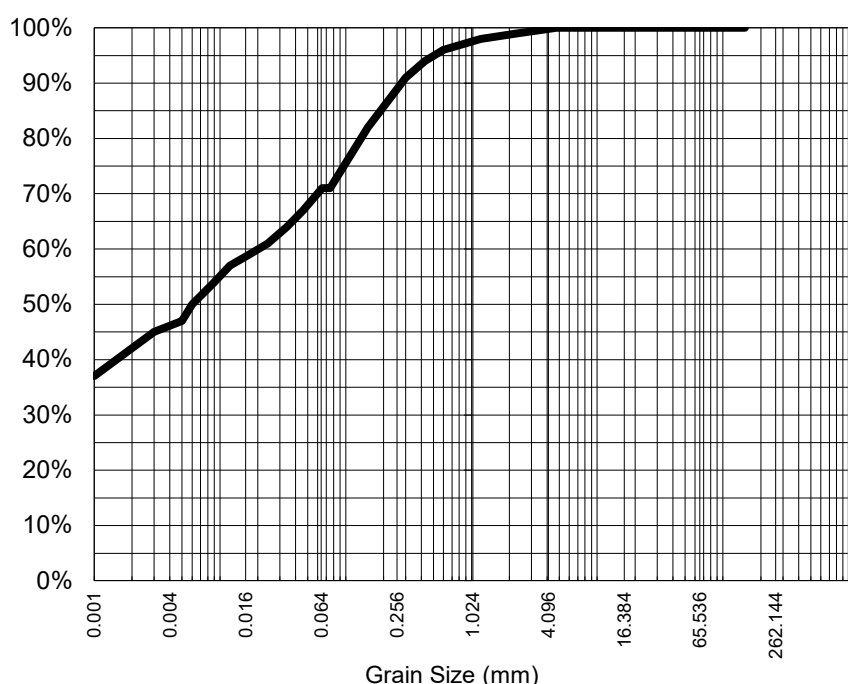
ALS Laboratory Group Pty Ltd
2 Byth Street
Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

ALS Environmental
Brisbane QLD



CLIENT: DARREN RICHARDSON
DATE REPORTED: 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD
DATE RECEIVED: 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld
REPORT NO: EB2116770-012 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B13-4B

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	98%
0.600	96%
0.425	94%
0.300	91%
0.150	82%
0.075	71%
Particle Size (microns)	
46	67%
34	64%
24	61%
17	59%
12	57%
9	54%
6	50%
5	47%
1	37%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.006
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.8

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

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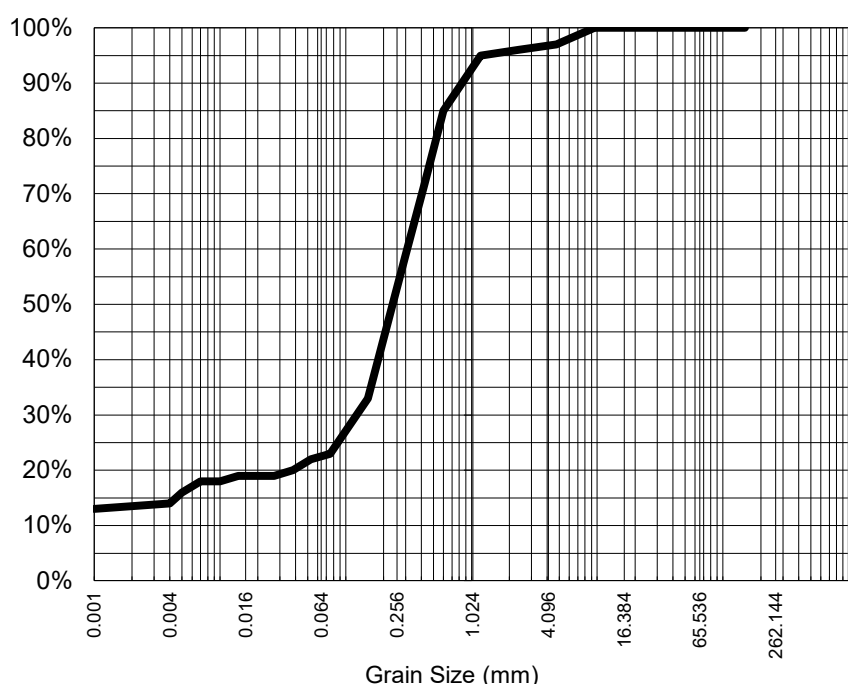
ALS Laboratory Group Pty Ltd
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Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

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CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2116770-013 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B13-4

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	97%
2.36	96%
1.18	95%
0.600	85%
0.425	72%
0.300	59%
0.150	33%
0.075	23%
Particle Size (microns)	
53	22%
38	20%
27	19%
19	19%
14	19%
10	18%
7	18%
5	16%
1	13%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.248
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.75

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Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

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pH 07 3243 7222
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Brisbane QLD



CLIENT: DARREN RICHARDSON

DATE REPORTED: 29-Jun-2021

COMPANY: BMT COMMERCIAL
AUSTRALIA PTY LTD

DATE RECEIVED: 15-Jun-2021

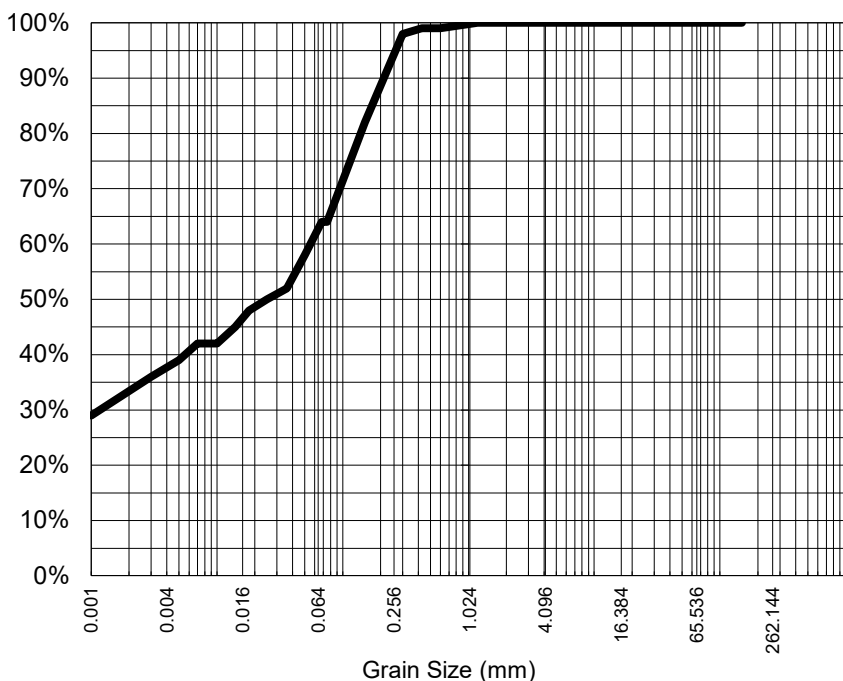
ADDRESS: Po Box 203
Spring Hill
Brisbane Qld

REPORT NO: EB2116770-014 / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B13-1

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	98%
0.150	82%
0.075	64%
Particle Size (microns)	
50	58%
36	52%
25	50%
18	48%
14	45%
10	42%
7	42%
5	39%
1	29%

Median Particle Size (mm)*	0.025
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.68

NATA Accreditation: 825 Site: Brisbane

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Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

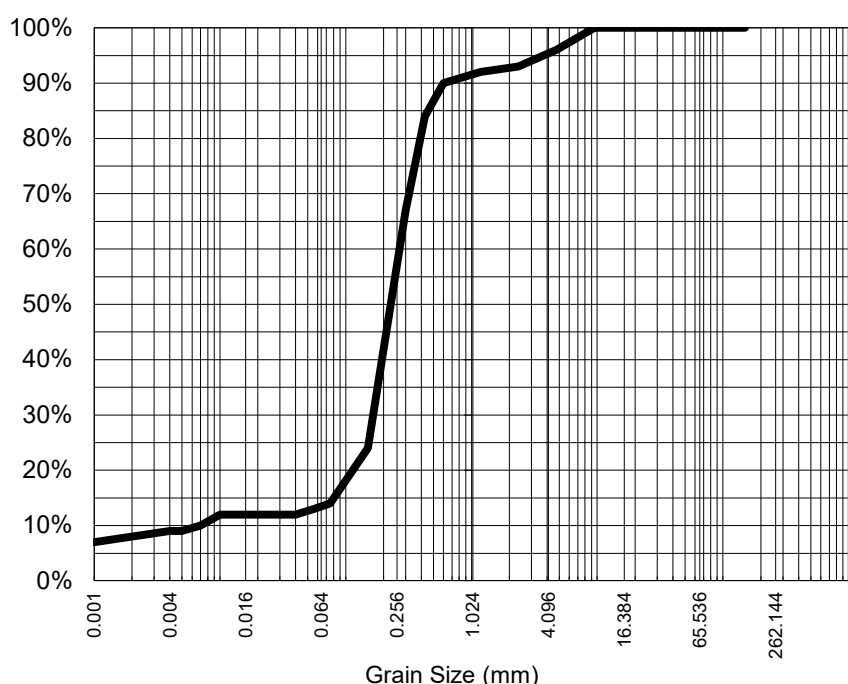
ALS Laboratory Group Pty Ltd
2 Byth Street
Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

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Brisbane QLD



CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2116770-015 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B15-3

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	96%
2.36	93%
1.18	92%
0.600	90%
0.425	84%
0.300	67%
0.150	24%
0.075	14%
Particle Size (microns)	
56	13%
40	12%
28	12%
20	12%
15	12%
10	12%
7	10%
5	9%
1	7%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.241
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.72

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

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Certificate of Analysis

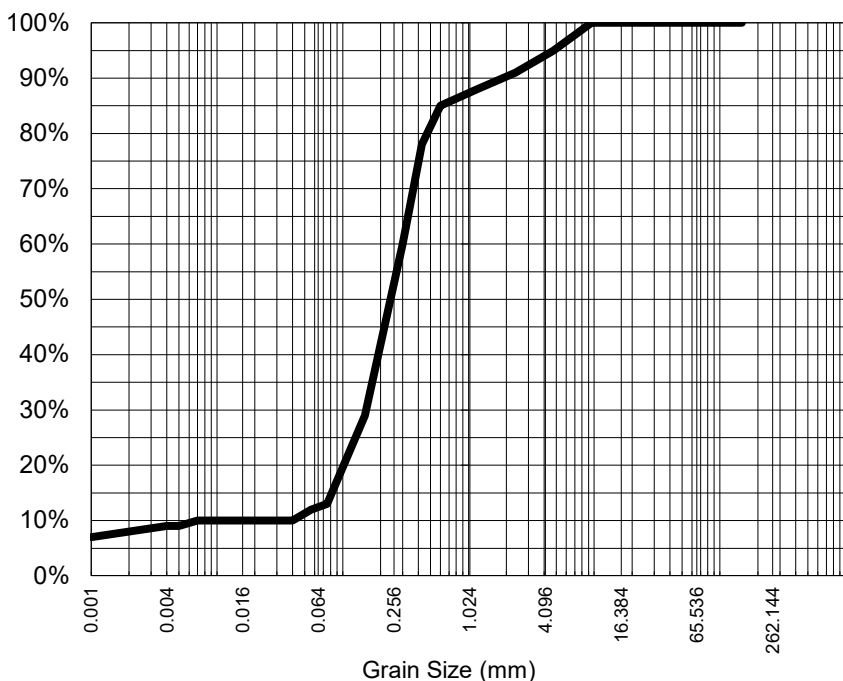
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Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

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Brisbane QLD



CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill **REPORT NO:** EB2116770-016 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B15-2

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
9.50	100%
4.75	95%
2.36	91%
1.18	88%
0.600	85%
0.425	78%
0.300	60%
0.150	29%
0.075	13%
Particle Size (microns)	
56	12%
40	10%
28	10%
20	10%
15	10%
10	10%
7	10%
5	9%
1	7%

Median Particle Size (mm)*	0.252
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.74

Analysed: 21-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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Soil Senior Chemist
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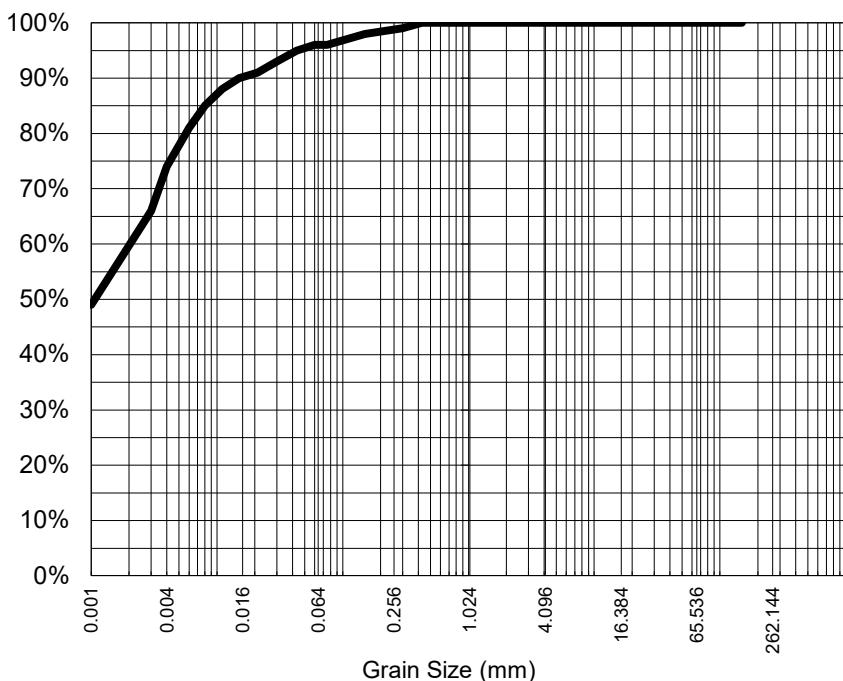
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CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill **REPORT NO:** EB2116770-017 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B15-1

Particle Size Distribution



Particle Size (mm)	% Passing
0.425	100%
0.300	99%
0.150	98%
0.075	96%
Particle Size (microns)	
43	95%
30	93%
21	91%
15	90%
11	88%
8	85%
6	81%
4	74%
1	49%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.86 (2.85)*

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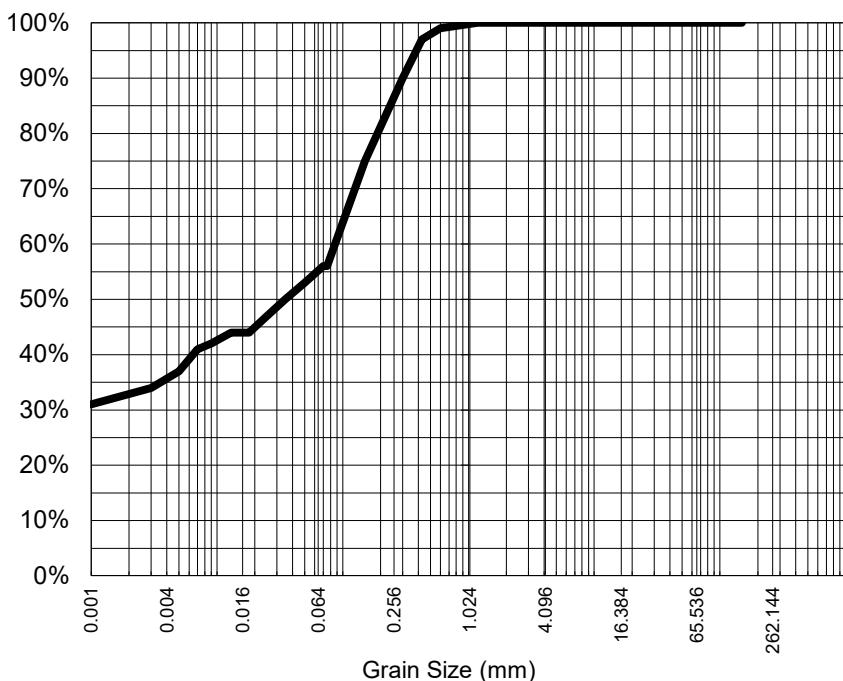
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CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2116770-018 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B12-2

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	97%
0.300	90%
0.150	75%
0.075	56%
Particle Size (microns)	
50	53%
35	50%
25	47%
18	44%
13	44%
9	42%
7	41%
5	37%
1	31%

Median Particle Size (mm)*	0.035
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

Analysed: 21-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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Satish Trivedi
Soil Senior Chemist
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Certificate of Analysis

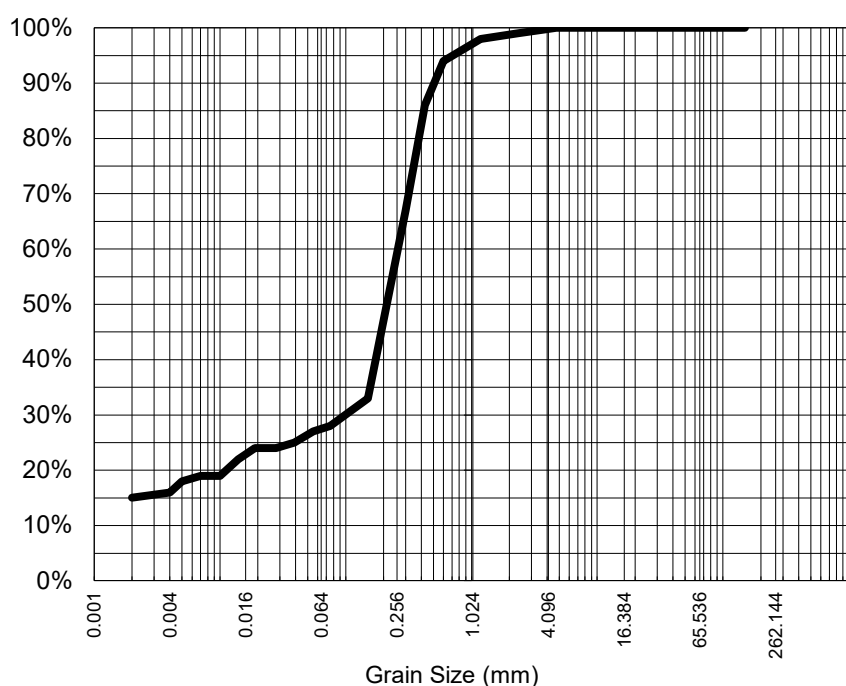
ALS Laboratory Group Pty Ltd
2 Byth Street
Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

ALS Environmental
Brisbane QLD



CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2116770-019 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B12-1

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	98%
0.600	94%
0.425	86%
0.300	67%
0.150	33%
0.075	28%
Particle Size (microns)	
55	27%
39	25%
28	24%
19	24%
14	22%
10	19%
7	19%
5	18%
2	15%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.225
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.69

NATA Accreditation: 825 Site: Brisbane
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Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

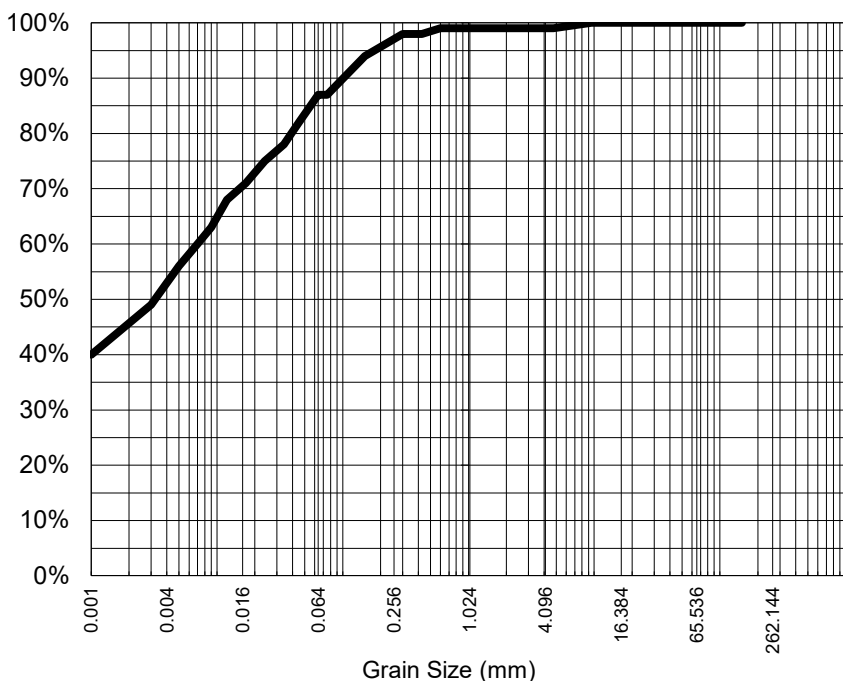
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Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

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Brisbane QLD



CLIENT: DARREN RICHARDSON **DATE REPORTED:** 29-Jun-2021
COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD **DATE RECEIVED:** 15-Jun-2021
ADDRESS: Po Box 203 Spring Hill **REPORT NO:** EB2116770-020 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B10-8

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	99%
2.36	99%
1.18	99%
0.600	99%
0.425	98%
0.300	98%
0.150	94%
0.075	87%
Particle Size (microns)	
45	82%
34	78%
24	75%
17	71%
12	68%
9	63%
7	60%
5	56%
1	40%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Sample Comments:

Analysed: 21-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.67

NATA Accreditation: 825 Site: Brisbane
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Satish Trivedi
Soil Senior Chemist
Authorised Signatory



CERTIFICATE OF ANALYSIS

Work Order	: PR2156750	Issue Date	: 08-Jul-2021
Customer	: Australian Laboratory Services Pty Ltd.	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: results address	Contact	: Client Service
Address	: 2 Byth Street 4051 Stafford QLD Australia	Address	: Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic
E-mail	: subresults.bri@alsglobal.com	E-mail	: customer.support@alsglobal.com
Telephone	: ----	Telephone	: +420 226 226 228
Project	: EB2116770	Page	: 1 of 2
Order number	: 506792	Date Samples Received	: 17-Jun-2021
		Quote number	: PR2015ALSEN-AU0002 (CZ-251-15-0965)
Site	: ----	Date of test	: 17-Jun-2021 - 08-Jul-2021
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.

The laboratory declares that the test results relate only to the listed samples. If the section "Sampled by" of the Certificate of analysis states: "Sampled by Customer" then the results relate to the sample as received.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018

Signatories

Zdeněk Jiráček

Position

Environmental Business Unit
Manager



The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)



Analytical Results

Sub-Matrix: SOIL				Client sample ID		B13-8		B15-3		B15-2	
				Laboratory sample ID		PR2156750-001		PR2156750-002		PR2156750-003	
				Client sampling date / time		15-Jun-2021 12:48		15-Jun-2021 15:15		15-Jun-2021 15:30	
Parameter		Method	LOR	Unit	Result	MU	Result	MU	Result	MU	
Physical Parameters											
Dry matter @ 105°C		S-DRY-GRCI	0.10	%	99.4	± 6.0%	99.8	± 6.0%	99.9	± 6.0%	
Radiological Parameters											
Gross alpha activity		S-GAA-PRO	500	Bq/kg DW	590	± 58.8%	640	± 54.4%	560	± 61.4%	
Gross beta activity		S-GBA-PRO	500	Bq/kg DW	<500	----	<500	----	510	± 67.3%	

Sub-Matrix: SOIL				Client sample ID		B12-1		----		----	
				Laboratory sample ID		PR2156750-004		----		----	
				Client sampling date / time		15-Jun-2021 16:20		----		----	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
Physical Parameters											
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	99.1	± 6.0%	----	----	----	----		
Radiological Parameters											
Gross alpha activity	S-GAA-PRO	500	Bq/kg DW	660	± 52.4%	----	----	----	----		
Gross beta activity	S-GBA-PRO	500	Bq/kg DW	<500	----	----	----	----	----		

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. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor $k = 2$, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
S-DRY-GRCI	CZ_SOP_D06_01_045 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007), CZ_SOP_D06_07_046 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007, CSN 46 5735) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-GAA-PRO	CZ_SOP_D06_07_368 (CSN 75 7611 and ISO 9696) Determination of gross alpha mass activity by direct measurement of the sample by means of alpha radiation analyzer.
S-GBA-PRO	CZ_SOP_D06_07_369 (CSN 75 7612, CSN EN ISO 9697) Determination of gross beta mass activity by direct measurement of the sample by means of beta radiation analyzer.
Preparation Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).

A “*” symbol preceding any method indicates laboratory or subcontractor non-accredited test. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. In the case when a procedure specified in an accredited method was used for non-accredited matrix, the reported results are non-accredited; please refer to information in General Comment section on the front page. If the report contains subcontracted analyses, those are made in a subcontracted laboratory outside the laboratories ALS Czech Republic, s.r.o.

The calculation methods of summation parameters are available on request in the client service.

QUALITY CONTROL REPORT

Work Order : **EB2116770**

Page : 1 of 19

Amendment : **1**

Client : **BMT COMMERCIAL AUSTRALIA PTY LTD**

Laboratory : Environmental Division Brisbane

Contact : DARREN RICHARDSON

Contact : Andrew Epps

Address : PO BOX 203 SPRING HILL
BRISBANE QLD 4004

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : ----

Telephone : +61 7 3552 8639

Project : Port of Brisbane SAP

Date Samples Received : 15-Jun-2021

Order number : ----

Date Analysis Commenced : 17-Jun-2021

C-O-C number : ----

Issue Date : 21-Jul-2021

Sampler : BRAD HILES

Site : ----

Quote number : BN/016/19

No. of samples received : 21

No. of samples analysed : 21



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
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Dave Gitsham	Metals Instrument Chemist	Brisbane Inorganics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Sarah Ashworth	Laboratory Manager - Brisbane	Brisbane External Subcontracting, 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

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3740746)									
EB2116770-011	B13-4C	EG005T: Aluminium	7429-90-5	50	mg/kg	6510	6850	5.0	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	17500	16800	3.7	0% - 20%
EB2116770-001	RF7	EG005T: Aluminium	7429-90-5	50	mg/kg	11700	12000	2.8	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	27100	27400	1.2	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 3740744)									
EB2116770-015	B15-3	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.01	0.02	0.0	No Limit
EB2116770-001	RF7	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.08	0.07	17.9	No Limit
EA029-A: pH Measurements (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	6.1	6.1	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	4.8	4.7	2.3	0% - 20%
EA029-B: Acidity Trail (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	3	2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	3	2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	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 (%)
EA029-C: Sulfur Trail (QC Lot: 3741734) - continued									
EB2116208-001	Anonymous	EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA029-D: Calcium Values (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	<0.020	0.0	No Limit
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA029-E: Magnesium Values (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA029-H: Acid Base Accounting (QC Lot: 3741734)									
EB2116208-001	Anonymous	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA033-A: Actual Acidity (QC Lot: 3741735)									
EB2116770-009	B13-8	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.8	8.8	0.0	0% - 20%
ES2122202-004	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	6.8	6.6	2.7	0% - 20%
EA033-B: Potential Acidity (QC Lot: 3741735)									
EB2116770-009	B13-8	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.150	0.150	0.0	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	93	94	0.0	No Limit
ES2122202-004	Anonymous	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.010	0.011	0.0	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EA033-C: Acid Neutralising Capacity (QC Lot: 3741735)									



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 (%)
EA033-C: Acid Neutralising Capacity (QC Lot: 3741735) - continued									
EB2116770-009	B13-8	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	5.35	5.32	0.6	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.71	1.70	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	1070	1060	0.6	0% - 20%
ES2122202-004	Anonymous	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	0.11	0.11	0.0	0% - 50%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.04	0.03	0.0	No Limit
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	22	21	5.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3740754)									
EB2116770-001	RF7	EA055: Moisture Content	----	0.1	%	60.1	61.8	2.7	0% - 20%
EB2116770-011	B13-4C	EA055: Moisture Content	----	0.1	%	34.2	32.2	5.7	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3740745)									
EB2116770-001	RF7	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	7.82	8.59	9.4	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	37.9	41.6	9.5	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	16.9	18.8	10.8	0% - 50%
		EG020-SD: Lead	7439-92-1	1	mg/kg	17.0	19.8	15.4	0% - 50%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	21.7	23.2	6.7	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	74.6	80.8	8.0	0% - 20%
EB2116770-011	B13-4C	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	3.98	4.34	8.6	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	17.8	18.6	4.6	0% - 50%
		EG020-SD: Copper	7440-50-8	1	mg/kg	8.5	8.8	3.6	No Limit
		EG020-SD: Lead	7439-92-1	1	mg/kg	7.7	8.2	6.6	No Limit
		EG020-SD: Nickel	7440-02-0	1	mg/kg	11.8	12.9	9.0	0% - 50%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	39.6	40.4	1.9	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3740751)									
EB2116770-009	B13-8	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3740750)									
EB2116770-009	B13-8	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1010	1010	0.0	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3740749)									
EB2116770-009	B13-8	EK067G: Total Phosphorus as P	----	2	mg/kg	474	523	9.7	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3769787)									
EB2116770-001	RF7	EP003: Total Organic Carbon	----	0.02	%	1.02	1.02	0.0	0% - 20%
EB2116770-011	B13-4C	EP003: Total Organic Carbon	----	0.02	%	0.36	0.36	0.0	0% - 50%



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 (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3740966)									
EB2116871-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3740966)									
EB2116871-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3740966)									
EB2116871-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3740752)									
EB2116770-009	B13-8	EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	4	3	40.4	No Limit
		EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	9	7	30.9	No Limit
		EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	19	15	23.5	No Limit
		EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	6	5	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3740965)									
EB2116770-009	B13-8	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3740752)									
EB2116770-009	B13-8	EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	5	<3	42.3	No Limit
		EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	12	10	19.1	No Limit
		EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	17	10	51.9	No Limit
		EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3740965)									
EB2116770-009	B13-8	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD: BTEXN (QC Lot: 3740965)									
EB2116770-009	B13-8	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
			106-42-3						
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP090: Organotin Compounds (QC Lot: 3740747)									
EB2116770-001	RF7	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
EB2116770-011	B13-4C	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP090: Organotin Compounds (QC Lot: 3740747) - continued									
EB2116770-011	B13-4C	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
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3741843)									
EB2116770-001	RF7	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EB2116770-009	B13-8	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<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: 3741843) - continued									
EB2116770-009	B13-8	EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3741842)									
EB2116770-001	RF7	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EB2116770-009	B13-8	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	<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: 3741842) - continued									
EB2116770-009	B13-8	EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 3741844)									
EB2116770-009	B13-8	EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3741845)									
EB2116770-015	B15-3	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	4	<4	0.0	No Limit
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	5	4	0.0	No Limit
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	<4	<4	0.0	No Limit
			205-82-3						
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	4	0.0	No Limit
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	4	µg/kg	<4	<4	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 (%)
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3741845) - continued									
EB2116770-015	B15-3	EP132B-SD: Dibenz(a,h)anthracene	53-70-3	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Indeno(1,2,3.cd)pyrene	193-39-5	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	9	8	11.8	No Limit
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	<5	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3740746)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12940 mg/kg	99.2	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	29422 mg/kg	98.8	70.0	120
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3740744)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	98.3	70.0	130
EA029-A: pH Measurements (QCLot: 3741734)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.4 pH Unit	100	70.0	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	4.2 pH Unit	108	70.0	130
EA029-B: Acidity Trail (QCLot: 3741734)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	15 mole H+ / t	106	70.0	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	27.5 mole H+ / t	99.9	70.0	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 3741734)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.04779 % S	85.9	70.0	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.20322 % S	89.8	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 3741734)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.14152 % Ca	111	70.0	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.19926 % Ca	88.6	70.0	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 3741734)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.213 % Mg	86.4	70.0	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.22344 % Mg	87.0	70.0	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 3741734)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-F: Excess Acid Neutralising Capacity (QCLot: 3741734) - continued								
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----
EA029-H: Acid Base Accounting (QCLot: 3741734)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3741735)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	100	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	15 mole H+ / t	106	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3741735)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.155 % S	90.8	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3741735)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	98.6	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----
EA152: Soil Particle Density (QCLot: 3741658)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	98.1	80.0	120
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3740745)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	104.25 mg/kg	94.7	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.458 mg/kg	92.6	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	17.886 mg/kg	84.8	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	47.82 mg/kg	96.9	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	63.544 mg/kg	95.5	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	13.462 mg/kg	92.4	77.0	123
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.532 mg/kg	95.3	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	180.621 mg/kg	89.8	71.0	127
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3740751)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	98.7	83.2	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3740750)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	848 mg/kg	114	73.0	121
				<20	2180 mg/kg	98.3	72.0	128



Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3740749)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	939 mg/kg	87.5	80.0	115
				<2	1200 mg/kg	98.0	79.0	121
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3769787)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.03 %	103	70.0	130
				<0.02	0.2 %	105	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3740966)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	97.3	59.7	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3740966)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	103	58.1	124
EP080: BTEXN (QCLot: 3740966)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	66.8	115
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.8	68.8	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.8	68.5	116
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	102	69.7	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	72.2	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.3	73.2	116
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3740752)								
EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	<3	157 mg/kg	114	43.0	126
EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	<3	245 mg/kg	130	66.0	140
EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3740965)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	18 mg/kg	93.1	66.0	120
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3740752)								
EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	<3	227 mg/kg	121	40.0	134
EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	<3	162 mg/kg	130	66.0	136
EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3740965)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	22.5 mg/kg	97.0	66.0	119
EP080-SD: BTEXN (QCLot: 3740965)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.8	73.0	105
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	1 mg/kg	87.9	73.0	105
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	1 mg/kg	84.6	67.0	104
EP080-SD: meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	2 mg/kg	90.4	66.0	106
	106-42-3							
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	1 mg/kg	94.0	68.0	105



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP080-SD: BTEXN (QCLot: 3740965) - continued								
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	1 mg/kg	90.8	72.0	115
EP090: Organotin Compounds (QCLot: 3740747)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	62.7	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	85.0	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	115	52.0	139
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3741843)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	91.8	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	92.0	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	81.8	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	88.5	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	88.9	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	92.0	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	78.3	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	84.9	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	91.5	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	86.1	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	86.6	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	84.6	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	87.3	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	86.6	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	80.9	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	87.4	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	79.5	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	80.1	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	82.1	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	95.1	51.0	117
EP131A: Organochlorine Pesticides (QCLot: 3741842)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	76.2	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	69.1	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	58.0	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	65.8	37.0	140
EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	48.2	25.9	141
EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	68.1	35.0	129
EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	69.4	23.4	138
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5-9/50-2	0.5	µg/kg	<0.50	----	----	----	----



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP131A: Organochlorine Pesticides (QCLot: 3741842) - continued								
EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	5 µg/kg	81.5	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	73.5	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	71.7	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	72.5	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	78.2	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	61.4	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	72.2	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	76.8	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	75.0	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	60.3	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	51.5	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	77.7	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	79.3	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3741844)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	50 µg/kg	84.6	45.0	115
EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	84.6	45.0	115
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3741845)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	96.6	63.0	129
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	97.4	64.0	128
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	119	65.0	129
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	103	68.0	132
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	104	68.0	124
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	104	64.0	134
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	108	65.0	131
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	108	64.0	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	108	67.0	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	112	62.0	130
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	105	65.0	133
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	<4	25 µg/kg	103	68.0	120
	205-82-3							



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Acceptable Limits (%)	
						Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3741845) - continued									
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	96.5	61.0	133	
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	102	63.0	127	
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	112	66.0	118	
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	104	69.0	119	
EP132B-SD: Benzo(g,h,i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	95.2	66.0	120	
EP132B-SD: Dibenz(a,h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	99.5	64.0	122	
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	100.0	64.0	120	
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	95.9	68.0	136	
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----	

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP090: Organotin Compounds (Soluble) (QCLot: 3748678)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	129	30.7	134
EP090: Organotin Compounds (Soluble) (QCLot: 3751120)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	113	30.7	134
EP131A: Organochlorine Pesticides (QCLot: 3752165)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	115	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	114	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	103	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	102	36.0	131
EP131A: 4,4'-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	94.4	36.0	142
EP131A: 4,4'-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	104	30.4	112
EP131A: 4,4'-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	85.7	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	115	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	105	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	113	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	72.7	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	108	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	98.6	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	120	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	104	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	114	33.0	117
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	114	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	110	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	106	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	112	27.0	116

Matrix Spike (MS) Report

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3740744)							
EB2116770-002	RF6	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	86.8	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3740745)							
EB2116770-002	RF6	EG020-SD: Arsenic	7440-38-2	100 mg/kg	93.0	70.0	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	97.4	70.0	130
		EG020-SD: Chromium	7440-47-3	100 mg/kg	99.9	70.0	130
		EG020-SD: Copper	7440-50-8	100 mg/kg	99.7	70.0	130
		EG020-SD: Lead	7439-92-1	100 mg/kg	97.5	70.0	130
		EG020-SD: Nickel	7440-02-0	100 mg/kg	100	70.0	130
		EG020-SD: Zinc	7440-66-6	100 mg/kg	94.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3740751)							
EB2116770-015	B15-3	EK059G: Nitrite + Nitrate as N (Sol.)	----	2 mg/kg	98.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3740750)							
EB2116770-015	B15-3	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	109	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3740749)							
EB2116770-015	B15-3	EK067G: Total Phosphorus as P	----	100 mg/kg	# 67.7	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3740966)							
EB2116871-002	Anonymous	EP080: C6 - C9 Fraction	----	8 mg/kg	88.5	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3740966)							
EB2116871-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	95.4	70.0	130
EP080: BTEXN (QCLot: 3740966)							
EB2116871-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	94.8	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	93.9	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3740752)							



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 Petroleum Hydrocarbons (QCLot: 3740752) - continued							
EB2116770-015	B15-3	EP071-SD-SV: C10 - C14 Fraction	----	157 mg/kg	121	70.0	130
		EP071-SD-SV: C15 - C28 Fraction	----	245 mg/kg	114	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3740965)							
EB2116770-015	B15-3	EP080-SD: C6 - C9 Fraction	----	8 mg/kg	75.6	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3740752)							
EB2116770-015	B15-3	EP071-SD-SV: >C10 - C16 Fraction	----	227 mg/kg	120	70.0	130
		EP071-SD-SV: >C16 - C34 Fraction	----	162 mg/kg	113	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3740965)							
EB2116770-015	B15-3	EP080-SD: C6 - C10 Fraction	C6_C10	8 mg/kg	74.4	70.0	130
EP080-SD: BTEXN (QCLot: 3740965)							
EB2116770-015	B15-3	EP080-SD: Benzene	71-43-2	2 mg/kg	79.2	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	77.2	70.0	130
EP090: Organotin Compounds (QCLot: 3740747)							
EB2116770-002	RF6	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 13.7	20.0	130
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	94.6	20.0	130
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	95.9	20.0	130
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3741843)							
EB2116770-009	B13-8	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	64.3	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	69.7	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	74.6	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	73.5	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	63.3	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	67.6	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	66.0	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	63.6	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	67.0	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	70.1	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	67.8	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	50.8	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	60.5	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	71.3	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	49.6	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	58.8	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	72.2	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	70.9	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	61.5	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	67.7	51.0	137



Sub-Matrix: **SOIL**

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: 3741842)							
EB2116770-009	B13-8	EP131A: Aldrin	309-00-2	5 µg/kg	59.1	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	62.6	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	60.1	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	55.9	25.2	147
		EP131A: 4,4'-DDD	72-54-8	5 µg/kg	39.2	25.9	150
		EP131A: 4,4'-DDE	72-55-9	5 µg/kg	59.5	31.2	125
		EP131A: 4,4'-DDT	50-29-3	5 µg/kg	75.8	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	67.2	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	76.0	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	67.9	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	67.5	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	79.4	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	55.2	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	60.7	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	68.7	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	57.0	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	61.2	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	58.3	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	62.9	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	64.0	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	63.6	29.5	138
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3741844)							
EB2116770-009	B13-8	EP131B: Total Polychlorinated biphenyls	----	50 µg/kg	66.5	44.0	136
		EP131B: Aroclor 1254	11097-69-1	50 µg/kg	66.5	44.0	136
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3741845)							
EB2116770-015	B15-3	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	105	70.0	130
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	79.8	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	119	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	98.3	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	97.1	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	103	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	106	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	92.8	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	93.0	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	107	70.0	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	102	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	25 µg/kg	94.1	70.0	130
			205-82-3				
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	99.1	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: 3741845) - continued							
EB2116770-015	B15-3	EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	99.3	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	110	70.0	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	103	70.0	130
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	25 µg/kg	95.3	70.0	130
		EP132B-SD: Dibenz(a,h)anthracene	53-70-3	25 µg/kg	98.6	70.0	130
		EP132B-SD: Indeno(1,2,3-cd)pyrene	193-39-5	25 µg/kg	100	70.0	130
		EP132B-SD: Coronene	191-07-1	25 µg/kg	100	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB2116770**

Page : 1 of 15

Amendment : **1**

Client : **BMT COMMERCIAL AUSTRALIA PTY LTD**

Laboratory : Environmental Division Brisbane

Contact : **DARREN RICHARDSON**

Telephone : +61 7 3552 8639

Project : Port of Brisbane SAP

Date Samples Received : 15-Jun-2021

Site : ----

Issue Date : 21-Jul-2021

Sampler : **BRAD HILES**

No. of samples received : 21

Order number : ----

No. of samples analysed : 21

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK067G: Total Phosphorus as P by Discrete Analyser	EB2116770--015	B15-3	Total Phosphorus as P	----	67.7 %	70.0-130%	Recovery less than lower data quality objective
EP090: Organotin Compounds	EB2116770--002	RF6	Monobutyltin	78763-54-9	13.7 %	20.0-130%	Recovery less than lower data quality objective

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Soil Particle Density	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-AES	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Organochlorine Pesticides (Ultra-trace)	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Organochlorine Pesticides (Ultra-trace)	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	0	13	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		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements								
80* dried soil (EA029)		15-Jun-2021	18-Jun-2021	10-Mar-2024	✔	18-Jun-2021	16-Sep-2021	✔
B13-8,	B15-3,							
B15-2,	B12-1							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-B: Acidity Trail								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-C: Sulfur Trail								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-D: Calcium Values								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-E: Magnesium Values								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-F: Excess Acid Neutralising Capacity								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-G: Retained Acidity								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA029-H: Acid Base Accounting								
80* dried soil (EA029) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	10-Mar-2024	✓	18-Jun-2021	16-Sep-2021	✓
EA033-A: Actual Acidity								
80* dried soil (EA033) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	15-Jun-2022	✓	18-Jun-2021	16-Sep-2021	✓
EA033-B: Potential Acidity								
80* dried soil (EA033) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	15-Jun-2022	✓	18-Jun-2021	16-Sep-2021	✓
EA033-C: Acid Neutralising Capacity								
80* dried soil (EA033) B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	15-Jun-2022	✓	18-Jun-2021	16-Sep-2021	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA033-D: Retained Acidity									
80* dried soil (EA033) B13-8, B15-2,		B15-3, B12-1	15-Jun-2021	18-Jun-2021	15-Jun-2022	✓	18-Jun-2021	16-Sep-2021	✓
EA033-E: Acid Base Accounting									
80* dried soil (EA033) B13-8, B15-2,		B15-3, B12-1	15-Jun-2021	18-Jun-2021	15-Jun-2022	✓	18-Jun-2021	16-Sep-2021	✓
EA055: Moisture Content (Dried @ 105-110°C)									
Soil Glass Jar - Unpreserved (EA055) RF7, RF2, B16-0, B13-9, B13-8, B13-4C, B13-4, B15-3, B15-1, B12-1,		RF6, RF3, B16-1, RF4, B13-5, B13-4B, B13-1, B15-2, B12-2, B10-8	15-Jun-2021	----	----	----	17-Jun-2021	29-Jun-2021	✓
EA150: Particle Sizing									
Snap Lock Bag (EA150H) RF7, RF2, B16-0, B13-9, B13-8, B13-4C, B13-4, B15-3, B15-1, B12-1,		RF6, RF3, B16-1, RF4, B13-5, B13-4B, B13-1, B15-2, B12-2, B10-8	15-Jun-2021	----	----	----	29-Jun-2021	12-Dec-2021	✓

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 Work Order : EB2116770 Amendment 1
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H)		15-Jun-2021	----	----	----	29-Jun-2021	12-Dec-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							
EA152: Soil Particle Density								
Snap Lock Bag (EA152)		15-Jun-2021	----	----	----	29-Jun-2021	12-Dec-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)		15-Jun-2021	30-Jun-2021	12-Dec-2021	✓	05-Jul-2021	12-Dec-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020-SD: Total Metals in Sediments by ICPMS							
Soil Glass Jar - Unpreserved (EG020-SD)							
RF7, RF2, B16-0, B13-9, B13-8, B13-4C, B13-4, B15-3, B15-1, B12-1, RF6, RF3, B16-1, RF4, B13-5, B13-4B, B13-1, B15-2, B12-2, B10-8	15-Jun-2021	30-Jun-2021	12-Dec-2021	✓	05-Jul-2021	12-Dec-2021	✓
EG035T: Total Recoverable Mercury by FIMS (Low Level)							
Soil Glass Jar - Unpreserved (EG035T-LL)							
RF7, RF2, B16-0, B13-9, B13-8, B15-3, B15-1, RF6, RF3, B16-1, RF4, B13-4C, B15-2, B12-2	15-Jun-2021	30-Jun-2021	13-Jul-2021	✓	05-Jul-2021	13-Jul-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G)							
B13-8, B15-2, B15-3, B12-1	15-Jun-2021	30-Jun-2021	13-Jul-2021	✓	30-Jun-2021	02-Jul-2021	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G)							
B13-8, B15-2, B15-3, B12-1	15-Jun-2021	30-Jun-2021	13-Jul-2021	✓	02-Jul-2021	28-Jul-2021	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G)							
B13-8, B15-2, B15-3, B12-1	15-Jun-2021	30-Jun-2021	13-Jul-2021	✓	02-Jul-2021	28-Jul-2021	✓
EN82: Porewater Extraction							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)							
B13-5, B12-1, B13-1	15-Jun-2021	17-Jun-2021	29-Jun-2021	✓	----	----	----
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)							
B13-4B, B10-8, B13-4	15-Jun-2021	21-Jun-2021	29-Jun-2021	✓	----	----	----



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil								
Pulp Bag (EP003)								
RF7, RF2, B16-0, B13-9, B13-8, B13-4C, B13-4, B15-3, B15-1, B12-1,	RF6, RF3, B16-1, RF4, B13-5, B13-4B, B13-1, B15-2, B12-2, B10-8	15-Jun-2021	02-Jul-2021	13-Jul-2021	✔	02-Jul-2021	13-Jul-2021	✔
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040702		15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040702		15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040702		15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080-SD)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔
Soil Glass Jar - Unpreserved (EP071-SD-SV)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	22-Jun-2021	29-Jun-2021	✔	23-Jun-2021	01-Aug-2021	✔
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080-SD)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔
Soil Glass Jar - Unpreserved (EP071-SD-SV)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	22-Jun-2021	29-Jun-2021	✔	23-Jun-2021	01-Aug-2021	✔
EP080-SD: BTEXN								
Soil Glass Jar - Unpreserved (EP080-SD)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	17-Jun-2021	29-Jun-2021	✔	23-Jun-2021	29-Jun-2021	✔

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP090: Organotin Compounds								
Soil Glass Jar - Unpreserved (EP090)		15-Jun-2021	26-Jun-2021	29-Jun-2021	✓	29-Jun-2021	05-Aug-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Soil Glass Jar - Unpreserved (EP130)		15-Jun-2021	19-Jun-2021	29-Jun-2021	✓	21-Jun-2021	29-Jul-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							
EP131A: Organochlorine Pesticides								
Soil Glass Jar - Unpreserved (EP131A)		15-Jun-2021	19-Jun-2021	29-Jun-2021	✓	21-Jun-2021	29-Jul-2021	✓
RF7,	RF6,							
RF2,	RF3,							
B16-0,	B16-1,							
B13-9,	RF4,							
B13-8,	B13-5,							
B13-4C,	B13-4B,							
B13-4,	B13-1,							
B15-3,	B15-2,							
B15-1,	B12-2,							
B12-1,	B10-8							
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Soil Glass Jar - Unpreserved (EP131B)		15-Jun-2021	19-Jun-2021	29-Jun-2021	✓	21-Jun-2021	29-Jul-2021	✓
B13-8,	B15-3,							
B15-2,	B12-1							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP132B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP132B-SD)								
B13-8, B15-2,	B15-3, B12-1	15-Jun-2021	18-Jun-2021	29-Jun-2021	✔	18-Jun-2021	28-Jul-2021	✔

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP090: Organotin Compounds (Soluble)								
Amber Glass Bottle - Unpreserved (EP090S) B13-5, B12-1	B13-1,	17-Jun-2021	23-Jun-2021	24-Jun-2021	✓	23-Jun-2021	02-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) B13-4B, B10-8	B13-4,	21-Jun-2021	23-Jun-2021	28-Jun-2021	✓	23-Jun-2021	02-Aug-2021	✓
EP131A: Organochlorine Pesticides								
Amber Glass Bottle - Unpreserved (EP131A) B13-5, B12-1	B13-1,	17-Jun-2021	23-Jun-2021	24-Jun-2021	✓	23-Jun-2021	02-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP131A) B13-4B, B10-8	B13-4,	21-Jun-2021	23-Jun-2021	28-Jun-2021	✓	23-Jun-2021	02-Aug-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)							
Chromium Suite for Acid Sulphate Soils	EA033	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Soil Particle Density	EA152	0	20	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Soil Particle Density	EA152	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	4	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	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	
Laboratory Control Samples (LCS) - Continued							
Total Metals in Sediments by ICPMS	EG020-SD	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	2	4	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	0	20	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	4	25.00	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	
Matrix Spikes (MS) - Continued							
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	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)							
Organochlorine Pesticides (Ultra-trace)	EP131A	0	6	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	0	13	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	2	13	15.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Organochlorine Pesticides (Ultra-trace)	EP131A	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	2	13	15.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	0	6	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	0	13	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
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
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).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Gross Alpha and Beta activity in solids	EA250	SOIL	In house: Referenced to ISO 9697 / CSN 757611. Determination of Gross Alpha and Beta activity in soil and sediment by Thick Source method. An appropriate mass of sample is dried and pulverised prior to direct activity counting. (If required, Potassium may be determined separately and results corrected accordingly for 40K.) Analysis is performed by ALS (Czech Republic) who hold technical accreditation #1163 for Gross alpha and beta activity under CAI. CAI are a European accreditation body, equivalent to NATA in Australia and recognised internationally by NATA under ILAC.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. Analyte list and LORs per NODG.
Total Mercury by FIMS (Low Level)	EG035T-LL	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x)- 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 (NO _x -N) and nitrate (NO ₃ -N) by calculation, Combined oxidised Nitrogen (NO ₂ +NO ₃) in a water extract is determined by direct colourimetry by Discrete Analyser.



Analytical Methods	Method	Matrix	Method Descriptions
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 Nitrogen, each determined separately as N.
Total Phosphorus By Discrete Analyser	EK067G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
TPH - Semivolatile Fractions Only	EP071-SD-SV	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	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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 quantified 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)
PCB's (Ultra-trace)	EP131B	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.

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.
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
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.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).



Preparation Methods	Method	Matrix	Method Descriptions
Porewater Extraction	EN82	SOIL	Extraction of porewater from sediment samples using centrifuge.
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Sep. Funnel Extraction of Liquids (Ultra-trace pesticides.)	ORG14-UTP	SOIL	In house: Referenced to USEPA 3510 Samples are extracted into dichloromethane, concentrated and exchanged into an appropriate solvent for GPC and florisil cleanup as required. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
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, Na ₂ SO ₄ 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.
Tumbler Extraction of Solids/ Sample Cleanup	ORG17A-UTP	SOIL	In house: Mechanical agitation (tumbler). 20g of sample, Na ₂ SO ₄ 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, Na ₂ SO ₄ 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 derivatisated, extracted and the substitution 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.

CERTIFICATE OF ANALYSIS

Work Order : **EB2118023**
Client : **BMT COMMERCIAL AUSTRALIA PTY LTD**
Contact : **DARREN RICHARDSON**
Address : **PO BOX 203 SPRING HILL**
BRISBANE QLD 4004
Telephone : **----**
Project : **Port of Brisbane SAP**
Order number : **----**
C-O-C number : **----**
Sampler : **BRAD HILES**
Site : **----**
Quote number : **BN/016/19**
No. of samples received : **26**
No. of samples analysed : **25**

Page : 1 of 51
Laboratory : Environmental Division Brisbane
Contact : Andrew Epps
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 3552 8639
Date Samples Received : 28-Jun-2021 13:00
Date Analysis Commenced : 30-Jun-2021
Issue Date : 27-Jul-2021 10:51



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane External Subcontracting, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Thomas Donovan		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.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- EP080: 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.
- 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.
- EP132B-SD and EP131B : LOR is raised due to high amount of moistures is present.
- EP131B : Particular samples raised LOR due to high amount of moistures is present.
- EP131A : Positive OC result is confirmed by re-extraction and re-analysis.
- **PCB, Pesticides, and Ultra-trace PAH analysis is conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- EK067G (Total Phosphorus as P): Sample EB2118023_006 (B10-6) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP090 Organotins: Sample 'B4-0' required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly and surrogate values are not determined.
- EP130: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP090 Organotins: Samples 'B4-4' and 'B11-9' show poor matrix spike recovery for MBT due to matrix interference.
- EP090S Organotins: The TBT LOR for sample 'B8-3' has been raised due to low sample volume.
- EP090S Organotins: Sample 'B8-3' shows poor surrogate recovery. Insufficient sample remaining for re-extraction and re-analysis.
- EP090 Organotins: The LOR has been raised for sample 'B10-6B' and 'BC-2' due to matrix interference.
- ASS: EA029 (SPOCAS): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Laboratory determinations of ANC needs to be corroborated by effectiveness of the measured ANC in relation to incubation ANC. Unless corroborated, the results of ANC testing should be discounted when determining Net Acidity for comparison with action criteria, or for the determination of the acidity hazard and required liming amounts.
- ASS: EA033 (CRS Suite): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m³ in-situ soil', multiply 'reported results' x 'wet bulk density of soil in t/m³'.
- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. PR2163245. NATA and CAI accreditations' are both recognised under ILAC.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m³ in-situ soil, multiply reported results x wet bulk density of soil in t/m³.

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Work Order : EB2118023
Client : BMT COMMERCIAL AUSTRALIA PTY LTD
Project : Port of Brisbane SAP



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- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.

Sub-Matrix: PORE WATER LEACHATE
(Matrix: WATER)

EP090S: Organotin Surrogate



Analytical Results

Sub-Matrix: PORE WATER LEACHATE
 (Matrix: WATER)

Sample ID

				B5-0	B11-9	B11-9B	B10-6	B10-6B
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-001	EB2118023-003	EB2118023-004	EB2118023-006	EB2118023-007
				Result	Result	Result	Result	Result
EP090S: Organotin Surrogate - Continued								
Tripopyltin	----	5	%	46.6	42.5	58.4	64.2	69.6
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.010	%	102	100	101	100	102



Analytical Results

Sub-Matrix: PORE WATER LEACHATE
 (Matrix: WATER)

Sample ID

				B11-8	B10-5	B7-1	B8-3	B6-2
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-009	EB2118023-010	EB2118023-016	EB2118023-020	EB2118023-022
				Result	Result	Result	Result	Result
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Nickel	7440-02-0	0.5	µg/L	6.7	7.5	3.6	2.5	0.8
EP090: Organotin Compounds (Soluble)								
Tributyltin	56573-85-4	2	ngSn/L	<2	<2	<2	<32	<2
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
gamma-BHC	58-89-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	72-43-5	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Total Chlordane (sum)	----	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.010	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010

EP090S: Organotin Surrogate



Analytical Results

Sub-Matrix: PORE WATER LEACHATE
 (Matrix: WATER)

Sample ID

				B11-8	B10-5	B7-1	B8-3	B6-2
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-009	EB2118023-010	EB2118023-016	EB2118023-020	EB2118023-022
				Result	Result	Result	Result	Result
EP090S: Organotin Surrogate - Continued								
Tripopyltin	----	5	%	51.9	60.7	52.8	18.6	71.0
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.010	%	105	118	115	105	108

Sub-Matrix: PORE WATER LEACHATE (Matrix: WATER)				Sample ID	B6-2B	B4-0	----	----	----
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	EB2118023-023	EB2118023-026	-----	-----	-----	
				Result	Result	----	----	----	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	----	----	----	
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Nickel	7440-02-0	0.5	µg/L	1.2	2.8	----	----	----	
EP090: Organotin Compounds (Soluble)									
Tributyltin	56573-85-4	2	ngSn/L	<2	52	----	----	----	
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.010	µg/L	<0.010	<0.010	----	----	----	
alpha-BHC	319-84-6	0.010	µg/L	<0.010	<0.010	----	----	----	
beta-BHC	319-85-7	0.010	µg/L	<0.010	<0.010	----	----	----	
delta-BHC	319-86-8	0.010	µg/L	<0.010	<0.010	----	----	----	
4,4`-DDD	72-54-8	0.010	µg/L	<0.010	<0.010	----	----	----	
4,4`-DDE	72-55-9	0.010	µg/L	<0.010	<0.010	----	----	----	
4,4`-DDT	50-29-3	0.010	µg/L	<0.010	<0.010	----	----	----	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.010	µg/L	<0.010	<0.010	----	----	----	
Dieldrin	60-57-1	0.010	µg/L	<0.010	<0.010	----	----	----	
alpha-Endosulfan	959-98-8	0.010	µg/L	<0.010	<0.010	----	----	----	
beta-Endosulfan	33213-65-9	0.010	µg/L	<0.010	<0.010	----	----	----	
Endosulfan sulfate	1031-07-8	0.010	µg/L	<0.010	<0.010	----	----	----	
^ Endosulfan (sum)	115-29-7	0.010	µg/L	<0.010	<0.010	----	----	----	
Endrin	72-20-8	0.010	µg/L	<0.010	<0.010	----	----	----	
Endrin aldehyde	7421-93-4	0.010	µg/L	<0.010	<0.010	----	----	----	
Endrin ketone	53494-70-5	0.010	µg/L	<0.010	<0.010	----	----	----	
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	----	----	----	
Heptachlor epoxide	1024-57-3	0.010	µg/L	<0.010	<0.010	----	----	----	
Hexachlorobenzene (HCB)	118-74-1	0.010	µg/L	<0.010	<0.010	----	----	----	
gamma-BHC	58-89-9	0.010	µg/L	<0.010	<0.010	----	----	----	
Methoxychlor	72-43-5	0.010	µg/L	<0.010	<0.010	----	----	----	
cis-Chlordane	5103-71-9	0.010	µg/L	<0.010	<0.010	----	----	----	
trans-Chlordane	5103-74-2	0.010	µg/L	<0.010	<0.010	----	----	----	
^ Total Chlordane (sum)	----	0.010	µg/L	<0.010	<0.010	----	----	----	
Oxychlordane	27304-13-8	0.010	µg/L	<0.010	<0.010	----	----	----	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.010	µg/L	<0.010	<0.010	----	----	----	
EP090S: Organotin Surrogate									



Analytical Results

Sub-Matrix: PORE WATER LEACHATE (Matrix: WATER)				Sample ID	B6-2B	B4-0	----	----	----
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2118023-023	EB2118023-026	-----	-----	-----
Result					Result	Result	----	----	----
EP090S: Organotin Surrogate - Continued									
Tripropyltin	----	5	%		101	36.8	----	----	----
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.010	%		126	113	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.3	----	----	----	----
pH OX (23B)	----	0.1	pH Unit		6.7	----	----	----	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		<2	----	----	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	----	----	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	----	----	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		<0.020	----	----	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		<0.020	----	----	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		<0.020	----	----	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.130	----	----	----	----
Peroxide Sulfur (23De)	----	0.020	% S		0.478	----	----	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		0.348	----	----	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		217	----	----	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		0.315	----	----	----	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		0.483	----	----	----	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		0.168	----	----	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		84	----	----	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		0.134	----	----	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.250	----	----	----	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.368	----	----	----	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		0.118	----	----	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		97	----	----	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		0.156	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		0.843	----	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		168	----	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		0.270	----	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005	
				Result	Result	Result	Result	Result	
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	----	----	----	----	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----	
Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.35	----	----	----	----	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	217	----	----	----	----	
Liming Rate excluding ANC	----	1	kg CaCO3/t	16	----	----	----	----	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	8.3	----	----	----	----	
Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----	
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.345	----	----	----	----	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	215	----	----	----	----	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	2.03	----	----	----	----	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	406	----	----	----	----	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	0.65	----	----	----	----	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	----	----	----	----	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----	
Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.34	----	----	----	----	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	215	----	----	----	----	
Liming Rate excluding ANC	----	1	kg CaCO3/t	16	----	----	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	----	----	59.9	58.8	61.4	
Moisture Content	----	1.0	%	61.7	----	----	----	----	
EA150: Particle Sizing									



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
				Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued								
+75µm	----	1	%	8	----	16	14	17
+150µm	----	1	%	2	----	4	4	8
+300µm	----	1	%	<1	----	1	1	3
+425µm	----	1	%	<1	----	<1	<1	3
+600µm	----	1	%	<1	----	<1	<1	2
+1180µm	----	1	%	<1	----	<1	<1	2
+2.36mm	----	1	%	<1	----	<1	<1	1
+4.75mm	----	1	%	<1	----	<1	<1	<1
+9.5mm	----	1	%	<1	----	<1	<1	<1
+19.0mm	----	1	%	<1	----	<1	<1	<1
+37.5mm	----	1	%	<1	----	<1	<1	<1
+75.0mm	----	1	%	<1	----	<1	<1	<1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	38	----	39	43	40
Silt (2-60 µm)	----	1	%	53	----	45	42	42
Sand (0.06-2.00 mm)	----	1	%	9	----	16	15	17
Gravel (>2mm)	----	1	%	<1	----	<1	<1	1
Cobbles (>6cm)	----	1	%	<1	----	<1	<1	<1
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.68	----	2.80	2.64	2.78
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	13200	----	12400	12100	12100
Iron	7439-89-6	50	mg/kg	32800	----	33000	31200	32000
EG020-SD: Total Metals in Sediments by ICPMS								
Arsenic	7440-38-2	1.00	mg/kg	7.82	----	9.33	8.77	10.8
Cadmium	7440-43-9	0.1	mg/kg	<0.1	----	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg	34.7	----	31.3	30.6	32.4
Copper	7440-50-8	1.0	mg/kg	38.0	----	23.3	22.2	22.6
Lead	7439-92-1	1.0	mg/kg	22.4	----	15.7	14.8	15.8
Nickel	7440-02-0	1.0	mg/kg	21.2	----	19.6	19.0	19.6
Silver	7440-22-4	0.1	mg/kg	0.2	----	0.2	<0.1	<0.1
Zinc	7440-66-6	1.0	mg/kg	138	----	87.3	82.2	94.2
EG035T: Total Recoverable Mercury by FIMS (Low Level)								
Mercury	7439-97-6	0.01	mg/kg	0.10	----	0.10	0.07	0.08



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.6	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		1510	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		1510	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		929	----	----	----	----
EN82: Porewater Extraction									
Volume	----	1	mL		1	----	1	1	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		1.49	----	1.27	1.28	1.55
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	----	----	----	----
C10 - C14 Fraction	----	3	mg/kg		6	----	----	----	----
C15 - C28 Fraction	----	3	mg/kg		66	----	----	----	----
C29 - C36 Fraction	----	5	mg/kg		77	----	----	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		149	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
					Result	Result	Result	Result	Result
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons - Continued									
>C10 - C16 Fraction	----	3	mg/kg		8	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	----	----	----	----
>C16 - C34 Fraction	----	3	mg/kg		123	----	----	----	----
>C34 - C40 Fraction	----	5	mg/kg		38	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		169	----	----	----	----
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		<1	----	<1	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg		1	----	<1	<1	<1
Tributyltin	56573-85-4	0.5	µgSn/kg		2.4	----	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg		<10	----	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	----	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	----	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	----	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	----	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	----	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	----	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	----	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	----	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	----	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	----	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	----	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	----	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	----	<10	<10	<10

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005	
				Result	Result	Result	Result	Result	
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued									
Azinphos Methyl	86-50-0	10	µg/kg	<10	----	<10	<10	<10	
Monocrotophos	6923-22-4	10	µg/kg	<10	----	<10	<10	<10	
Parathion	56-38-2	10	µg/kg	<10	----	<10	<10	<10	
Parathion-methyl	298-00-0	10	µg/kg	<10	----	<10	<10	<10	
Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	----	<10	<10	<10	
Prothiofos	34643-46-4	10	µg/kg	<10	----	<10	<10	<10	
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
alpha-BHC	319-84-6	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
beta-BHC	319-85-7	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Dieldrin	60-57-1	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Endrin	72-20-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	----	<0.25	<0.25	<0.25	
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	----	<0.50	<0.50	<0.50	
EP131B: Polychlorinated Biphenyls (as Aroclors)									



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
				Result	Result	Result	Result	Result

EP131B: Polychlorinated Biphenyls (as Aroclors) - Continued

^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	----	----	----	----

EP132B: Polynuclear Aromatic Hydrocarbons

Naphthalene	91-20-3	5	µg/kg	9	----	----	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----
Acenaphthylene	208-96-8	4	µg/kg	15	----	----	----	----
Acenaphthene	83-32-9	4	µg/kg	<5	----	----	----	----
Fluorene	86-73-7	4	µg/kg	<5	----	----	----	----
Phenanthrene	85-01-8	4	µg/kg	21	----	----	----	----
Anthracene	120-12-7	4	µg/kg	13	----	----	----	----
Fluoranthene	206-44-0	4	µg/kg	54	----	----	----	----
Pyrene	129-00-0	4	µg/kg	62	----	----	----	----
Benz(a)anthracene	56-55-3	4	µg/kg	34	----	----	----	----
Chrysene	218-01-9	4	µg/kg	32	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	59	----	----	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	28	----	----	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg	37	----	----	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg	51	----	----	----	----
Perylene	198-55-0	4	µg/kg	100	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	41	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	8	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	32	----	----	----	----
Coronene	191-07-1	5	µg/kg	10	----	----	----	----
^ Sum of PAHs	----	4	µg/kg	606	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	75	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	75	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	75	----	----	----	----

Radionuclides / Activity



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B5-0	Trip Blank 040703	B11-9	B11-9B	B11-9C
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-001	EB2118023-002	EB2118023-003	EB2118023-004	EB2118023-005
					Result	Result	Result	Result	Result
Radionuclides / Activity - Continued									
Gross alpha	----	500	Bq/kg DW		<500	----	----	----	----
Gross beta	----	500	Bq/kg DW		<500	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	121	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	107	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	125	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		71.8	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		70.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		83.4	----	----	----	----
EP090S: Organotin Surrogate									
Tripopyltin	----	0.5	%		99.3	----	91.7	100	87.3
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		75.0	----	62.6	42.0	66.4
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		42.4	----	44.5	53.0	55.8
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		51.2	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		96.4	----	----	----	----
Anthracene-d10	1719-06-8	10	%		91.3	----	----	----	----
4-Terphenyl-d14	1718-51-0	10	%		81.3	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		8.7	8.7	----	9.0	----
pH OX (23B)	----	0.1	pH Unit		7.9	7.8	----	8.2	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	----	<2	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	<2	----	<2	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	<2	----	<2	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		<0.020	<0.020	----	<0.020	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		<0.020	<0.020	----	<0.020	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		<0.020	<0.020	----	<0.020	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		0.106	0.101	----	0.096	----
Peroxide Sulfur (23De)	----	0.020	% S		0.385	0.384	----	0.303	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		0.279	0.284	----	0.207	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		174	177	----	129	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		0.280	0.283	----	0.278	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		1.17	1.21	----	7.00	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		0.893	0.926	----	6.72	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		446	462	----	3360	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		0.714	0.741	----	5.38	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		0.144	0.143	----	0.096	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		0.245	0.246	----	0.216	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		0.101	0.103	----	0.120	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		83	85	----	99	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		0.133	0.136	----	0.158	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		2.72	2.68	----	18.3	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		543	536	----	3660	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		0.870	0.859	----	5.87	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010	
				Result	Result	Result	Result	Result	
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	1.5	----	1.5	----	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	----	<0.02	----	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	----	<10	----	
Liming Rate	----	1	kg CaCO3/t	<1	<1	----	<1	----	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.28	0.28	----	0.21	----	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	174	177	----	129	----	
Liming Rate excluding ANC	----	1	kg CaCO3/t	13	13	----	10	----	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	8.7	8.7	----	9.0	----	
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	----	<2	----	
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	----	<0.02	----	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	0.289	0.274	----	0.198	----	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	180	171	----	124	----	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	3.50	3.72	----	25.2	----	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	699	744	----	5030	----	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.12	1.19	----	8.06	----	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	1.5	1.5	----	1.5	----	
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	----	<0.02	----	
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	----	<10	----	
Liming Rate	----	1	kg CaCO3/t	<1	<1	----	<1	----	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.29	0.27	----	0.20	----	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	180	171	----	124	----	
Liming Rate excluding ANC	----	1	kg CaCO3/t	14	13	----	9	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	----	----	45.6	----	51.4	
Moisture Content	----	1.0	%	43.9	45.4	----	37.7	----	
EA150: Particle Sizing									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued									
+75µm	----	1	%		48	42	49	57	39
+150µm	----	1	%		22	18	43	30	25
+300µm	----	1	%		4	4	20	24	5
+425µm	----	1	%		2	2	4	19	2
+600µm	----	1	%		1	1	<1	15	1
+1180µm	----	1	%		<1	<1	<1	11	<1
+2.36mm	----	1	%		<1	<1	<1	10	<1
+4.75mm	----	1	%		<1	<1	<1	8	<1
+9.5mm	----	1	%		<1	<1	<1	<1	<1
+19.0mm	----	1	%		<1	<1	<1	<1	<1
+37.5mm	----	1	%		<1	<1	<1	<1	<1
+75.0mm	----	1	%		<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		29	31	33	25	38
Silt (2-60 µm)	----	1	%		21	25	17	16	21
Sand (0.06-2.00 mm)	----	1	%		50	44	50	49	41
Gravel (>2mm)	----	1	%		<1	<1	<1	10	<1
Cobbles (>6cm)	----	1	%		<1	<1	<1	<1	<1
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		2.60	2.59	2.65	2.59	2.59
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		8170	8670	7220	7070	9980
Iron	7439-89-6	50	mg/kg		23400	24900	18200	21100	25900
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg		6.56	7.15	4.77	5.87	6.55
Cadmium	7440-43-9	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	1.0	mg/kg		21.3	23.3	18.2	21.9	25.2
Copper	7440-50-8	1.0	mg/kg		17.0	17.0	15.2	15.9	20.7
Lead	7439-92-1	1.0	mg/kg		10.7	11.9	8.2	9.5	12.5
Nickel	7440-02-0	1.0	mg/kg		14.9	15.8	11.9	12.8	16.6
Silver	7440-22-4	0.1	mg/kg		<0.1	<0.1	<0.1	0.1	<0.1
Zinc	7440-66-6	1.0	mg/kg		68.6	73.2	53.8	56.1	72.2
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg		0.06	0.05	0.04	0.07	0.08



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.6	0.5	----	0.3	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		820	890	----	780	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		820	890	----	780	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		558	546	----	490	----
EN82: Porewater Extraction									
Volume	----	1	mL		1	1	----	1	1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.85	1.12	0.67	0.71	1.04
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	<3	----	<3	----
C10 - C14 Fraction	----	3	mg/kg		5	8	----	3	----
C15 - C28 Fraction	----	3	mg/kg		45	54	----	30	----
C29 - C36 Fraction	----	5	mg/kg		46	62	----	36	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		96	124	----	69	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	<3	----	<3	----
>C10 - C16 Fraction	----	3	mg/kg		7	10	----	4	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	<3.0	----	<3.0	----
>C16 - C34 Fraction	----	3	mg/kg		78	99	----	57	----
>C34 - C40 Fraction	----	5	mg/kg		23	31	----	18	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		108	140	----	79	----
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
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		7.2	<0.8	<0.5	<0.5	<0.5
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued									
alpha-Endosulfan	959-98-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg		<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)									
^ Total Polychlorinated biphenyls	----	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1016	12674-11-2	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1221	11104-28-2	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1232	11141-16-5	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1242	53469-21-9	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1248	12672-29-6	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1254	11097-69-1	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
Aroclor 1260	11096-82-5	5.0	µg/kg		<5.0	<5.0	----	<5.0	----
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	5	µg/kg		11	14	----	9	----
2-Methylnaphthalene	91-57-6	5	µg/kg		<5	<5	----	<5	----
Acenaphthylene	208-96-8	4	µg/kg		13	16	----	20	----
Acenaphthene	83-32-9	4	µg/kg		<4	<4	----	<4	----
Fluorene	86-73-7	4	µg/kg		<4	4	----	<4	----
Phenanthrene	85-01-8	4	µg/kg		20	38	----	27	----
Anthracene	120-12-7	4	µg/kg		10	20	----	13	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	4	µg/kg		63	112	----	90	----
Pyrene	129-00-0	4	µg/kg		69	110	----	103	----
Benz(a)anthracene	56-55-3	4	µg/kg		47	76	----	85	----
Chrysene	218-01-9	4	µg/kg		41	63	----	64	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg		65	76	----	135	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg		21	38	----	57	----
Benzo(e)pyrene	192-97-2	4	µg/kg		39	47	----	76	----
Benzo(a)pyrene	50-32-8	4	µg/kg		58	74	----	131	----
Perylene	198-55-0	4	µg/kg		85	85	----	68	----
Benzo(g,h,i)perylene	191-24-2	4	µg/kg		39	43	----	88	----
Dibenz(a,h)anthracene	53-70-3	4	µg/kg		8	12	----	25	----
Indeno(1,2,3-cd)pyrene	193-39-5	4	µg/kg		31	39	----	72	----
Coronene	191-07-1	5	µg/kg		9	8	----	15	----
^ Sum of PAHs	----	4	µg/kg		629	875	----	1080	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg		83	110	----	192	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg		83	110	----	192	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg		83	110	----	192	----
Radionuclides / Activity									
Gross alpha	----	500	Bq/kg DW		670	<500	----	<500	----
Gross beta	----	500	Bq/kg DW		<500	<500	----	550	----
EP080-SD: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		71.1	67.9	----	82.8	----
Toluene-D8	2037-26-5	0.2	%		66.8	65.2	----	76.3	----
4-Bromofluorobenzene	460-00-4	0.2	%		77.1	76.8	----	90.5	----
EP090S: Organotin Surrogate									
Tripopyltin	----	0.5	%		92.1	96.1	79.9	95.2	68.4
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		52.5	52.2	70.7	80.3	64.6
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		54.6	62.4	63.9	86.3	56.8
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		71.2	52.5	----	81.2	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		118	114	----	109	----

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B10-6	B10-6B	B11-5	B11-8	B10-5
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-006	EB2118023-007	EB2118023-008	EB2118023-009	EB2118023-010
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	10	%		114	110	----	101	----
4-Terphenyl-d14	1718-51-0	10	%		97.5	102	----	88.6	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit	----	----	8.3	8.2	8.3	8.6
pH OX (23B)	----	0.1	pH Unit	----	----	7.3	5.9	7.7	7.8
EA029-B: Acidity Trail									
Titratable Actual Acidity (23F)	----	2	mole H+ / t	----	----	<2	<2	<2	<2
Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	----	----	<2	14	<2	<2
Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	----	----	<2	14	<2	<2
sulfidic - Titratable Actual Acidity (s-23F)	----	0.020	% pyrite S	----	----	<0.020	<0.020	<0.020	<0.020
sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	----	----	<0.020	0.023	<0.020	<0.020
sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	----	----	<0.020	0.023	<0.020	<0.020
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S	----	----	0.154	0.165	0.148	0.108
Peroxide Sulfur (23De)	----	0.020	% S	----	----	0.508	0.546	0.503	0.422
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	----	----	0.354	0.381	0.354	0.314
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	----	----	221	237	221	196
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	----	----	0.373	0.368	0.377	0.354
Peroxide Calcium (23Wh)	----	0.020	% Ca	----	----	0.729	0.404	1.32	1.37
Acid Reacted Calcium (23X)	----	0.020	% Ca	----	----	0.356	0.035	0.942	1.02
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	----	----	178	18	470	508
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	----	----	0.285	0.028	0.754	0.814
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	----	----	0.276	0.313	0.258	0.180
Peroxide Magnesium (23Tm)	----	0.020	% Mg	----	----	0.382	0.383	0.355	0.261
Acid Reacted Magnesium (23U)	----	0.020	% Mg	----	----	0.106	0.070	0.097	0.081
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	----	----	87	58	80	66
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	----	----	0.140	0.092	0.128	0.107
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	----	----	1.30	----	2.62	2.85
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	----	----	259	----	522	570
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	----	----	0.415	----	0.837	0.912

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016	
				Result	Result	Result	Result	Result	
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)	----	0.02	% S	----	<0.02	0.14	<0.02	<0.02	
Net Acidity (acidity units)	----	10	mole H+ / t	----	<10	89	<10	<10	
Liming Rate	----	1	kg CaCO3/t	----	<1	7	<1	<1	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	0.35	0.38	0.35	0.31	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	221	237	221	196	
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	16	18	16	15	
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	8.3	8.2	8.3	8.6	
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	----	<2	<2	<2	<2	
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	<0.02	<0.02	<0.02	<0.02	
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	0.344	0.495	0.297	0.293	
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	214	308	185	183	
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	2.61	2.08	4.16	4.05	
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	522	415	832	810	
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	0.84	0.66	1.33	1.30	
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)	----	0.02	% S	----	<0.02	0.05	<0.02	<0.02	
Net Acidity (acidity units)	----	10	mole H+ / t	----	<10	32	<10	<10	
Liming Rate	----	1	kg CaCO3/t	----	<1	2	<1	<1	
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	0.34	0.49	0.30	0.29	
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	214	308	185	183	
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	16	23	14	14	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	----	63.2	60.4	58.4	----	
Moisture Content	----	1.0	%	----	----	----	----	49.0	
EA150: Particle Sizing									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016
					Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued									
+75µm	----	1	%	----	6	8	14	43	
+150µm	----	1	%	----	3	5	10	33	
+300µm	----	1	%	----	1	2	7	10	
+425µm	----	1	%	----	<1	1	6	6	
+600µm	----	1	%	----	<1	<1	6	5	
+1180µm	----	1	%	----	<1	<1	5	3	
+2.36mm	----	1	%	----	<1	<1	4	2	
+4.75mm	----	1	%	----	<1	<1	4	<1	
+9.5mm	----	1	%	----	<1	<1	4	<1	
+19.0mm	----	1	%	----	<1	<1	<1	<1	
+37.5mm	----	1	%	----	<1	<1	<1	<1	
+75.0mm	----	1	%	----	<1	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	----	62	60	55	37	
Silt (2-60 µm)	----	1	%	----	32	31	30	19	
Sand (0.06-2.00 mm)	----	1	%	----	6	9	10	42	
Gravel (>2mm)	----	1	%	----	<1	<1	5	2	
Cobbles (>6cm)	----	1	%	----	<1	<1	<1	<1	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.75	2.78	2.59	2.60	
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg	----	16200	13900	13100	9200	
Iron	7439-89-6	50	mg/kg	----	37300	24600	38000	24700	
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg	----	8.90	3.30	6.30	5.83	
Cadmium	7440-43-9	0.1	mg/kg	----	0.3	<0.1	0.2	<0.1	
Chromium	7440-47-3	1.0	mg/kg	----	37.4	22.8	31.7	26.0	
Copper	7440-50-8	1.0	mg/kg	----	39.0	22.9	28.7	23.4	
Lead	7439-92-1	1.0	mg/kg	----	42.3	20.0	24.5	14.6	
Nickel	7440-02-0	1.0	mg/kg	----	22.8	17.3	20.2	15.4	
Silver	7440-22-4	0.1	mg/kg	----	0.4	0.1	0.3	0.1	
Zinc	7440-66-6	1.0	mg/kg	----	135	75.3	94.2	85.4	
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg	----	0.13	0.05	0.13	0.07	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		----	0.1	0.1	0.2	0.3
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		----	1460	1370	1210	920
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		----	1460	1370	1210	920
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		----	924	732	675	599
EN82: Porewater Extraction									
Volume	----	1	mL		----	----	----	----	1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		----	1.40	1.30	1.37	1.16
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		----	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg		----	7	8	6	5
C15 - C28 Fraction	----	3	mg/kg		----	87	98	108	45
C29 - C36 Fraction	----	5	mg/kg		----	93	109	117	57
^ C10 - C36 Fraction (sum)	----	3	mg/kg		----	187	215	231	107
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		----	<3	<3	<3	<3



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016	
				Result	Result	Result	Result	Result	
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons - Continued									
>C10 - C16 Fraction	----	3	mg/kg	----	11	12	10	6	
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg	----	<3.0	<3.0	<3.0	<3.0	
>C16 - C34 Fraction	----	3	mg/kg	----	156	179	195	87	
>C34 - C40 Fraction	----	5	mg/kg	----	48	56	61	30	
^ >C10 - C40 Fraction (sum)	----	3	mg/kg	----	215	247	266	123	
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2	
Ethylbenzene	100-41-4	0.2	mg/kg	----	<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	
ortho-Xylene	95-47-6	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2	
Naphthalene	91-20-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2	
EP090: Organotin Compounds									
Monobutyltin	78763-54-9	1	µgSn/kg	----	<1	<1	<1	<1	
Dibutyltin	1002-53-5	1	µgSn/kg	----	2	3	4	<1	
Tributyltin	56573-85-4	0.5	µgSn/kg	----	<0.5	<0.5	<0.5	2.4	
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg	----	<10	<10	<10	<10	
Carbophenothion	786-19-6	10	µg/kg	----	<10	<10	<10	<10	
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg	----	<10.0	<10.0	<10.0	<10.0	
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	----	<10	<10	<10	<10	
Chlorpyrifos	2921-88-2	10	µg/kg	----	<10	<10	<10	<10	
Chlorpyrifos-methyl	5598-13-0	10	µg/kg	----	<10	<10	<10	<10	
Demeton-S-methyl	919-86-8	10	µg/kg	----	<10	<10	<10	<10	
Diazinon	333-41-5	10	µg/kg	----	<10	<10	<10	<10	
Dichlorvos	62-73-7	10	µg/kg	----	<10	<10	<10	<10	
Dimethoate	60-51-5	10	µg/kg	----	<10	<10	<10	<10	
Ethion	563-12-2	10	µg/kg	----	<10	<10	<10	<10	
Fenamiphos	22224-92-6	10	µg/kg	----	<10	<10	<10	<10	
Fenthion	55-38-9	10	µg/kg	----	<10	<10	<10	<10	
Malathion	121-75-5	10	µg/kg	----	<10	<10	<10	<10	

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016	
				Result	Result	Result	Result	Result	
EP130A: Organophosphorus Pesticides (Ultra-trace) - Continued									
Azinphos Methyl	86-50-0	10	µg/kg	----	<10	<10	<10	<10	
Monocrotophos	6923-22-4	10	µg/kg	----	<10	<10	<10	<10	
Parathion	56-38-2	10	µg/kg	----	<10	<10	<10	<10	
Parathion-methyl	298-00-0	10	µg/kg	----	<10	<10	<10	<10	
Pirimphos-ethyl	23505-41-1	10	µg/kg	----	<10	<10	<10	<10	
Prothiofos	34643-46-4	10	µg/kg	----	<10	<10	<10	<10	
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
alpha-BHC	319-84-6	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
beta-BHC	319-85-7	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	4.92	
4,4'-DDE	72-55-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	4.92	
Dieldrin	60-57-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
alpha-Endosulfan	959-98-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
beta-Endosulfan	33213-65-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Endrin	72-20-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Endrin aldehyde	7421-93-4	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Endrin ketone	53494-70-5	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
gamma-BHC	58-89-9	0.25	µg/kg	----	<0.25	<0.25	<0.25	<0.25	
Methoxychlor	72-43-5	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
cis-Chlordane	5103-71-9	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
trans-Chlordane	5103-74-2	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
^ Total Chlordane (sum)	----	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
Oxychlordane	27304-13-8	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	----	<0.50	<0.50	<0.50	<0.50	
EP131B: Polychlorinated Biphenyls (as Aroclors)									

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016	
				Result	Result	Result	Result	Result	
EP131B: Polychlorinated Biphenyls (as Aroclors) - Continued									
^ Total Polychlorinated biphenyls				----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1016	12674-11-2	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1221	11104-28-2	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1232	11141-16-5	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1242	53469-21-9	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1248	12672-29-6	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1254	11097-69-1	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
Aroclor 1260	11096-82-5	5.0	µg/kg	----	<6.2	<6.2	<6.2	<5.0	
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	5	µg/kg	----	23	15	9	12	
2-Methylnaphthalene	91-57-6	5	µg/kg	----	18	12	6	6	
Acenaphthylene	208-96-8	4	µg/kg	----	18	18	21	14	
Acenaphthene	83-32-9	4	µg/kg	----	5	<5	<5	<4	
Fluorene	86-73-7	4	µg/kg	----	14	11	5	<4	
Phenanthrene	85-01-8	4	µg/kg	----	37	32	19	16	
Anthracene	120-12-7	4	µg/kg	----	18	14	15	11	
Fluoranthene	206-44-0	4	µg/kg	----	69	50	49	52	
Pyrene	129-00-0	4	µg/kg	----	93	69	72	60	
Benz(a)anthracene	56-55-3	4	µg/kg	----	52	39	36	32	
Chrysene	218-01-9	4	µg/kg	----	50	34	32	29	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	62	64	72	54	
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	27	22	32	21	
Benzo(e)pyrene	192-97-2	4	µg/kg	----	46	44	45	34	
Benzo(a)pyrene	50-32-8	4	µg/kg	----	47	50	70	46	
Perylene	198-55-0	4	µg/kg	----	1470	857	230	102	
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	----	43	44	54	35	
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	----	10	10	16	7	
Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	----	32	34	46	28	
Coronene	191-07-1	5	µg/kg	----	18	11	10	9	
^ Sum of PAHs				----	2150	1430	839	568	
^ Benzo(a)pyrene TEQ (zero)				----	75	77	105	67	
^ Benzo(a)pyrene TEQ (half LOR)				----	75	77	105	67	
^ Benzo(a)pyrene TEQ (LOR)				----	75	77	105	67	
Radionuclides / Activity									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TripBlank 040705	B5-1	B5-1B	B5-1C	B7-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-011	EB2118023-013	EB2118023-014	EB2118023-015	EB2118023-016
					Result	Result	Result	Result	Result
Radionuclides / Activity - Continued									
Gross alpha	----	500	Bq/kg DW		----	880	1070	830	570
Gross beta	----	500	Bq/kg DW		----	<500	590	600	540
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		112	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		97.0	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		113	----	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	79.0	71.6	85.2	80.7
Toluene-D8	2037-26-5	0.2	%		----	74.6	65.8	77.0	75.4
4-Bromofluorobenzene	460-00-4	0.2	%		----	84.7	79.9	94.3	87.8
EP090S: Organotin Surrogate									
Tripopyltin	----	0.5	%		----	44.7	71.8	96.9	94.6
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		----	58.2	67.2	72.7	80.0
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		----	49.0	51.7	41.2	71.8
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		----	77.5	62.5	57.5	71.2
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		----	108	82.8	108	112
Anthracene-d10	1719-06-8	10	%		----	116	90.9	112	103
4-Terphenyl-d14	1718-51-0	10	%		----	94.4	78.1	105	94.6



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
				Result	Result	Result	Result	Result
EA029-A: pH Measurements								
pH KCl (23A)	----	0.1	pH Unit	8.6	----	----	----	----
pH OX (23B)	----	0.1	pH Unit	7.9	----	----	----	----
EA029-B: Acidity Trail								
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	<2	----	----	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	----	----	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S	<0.020	----	----	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S	<0.020	----	----	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail								
KCl Extractable Sulfur (23Ce)	----	0.020	% S	0.122	----	----	----	----
Peroxide Sulfur (23De)	----	0.020	% S	0.358	----	----	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S	0.236	----	----	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	147	----	----	----	----
EA029-D: Calcium Values								
KCl Extractable Calcium (23Vh)	----	0.020	% Ca	0.312	----	----	----	----
Peroxide Calcium (23Wh)	----	0.020	% Ca	1.21	----	----	----	----
Acid Reacted Calcium (23X)	----	0.020	% Ca	0.895	----	----	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	447	----	----	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S	0.716	----	----	----	----
EA029-E: Magnesium Values								
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg	0.183	----	----	----	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg	0.322	----	----	----	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg	0.138	----	----	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	114	----	----	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S	0.182	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity								
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3	2.87	----	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	574	----	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S	0.920	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
					Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	----	----	----	----
Net Acidity (sulfur units)	----	0.02	% S		<0.02	----	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		<10	----	----	----	----
Liming Rate	----	1	kg CaCO3/t		<1	----	----	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.24	----	----	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		147	----	----	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		11	----	----	----	----
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit		8.6	----	----	----	----
Titratable Actual Acidity (23F)	----	2	mole H+ / t		<2	----	----	----	----
sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.02	----	----	----	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S		0.208	----	----	----	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t		130	----	----	----	----
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3		3.87	----	----	----	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t		773	----	----	----	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S		1.24	----	----	----	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	----	----	----	----
Net Acidity (sulfur units)	----	0.02	% S		<0.02	----	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		<10	----	----	----	----
Liming Rate	----	1	kg CaCO3/t		<1	----	----	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.21	----	----	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		130	----	----	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		10	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		55.4	24.0	58.9	61.1	53.8
EA150: Particle Sizing									
+75µm	----	1	%		37	86	63	12	28

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021	
				Result	Result	Result	Result	Result	
EA150: Particle Sizing - Continued									
+150µm	----	1	%	29	83	60	7	16	
+300µm	----	1	%	19	70	39	3	4	
+425µm	----	1	%	12	48	20	2	2	
+600µm	----	1	%	7	18	14	2	1	
+1180µm	----	1	%	4	<1	9	1	<1	
+2.36mm	----	1	%	3	<1	5	<1	<1	
+4.75mm	----	1	%	2	<1	2	<1	<1	
+9.5mm	----	1	%	<1	<1	<1	<1	<1	
+19.0mm	----	1	%	<1	<1	<1	<1	<1	
+37.5mm	----	1	%	<1	<1	<1	<1	<1	
+75.0mm	----	1	%	<1	<1	<1	<1	<1	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	40	9	17	47	39	
Silt (2-60 µm)	----	1	%	22	5	19	41	31	
Sand (0.06-2.00 mm)	----	1	%	35	86	58	11	30	
Gravel (>2mm)	----	1	%	3	<1	6	1	<1	
Cobbles (>6cm)	----	1	%	<1	<1	<1	<1	<1	
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.63	2.66	2.47	2.79	2.42	
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg	10800	2600	10000	13000	11000	
Iron	7439-89-6	50	mg/kg	30100	8150	25600	31000	30000	
EG020-SD: Total Metals in Sediments by ICPMS									
Arsenic	7440-38-2	1.00	mg/kg	6.99	1.35	10.0	7.55	6.56	
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1	
Chromium	7440-47-3	1.0	mg/kg	29.8	7.4	24.2	30.2	28.6	
Copper	7440-50-8	1.0	mg/kg	26.5	4.6	55.7	27.6	26.5	
Lead	7439-92-1	1.0	mg/kg	13.6	3.8	36.9	16.6	16.5	
Nickel	7440-02-0	1.0	mg/kg	22.4	6.5	16.6	19.2	17.1	
Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.2	0.1	0.1	
Zinc	7440-66-6	1.0	mg/kg	84.4	21.8	250	91.0	93.1	
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Mercury	7439-97-6	0.01	mg/kg	0.08	0.01	0.13	0.08	0.08	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		0.3	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		1100	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		1100	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		567	----	----	----	----
EN82: Porewater Extraction									
Volume	----	1	mL		----	----	----	1	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.97	0.21	7.29	1.37	1.30
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	----	----	----	----
C10 - C14 Fraction	----	3	mg/kg		6	----	----	----	----
C15 - C28 Fraction	----	3	mg/kg		44	----	----	----	----
C29 - C36 Fraction	----	5	mg/kg		49	----	----	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		99	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	----	----	----	----
>C10 - C16 Fraction	----	3	mg/kg		7	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	----	----	----	----
>C16 - C34 Fraction	----	3	mg/kg		81	----	----	----	----
>C34 - C40 Fraction	----	5	mg/kg		22	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		110	----	----	----	----
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	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
					Result	Result	Result	Result	Result
EP090: Organotin Compounds									
Monobutyltin	78763-54-9	1	µgSn/kg		<1	<1	<2	<1	<1
Dibutyltin	1002-53-5	1	µgSn/kg		<1	<1	<15	<1	2
Tributyltin	56573-85-4	0.5	µgSn/kg		0.6	<0.5	<3.0	<0.5	2.8
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg		<10	<10	<16	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<16	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<16.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<16	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<16	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<16	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<16	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<16	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<16	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<16	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<16	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<16	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<16	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<16	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<16	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<16	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<16	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<16	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<16	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<16	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	<6.2	----	----	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	<6.2	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	9	----	----	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	<5	----	----	----	----
Acenaphthylene	208-96-8	4	µg/kg	7	----	----	----	----
Acenaphthene	83-32-9	4	µg/kg	<5	----	----	----	----
Fluorene	86-73-7	4	µg/kg	<5	----	----	----	----
Phenanthrene	85-01-8	4	µg/kg	10	----	----	----	----
Anthracene	120-12-7	4	µg/kg	7	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
					Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	4	µg/kg		27	----	----	----	----
Pyrene	129-00-0	4	µg/kg		32	----	----	----	----
Benz(a)anthracene	56-55-3	4	µg/kg		17	----	----	----	----
Chrysene	218-01-9	4	µg/kg		17	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg		30	----	----	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg		11	----	----	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg		19	----	----	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg		24	----	----	----	----
Perylene	198-55-0	4	µg/kg		59	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	4	µg/kg		20	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	4	µg/kg		<5	----	----	----	----
Indeno(1,2,3,cd)pyrene	193-39-5	4	µg/kg		15	----	----	----	----
Coronene	191-07-1	5	µg/kg		5	----	----	----	----
^ Sum of PAHs	----	4	µg/kg		309	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg		32	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg		34	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg		36	----	----	----	----
Radionuclides / Activity									
Gross alpha	----	500	Bq/kg DW		730	----	----	----	----
Gross beta	----	500	Bq/kg DW		<500	----	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		80.1	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		70.7	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		85.3	----	----	----	----
EP090S: Organotin Surrogate									
Tripopyltin	----	0.5	%		98.5	103	111	57.0	99.9
EP130S: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	10	%		84.7	69.1	80.5	64.5	68.2
EP131S: OC Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.50	%		72.1	41.2	93.7	56.4	43.8
EP131T: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.5	%		72.5	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	10	%		95.7	----	----	----	----

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				B9-1	B2-0	BC-2	B8-3	B8-1
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-017	EB2118023-018	EB2118023-019	EB2118023-020	EB2118023-021
				Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	10	%	92.2	----	----	----	----
4-Terphenyl-d14	1718-51-0	10	%	80.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
					Result	Result	Result	Result	Result
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		----	----	8.3	----	----
pH OX (23B)	----	0.1	pH Unit		----	----	7.0	----	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		----	----	<2	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		----	----	<2	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		----	----	<2	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.020	% pyrite S		----	----	<0.020	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.020	% pyrite S		----	----	<0.020	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.020	% pyrite S		----	----	<0.020	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.020	% S		----	----	0.125	----	----
Peroxide Sulfur (23De)	----	0.020	% S		----	----	0.445	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.020	% S		----	----	0.320	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		----	----	199	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.020	% Ca		----	----	0.344	----	----
Peroxide Calcium (23Wh)	----	0.020	% Ca		----	----	0.671	----	----
Acid Reacted Calcium (23X)	----	0.020	% Ca		----	----	0.326	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		----	----	163	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.020	% S		----	----	0.261	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.020	% Mg		----	----	0.292	----	----
Peroxide Magnesium (23Tm)	----	0.020	% Mg		----	----	0.424	----	----
Acid Reacted Magnesium (23U)	----	0.020	% Mg		----	----	0.133	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		----	----	109	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.020	% S		----	----	0.175	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.020	% CaCO3		----	----	1.55	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		----	----	309	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.020	% S		----	----	0.495	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
					Result	Result	Result	Result	Result
EA029-F: Excess Acid Neutralising Capacity - Continued									
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	1.5	----	----
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	<0.02	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	<10	----	----
Liming Rate	----	1	kg CaCO3/t	----	----	----	<1	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	0.32	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	199	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	15	----	----
EA033-A: Actual Acidity									
pH KCl (23A)	----	0.1	pH Unit	----	----	----	8.3	----	----
Titrateable Actual Acidity (23F)	----	2	mole H+ / t	----	----	----	<2	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S	----	----	----	<0.02	----	----
EA033-B: Potential Acidity									
Chromium Reducible Sulfur (22B)	----	0.005	% S	----	----	----	0.289	----	----
acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	----	----	----	180	----	----
EA033-C: Acid Neutralising Capacity									
Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	----	----	----	3.09	----	----
acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	----	----	----	617	----	----
sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	----	----	----	0.99	----	----
EA033-E: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-	----	----	----	1.5	----	----
Net Acidity (sulfur units)	----	0.02	% S	----	----	----	<0.02	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	----	----	----	<10	----	----
Liming Rate	----	1	kg CaCO3/t	----	----	----	<1	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	----	----	----	0.29	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	----	----	----	180	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	----	----	----	14	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		52.6	58.5	68.4	64.4	51.3
EA150: Particle Sizing									
+75µm	----	1	%		46	35	5	4	22



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		----	----	0.4	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		----	----	2300	----	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		----	----	2300	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		----	----	855	----	----
EN82: Porewater Extraction									
Volume	----	1	mL		1	1	----	----	1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.72	1.14	1.72	1.74	1.34
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		----	----	<3	----	----
C10 - C14 Fraction	----	3	mg/kg		----	----	14	----	----
C15 - C28 Fraction	----	3	mg/kg		----	----	109	----	----
C29 - C36 Fraction	----	5	mg/kg		----	----	129	----	----
^ C10 - C36 Fraction (sum)	----	3	mg/kg		----	----	252	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		----	----	<3	----	----
>C10 - C16 Fraction	----	3	mg/kg		----	----	16	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		----	----	<3.0	----	----
>C16 - C34 Fraction	----	3	mg/kg		----	----	208	----	----
>C34 - C40 Fraction	----	5	mg/kg		----	----	59	----	----
^ >C10 - C40 Fraction (sum)	----	3	mg/kg		----	----	283	----	----
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	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time					28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
					Result	Result	Result	Result	Result
EP090: Organotin Compounds									
Monobutyltin	78763-54-9	1	µgSn/kg		<1	<1	<1	<1	<2
Dibutyltin	1002-53-5	1	µgSn/kg		<1	<1	<1	1	13
Tributyltin	56573-85-4	0.5	µgSn/kg		0.6	<0.5	1.5	1.8	148
EP130A: Organophosphorus Pesticides (Ultra-trace)									
Bromophos-ethyl	4824-78-6	10	µg/kg		<10	<10	<10	<10	<10
Carbophenothion	786-19-6	10	µg/kg		<10	<10	<10	<10	<10
Chlorfenvinphos (E)	18708-86-6	10.0	µg/kg		<10.0	<10.0	<10.0	<10.0	<10.0
Chlorfenvinphos (Z)	18708-87-7	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos	2921-88-2	10	µg/kg		<10	<10	<10	<10	<10
Chlorpyrifos-methyl	5598-13-0	10	µg/kg		<10	<10	<10	<10	<10
Demeton-S-methyl	919-86-8	10	µg/kg		<10	<10	<10	<10	<10
Diazinon	333-41-5	10	µg/kg		<10	<10	<10	<10	<10
Dichlorvos	62-73-7	10	µg/kg		<10	<10	<10	<10	<10
Dimethoate	60-51-5	10	µg/kg		<10	<10	<10	<10	<10
Ethion	563-12-2	10	µg/kg		<10	<10	<10	<10	<10
Fenamiphos	22224-92-6	10	µg/kg		<10	<10	<10	<10	<10
Fenthion	55-38-9	10	µg/kg		<10	<10	<10	<10	<10
Malathion	121-75-5	10	µg/kg		<10	<10	<10	<10	<10
Azinphos Methyl	86-50-0	10	µg/kg		<10	<10	<10	<10	<10
Monocrotophos	6923-22-4	10	µg/kg		<10	<10	<10	<10	<10
Parathion	56-38-2	10	µg/kg		<10	<10	<10	<10	<10
Parathion-methyl	298-00-0	10	µg/kg		<10	<10	<10	<10	<10
Pirimphos-ethyl	23505-41-1	10	µg/kg		<10	<10	<10	<10	<10
Prothiofos	34643-46-4	10	µg/kg		<10	<10	<10	<10	<10
EP131A: Organochlorine Pesticides									
Aldrin	309-00-2	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
alpha-BHC	319-84-6	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDD	72-54-8	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDE	72-55-9	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
4,4`-DDT	50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
Dieldrin	60-57-1	0.50	µg/kg		<0.50	<0.50	<0.50	<0.50	<0.50



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
				Result	Result	Result	Result	Result
EP131A: Organochlorine Pesticides - Continued								
alpha-Endosulfan	959-98-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-Endosulfan	33213-65-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Endosulfan (sum)	115-29-7	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin	72-20-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin aldehyde	7421-93-4	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	53494-70-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene (HCB)	118-74-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	<0.25	<0.25	<0.25
Methoxychlor	72-43-5	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	5103-71-9	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
trans-Chlordane	5103-74-2	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Total Chlordane (sum)	----	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Oxychlordane	27304-13-8	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.50	µg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP131B: Polychlorinated Biphenyls (as Aroclors)								
^ Total Polychlorinated biphenyls	----	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1016	12674-11-2	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1221	11104-28-2	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1232	11141-16-5	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1242	53469-21-9	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1248	12672-29-6	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1254	11097-69-1	5.0	µg/kg	----	----	<6.2	----	----
Aroclor 1260	11096-82-5	5.0	µg/kg	----	----	<6.2	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	5	µg/kg	----	----	26	----	----
2-Methylnaphthalene	91-57-6	5	µg/kg	----	----	8	----	----
Acenaphthylene	208-96-8	4	µg/kg	----	----	14	----	----
Acenaphthene	83-32-9	4	µg/kg	----	----	<5	----	----
Fluorene	86-73-7	4	µg/kg	----	----	6	----	----
Phenanthrene	85-01-8	4	µg/kg	----	----	25	----	----
Anthracene	120-12-7	4	µg/kg	----	----	14	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
				Result	Result	Result	Result	Result
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	4	µg/kg	----	----	47	----	----
Pyrene	129-00-0	4	µg/kg	----	----	56	----	----
Benz(a)anthracene	56-55-3	4	µg/kg	----	----	32	----	----
Chrysene	218-01-9	4	µg/kg	----	----	30	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	4	µg/kg	----	----	58	----	----
Benzo(k)fluoranthene	207-08-9	4	µg/kg	----	----	22	----	----
Benzo(e)pyrene	192-97-2	4	µg/kg	----	----	38	----	----
Benzo(a)pyrene	50-32-8	4	µg/kg	----	----	49	----	----
Perylene	198-55-0	4	µg/kg	----	----	147	----	----
Benzo(g,h,i)perylene	191-24-2	4	µg/kg	----	----	41	----	----
Dibenz(a,h)anthracene	53-70-3	4	µg/kg	----	----	9	----	----
Indeno(1,2,3-cd)pyrene	193-39-5	4	µg/kg	----	----	32	----	----
Coronene	191-07-1	5	µg/kg	----	----	10	----	----
^ Sum of PAHs	----	4	µg/kg	----	----	664	----	----
^ Benzo(a)pyrene TEQ (zero)	----	4	µg/kg	----	----	73	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	4	µg/kg	----	----	73	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	4	µg/kg	----	----	73	----	----
Radionuclides / Activity								
Gross alpha	----	500	Bq/kg DW	----	----	540	----	----
Gross beta	----	500	Bq/kg DW	----	----	530	----	----
EP080-SD: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	73.3	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	69.6	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	82.3	----	----
EP090S: Organotin Surrogate								
Tripopyltin	----	0.5	%	120	85.4	118	108	Not Authorised
EP130S: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	10	%	70.1	52.8	82.4	41.4	71.8
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.50	%	60.6	58.5	43.6	43.5	43.2
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.5	%	----	----	65.0	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	10	%	----	----	123	----	----



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				B6-2	B6-2B	B6-3	B4-4	B4-0
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2118023-022	EB2118023-023	EB2118023-024	EB2118023-025	EB2118023-026
				Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	10	%	----	----	115	----	----
4-Terphenyl-d14	1718-51-0	10	%	----	----	96.8	----	----



Surrogate Control Limits

Sub-Matrix: PORE WATER LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP090S: Organotin Surrogate			
Tripopyltin	----	24	116
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127
EP080-SD: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	145
Toluene-D8	2037-26-5	42	144
4-Bromofluorobenzene	460-00-4	58	142
EP090S: Organotin Surrogate			
Tripopyltin	----	35	130
EP130S: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	14	102
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	119
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	106
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	55	135
Anthracene-d10	1719-06-8	70	136
4-Terphenyl-d14	1718-51-0	57	127



Inter-Laboratory Testing

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

(SOIL) EP131A: Organochlorine Pesticides
(SOIL) EP131S: OC Pesticide Surrogate
(WATER) EP131A: Organochlorine Pesticides
(WATER) EP131S: OC Pesticide Surrogate
(SOIL) EP130A: Organophosphorus Pesticides (Ultra-trace)
(SOIL) EP130S: Organophosphorus Pesticide Surrogate
(SOIL) EP131B: Polychlorinated Biphenyls (as Aroclors)
(SOIL) EP131T: PCB Surrogate
(SOIL) EP132B: Polynuclear Aromatic Hydrocarbons
(SOIL) EP132T: Base/Neutral Extractable Surrogates

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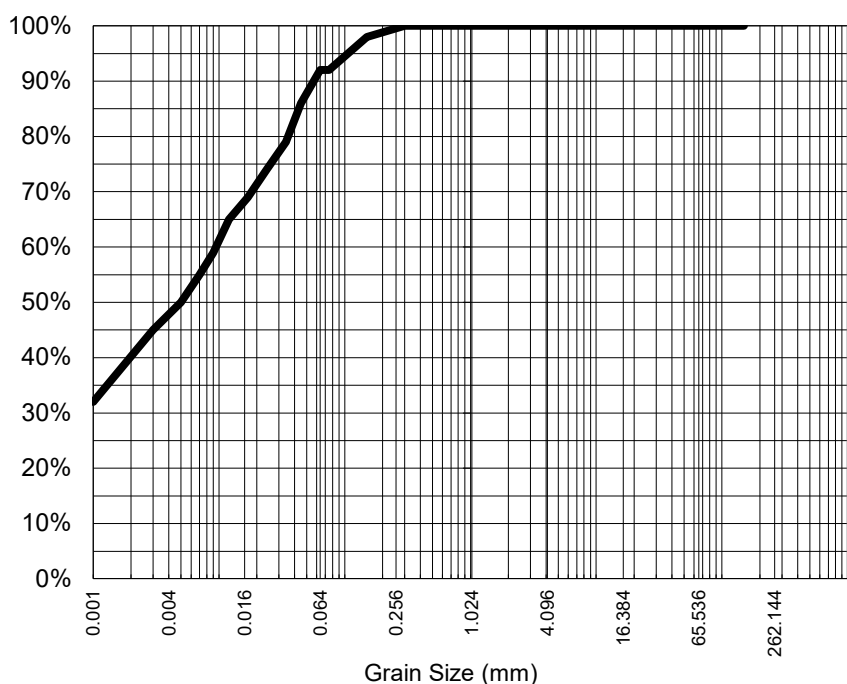
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pH 07 3243 7222
samples.brisbane@alsenviro.com

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COMPANY: BMT COMMERCIAL AUSTRALIA PTY LTD
DATE RECEIVED: 28-Jun-2021
ADDRESS: Po Box 203 Spring Hill Brisbane Qld
REPORT NO: EB2118023-001 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B5-0

Particle Size Distribution



Particle Size (mm)	% Passing
0.300	100%
0.150	98%
0.075	92%
Particle Size (microns)	
45	86%
34	79%
24	74%
17	69%
12	65%
9	59%
7	55%
5	50%
1	32%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.68

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

NATA Accreditation: 825 Site: Brisbane
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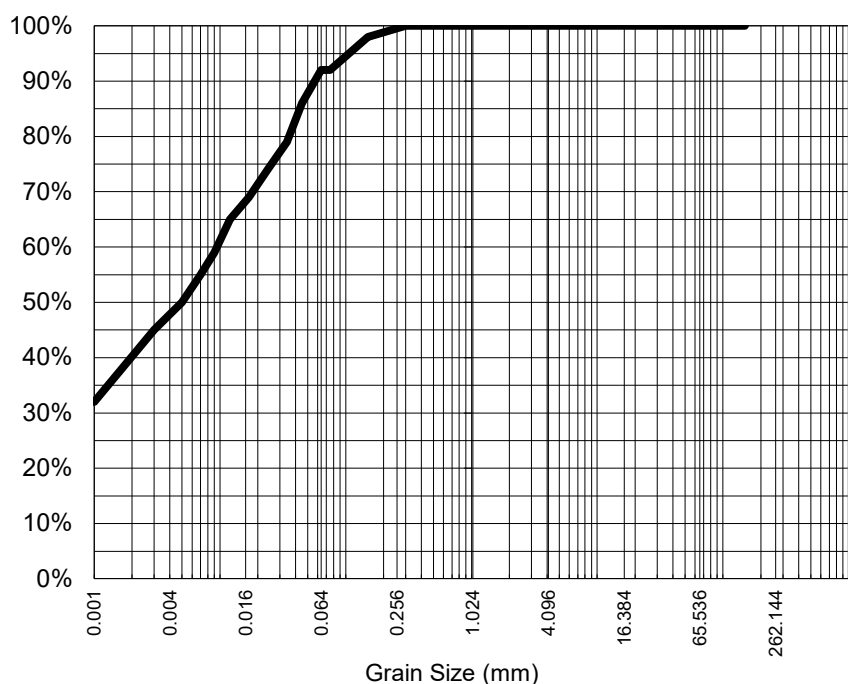
ADDRESS: Po Box 203
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REPORT NO: EB2118023-001DUP / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B5-0

Particle Size Distribution



Particle Size (mm)	% Passing
0.300	100%
0.150	98%
0.075	92%
Particle Size (microns)	
45	86%
34	79%
24	74%
17	69%
12	65%
9	59%
7	55%
5	50%
1	32%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.68

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Soil Senior Chemist

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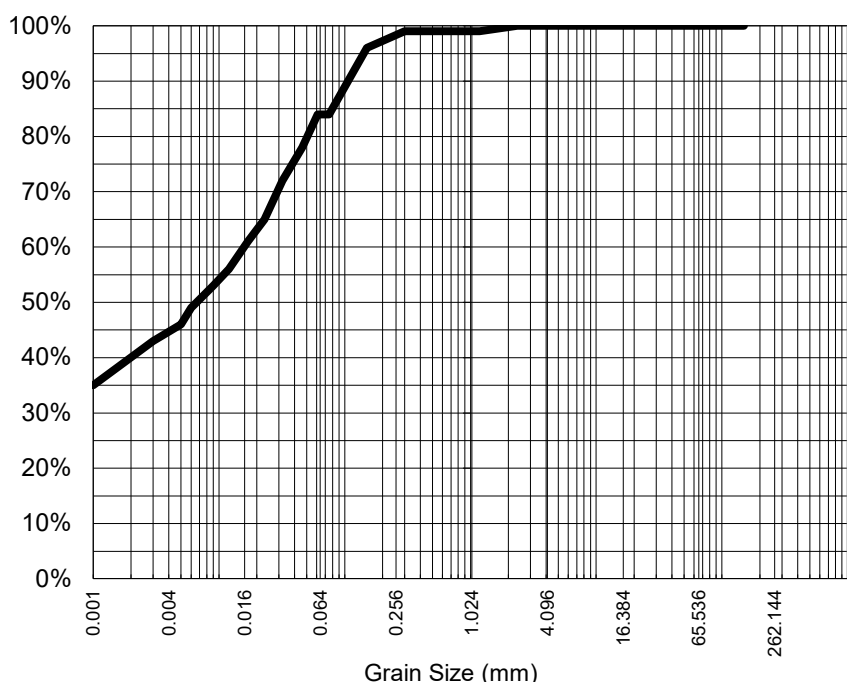
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PROJECT: Port of Brisbane SAP

SAMPLE ID: B11-9

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	99%
0.300	99%
0.150	96%
0.075	84%
Particle Size (microns)	
46	78%
32	72%
23	65%
17	61%
12	56%
9	53%
6	49%
5	46%
1	35%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.007
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.8

Satish

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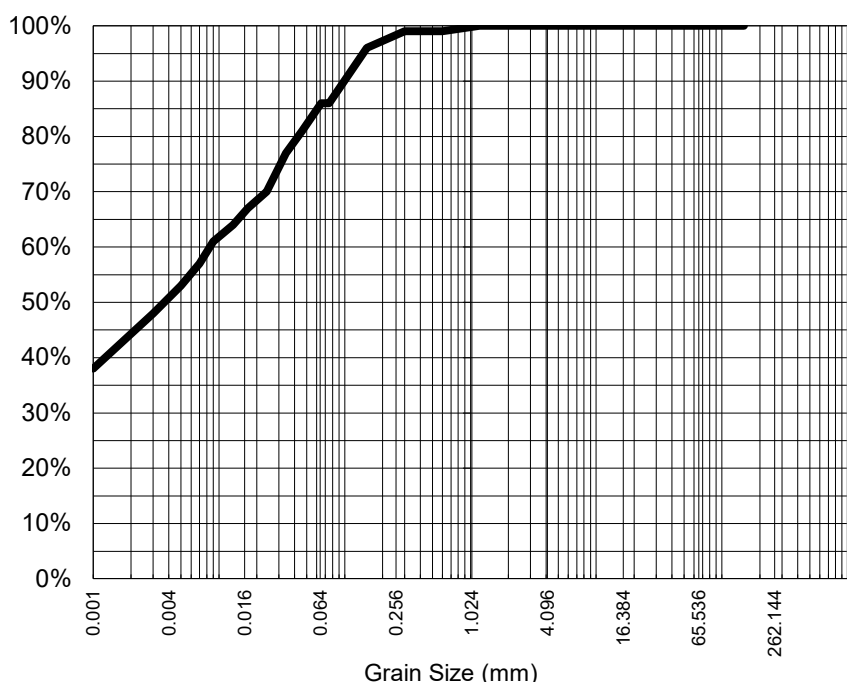
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Brisbane Qld

REPORT NO: EB2118023-004 / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B11-9B

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	99%
0.150	96%
0.075	86%
Particle Size (microns)	
46	81%
34	77%
24	70%
17	67%
13	64%
9	61%
7	57%
5	53%
1	38%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.64

Satish

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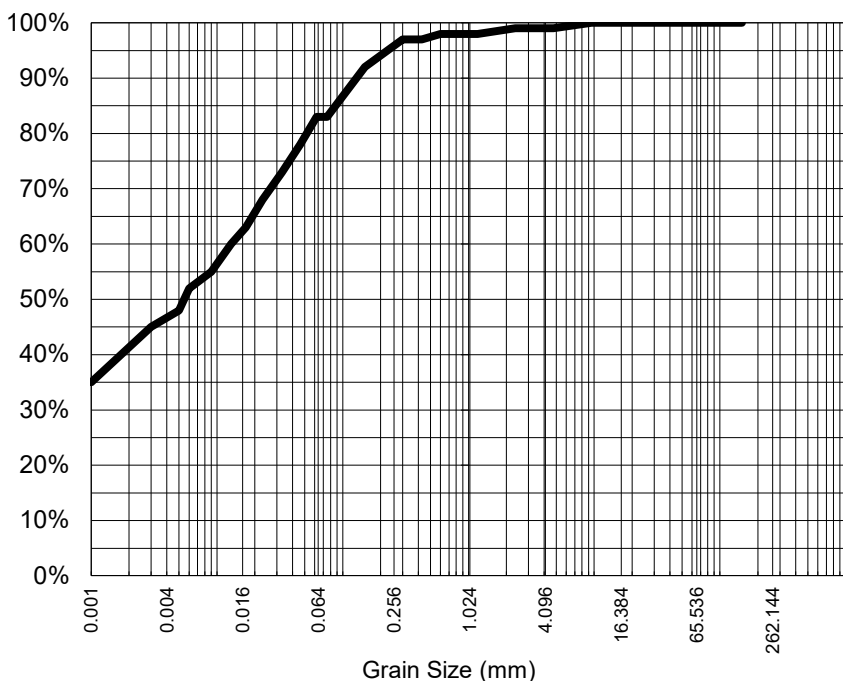
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B11-9C

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	99%
2.36	99%
1.18	98%
0.600	98%
0.425	97%
0.300	97%
0.150	92%
0.075	83%
Particle Size (microns)	
46	78%
33	73%
23	68%
17	63%
13	60%
9	55%
6	52%
5	48%
1	35%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.78

Satish

Satish Trivedi
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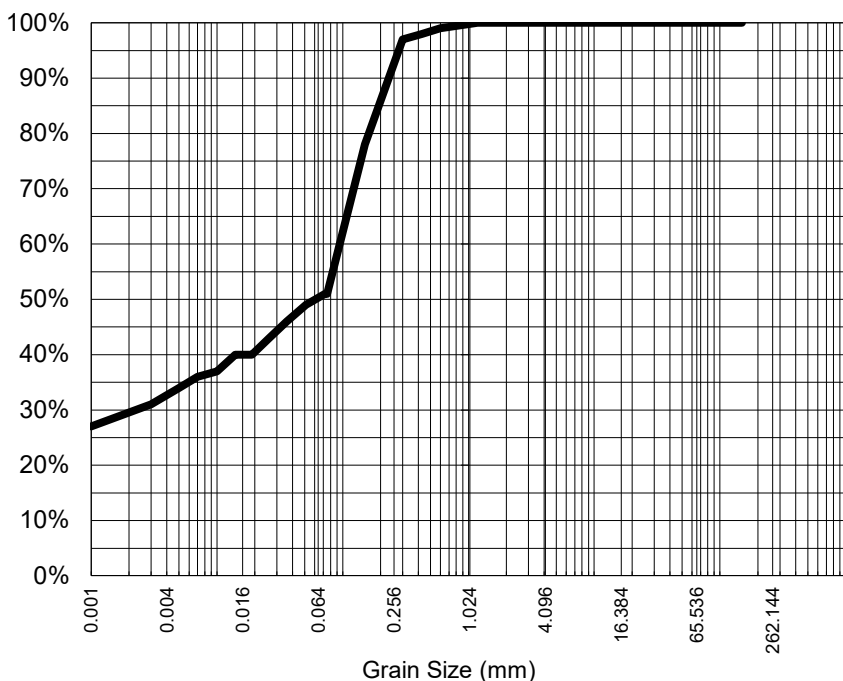
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B10-6

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	98%
0.300	97%
0.150	78%
0.075	51%
Particle Size (microns)	
51	49%
36	46%
26	43%
19	40%
14	40%
10	37%
7	36%
5	34%
1	27%

Median Particle Size (mm)*	0.062
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.6

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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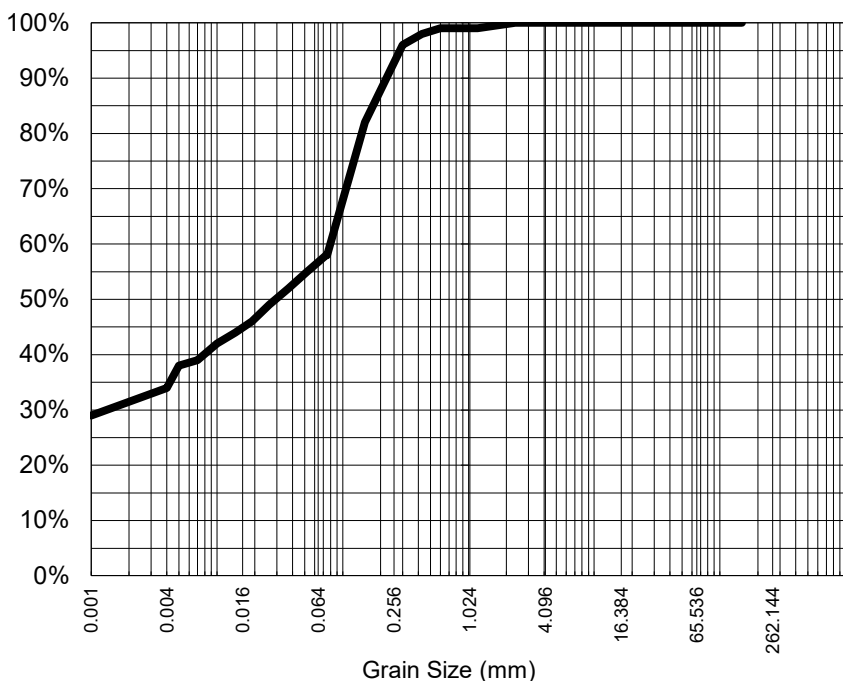
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PROJECT: Port of Brisbane SAP
SAMPLE ID: B10-6B

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	98%
0.300	96%
0.150	82%
0.075	58%
Particle Size (microns)	
52	55%
37	52%
26	49%
19	46%
14	44%
10	42%
7	39%
5	38%
1	29%

Median Particle Size (mm)*	0.030
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.59

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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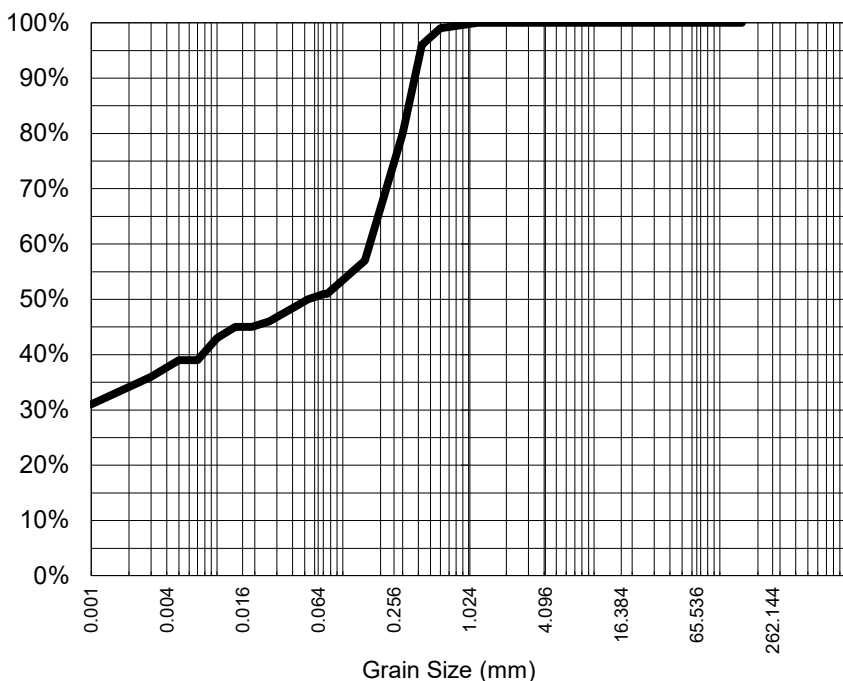
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B11-5

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	96%
0.300	80%
0.150	57%
0.075	51%
Particle Size (microns)	
53	50%
37	48%
26	46%
19	45%
14	45%
10	43%
7	39%
5	39%
1	31%

Median Particle Size (mm)*	0.053
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.65

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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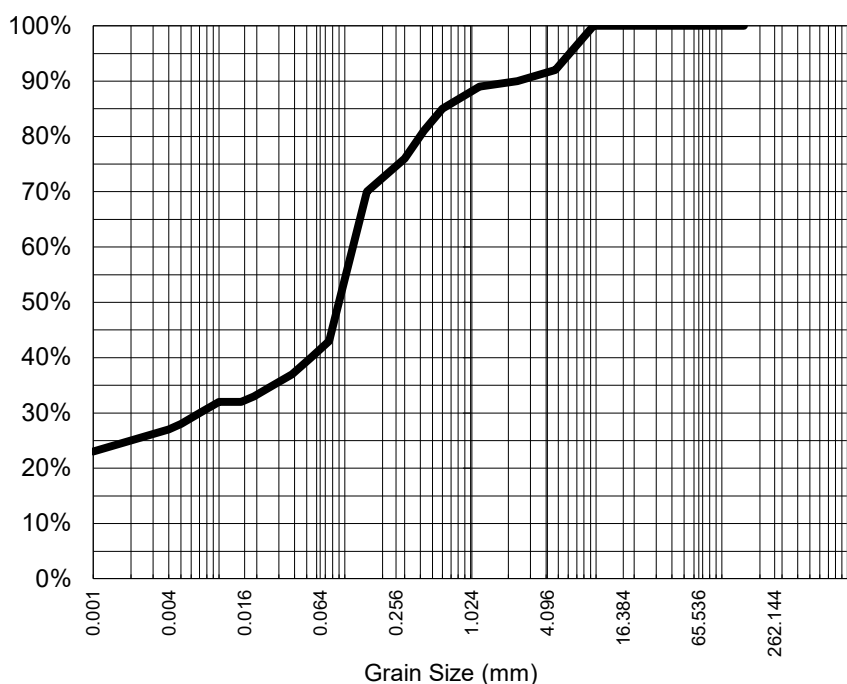
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Brisbane Qld
REPORT NO: EB2118023-009 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B11-8

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	92%
2.36	90%
1.18	89%
0.600	85%
0.425	81%
0.300	76%
0.150	70%
0.075	43%
Particle Size (microns)	
54	40%
38	37%
27	35%
19	33%
15	32%
10	32%
7	30%
5	28%
1	23%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.094
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.59

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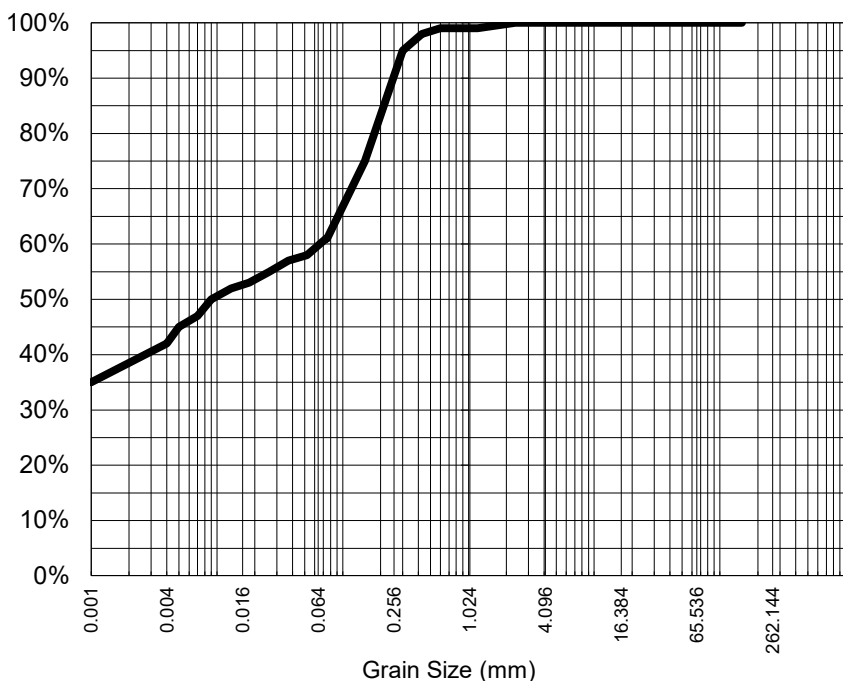
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B10-5

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	98%
0.300	95%
0.150	75%
0.075	61%
Particle Size (microns)	
52	58%
37	57%
26	55%
18	53%
13	52%
9	50%
7	47%
5	45%
1	35%

Median Particle Size (mm)*	0.009
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.59

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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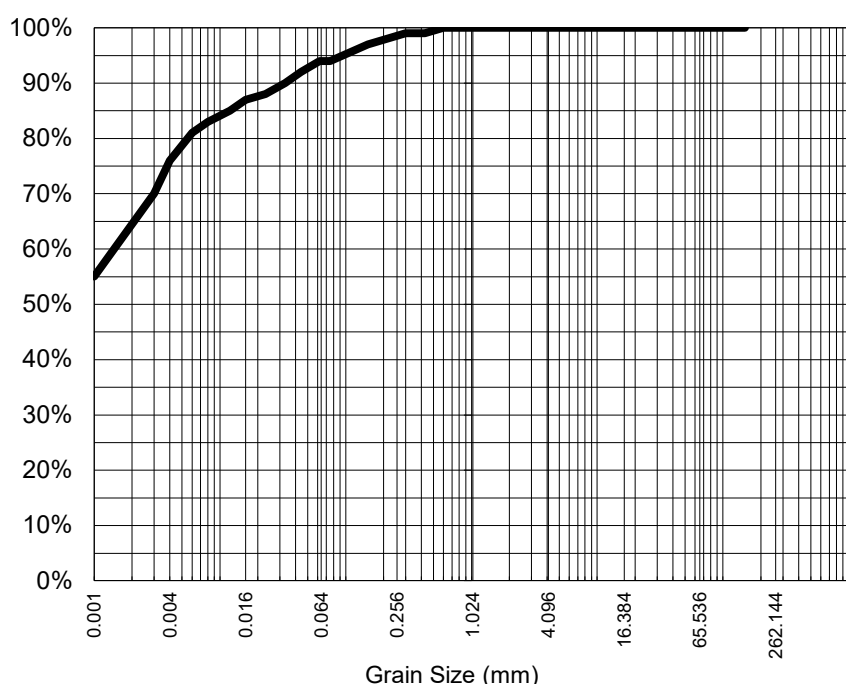
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REPORT NO: EB2118023-013 / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B5-1

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	97%
0.075	94%
Particle Size (microns)	
44	92%
33	90%
23	88%
16	87%
12	85%
8	83%
6	81%
4	76%
1	55%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.75

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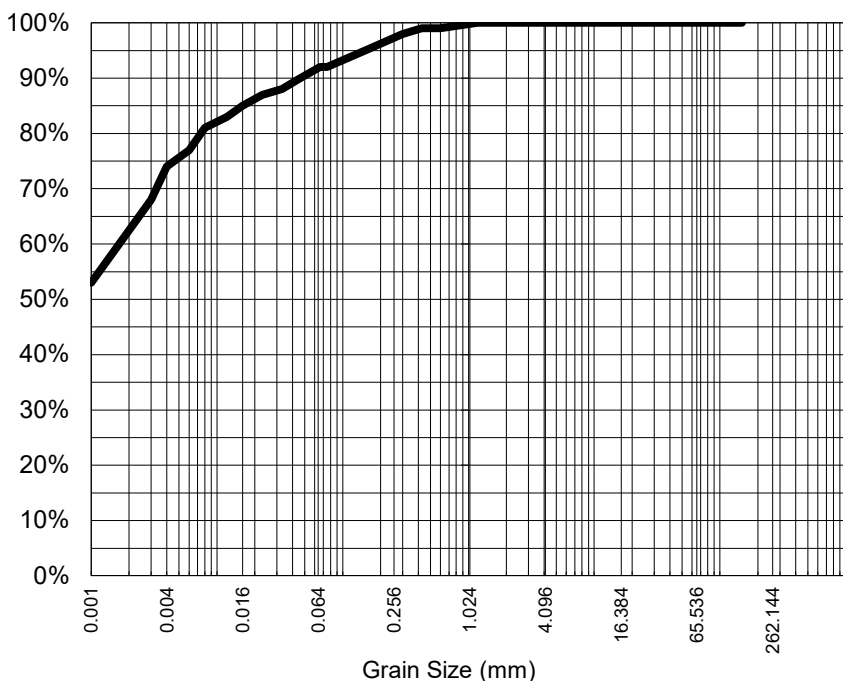
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-014 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B5-1B

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	98%
0.150	95%
0.075	92%
Particle Size (microns)	
46	90%
33	88%
23	87%
16	85%
12	83%
8	81%
6	77%
4	74%
1	53%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.78

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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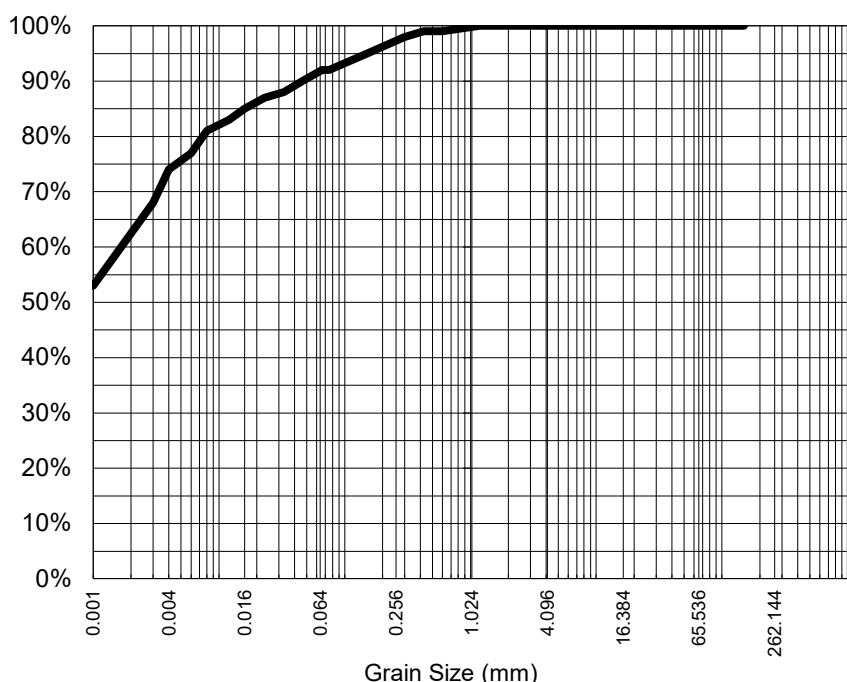
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Spring Hill
Brisbane Qld

REPORT NO: EB2118023-014DUP / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B5-1B

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	99%
0.300	98%
0.150	95%
0.075	92%
Particle Size (microns)	
46	90%
33	88%
23	87%
16	85%
12	83%
8	81%
6	77%
4	74%
1	53%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.78

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

NATA Accreditation: 825 Site: Brisbane
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Certificate of Analysis

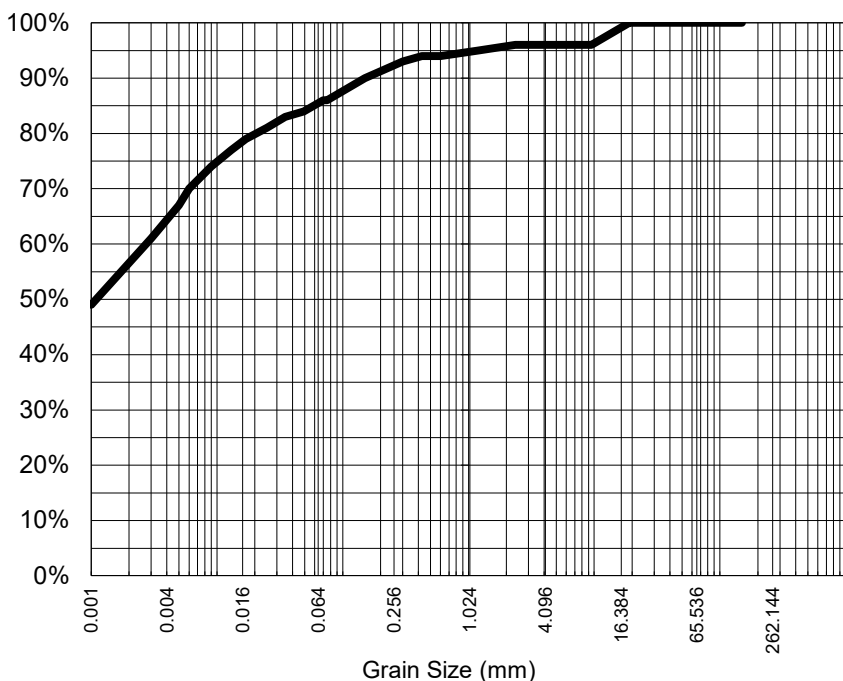
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pH 07 3243 7222
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-015 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B5-1C

Particle Size Distribution



Particle Size (mm)	% Passing
19.0	100%
9.50	96%
4.75	96%
2.36	96%
1.18	95%
0.600	94%
0.425	94%
0.300	93%
0.150	90%
0.075	86%
Particle Size (microns)	
49	84%
35	83%
25	81%
17	79%
13	77%
9	74%
6	70%
5	67%
1	49%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.59

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

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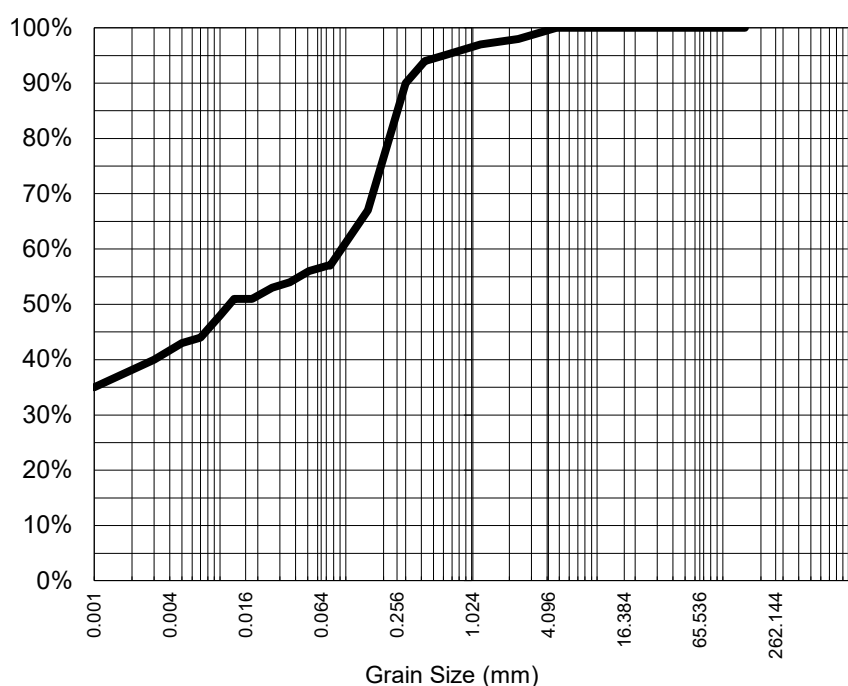
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PROJECT: Port of Brisbane SAP **SAMPLE ID:** B7-1

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	98%
1.18	97%
0.600	95%
0.425	94%
0.300	90%
0.150	67%
0.075	57%
Particle Size (microns)	
51	56%
36	54%
26	53%
18	51%
13	51%
10	48%
7	44%
5	43%
1	35%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.012
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.6

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

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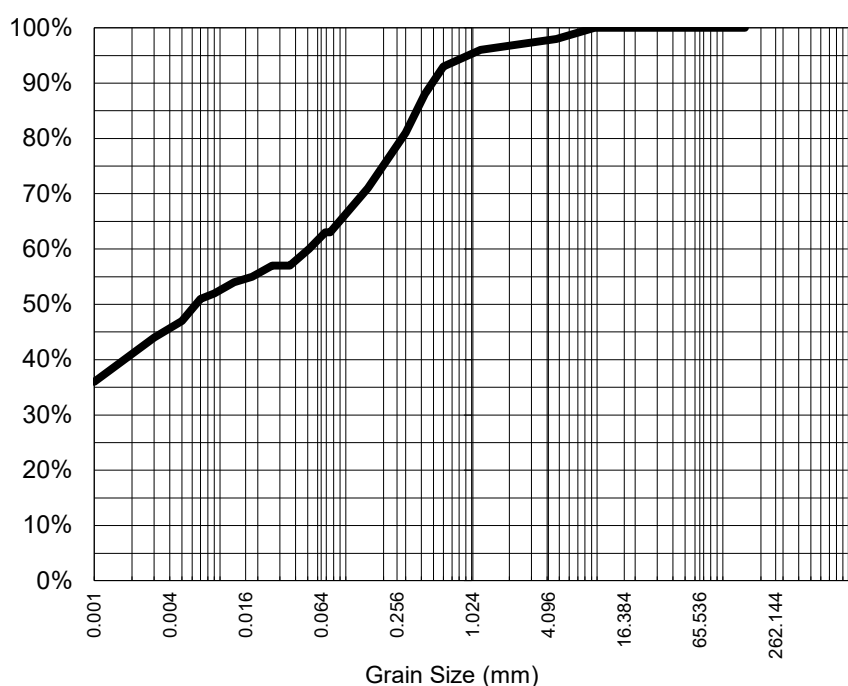
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-017 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B9-1

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	98%
2.36	97%
1.18	96%
0.600	93%
0.425	88%
0.300	81%
0.150	71%
0.075	63%
Particle Size (microns)	
51	60%
36	57%
26	57%
18	55%
13	54%
9	52%
7	51%
5	47%
1	36%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.63

Satish Trivedi
Soil Senior Chemist
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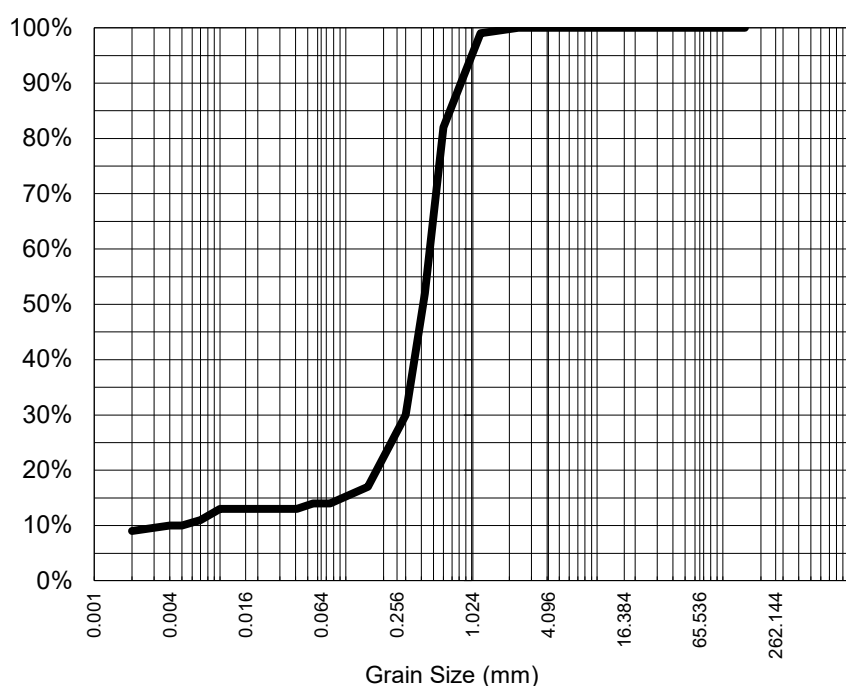
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Spring Hill
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REPORT NO: EB2118023-018 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B2-0

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	82%
0.425	52%
0.300	30%
0.150	17%
0.075	14%
Particle Size (microns)	
55	14%
41	13%
29	13%
20	13%
15	13%
10	13%
7	11%
5	10%
2	9%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	0.414
----------------------------	-------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.66

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Soil Senior Chemist
Authorised Signatory

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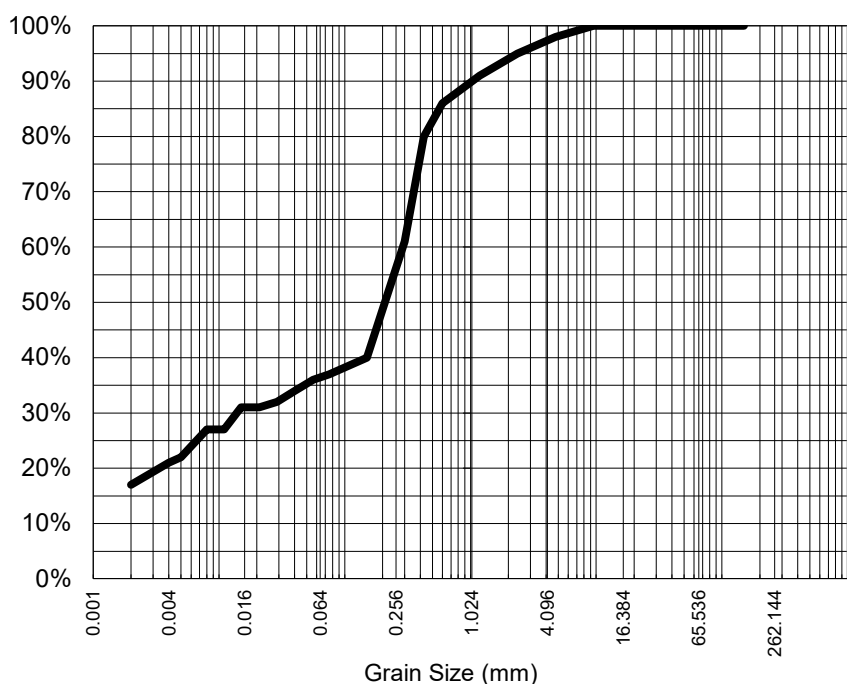
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-019 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** BC-2

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	98%
2.36	95%
1.18	91%
0.600	86%
0.425	80%
0.300	61%
0.150	40%
0.075	37%
Particle Size (microns)	
56	36%
40	34%
29	32%
21	31%
15	31%
11	27%
8	27%
5	22%
2	17%

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.221
----------------------------	-------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.47

Satish

Satish Trivedi
Soil Senior Chemist
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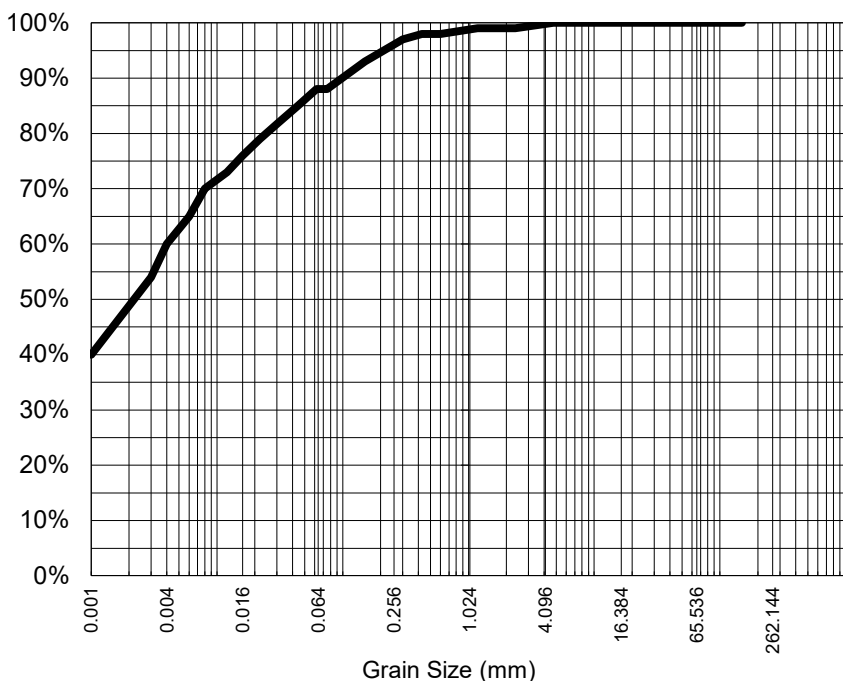
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-020 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B8-3

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	99%
0.600	98%
0.425	98%
0.300	97%
0.150	93%
0.075	88%
Particle Size (microns)	
44	85%
31	82%
22	79%
16	76%
12	73%
8	70%
6	65%
4	60%
1	40%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.79

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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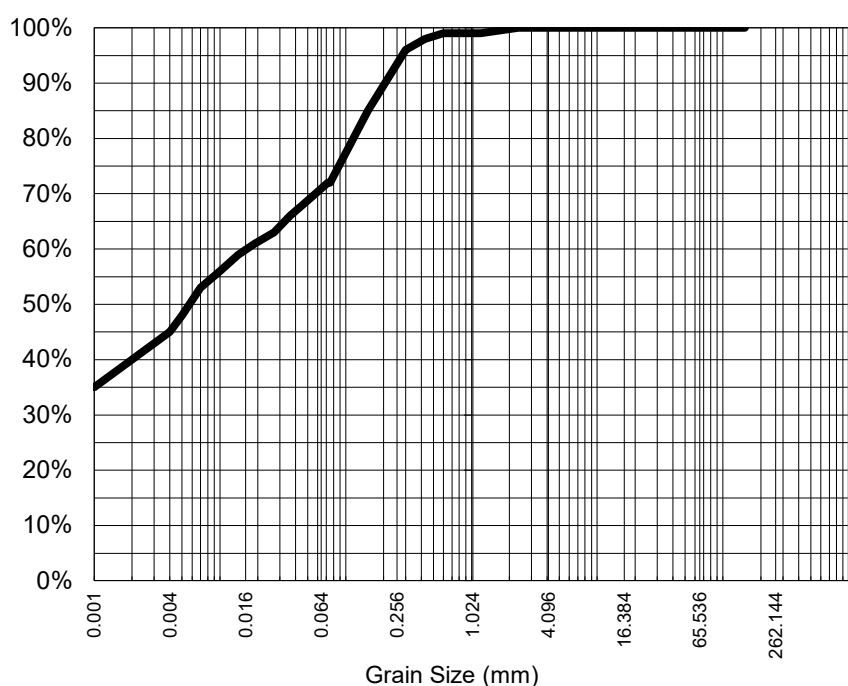
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ADDRESS: Po Box 203 Spring Hill **REPORT NO:** EB2118023-021 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B8-1

Particle Size Distribution



Particle Size (mm)	% Passing
2.36	100%
1.18	99%
0.600	99%
0.425	98%
0.300	96%
0.150	85%
0.075	72%
Particle Size (microns)	
51	69%
36	66%
27	63%
19	61%
14	59%
10	56%
7	53%
5	48%
1	35%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.42 (2.45)*

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Soil Senior Chemist
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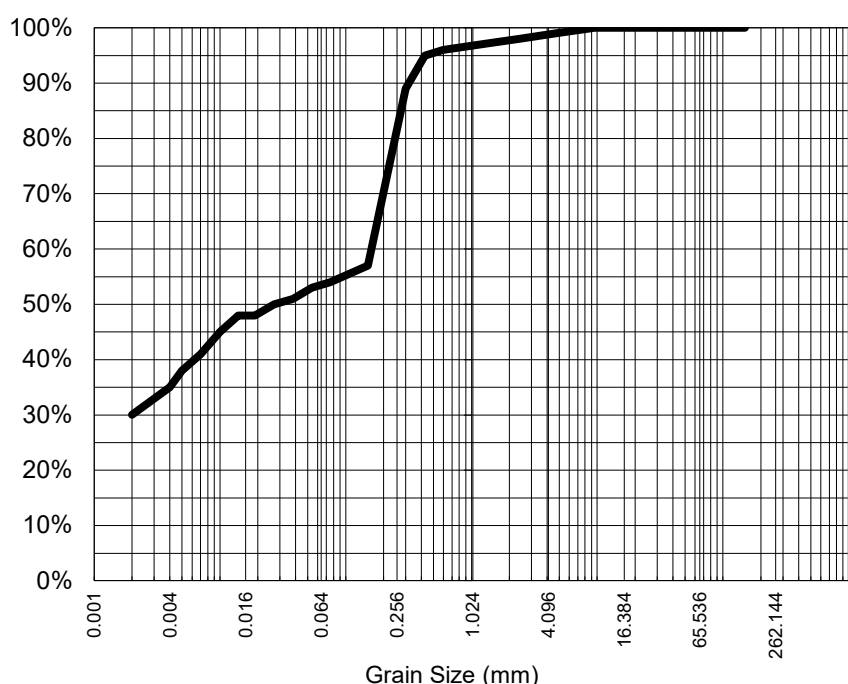
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld
REPORT NO: EB2118023-022 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B6-2

Particle Size Distribution



Particle Size (mm)	% Passing
9.50	100%
4.75	99%
2.36	98%
1.18	97%
0.600	96%
0.425	95%
0.300	89%
0.150	57%
0.075	54%
Particle Size (microns)	
54	53%
38	51%
27	50%
19	48%
14	48%
10	45%
7	41%
5	38%
2	30%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	0.027
----------------------------	-------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.44 (2.45)*

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Soil Senior Chemist
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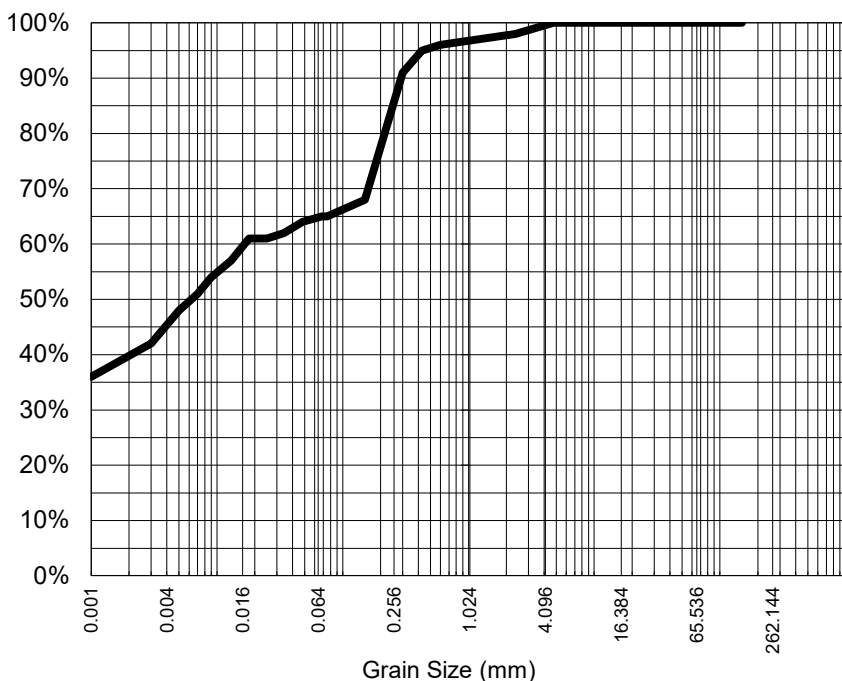
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-023 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B6-2B

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	98%
1.18	97%
0.600	96%
0.425	95%
0.300	91%
0.150	68%
0.075	65%
Particle Size (microns)	
48	64%
34	62%
25	61%
18	61%
13	57%
9	54%
7	51%
5	48%
1	36%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.68

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Soil Senior Chemist
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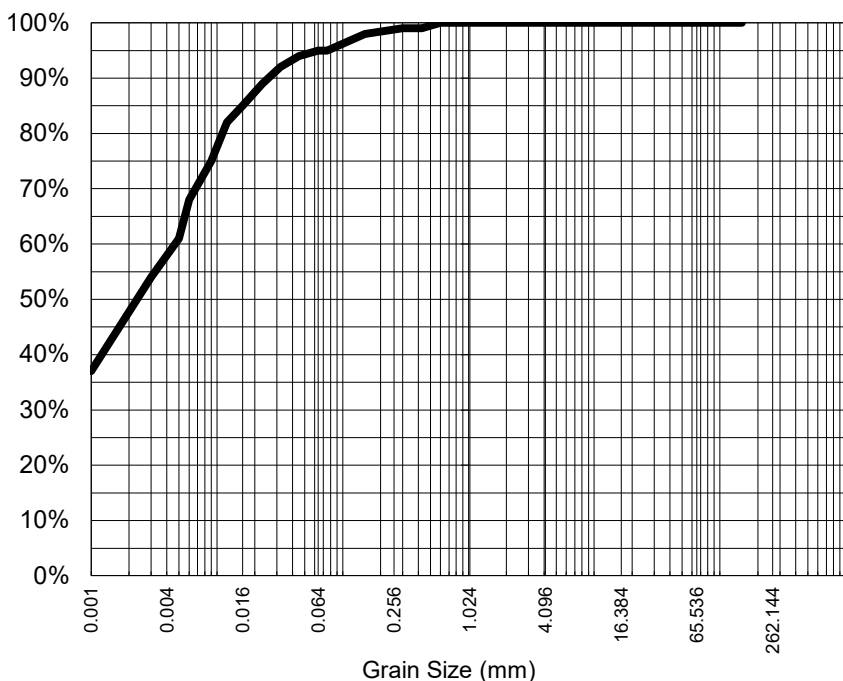
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ADDRESS: Po Box 203 Spring Hill **REPORT NO:** EB2118023-024 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B6-3

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	98%
0.075	95%
Particle Size (microns)	
45	94%
32	92%
23	89%
16	85%
12	82%
9	75%
6	68%
5	61%
1	37%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.82 (2.65)*

Analysed: 30-Jun-21

Limit of Reporting: 1%

Dispersion Method Shaker

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DATE RECEIVED: 28-Jun-2021

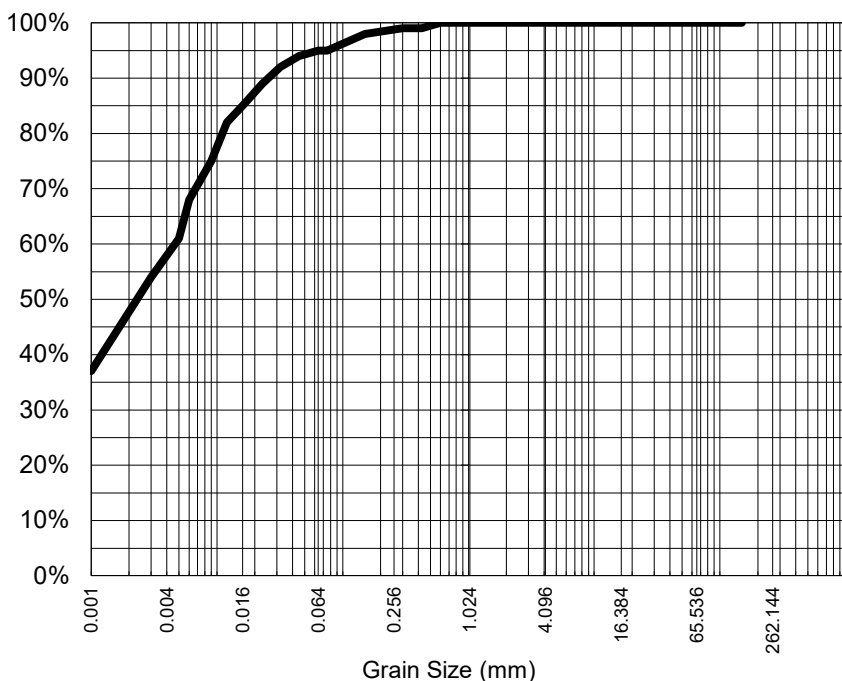
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Brisbane Qld

REPORT NO: EB2118023-024DUP / PSD

PROJECT: Port of Brisbane SAP

SAMPLE ID: B6-3

Particle Size Distribution



Analysis Notes

Samples analysed as received.

Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	99%
0.150	98%
0.075	95%
Particle Size (microns)	
45	94%
32	92%
23	89%
16	85%
12	82%
9	75%
6	68%
5	61%
1	37%

Median Particle Size (mm)*	<0.006
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.82 (2.65)*

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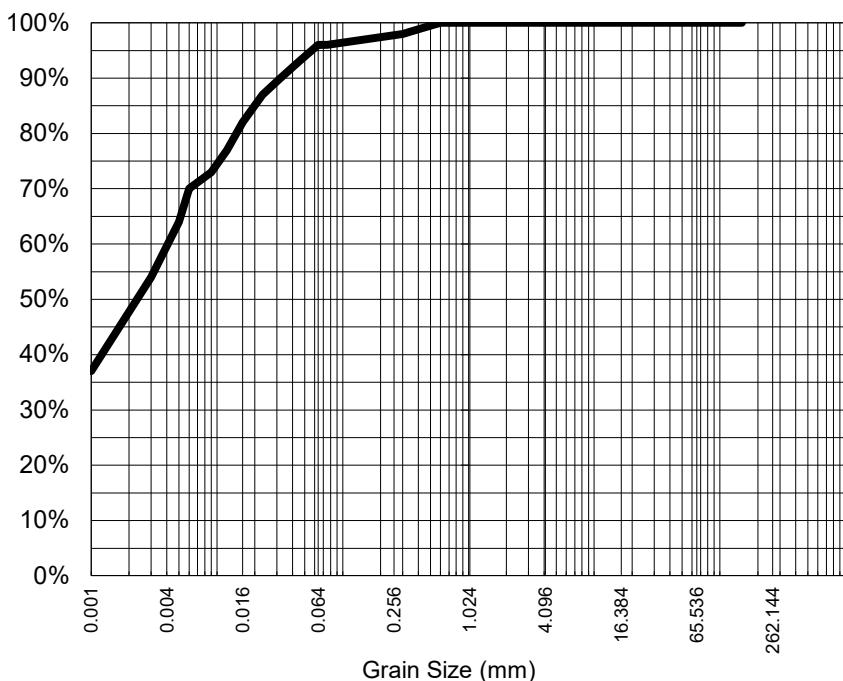
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ADDRESS: Po Box 203 Spring Hill Brisbane Qld **REPORT NO:** EB2118023-025 / PSD
PROJECT: Port of Brisbane SAP **SAMPLE ID:** B4-4

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	99%
0.300	98%
0.150	97%
0.075	96%
Particle Size (microns)	
45	93%
32	90%
23	87%
16	82%
12	77%
9	73%
6	70%
5	64%
1	37%

Analysis Notes

Samples analysed as received.

* Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Median Particle Size (mm)*	<0.006
----------------------------	--------

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.98 (2.65)*

NATA Accreditation: 825 Site: Brisbane

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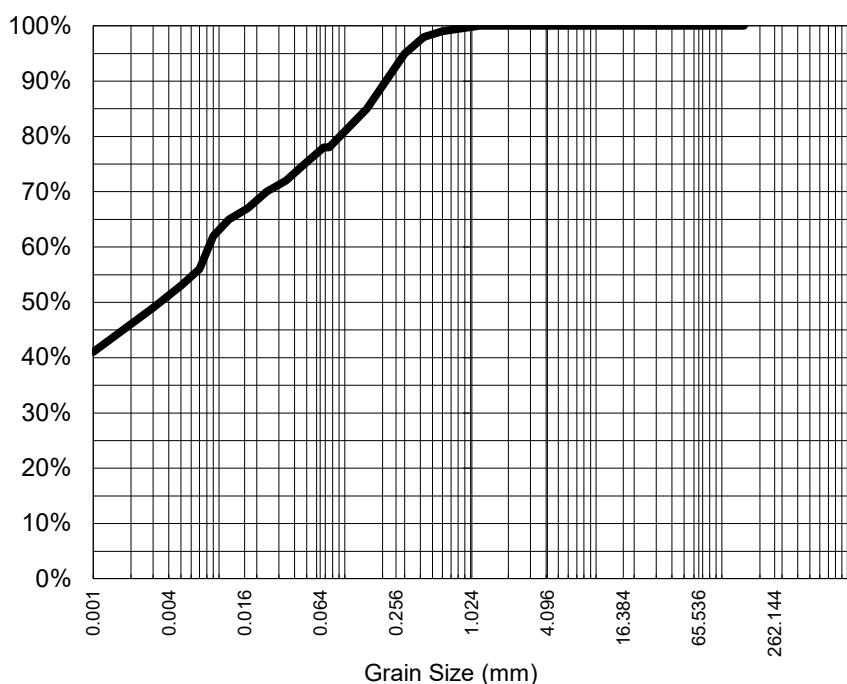
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ADDRESS: Po Box 203
Spring Hill
Brisbane Qld
REPORT NO: EB2118023-026 / PSD
PROJECT: Port of Brisbane SAP
SAMPLE ID: B4-0

Particle Size Distribution



Particle Size (mm)	% Passing
1.18	100%
0.600	99%
0.425	98%
0.300	95%
0.150	85%
0.075	78%
Particle Size (microns)	
48	75%
34	72%
24	70%
17	67%
12	65%
9	62%
7	56%
5	53%
1	41%

Analysis Notes

Samples analysed as received.

Median Particle Size (mm)*	<0.007
----------------------------	--------

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 30-Jun-21

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.49 (2.65)*

Satish

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

NATA Accreditation: 825 Site: Brisbane
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CERTIFICATE OF ANALYSIS

Work Order	: PR2163245	Issue Date	: 26-Jul-2021
Customer	: Australian Laboratory Services Pty Ltd.	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: results address	Contact	: Client Service
Address	: 32 Shand Street 4053 Stafford, Brisbane	Address	: Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic
E-mail	: subresults.bri@alsglobal.com	E-mail	: customer.support@alsglobal.com
Telephone	: ----	Telephone	: +420 226 226 228
Project	: EB2118023	Page	: 1 of 3
Order number	: 506840	Date Samples Received	: 14-Jul-2021
		Quote number	: PR2015ALSEN-AU0002 (CZ-251-15-0965)
Site	: ----	Date of test	: 14-Jul-2021 - 26-Jul-2021
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.

The laboratory declares that the test results relate only to the listed samples. If the section "Sampled by" of the Certificate of analysis states: "Sampled by Customer" then the results relate to the sample as received.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018

Signatories

Zdeněk Jiráček

Position

Environmental Business Unit
Manager



The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)



Analytical Results

Sub-Matrix: SEDIMENT				Client sample ID		B5-0		B10-6		B10-6B	
				Laboratory sample ID		PR2163245-001		PR2163245-002		PR2163245-003	
				Client sampling date / time		25-Jun-2021 12:00		25-Jun-2021 12:00		25-Jun-2021 12:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU	Result	MU
Physical Parameters											
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	96.0	± 6.0%	98.8	± 6.0%	97.9	± 6.0%		
Radiological Parameters											
Gross alpha activity	S-GAA-PRO	500	Bq/kg DW	<500	----	670	± 51.7%	<500	----		
Gross beta activity	S-GBA-PRO	500	Bq/kg DW	<500	----	<500	----	<500	----		

Sub-Matrix: SEDIMENT				Client sample ID		B11-8		B5-1		B5-1B	
				Laboratory sample ID		PR2163245-004		PR2163245-005		PR2163245-006	
				Client sampling date / time		25-Jun-2021 12:00		24-Jun-2021 12:00		24-Jun-2021 12:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU	Result	MU
Physical Parameters											
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	98.7	± 6.0%	97.5	± 6.0%	97.4	± 6.0%		
Radiological Parameters											
Gross alpha activity	S-GAA-PRO	500	Bq/kg DW	<500	----	880	± 40.5%	1070	± 34.6%		
Gross beta activity	S-GBA-PRO	500	Bq/kg DW	550	± 61.9%	<500	----	590	± 58.6%		

Sub-Matrix: SEDIMENT				Client sample ID		B5-1C		B7-1		B9-1	
				Laboratory sample ID		PR2163245-007		PR2163245-008		PR2163245-009	
				Client sampling date / time		24-Jun-2021 12:00		24-Jun-2021 12:00		24-Jun-2021 12:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU	Result	MU
Physical Parameters											
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	98.4	± 6.0%	98.3	± 6.0%	97.4	± 6.0%		
Radiological Parameters											
Gross alpha activity	S-GAA-PRO	500	Bq/kg DW	830	± 42.8%	570	± 60.5%	730	± 48.2%		
Gross beta activity	S-GBA-PRO	500	Bq/kg DW	600	± 57.9%	540	± 63.9%	<500	----		

Sub-Matrix: SEDIMENT				Client sample ID		B6-3		----		----	
				Laboratory sample ID		PR2163245-010		----		----	
				Client sampling date / time		24-Jun-2021 12:00		----		----	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU	Result	MU
Physical Parameters											
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	96.8	± 6.0%	----	----	----	----		
Radiological Parameters											
Gross alpha activity	S-GAA-PRO	500	Bq/kg DW	540	± 63.3%	----	----	----	----		
Gross beta activity	S-GBA-PRO	500	Bq/kg DW	530	± 64.5%	----	----	----	----		

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. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor $k = 2$, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
S-DRY-GRCI	CZ_SOP_D06_01_045 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007), CZ_SOP_D06_07_046 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007, CSN 46 5735) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-GAA-PRO	CZ_SOP_D06_07_368 (CSN 75 7611 and ISO 9696) Determination of gross alpha mass activity by direct measurement of the sample by means of alpha radiation analyzer.

Issue Date : 26-Jul-2021
Page : 3 of 3
Work Order : PR2163245
Customer : Australian Laboratory Services Pty Ltd.



<i>Analytical Methods</i>	<i>Method Descriptions</i>
S-GBA-PRO	CZ_SOP_D06_07_369 (CSN 75 7612, CSN EN ISO 9697) Determination of gross beta mass activity by direct measurement of the sample by means of beta radiation analyzer.
<i>Preparation Methods</i>	<i>Method Descriptions</i>
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).

A “*” symbol preceding any method indicates laboratory or subcontractor non-accredited test. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. In the case when a procedure specified in an accredited method was used for non-accredited matrix, the reported results are non-accredited; please refer to information in General Comment section on the front page. If the report contains subcontracted analyses, those are made in a subcontracted laboratory outside the laboratories ALS Czech Republic, s.r.o.

The calculation methods of summation parameters are available on request in the client service.

QUALITY CONTROL REPORT

Work Order	: EB2118023	Page	: 1 of 30
Client	: BMT COMMERCIAL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DARREN RICHARDSON	Contact	: Andrew Epps
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3552 8639
Project	: Port of Brisbane SAP	Date Samples Received	: 28-Jun-2021
Order number	: ----	Date Analysis Commenced	: 30-Jun-2021
C-O-C number	: ----	Issue Date	: 27-Jul-2021
Sampler	: BRAD HILES		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 26		
No. of samples analysed	: 25		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane External Subcontracting, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Thomas Donovan		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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3766278)									
EB2118023-001	B5-0	EG005T: Aluminium	7429-90-5	50	mg/kg	13200	13000	1.3	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	32800	33100	0.9	0% - 20%
EB2118023-014	B5-1B	EG005T: Aluminium	7429-90-5	50	mg/kg	13900	13500	2.7	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	24600	23700	3.7	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3766279)									
EB2118023-024	B6-3	EG005T: Aluminium	7429-90-5	50	mg/kg	15000	15200	1.2	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	35300	34500	2.4	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 3766276)									
EB2118023-001	B5-0	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.10	0.11	0.0	0% - 50%
EB2118023-014	B5-1B	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.05	0.05	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 3766280)									
EB2118023-024	B6-3	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.09	0.09	0.0	No Limit
EA029-A: pH Measurements (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	6.3	6.4	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	7.6	7.5	1.3	0% - 20%
EB2118023-006	B10-6	EA029: pH KCl (23A)	----	0.1	pH Unit	8.7	8.7	0.0	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	7.9	7.9	0.0	0% - 20%
EA029-B: Acidity Trail (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	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 (%)
EA029-B: Acidity Trail (QC Lot: 3783806) - continued									
EM2111819-002	Anonymous	EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EB2118023-006	B10-6	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.0	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	<2	0.0	No Limit
EA029-C: Sulfur Trail (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EB2118023-006	B10-6	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	0.106	0.113	6.6	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	0.385	0.370	4.2	0% - 50%
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	0.279	0.256	8.6	0% - 50%
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	174	160	8.6	0% - 50%
EA029-D: Calcium Values (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.220	0.215	2.2	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.267	0.272	1.6	0% - 50%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.047	0.056	17.7	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.038	0.045	17.7	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	23	28	17.7	No Limit
EB2118023-006	B10-6	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.280	0.298	6.0	0% - 50%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	1.17	1.14	3.2	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	0.893	0.839	6.2	0% - 20%
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	0.714	0.671	6.2	0% - 20%
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	446	418	6.2	0% - 20%
EA029-E: Magnesium Values (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.086	0.083	2.8	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.086	0.090	4.9	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.0	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<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 (%)
EA029-E: Magnesium Values (QC Lot: 3783806) - continued									
EB2118023-006	B10-6	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.144	0.153	5.8	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.245	0.238	2.8	0% - 50%
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	0.101	0.086	16.4	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	0.133	0.113	16.4	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	83	70	16.4	No Limit
EA029-F: Excess Acid Neutralising Capacity (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	0.492	0.513	4.2	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.157	0.164	4.2	No Limit
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	98	102	4.2	0% - 50%
EB2118023-006	B10-6	EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	2.72	2.72	0.1	0% - 20%
		EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	0.870	0.871	0.1	0% - 20%
		EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	543	544	0.0	0% - 20%
EA029-H: Acid Base Accounting (QC Lot: 3783806)									
EM2111819-002	Anonymous	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
EB2118023-006	B10-6	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.28	0.26	8.6	0% - 50%
		EA029: Liming Rate	----	1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	13	12	8.6	0% - 50%
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	174	160	8.6	0% - 50%
EA033-A: Actual Acidity (QC Lot: 3783807)									
EM2112837-009	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	3	3	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	6.2	6.1	0.0	0% - 20%
EB2118023-006	B10-6	EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCl (23A)	----	0.1	pH Unit	8.7	8.7	0.0	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 (%)
EA033-B: Potential Acidity (QC Lot: 3783807)									
EM2112837-009	Anonymous	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.016	0.018	9.5	No Limit
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	10	11	9.5	No Limit
EB2118023-006	B10-6	EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	0.289	0.293	1.3	0% - 20%
		EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	180	182	1.3	0% - 50%
EA033-C: Acid Neutralising Capacity (QC Lot: 3783807)									
EB2118023-006	B10-6	EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	3.50	3.52	0.6	0% - 20%
		EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	1.12	1.13	0.0	0% - 20%
		EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	699	703	0.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3765324)									
EB2118023-001	B5-0	EA055: Moisture Content	----	0.1	%	61.7	63.4	2.7	0% - 20%
EB2118023-014	B5-1B	EA055: Moisture Content	----	0.1	%	60.4	60.0	0.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3765325)									
EB2118023-024	B6-3	EA055: Moisture Content	----	0.1	%	68.4	69.4	1.5	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3766277)									
EB2118023-001	B5-0	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.2	0.2	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	7.82	7.64	2.2	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	34.7	32.3	7.1	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	38.0	37.4	1.7	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	22.4	21.7	3.1	0% - 20%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	21.2	20.6	3.2	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	138	133	3.6	0% - 20%
EB2118023-014	B5-1B	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	3.30	3.22	2.6	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	22.8	22.1	3.3	0% - 20%
		EG020-SD: Copper	7440-50-8	1	mg/kg	22.9	22.2	3.2	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	20.0	18.4	8.4	0% - 50%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	17.3	16.7	3.9	0% - 50%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	75.3	73.0	3.1	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3766281)									
EB2118023-024	B6-3	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	0.2	0.1	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	9.31	8.63	7.5	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	34.3	34.0	1.0	0% - 20%

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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 (%)
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3766281) - continued									
EB2118023-024	B6-3	EG020-SD: Copper	7440-50-8	1	mg/kg	33.4	32.8	1.7	0% - 20%
		EG020-SD: Lead	7439-92-1	1	mg/kg	21.9	20.7	5.3	0% - 20%
		EG020-SD: Nickel	7440-02-0	1	mg/kg	21.1	21.2	0.0	0% - 20%
		EG020-SD: Zinc	7440-66-6	1	mg/kg	121	116	4.5	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3766298)									
EB2118023-001	B5-0	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.6	0.3	74.0	No Limit
EB2118230-001	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	2.2	2.7	19.6	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3766315)									
EB2118023-001	B5-0	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1510	1480	1.6	0% - 20%
EB2118230-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	3460	3470	0.4	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3766314)									
EB2118023-001	B5-0	EK067G: Total Phosphorus as P	----	2	mg/kg	929	930	0.2	0% - 20%
EB2118230-001	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	934	932	0.1	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3788058)									
EB2118023-001	B5-0	EP003: Total Organic Carbon	----	0.02	%	1.49	1.48	0.0	0% - 20%
EB2118023-014	B5-1B	EP003: Total Organic Carbon	----	0.02	%	1.30	1.37	4.9	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 3788059)									
EB2118023-024	B6-3	EP003: Total Organic Carbon	----	0.02	%	1.72	1.72	0.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3765830)									
EB2117804-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EB2118208-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3765830)									
EB2117804-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EB2118208-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3765830)									
EB2117804-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EB2118208-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		

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 Project : Port of Brisbane SAP



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: 3764780)									
EB2118023-001	B5-0	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EB2118023-024	B6-3	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 3767021)									
EB2118023-001	B5-0	EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	6	5	0.0	No Limit
		EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	66	57	13.9	0% - 20%
		EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	149	130	13.6	0% - 20%
		EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	77	68	11.2	0% - 50%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3764780)									
EB2118023-001	B5-0	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	No Limit
EB2118023-024	B6-3	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 3767021)									
EB2118023-001	B5-0	EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	8	7	17.0	No Limit
		EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	123	108	13.0	0% - 20%
		EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	169	151	11.2	0% - 20%
		EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	38	36	5.5	No Limit
EP080-SD: BTEXN (QC Lot: 3764780)									
EB2118023-001	B5-0	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
			106-42-3						
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	No Limit
EB2118023-024	B6-3	EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080-SD: meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
			106-42-3						
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.5	<0.5	0.0	No Limit		
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
EP090: Organotin Compounds (QC Lot: 3765318)									
EB2118023-001	B5-0	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	2.4	2.3	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
EB2118023-014	B5-1B	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	3	4	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 (%)
EP090: Organotin Compounds (QC Lot: 3765322)									
EB2118023-024	B6-3	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	1.5	1.5	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
EM2112192-049	Anonymous	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
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3769041)									
EB2118023-023	B6-2B	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EB2118023-013	B5-1	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<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: 3769041) - continued									
EB2118023-013	B5-1	EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EP130A: Organophosphorus Pesticides (Ultra-trace) (QC Lot: 3770828)									
EB2118023-001	B5-0	EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Carbophenothion	786-19-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	<10.0	0.0	No Limit
		EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Diazinon	333-41-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dichlorvos	62-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Dimethoate	60-51-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Ethion	563-12-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Fenthion	55-38-9	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Malathion	121-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion	56-38-2	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	<10	0.0	No Limit
		EP130: Prothiofos	34643-46-4	10	µg/kg	<10	<10	0.0	No Limit
EP131A: Organochlorine Pesticides (QC Lot: 3769042)									
EB2118023-023	B6-2B	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit

EP131A: Organochlorine Pesticides (QC Lot: 3770826)



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: 3770826) - continued									
EB2118023-001	B5-0	EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	<0.25	0.0	No Limit
		EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Dieldrin	60-57-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endosulfan (sum)	115-29-7	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin	72-20-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
		EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	<0.50	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 3769043)									
EB2118023-013	B5-1	EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 3770827)									
EB2118023-001	B5-0	EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<6.2	<6.2	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 (%)
EP131B: Polychlorinated Biphenyls (as Aroclors) (QC Lot: 3770827) - continued									
EB2118023-001	B5-0	EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<6.2	<6.2	0.0	No Limit
		EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<6.2	<6.2	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3769044)									
EB2118023-013	B5-1	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	18	16	12.4	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	5	<5	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	14	10	32.7	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	37	26	33.6	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	18	12	39.3	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	69	50	31.5	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	93	70	28.0	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	52	37	33.5	0% - 50%
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	50	40	22.5	0% - 50%
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	62	60	4.6	0% - 50%
		205-82-3							
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	27	25	10.5	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	46	41	10.2	No Limit
		EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	47	45	4.7	No Limit
		EP132B-SD: Perylene	198-55-0	4	µg/kg	1470	1210	18.9	0% - 20%
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	4	µg/kg	43	38	10.9	No Limit
		EP132B-SD: Dibenz(a,h)anthracene	53-70-3	4	µg/kg	10	8	15.5	No Limit
		EP132B-SD: Indeno(1,2,3.cd)pyrene	193-39-5	4	µg/kg	32	29	9.3	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	2150	1760	19.9	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	23	18	23.4	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	18	14	29.3	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	18	14	20.3	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3770840)									
EB2118023-006	B10-6	EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	13	11	14.0	No Limit
		EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	<4	0.0	No Limit
		EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	20	15	26.6	No Limit
		EP132B-SD: Anthracene	120-12-7	4	µg/kg	10	10	0.0	No Limit
		EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	63	60	4.6	0% - 50%
		EP132B-SD: Pyrene	129-00-0	4	µg/kg	69	65	6.5	0% - 50%
		EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	47	43	8.5	0% - 50%
		EP132B-SD: Chrysene	218-01-9	4	µg/kg	41	36	13.8	0% - 50%
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	65	59	9.4	0% - 50%
		205-82-3							
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	21	26	21.9	No Limit
		EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	39	36	8.5	No Limit

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



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: 3770840) - continued									
EB2118023-006	B10-6	EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	58	55	4.2	0% - 50%
		EP132B-SD: Perylene	198-55-0	4	µg/kg	85	80	6.0	0% - 20%
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	4	µg/kg	39	38	2.9	No Limit
		EP132B-SD: Dibenz(a,h)anthracene	53-70-3	4	µg/kg	8	9	0.0	No Limit
		EP132B-SD: Indeno(1,2,3.cd)pyrene	193-39-5	4	µg/kg	31	32	0.0	No Limit
		EP132B-SD: Sum of PAHs	----	4	µg/kg	629	592	6.1	0% - 20%
		EP132B-SD: Naphthalene	91-20-3	5	µg/kg	11	9	15.2	No Limit
		EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	<5	0.0	No Limit
		EP132B-SD: Coronene	191-07-1	5	µg/kg	9	8	0.0	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 (%)
EG035T: Total Mercury by FIMS (QC Lot: 3775153)									
EB2118023-001	B5-0	EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	0.0	No Limit
EG035T: Total Mercury by FIMS (QC Lot: 3789823)									
EB2118023-016	B7-1	EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	0.0	No Limit
EG035T: Total Mercury by FIMS (QC Lot: 3799744)									
EB2118023-010	B10-5	EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3774887)									
EB2118023-001	B5-0	EG093A-T: Nickel	7440-02-0	0.5	µg/L	4.6	4.7	2.3	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3789819)									
EB2118023-016	B7-1	EG093A-T: Nickel	7440-02-0	0.5	µg/L	3.6	3.7	0.0	No Limit
EG093T: Total Metals in Saline Water by ORC-ICPMS (QC Lot: 3799745)									
EB2118023-010	B10-5	EG093A-T: Nickel	7440-02-0	0.5	µg/L	7.5	7.7	1.5	0% - 50%
EP090: Organotin Compounds (Soluble) (QC Lot: 3800605)									
EB2120197-001	Anonymous	EP090S: Tributyltin	56573-85-4	2	ngSn/L	<5	<5	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3766278)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12940 mg/kg	98.1	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	29422 mg/kg	97.3	70.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3766279)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	12940 mg/kg	101	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	29422 mg/kg	100	70.0	120
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3766276)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	87.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3766280)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.087 mg/kg	88.5	70.0	130
EA029-A: pH Measurements (QCLot: 3783806)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.4 pH Unit	101	70.0	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	4.2 pH Unit	107	70.0	130
EA029-B: Acidity Trail (QCLot: 3783806)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	15 mole H+ / t	111	70.0	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	27.5 mole H+ / t	102	70.0	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 3783806)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.04779 % S	97.6	70.0	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.20322 % S	91.5	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 3783806)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.14152 % Ca	117	70.0	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.19926 % Ca	125	70.0	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 3783806)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.213 % Mg	82.7	70.0	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.22344 % Mg	97.5	70.0	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-E: Magnesium Values (QCLot: 3783806) - continued								
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 3783806)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----
EA029-H: Acid Base Accounting (QCLot: 3783806)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----
EA033-A: Actual Acidity (QCLot: 3783807)								
EA033: pH KCl (23A)	----	----	pH Unit	----	4.4 pH Unit	101	91.0	107
EA033: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	15 mole H+ / t	111	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.02	----	----	----	----
EA033-B: Potential Acidity (QCLot: 3783807)								
EA033: Chromium Reducible Sulfur (22B)	----	0.005	% S	<0.005	0.246 % S	105	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	----	10	mole H+ / t	<10	----	----	----	----
EA033-C: Acid Neutralising Capacity (QCLot: 3783807)								
EA033: Acid Neutralising Capacity (19A2)	----	0.01	% CaCO3	<0.01	10 % CaCO3	98.0	91.0	112
EA033: acidity - Acid Neutralising Capacity (a-19A2)	----	10	mole H+ / t	<10	----	----	----	----
EA033: sulfidic - Acid Neutralising Capacity (s-19A2)	----	0.01	% pyrite S	<0.01	----	----	----	----
EA152: Soil Particle Density (QCLot: 3763820)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	99.2	80.0	120
EA152: Soil Particle Density (QCLot: 3763822)								
EA152: Soil Particle Density (Clay/Silt/Sand)	----	----	g/cm3	----	2.68 g/cm3	103	80.0	120
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3766277)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	104.25 mg/kg	86.0	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.458 mg/kg	87.7	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	17.886 mg/kg	90.9	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	47.82 mg/kg	92.8	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	63.544 mg/kg	87.4	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	13.462 mg/kg	91.3	77.0	123



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3766277) - continued								
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.532 mg/kg	83.1	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	180.621 mg/kg	88.9	71.0	127
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3766281)								
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	104.25 mg/kg	85.4	80.0	124
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.458 mg/kg	88.0	87.0	122
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	17.886 mg/kg	91.6	79.0	129
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	47.82 mg/kg	90.8	85.0	118
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	63.544 mg/kg	92.2	86.0	119
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	13.462 mg/kg	92.8	77.0	123
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.532 mg/kg	83.8	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	180.621 mg/kg	84.5	71.0	127
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3766298)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	99.3	83.2	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3766315)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	848 mg/kg	112	73.0	121
				<20	2180 mg/kg	103	72.0	128
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3766314)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	939 mg/kg	98.9	80.0	115
				<2	1200 mg/kg	107	79.0	121
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3788058)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.03 %	102	70.0	130
				<0.02	0.2 %	100	70.0	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 3788059)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.03 %	98.2	70.0	130
				<0.02	0.2 %	96.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3765830)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	91.2	59.7	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3765830)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	92.1	58.1	124
EP080: BTEXN (QCLot: 3765830)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.4	66.8	115
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	68.8	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.4	68.5	116
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	93.2	69.7	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	72.2	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.5	73.2	116



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3764780)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	18 mg/kg	88.9	66.0	120
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3767021)								
EP071-SD-SV: C10 - C14 Fraction	----	3	mg/kg	<3	157 mg/kg	99.6	43.0	126
EP071-SD-SV: C15 - C28 Fraction	----	3	mg/kg	<3	245 mg/kg	101	66.0	140
EP071-SD-SV: C29 - C36 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3764780)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	22.5 mg/kg	88.8	66.0	119
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3767021)								
EP071-SD-SV: >C10 - C16 Fraction	----	3	mg/kg	<3	227 mg/kg	101	40.0	134
EP071-SD-SV: >C16 - C34 Fraction	----	3	mg/kg	<3	162 mg/kg	101	66.0	136
EP071-SD-SV: >C34 - C40 Fraction	----	5	mg/kg	<5	----	----	----	----
EP071-SD-SV: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD: BTEXN (QCLot: 3764780)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.9	73.0	105
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	1 mg/kg	84.9	73.0	105
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	1 mg/kg	85.3	67.0	104
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	2 mg/kg	87.7	66.0	106
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	1 mg/kg	96.0	68.0	105
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	1 mg/kg	87.0	72.0	115
EP090: Organotin Compounds (QCLot: 3765318)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	47.5	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	44.8	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	55.7	52.0	139
EP090: Organotin Compounds (QCLot: 3765322)								
EP090: Monobutyltin	78763-54-9	1	µgSn/kg	<1	1.25 µgSn/kg	108	36.0	128
EP090: Dibutyltin	1002-53-5	1	µgSn/kg	<1	1.25 µgSn/kg	120	42.0	132
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	118	52.0	139
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3769041)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	91.7	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	77.2	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	85.8	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	89.6	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	90.7	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	92.8	52.0	108



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3769041) - continued								
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	92.1	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	78.9	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	78.3	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	88.8	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	88.0	51.0	121
EP130: Fenamiphos	22224-92-6	10	µg/kg	<10	50 µg/kg	88.2	50.0	120
EP130: Fenthion	55-38-9	10	µg/kg	<10	50 µg/kg	91.8	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	94.0	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	75.2	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	77.4	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	79.6	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	87.6	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	81.8	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	93.2	51.0	117
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3770828)								
EP130: Bromophos-ethyl	4824-78-6	10	µg/kg	<10	50 µg/kg	93.0	49.0	117
EP130: Carbophenothion	786-19-6	10	µg/kg	<10	50 µg/kg	77.7	54.0	104
EP130: Chlorfenvinphos (E)	18708-86-6	10	µg/kg	<10.0	5 µg/kg	86.7	48.0	156
EP130: Chlorfenvinphos (Z)	18708-87-7	10	µg/kg	<10	50 µg/kg	90.8	53.0	119
EP130: Chlorpyrifos	2921-88-2	10	µg/kg	<10	50 µg/kg	92.1	54.0	112
EP130: Chlorpyrifos-methyl	5598-13-0	10	µg/kg	<10	50 µg/kg	93.5	52.0	108
EP130: Demeton-S-methyl	919-86-8	10	µg/kg	<10	50 µg/kg	93.1	51.0	109
EP130: Diazinon	333-41-5	10	µg/kg	<10	50 µg/kg	80.2	57.0	121
EP130: Dichlorvos	62-73-7	10	µg/kg	<10	50 µg/kg	78.1	48.0	104
EP130: Dimethoate	60-51-5	10	µg/kg	<10	50 µg/kg	87.6	52.0	120
EP130: Ethion	563-12-2	10	µg/kg	<10	50 µg/kg	89.6	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	93.8	48.0	112
EP130: Malathion	121-75-5	10	µg/kg	<10	50 µg/kg	94.4	51.0	121
EP130: Azinphos Methyl	86-50-0	10	µg/kg	<10	50 µg/kg	76.6	45.0	127
EP130: Monocrotophos	6923-22-4	10	µg/kg	<10	50 µg/kg	77.9	48.0	128
EP130: Parathion	56-38-2	10	µg/kg	<10	50 µg/kg	81.0	49.0	125
EP130: Parathion-methyl	298-00-0	10	µg/kg	<10	50 µg/kg	89.1	51.0	119
EP130: Pirimphos-ethyl	23505-41-1	10	µg/kg	<10	50 µg/kg	82.9	48.0	120
EP130: Prothiofos	34643-46-4	10	µg/kg	<10	50 µg/kg	93.3	51.0	117
EP131A: Organochlorine Pesticides (QCLot: 3769042)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	77.1	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	57.5	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	65.1	30.5	131



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP131A: Organochlorine Pesticides (QCLot: 3769042) - continued								
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	66.5	37.0	140
EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	76.9	25.9	141
EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	62.1	35.0	129
EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	62.5	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	75.0	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	58.2	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	83.6	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	110	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	103	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	68.3	20.1	118
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	89.4	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	63.2	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	74.7	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	50.3	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	58.6	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	89.0	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	68.0	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	74.1	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3770826)								
EP131A: Aldrin	309-00-2	0.5	µg/kg	<0.50	5 µg/kg	77.4	38.0	139
EP131A: alpha-BHC	319-84-6	0.5	µg/kg	<0.50	5 µg/kg	57.5	17.6	136
EP131A: beta-BHC	319-85-7	0.5	µg/kg	<0.50	5 µg/kg	40.0	30.5	131
EP131A: delta-BHC	319-86-8	0.5	µg/kg	<0.50	5 µg/kg	66.3	37.0	140
EP131A: 4,4'-DDD	72-54-8	0.5	µg/kg	<0.50	5 µg/kg	76.9	25.9	141
EP131A: 4,4'-DDE	72-55-9	0.5	µg/kg	<0.50	5 µg/kg	66.5	35.0	129
EP131A: 4,4'-DDT	50-29-3	0.5	µg/kg	<0.50	5 µg/kg	76.6	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	74.1	30.2	140
EP131A: alpha-Endosulfan	959-98-8	0.5	µg/kg	<0.50	5 µg/kg	57.6	38.0	140
EP131A: beta-Endosulfan	33213-65-9	0.5	µg/kg	<0.50	5 µg/kg	81.7	32.0	152
EP131A: Endosulfan sulfate	1031-07-8	0.5	µg/kg	<0.50	5 µg/kg	109	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	86.2	25.8	158
EP131A: Endrin aldehyde	7421-93-4	0.5	µg/kg	<0.50	5 µg/kg	63.2	20.1	118



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP131A: Organochlorine Pesticides (QCLot: 3770826) - continued								
EP131A: Endrin ketone	53494-70-5	0.5	µg/kg	<0.50	5 µg/kg	85.6	13.4	135
EP131A: Heptachlor	76-44-8	0.5	µg/kg	<0.50	5 µg/kg	62.8	39.0	155
EP131A: Heptachlor epoxide	1024-57-3	0.5	µg/kg	<0.50	5 µg/kg	74.6	34.0	148
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/kg	<0.50	5 µg/kg	50.4	26.1	152
EP131A: gamma-BHC	58-89-9	0.25	µg/kg	<0.25	5 µg/kg	58.7	31.2	137
EP131A: Methoxychlor	72-43-5	0.5	µg/kg	<0.50	5 µg/kg	79.8	36.0	152
EP131A: cis-Chlordane	5103-71-9	0.25	µg/kg	<0.25	5 µg/kg	67.5	36.0	142
EP131A: trans-Chlordane	5103-74-2	0.25	µg/kg	<0.25	5 µg/kg	73.7	29.5	138
EP131A: Total Chlordane (sum)	----	0.25	µg/kg	<0.25	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3769043)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	50 µg/kg	53.6	45.0	115
EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	53.6	45.0	115
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3770827)								
EP131B: Total Polychlorinated biphenyls	----	5	µg/kg	<5.0	50 µg/kg	54.3	45.0	115
EP131B: Aroclor 1016	12674-11-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1221	11104-28-2	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1232	11141-16-5	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1242	53469-21-9	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1248	12672-29-6	5	µg/kg	<5.0	----	----	----	----
EP131B: Aroclor 1254	11097-69-1	5	µg/kg	<5.0	50 µg/kg	54.3	45.0	115
EP131B: Aroclor 1260	11096-82-5	5	µg/kg	<5.0	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3769044)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	83.6	63.0	129
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	95.5	64.0	128
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	96.1	65.0	129
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	79.6	68.0	132
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	93.9	68.0	124
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	80.7	64.0	134
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	78.4	65.0	131
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	73.7	64.0	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	76.2	67.0	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	95.8	62.0	130



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3769044) - continued								
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	82.8	65.0	133
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	<4	25 µg/kg	89.2	68.0	120
	205-82-3							
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	80.9	61.0	133
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	88.4	63.0	127
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	88.8	66.0	118
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	88.7	69.0	119
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	81.1	66.0	120
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	83.0	64.0	122
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	84.1	64.0	120
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	92.6	68.0	136
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3770840)								
EP132B-SD: Naphthalene	91-20-3	5	µg/kg	<5	25 µg/kg	81.1	63.0	129
EP132B-SD: 2-Methylnaphthalene	91-57-6	5	µg/kg	<5	25 µg/kg	102	64.0	128
EP132B-SD: Acenaphthylene	208-96-8	4	µg/kg	<4	25 µg/kg	94.4	65.0	129
EP132B-SD: Acenaphthene	83-32-9	4	µg/kg	<4	25 µg/kg	91.2	68.0	132
EP132B-SD: Fluorene	86-73-7	4	µg/kg	<4	25 µg/kg	90.0	68.0	124
EP132B-SD: Phenanthrene	85-01-8	4	µg/kg	<4	25 µg/kg	94.0	64.0	134
EP132B-SD: Anthracene	120-12-7	4	µg/kg	<4	25 µg/kg	92.8	65.0	131
EP132B-SD: Fluoranthene	206-44-0	4	µg/kg	<4	25 µg/kg	90.0	64.0	130
EP132B-SD: Pyrene	129-00-0	4	µg/kg	<4	25 µg/kg	90.1	67.0	133
EP132B-SD: Benz(a)anthracene	56-55-3	4	µg/kg	<4	25 µg/kg	97.7	62.0	130
EP132B-SD: Chrysene	218-01-9	4	µg/kg	<4	25 µg/kg	92.5	65.0	133
EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	4	µg/kg	<4	25 µg/kg	101	68.0	120
	205-82-3							
EP132B-SD: Benzo(k)fluoranthene	207-08-9	4	µg/kg	<4	25 µg/kg	91.5	61.0	133
EP132B-SD: Benzo(e)pyrene	192-97-2	4	µg/kg	<4	25 µg/kg	95.8	63.0	127
EP132B-SD: Benzo(a)pyrene	50-32-8	4	µg/kg	<4	25 µg/kg	93.2	66.0	118
EP132B-SD: Perylene	198-55-0	4	µg/kg	<4	25 µg/kg	95.0	69.0	119
EP132B-SD: Benzo(g.h.i)perylene	191-24-2	4	µg/kg	<4	25 µg/kg	91.7	66.0	120
EP132B-SD: Dibenz(a.h)anthracene	53-70-3	4	µg/kg	<4	25 µg/kg	92.5	64.0	122
EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	4	µg/kg	<4	25 µg/kg	92.7	64.0	120
EP132B-SD: Coronene	191-07-1	5	µg/kg	<5	25 µg/kg	87.9	68.0	136
EP132B-SD: Sum of PAHs	----	4	µg/kg	<4	----	----	----	----

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EG035T: Total Mercury by FIMS (QCLot: 3775153)								
EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	0.002 mg/L	98.0	84.0	114
EG035T: Total Mercury by FIMS (QCLot: 3789823)								
EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	0.002 mg/L	99.5	84.0	114
EG035T: Total Mercury by FIMS (QCLot: 3799744)								
EG035T-LL: Mercury	7439-97-6	0.00004	mg/L	<0.00004	0.002 mg/L	95.5	84.0	114
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3774887)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	92.3	80.0	120
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3789819)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	82.3	80.0	120
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3799745)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	96.0	80.0	120
EP090: Organotin Compounds (Soluble) (QCLot: 3775030)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	120	30.7	134
EP090: Organotin Compounds (Soluble) (QCLot: 3787892)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	90.0	30.7	134
EP090: Organotin Compounds (Soluble) (QCLot: 3798322)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	93.1	30.7	134
EP090: Organotin Compounds (Soluble) (QCLot: 3800605)								
EP090S: Tributyltin	56573-85-4	2	ngSn/L	<2	147 ngSn/L	67.8	30.7	134
EP131A: Organochlorine Pesticides (QCLot: 3776388)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	116	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	121	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	108	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	105	36.0	131
EP131A: 4,4'-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	111	36.0	142
EP131A: 4,4'-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	102	30.4	112
EP131A: 4,4'-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	85.9	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	115	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	104	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	109	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	72.8	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	109	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	113	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	116	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	108	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	114	33.0	117



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP131A: Organochlorine Pesticides (QCLot: 3776388) - continued								
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	119	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	113	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	85.9	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	111	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	93.8	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.01	µg/L	<0.010	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3789445)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	108	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	105	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	88.7	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	85.7	36.0	131
EP131A: 4,4'-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	92.8	36.0	142
EP131A: 4,4'-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	104	30.4	112
EP131A: 4,4'-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	89.7	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	110	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	107	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	92.4	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	94.9	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	112	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	87.5	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	74.7	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	103	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	105	33.0	117
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	113	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	100	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	116	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	105	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	89.2	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.01	µg/L	<0.010	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3800038)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	114	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	120	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	101	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	105	36.0	131



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
							Low	High
CAS Number	LOR	Unit						
EP131A: Organochlorine Pesticides (QCLot: 3800038) - continued								
EP131A: 4,4'-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	100	36.0	142
EP131A: 4,4'-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	108	30.4	112
EP131A: 4,4'-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	110	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	106	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	103	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	103	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	99.0	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	105	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	104	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	113	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	111	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	112	33.0	117
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	115	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	109	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	103	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	109	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	111	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.01	µg/L	<0.010	----	----	----	----
EP131A: Organochlorine Pesticides (QCLot: 3803549)								
EP131A: Aldrin	309-00-2	0.01	µg/L	<0.010	1.1 µg/L	109	34.0	145
EP131A: alpha-BHC	319-84-6	0.01	µg/L	<0.010	1.1 µg/L	112	27.2	131
EP131A: beta-BHC	319-85-7	0.01	µg/L	<0.010	1.1 µg/L	96.7	28.6	133
EP131A: delta-BHC	319-86-8	0.01	µg/L	<0.010	1.1 µg/L	104	36.0	131
EP131A: 4,4'-DDD	72-54-8	0.01	µg/L	<0.010	1.1 µg/L	95.4	36.0	142
EP131A: 4,4'-DDE	72-55-9	0.01	µg/L	<0.010	1.1 µg/L	106	30.4	112
EP131A: 4,4'-DDT	50-29-3	0.01	µg/L	<0.010	1.1 µg/L	94.0	29.5	142
EP131A: Dieldrin	60-57-1	0.01	µg/L	<0.010	1.1 µg/L	111	28.1	122
EP131A: alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	1.1 µg/L	105	34.0	119
EP131A: beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	1.1 µg/L	107	31.6	128
EP131A: Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	1.1 µg/L	68.9	35.0	159
EP131A: Endrin	72-20-8	0.01	µg/L	<0.010	1.1 µg/L	109	21.5	165
EP131A: Endosulfan (sum)	115-29-7	0.01	µg/L	<0.010	----	----	----	----
EP131A: Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	1.1 µg/L	87.2	22.7	123
EP131A: Endrin ketone	53494-70-5	0.01	µg/L	<0.010	1.1 µg/L	114	16.3	144
EP131A: Heptachlor	76-44-8	0.005	µg/L	<0.005	1.1 µg/L	113	33.0	160
EP131A: Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	1.1 µg/L	114	33.0	117

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EP131A: Organochlorine Pesticides (QCLot: 3803549) - continued								
EP131A: Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	1.1 µg/L	115	23.6	126
EP131A: gamma-BHC	58-89-9	0.01	µg/L	<0.010	1.1 µg/L	110	28.7	134
EP131A: Methoxychlor	72-43-5	0.01	µg/L	<0.010	1.1 µg/L	106	29.5	150
EP131A: cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	1.1 µg/L	109	27.0	116
EP131A: trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	1.1 µg/L	98.8	31.2	119
EP131A: Total Chlordane (sum)	----	0.01	µg/L	<0.010	----	----	----	----
EP131A: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----

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**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3766276)							
EB2118023-003	B11-9	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	87.7	70.0	130
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 3766280)							
EB2118023-025	B4-4	EG035T-LL: Mercury	7439-97-6	0.5 mg/kg	84.3	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3766277)							
EB2118023-003	B11-9	EG020-SD: Arsenic	7440-38-2	100 mg/kg	86.1	70.0	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	86.0	70.0	130
		EG020-SD: Chromium	7440-47-3	100 mg/kg	90.3	70.0	130
		EG020-SD: Copper	7440-50-8	100 mg/kg	88.1	70.0	130
		EG020-SD: Lead	7439-92-1	100 mg/kg	85.5	70.0	130
		EG020-SD: Nickel	7440-02-0	100 mg/kg	89.6	70.0	130
		EG020-SD: Zinc	7440-66-6	100 mg/kg	86.8	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3766281)							
EB2118023-025	B4-4	EG020-SD: Arsenic	7440-38-2	100 mg/kg	81.8	70.0	130
		EG020-SD: Cadmium	7440-43-9	25 mg/kg	83.6	70.0	130
		EG020-SD: Chromium	7440-47-3	100 mg/kg	84.0	70.0	130
		EG020-SD: Copper	7440-50-8	100 mg/kg	84.0	70.0	130
		EG020-SD: Lead	7439-92-1	100 mg/kg	92.0	70.0	130
		EG020-SD: Nickel	7440-02-0	100 mg/kg	84.9	70.0	130
		EG020-SD: Zinc	7440-66-6	100 mg/kg	81.9	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3766298)							
EB2118023-006	B10-6						

Matrix Spike (MS) Report

Laboratory sample ID		Sample ID	Method: Compound	CAS Number	Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%) Low High	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3766298) - continued								
EB2118023-006	B10-6	EK059G: Nitrite + Nitrate as N (Sol.)	----	2 mg/kg	96.2	70.0	130	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3766315)								
EB2118023-006	B10-6	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	92.7	70.0	130	
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3766314)								
EB2118023-006	B10-6	EK067G: Total Phosphorus as P	----	100 mg/kg	# 50.6	70.0	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3765830)								
EB2117873-007	Anonymous	EP080: C6 - C9 Fraction	----	8 mg/kg	87.5	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3765830)								
EB2117873-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	85.0	70.0	130	
EP080: BTEXN (QCLot: 3765830)								
EB2117873-007	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	88.7	70.0	130	
		EP080: Toluene	108-88-3	2 mg/kg	86.7	70.0	130	
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3764780)								
EB2118023-006	B10-6	EP080-SD: C6 - C9 Fraction	----	8 mg/kg	76.2	70.0	130	
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 3767021)								
EB2118023-006	B10-6	EP071-SD-SV: C10 - C14 Fraction	----	157 mg/kg	77.3	70.0	130	
		EP071-SD-SV: C15 - C28 Fraction	----	245 mg/kg	74.3	70.0	130	
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3764780)								
EB2118023-006	B10-6	EP080-SD: C6 - C10 Fraction	C6_C10	8 mg/kg	71.7	70.0	130	
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 3767021)								
EB2118023-006	B10-6	EP071-SD-SV: >C10 - C16 Fraction	----	227 mg/kg	77.3	70.0	130	
		EP071-SD-SV: >C16 - C34 Fraction	----	162 mg/kg	72.3	70.0	130	
EP080-SD: BTEXN (QCLot: 3764780)								
EB2118023-006	B10-6	EP080-SD: Benzene	71-43-2	2 mg/kg	75.5	70.0	130	
		EP080-SD: Toluene	108-88-3	2 mg/kg	71.8	70.0	130	
EP090: Organotin Compounds (QCLot: 3765318)								
EB2118023-003	B11-9	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 5.0	20.0	130	
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	66.3	20.0	130	
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	79.7	20.0	130	
EP090: Organotin Compounds (QCLot: 3765322)								
EB2118023-025	B4-4	EP090: Monobutyltin	78763-54-9	1.25 µgSn/kg	# 3.6	20.0	130	
		EP090: Dibutyltin	1002-53-5	1.25 µgSn/kg	42.4	20.0	130	
		EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	80.9	20.0	130	
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3769041)								



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: 3769041) - continued							
EB2118023-013	B5-1	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	70.6	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	67.2	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	75.8	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	69.9	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	70.5	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	67.4	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	61.7	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	61.9	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	50.4	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	60.6	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	72.3	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	68.4	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	68.0	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	71.1	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	52.3	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	55.2	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	72.6	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	71.4	48.0	140
		EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	63.5	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	65.8	51.0	137
EP130A: Organophosphorus Pesticides (Ultra-trace) (QCLot: 3770828)							
EB2118023-001	B5-0	EP130: Bromophos-ethyl	4824-78-6	50 µg/kg	55.4	36.0	144
		EP130: Carbophenothion	786-19-6	50 µg/kg	58.5	38.0	120
		EP130: Chlorfenvinphos (E)	18708-86-6	5 µg/kg	60.7	49.0	157
		EP130: Chlorfenvinphos (Z)	18708-87-7	50 µg/kg	55.8	53.0	145
		EP130: Chlorpyrifos	2921-88-2	50 µg/kg	62.7	60.0	140
		EP130: Chlorpyrifos-methyl	5598-13-0	50 µg/kg	56.3	56.0	126
		EP130: Demeton-S-methyl	919-86-8	50 µg/kg	52.6	9.70	148
		EP130: Diazinon	333-41-5	50 µg/kg	61.7	60.0	122
		EP130: Dichlorvos	62-73-7	50 µg/kg	51.2	33.0	123
		EP130: Dimethoate	60-51-5	50 µg/kg	71.2	36.0	142
		EP130: Ethion	563-12-2	50 µg/kg	64.6	48.0	136
		EP130: Fenamiphos	22224-92-6	50 µg/kg	55.9	42.0	136
		EP130: Fenthion	55-38-9	50 µg/kg	55.1	35.0	131
		EP130: Malathion	121-75-5	50 µg/kg	58.2	55.0	141
		EP130: Azinphos Methyl	86-50-0	50 µg/kg	52.6	23.5	132
		EP130: Monocrotophos	6923-22-4	50 µg/kg	57.9	35.0	153
		EP130: Parathion	56-38-2	50 µg/kg	58.1	57.0	147
		EP130: Parathion-methyl	298-00-0	50 µg/kg	61.0	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: 3770828) - continued							
EB2118023-001	B5-0	EP130: Pirimphos-ethyl	23505-41-1	50 µg/kg	51.5	45.0	137
		EP130: Prothiofos	34643-46-4	50 µg/kg	59.5	51.0	137
EP131A: Organochlorine Pesticides (QCLot: 3769042)							
EB2118023-013	B5-1	EP131A: Aldrin	309-00-2	5 µg/kg	52.6	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	50.2	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	47.2	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	43.5	25.2	147
		EP131A: 4,4' -DDD	72-54-8	5 µg/kg	50.4	25.9	150
		EP131A: 4,4' -DDE	72-55-9	5 µg/kg	90.0	31.2	125
		EP131A: 4,4' -DDT	50-29-3	5 µg/kg	65.3	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	60.7	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	97.5	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	54.6	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	61.2	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	59.0	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	53.9	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	48.4	13.4	151
		EP131A: Heptachlor	76-44-8	5 µg/kg	39.8	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	59.0	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	57.0	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	52.4	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	46.8	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	56.2	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	58.8	29.5	138
EP131A: Organochlorine Pesticides (QCLot: 3770826)							
EB2118023-001	B5-0	EP131A: Aldrin	309-00-2	5 µg/kg	40.8	23.4	153
		EP131A: alpha-BHC	319-84-6	5 µg/kg	84.2	17.6	156
		EP131A: beta-BHC	319-85-7	5 µg/kg	69.0	24.9	153
		EP131A: delta-BHC	319-86-8	5 µg/kg	72.0	25.2	147
		EP131A: 4,4' -DDD	72-54-8	5 µg/kg	49.4	25.9	150
		EP131A: 4,4' -DDE	72-55-9	5 µg/kg	52.2	31.2	125
		EP131A: 4,4' -DDT	50-29-3	5 µg/kg	69.1	23.4	163
		EP131A: Dieldrin	60-57-1	5 µg/kg	66.8	30.2	140
		EP131A: alpha-Endosulfan	959-98-8	5 µg/kg	81.0	28.8	135
		EP131A: beta-Endosulfan	33213-65-9	5 µg/kg	65.2	22.6	141
		EP131A: Endosulfan sulfate	1031-07-8	5 µg/kg	74.8	16.1	156
		EP131A: Endrin	72-20-8	5 µg/kg	65.6	17.7	162
		EP131A: Endrin aldehyde	7421-93-4	5 µg/kg	67.0	20.1	116
		EP131A: Endrin ketone	53494-70-5	5 µg/kg	66.1	13.4	151



Sub-Matrix: **SOIL**

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: 3770826) - continued							
EB2118023-001	B5-0	EP131A: Heptachlor	76-44-8	5 µg/kg	66.4	23.8	170
		EP131A: Heptachlor epoxide	1024-57-3	5 µg/kg	73.6	28.3	140
		EP131A: Hexachlorobenzene (HCB)	118-74-1	5 µg/kg	75.7	17.7	144
		EP131A: gamma-BHC	58-89-9	5 µg/kg	79.2	21.8	158
		EP131A: Methoxychlor	72-43-5	5 µg/kg	49.5	24.4	158
		EP131A: cis-Chlordane	5103-71-9	5 µg/kg	65.8	27.3	139
		EP131A: trans-Chlordane	5103-74-2	5 µg/kg	76.4	29.5	138
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3769043)							
EB2118023-013	B5-1	EP131B: Total Polychlorinated biphenyls	----	50 µg/kg	67.7	44.0	136
		EP131B: Aroclor 1254	11097-69-1	50 µg/kg	67.7	44.0	136
EP131B: Polychlorinated Biphenyls (as Aroclors) (QCLot: 3770827)							
EB2118023-001	B5-0	EP131B: Total Polychlorinated biphenyls	----	50 µg/kg	53.3	44.0	136
		EP131B: Aroclor 1254	11097-69-1	50 µg/kg	53.3	44.0	136
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3769044)							
EB2118023-013	B5-1	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	80.3	70.0	130
		EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	90.8	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	72.7	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	78.0	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	73.4	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	77.0	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	83.3	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	98.0	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	73.7	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	73.3	70.0	130
		EP132B-SD: Chrysene	218-01-9	25 µg/kg	96.9	70.0	130
		EP132B-SD: Benzo(b+j)fluoranthene	205-99-2	25 µg/kg	91.1	70.0	130
			205-82-3				
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	95.1	70.0	130
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	76.1	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	81.1	70.0	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	# Not Determined	70.0	130
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	25 µg/kg	76.7	70.0	130
		EP132B-SD: Dibenz(a,h)anthracene	53-70-3	25 µg/kg	81.8	70.0	130
		EP132B-SD: Indeno(1,2,3.cd)pyrene	193-39-5	25 µg/kg	80.7	70.0	130
EP132B-SD: Coronene	191-07-1	25 µg/kg	76.1	70.0	130		
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3770840)							
EB2118023-006	B10-6	EP132B-SD: Naphthalene	91-20-3	25 µg/kg	109	70.0	130

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



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: 3770840) - continued							
EB2118023-006	B10-6	EP132B-SD: 2-Methylnaphthalene	91-57-6	25 µg/kg	123	70.0	130
		EP132B-SD: Acenaphthylene	208-96-8	25 µg/kg	99.8	70.0	130
		EP132B-SD: Acenaphthene	83-32-9	25 µg/kg	90.5	70.0	130
		EP132B-SD: Fluorene	86-73-7	25 µg/kg	90.8	70.0	130
		EP132B-SD: Phenanthrene	85-01-8	25 µg/kg	111	70.0	130
		EP132B-SD: Anthracene	120-12-7	25 µg/kg	103	70.0	130
		EP132B-SD: Fluoranthene	206-44-0	25 µg/kg	106	70.0	130
		EP132B-SD: Pyrene	129-00-0	25 µg/kg	102	70.0	130
		EP132B-SD: Benz(a)anthracene	56-55-3	25 µg/kg	113	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	25 µg/kg	124	70.0	130
			205-82-3				
		EP132B-SD: Benzo(k)fluoranthene	207-08-9	25 µg/kg	89.5	70.0	130
		EP132B-SD: Benzo(e)pyrene	192-97-2	25 µg/kg	100	70.0	130
		EP132B-SD: Benzo(a)pyrene	50-32-8	25 µg/kg	113	70.0	130
		EP132B-SD: Perylene	198-55-0	25 µg/kg	122	70.0	130
		EP132B-SD: Benzo(g,h,i)perylene	191-24-2	25 µg/kg	107	70.0	130
		EP132B-SD: Dibenz(a,h)anthracene	53-70-3	25 µg/kg	90.9	70.0	130
		EP132B-SD: Indeno(1.2.3.cd)pyrene	193-39-5	25 µg/kg	106	70.0	130
		EP132B-SD: Coronene	191-07-1	25 µg/kg	94.5	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
EG035T: Total Mercury by FIMS (QCLot: 3775153)							
EB2118023-003	B11-9	EG035T-LL: Mercury	7439-97-6	0.002 mg/L	77.9	70.0	130
EG035T: Total Mercury by FIMS (QCLot: 3789823)							
EB2118023-022	B6-2	EG035T-LL: Mercury	7439-97-6	0.002 mg/L	73.1	70.0	130
EG035T: Total Mercury by FIMS (QCLot: 3799744)							
EB2118023-026	B4-0	EG035T-LL: Mercury	7439-97-6	0.002 mg/L	87.0	70.0	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3774887)							
EB2118023-003	B11-9	EG093A-T: Nickel	7440-02-0	500 µg/L	110	70.0	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3789819)							
EB2118023-022	B6-2	EG093A-T: Nickel	7440-02-0	500 µg/L	93.3	70.0	130
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3799745)							
EB2118023-026	B4-0	EG093A-T: Nickel	7440-02-0	500 µg/L	100	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2118023	Page	: 1 of 20
Client	: BMT COMMERCIAL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DARREN RICHARDSON	Telephone	: +61 7 3552 8639
Project	: Port of Brisbane SAP	Date Samples Received	: 28-Jun-2021
Site	: ----	Issue Date	: 27-Jul-2021
Sampler	: BRAD HILES	No. of samples received	: 26
Order number	: ----	No. of samples analysed	: 25

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- 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

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK067G: Total Phosphorus as P by Discrete Analyser	EB2118023--006	B10-6	Total Phosphorus as P	----	50.6 %	70.0-130%	Recovery less than lower data quality objective
EP090: Organotin Compounds	EB2118023--003	B11-9	Monobutyltin	78763-54-9	5.0 %	20.0-130%	Recovery less than lower data quality objective
EP090: Organotin Compounds	EB2118023--025	B4-4	Monobutyltin	78763-54-9	3.6 %	20.0-130%	Recovery less than lower data quality objective
EP132B: Polynuclear Aromatic Hydrocarbons	EB2118023--013	B5-1	Perylene	198-55-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

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	EB2118023-020	B8-3	Tripropyltin	----	18.6 %	24.0-116 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method			Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Soil Glass Jar - Unpreserved								
B5-0,	B10-6,		----	----	----	05-Jul-2021	03-Jul-2021	2
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EN82: Porewater Extraction								
Non-Volatile Leach: 14 day HT(e.g. SV organics)								
B10-5			16-Jul-2021	12-Jul-2021	4	----	----	----

Matrix: **WATER**

Method			Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP090: Organotin Compounds (Soluble)								
Amber Glass Bottle - Unpreserved								
B8-3,	B4-0		20-Jul-2021	12-Jul-2021	8	----	----	----

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
Container / Client Sample ID(s)						
EP131A: Organochlorine Pesticides						
Amber Glass Bottle - Unpreserved B8-3, B4-0	19-Jul-2021	12-Jul-2021	7	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Matrix: SOIL					
Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Soil Particle Density	0	23	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Total Metals by ICP-AES	0	24	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Organochlorine Pesticides (Ultra-trace)	0	15	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	1	26	3.85	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Organochlorine Pesticides (Ultra-trace)	0	15	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	0	26	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		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements								
Snap Lock Bag - frozen (EA029)		28-Jun-2021	12-Jul-2021	23-Mar-2024	✔	12-Jul-2021	10-Oct-2021	✔
B5-0,	B10-6,							
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B7-1,	B7-1,							
B9-1,	B6-3							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-B: Acidity Trail								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA029-C: Sulfur Trail								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA029-D: Calcium Values								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA029-E: Magnesium Values								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA029-F: Excess Acid Neutralising Capacity								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA029-G: Retained Acidity								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-H: Acid Base Accounting								
Snap Lock Bag - frozen (EA029)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	23-Mar-2024	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA033-A: Actual Acidity								
Snap Lock Bag - frozen (EA033)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	28-Jun-2022	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA033-B: Potential Acidity								
Snap Lock Bag - frozen (EA033)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	28-Jun-2022	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA033-C: Acid Neutralising Capacity								
Snap Lock Bag - frozen (EA033)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	28-Jun-2022	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA033-D: Retained Acidity								
Snap Lock Bag - frozen (EA033)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	28-Jun-2022	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EA033-E: Acid Base Accounting								
Snap Lock Bag - frozen (EA033)								
B5-0,	B10-6,	28-Jun-2021	12-Jul-2021	28-Jun-2022	✓	12-Jul-2021	10-Oct-2021	✓
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)		28-Jun-2021	----	----	----	30-Jun-2021	12-Jul-2021	✓
B5-0,	B11-9,							
B11-9B,	B11-9C,							
B10-6,	B10-6B,							
B11-5,	B11-8,							
B10-5,	B5-1,							
B5-1B,	B5-1C,							
B7-1,	B9-1,							
B2-0,	BC-2,							
B8-3,	B8-1,							
B6-2,	B6-2B,							
B6-3,	B4-4,							
B4-0								
EA150: Particle Sizing								
Snap Lock Bag (EA150H)		28-Jun-2021	---	----	----	13-Jul-2021	25-Dec-2021	✓
B5-0,	B10-6,							
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
Soil Glass Jar - Unpreserved (EA150H)		28-Jun-2021	----	----	----	13-Jul-2021	25-Dec-2021	✓
B11-9,	B11-9B,							
B11-9C,	B11-5,							
B10-5,	B2-0,							
BC-2,	B8-3,							
B8-1,	B6-2,							
B6-2B,	B4-4,							
B4-0								

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H)		28-Jun-2021	----	----	----	13-Jul-2021	25-Dec-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3							
Soil Glass Jar - Unpreserved (EA150H)		28-Jun-2021	----	----	----	13-Jul-2021	25-Dec-2021	✓
B11-9, B11-9C, B10-5, BC-2, B8-1, B6-2B, B4-0	B11-9B, B11-5, B2-0, B8-3, B6-2, B4-4,							
EA152: Soil Particle Density								
Snap Lock Bag (EA152)		28-Jun-2021	----	----	----	13-Jul-2021	25-Dec-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3							
Soil Glass Jar - Unpreserved (EA152)		28-Jun-2021	----	----	----	13-Jul-2021	25-Dec-2021	✓
B11-9, B11-9C, B10-5, BC-2, B8-1, B6-2B, B4-0	B11-9B, B11-5, B2-0, B8-3, B6-2, B4-4,							

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Evaluation	Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction			Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES									
Soil Glass Jar - Unpreserved (EG005T)		28-Jun-2021	01-Jul-2021	25-Dec-2021	✓	05-Jul-2021	25-Dec-2021	✓	
B5-0,	B11-9,								
B11-9B,	B11-9C,								
B10-6,	B10-6B,								
B11-5,	B11-8,								
B10-5,	B5-1,								
B5-1B,	B5-1C,								
B7-1,	B9-1,								
B2-0,	BC-2,								
B8-3,	B8-1,								
B6-2,	B6-2B,								
B6-3,	B4-4,								
B4-0									
EG020-SD: Total Metals in Sediments by ICPMS									
Soil Glass Jar - Unpreserved (EG020-SD)		28-Jun-2021	01-Jul-2021	25-Dec-2021	✓	05-Jul-2021	25-Dec-2021	✓	
B5-0,	B11-9,								
B11-9B,	B11-9C,								
B10-6,	B10-6B,								
B11-5,	B11-8,								
B10-5,	B5-1,								
B5-1B,	B5-1C,								
B7-1,	B9-1,								
B2-0,	BC-2,								
B8-3,	B8-1,								
B6-2,	B6-2B,								
B6-3,	B4-4,								
B4-0									
EG035T: Total Recoverable Mercury by FIMS (Low Level)									
Soil Glass Jar - Unpreserved (EG035T-LL)		28-Jun-2021	01-Jul-2021	26-Jul-2021	✓	05-Jul-2021	26-Jul-2021	✓	
B5-0,	B11-9,								
B11-9B,	B11-9C,								
B10-6,	B10-6B,								
B11-5,	B11-8,								
B10-5,	B5-1,								
B5-1B,	B5-1C,								
B7-1,	B9-1,								
B2-0,	BC-2,								
B8-3,	B8-1,								
B6-2,	B6-2B,								
B6-3,	B4-4,								
B4-0									



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK059G)		28-Jun-2021	01-Jul-2021	26-Jul-2021	✓	05-Jul-2021	03-Jul-2021	✗
B5-0,	B10-6,							
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Soil Glass Jar - Unpreserved (EK061G)		28-Jun-2021	02-Jul-2021	26-Jul-2021	✓	05-Jul-2021	30-Jul-2021	✓
B5-0,	B10-6,							
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EK067G: Total Phosphorus as P by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK067G)		28-Jun-2021	02-Jul-2021	26-Jul-2021	✓	05-Jul-2021	30-Jul-2021	✓
B5-0,	B10-6,							
B10-6B,	B11-8,							
B5-1,	B5-1B,							
B5-1C,	B7-1,							
B9-1,	B6-3							
EN82: Porewater Extraction								
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)		28-Jun-2021	01-Jul-2021	12-Jul-2021	✓	---	---	---
B5-0,	B11-9,							
B11-9B,	B10-6,							
B10-6B,	B11-8							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)		28-Jun-2021	05-Jul-2021	12-Jul-2021	✓	---	---	---
B8-3,	B4-0							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)		28-Jun-2021	12-Jul-2021	12-Jul-2021	✓	---	---	---
B7-1,	B6-2,							
B6-2B								
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN82)		28-Jun-2021	16-Jul-2021	12-Jul-2021	✗	---	---	---
B10-5								

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil								
Pulp Bag (EP003)								
B5-0, B11-9B, B10-6, B11-5, B10-5, B5-1B, B7-1, B2-0, B8-3, B6-2, B6-3, B4-0	B11-9, B11-9C, B10-6B, B11-8, B5-1, B5-1C, B9-1, BC-2, B8-1, B6-2B, B4-4,	28-Jun-2021	13-Jul-2021	26-Jul-2021	✓	13-Jul-2021	26-Jul-2021	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040703,	TripBlank 040705	28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	02-Jul-2021	12-Jul-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040703,	TripBlank 040705	28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	02-Jul-2021	12-Jul-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
Trip Blank 040703,	TripBlank 040705	28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	02-Jul-2021	12-Jul-2021	✓
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071-SD-SV)								
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3	28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	05-Jul-2021	11-Aug-2021	✓
Soil Glass Jar - Unpreserved (EP080-SD)								
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3	28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	01-Jul-2021	12-Jul-2021	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071-SD-SV)		28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	05-Jul-2021	11-Aug-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1, B10-6, B11-8, B5-1B, B7-1, B6-3								
Soil Glass Jar - Unpreserved (EP080-SD)		28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	01-Jul-2021	12-Jul-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1, B10-6, B11-8, B5-1B, B7-1, B6-3								
EP080-SD: BTEXN								
Soil Glass Jar - Unpreserved (EP080-SD)		28-Jun-2021	30-Jun-2021	12-Jul-2021	✓	01-Jul-2021	12-Jul-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1, B10-6, B11-8, B5-1B, B7-1, B6-3								
EP090: Organotin Compounds								
Soil Glass Jar - Unpreserved (EP090)		28-Jun-2021	01-Jul-2021	12-Jul-2021	✓	02-Jul-2021	10-Aug-2021	✓
B6-3, B4-0, B4-4								
Soil Glass Jar - Unpreserved (EP090)		28-Jun-2021	12-Jul-2021	12-Jul-2021	✓	16-Jul-2021	21-Aug-2021	✓
B5-0, B11-9B, B10-6, B11-5, B10-5, B5-1B, B7-1, B2-0, B8-3, B6-2, B11-9, B11-9C, B10-6B, B11-8, B5-1, B5-1C, B9-1, BC-2, B8-1, B6-2B								



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP130A: Organophosphorus Pesticides (Ultra-trace)								
Soil Glass Jar - Unpreserved (EP130)		28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	07-Jul-2021	11-Aug-2021	✓
B5-0, B11-9B, B10-6, B11-5, B10-5, B5-1B, B7-1, B2-0, B8-3, B6-2, B6-3, B4-0	B11-9, B11-9C, B10-6B, B11-8, B5-1, B5-1C, B9-1, BC-2, B8-1, B6-2B, B4-4,							
EP131A: Organochlorine Pesticides								
Soil Glass Jar - Unpreserved (EP131A)		28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	07-Jul-2021	11-Aug-2021	✓
B5-0, B11-9B, B10-6, B11-5, B10-5, B5-1B, B7-1, B2-0, B8-3, B6-2, B6-3, B4-0	B11-9, B11-9C, B10-6B, B11-8, B5-1, B5-1C, B9-1, BC-2, B8-1, B6-2B, B4-4,							
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Soil Glass Jar - Unpreserved (EP131B)		28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	07-Jul-2021	11-Aug-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3							
EP132B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP132B-SD)		28-Jun-2021	02-Jul-2021	12-Jul-2021	✓	05-Jul-2021	11-Aug-2021	✓
B5-0, B10-6B, B5-1, B5-1C, B9-1,	B10-6, B11-8, B5-1B, B7-1, B6-3							



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T-LL) B5-0, B11-9B, B10-6B,	B11-9, B10-6, B11-8	01-Jul-2021	----	----	----	06-Jul-2021	29-Jul-2021	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T-LL) B8-3,	B4-0	05-Jul-2021	----	----	----	26-Jul-2021	02-Aug-2021	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T-LL) B7-1, B6-2B	B6-2,	12-Jul-2021	----	----	----	14-Jul-2021	09-Aug-2021	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T-LL) B10-5		16-Jul-2021	----	----	----	26-Jul-2021	13-Aug-2021	✓
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG093A-T) B5-0, B11-9B, B10-6B,	B11-9, B10-6, B11-8	01-Jul-2021	14-Jul-2021	28-Dec-2021	✓	14-Jul-2021	28-Dec-2021	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG093A-T) B8-3,	B4-0	05-Jul-2021	22-Jul-2021	01-Jan-2022	✓	22-Jul-2021	01-Jan-2022	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG093A-T) B7-1, B6-2B	B6-2,	12-Jul-2021	14-Jul-2021	08-Jan-2022	✓	14-Jul-2021	08-Jan-2022	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG093A-T) B10-5		16-Jul-2021	22-Jul-2021	12-Jan-2022	✓	22-Jul-2021	12-Jan-2022	✓
EP090: Organotin Compounds (Soluble)								
Amber Glass Bottle - Unpreserved (EP090S) B5-0, B11-9B, B10-6B,	B11-9, B10-6, B11-8	01-Jul-2021	07-Jul-2021	08-Jul-2021	✓	07-Jul-2021	16-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) B8-3,	B4-0	05-Jul-2021	20-Jul-2021	12-Jul-2021	✖	20-Jul-2021	29-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) B7-1, B6-2B	B6-2,	12-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	22-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP090S) B10-5		16-Jul-2021	19-Jul-2021	23-Jul-2021	✓	19-Jul-2021	28-Aug-2021	✓

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 Work Order : EB2118023
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane SAP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP131A: Organochlorine Pesticides								
Amber Glass Bottle - Unpreserved (EP131A) B5-0, B11-9B, B10-6B,	B11-9, B10-6, B11-8	01-Jul-2021	06-Jul-2021	08-Jul-2021	✓	09-Jul-2021	15-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP131A) B8-3,	B4-0	05-Jul-2021	19-Jul-2021	12-Jul-2021	✗	20-Jul-2021	28-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP131A) B7-1, B6-2B	B6-2,	12-Jul-2021	13-Jul-2021	19-Jul-2021	✓	15-Jul-2021	22-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP131A) B10-5		16-Jul-2021	22-Jul-2021	23-Jul-2021	✓	22-Jul-2021	31-Aug-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)							
Chromium Suite for Acid Sulphate Soils	EA033	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	4	39	10.26	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Soil Particle Density	EA152	0	23	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	2	10	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Soil Particle Density	EA152	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	24	8.33	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
Laboratory Control Samples (LCS) - Continued							
Total Metals in Sediments by ICPMS	EG020-SD	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	4	23	17.39	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	2	10	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organochlorine Pesticides (Ultra-trace)	EP131A	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organophosphorus Pesticides (Ultra-trace)	EP130	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAHs in Sediments by GCMS(SIM)	EP132B-SD	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB's (Ultra-trace)	EP131B	2	10	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	0	24	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fractions Only	EP071-SD-SV	1	10	10.00	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	
Matrix Spikes (MS) - Continued							
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	10	10.00	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)							
Organochlorine Pesticides (Ultra-trace)	EP131A	0	15	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	1	26	3.85	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS - Low Level	EG035T-LL	3	12	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	3	12	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	4	15	26.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	4	26	15.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS - Low Level	EG035T-LL	3	12	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	3	12	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Organochlorine Pesticides (Ultra-trace)	EP131A	4	15	26.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	4	26	15.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS - Low Level	EG035T-LL	3	12	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	3	12	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organochlorine Pesticides (Ultra-trace)	EP131A	0	15	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Organotin Compounds (Soluble)	EP090S	0	26	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS - Low Level	EG035T-LL	3	12	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	3	12	25.00	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
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
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).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Gross Alpha and Beta activity in solids	EA250	SOIL	In house: Referenced to ISO 9697 / CSN 757611. Determination of Gross Alpha and Beta activity in soil and sediment by Thick Source method. An appropriate mass of sample is dried and pulverised prior to direct activity counting. (If required, Potassium may be determined separately and results corrected accordingly for 40K.) Analysis is performed by ALS (Czech Republic) who hold technical accreditation #1163 for Gross alpha and beta activity under CAI. CAI are a European accreditation body, equivalent to NATA in Australia and recognised internationally by NATA under ILAC.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. Analyte list and LORs per NODG.
Total Mercury by FIMS - Low Level	EG035T-LL	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
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).



Analytical Methods	Method	Matrix	Method Descriptions
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 Nitrogen, each determined separately as N.
Total Phosphorus By Discrete Analyser	EK067G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
TPH - Semivolatile Fractions Only	EP071-SD-SV	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	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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 quantified 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)
PCB's (Ultra-trace)	EP131B	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.
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.
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
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)



Preparation Methods	Method	Matrix	Method Descriptions
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.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Porewater Extraction	EN82	SOIL	Extraction of porewater from sediment samples using centrifuge.
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Sep. Funnel Extraction of Liquids (Ultra-trace pesticides.)	ORG14-UTP	SOIL	In house: Referenced to USEPA 3510 Samples are extracted into dichloromethane, concentrated and exchanged into an appropriate solvent for GPC and florisil cleanup as required. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
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.
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 derivatisated, extracted and the substitution 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.

CERTIFICATE OF ANALYSIS

Work Order	: EB2120926	Page	: 1 of 6
Amendment	: 1		
Client	: BMT COMMERCIAL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DARREN RICHARDSON	Contact	: Kimberly Hilton-Barber
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Port of Brisbane - Sediment Sampling	Date Samples Received	: 22-Jul-2021 12:52
Order number	: ----	Date Analysis Commenced	: 28-Jul-2021
C-O-C number	: ----	Issue Date	: 27-Aug-2021 15:58
Sampler	: BRAD HILES		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 8		
No. of samples analysed	: 8		



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

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, 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.

- Amendment 1 (25/08/2021): This report has been amended and re-released to allow the reporting of additional analytical data, specifically method EG005-SDH: Ni for all samples. Additionally, the EG093T data was updated due to a laboratory error.
- 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.

Page : 3 of 6
 Work Order : EB2120926 Amendment 1
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane - Sediment Sampling



Analytical Results

Sub-Matrix: **ELUTRIATE**
 (Matrix: **WATER**)

Sample ID

				B13-9	B15-1	B10-8	B5-1	B9-1
Sampling date / time				15-Jun-2021 00:00	15-Jun-2021 00:00	15-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EB2120926-001	EB2120926-002	EB2120926-003	EB2120926-004	EB2120926-005
				Result	Result	Result	Result	Result
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Nickel	7440-02-0	0.5	µg/L	0.6	0.6	0.8	1.2	<0.5



Analytical Results

Sub-Matrix: **ELUTRIATE**
 (Matrix: **WATER**)

Sample ID

				B6-3	B4-4	Elutriate Water EB2118023	----	----
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2120926-006	EB2120926-007	EB2120926-008	-----	-----
Result				Result	Result	Result	----	----
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Nickel	7440-02-0	0.5	µg/L	1.4	1.7	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	B13-9	B15-1	B10-8	B5-1	B9-1
Sampling date / time					15-Jun-2021 00:00	15-Jun-2021 00:00	15-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EB2120926-001	EB2120926-002	EB2120926-003	EB2120926-004	EB2120926-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		63.2	57.5	63.4	63.5	52.5
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES									
Nickel	7440-02-0	1.0	mg/kg		5.6	9.8	6.6	11.4	5.5
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)									
Seawater Sampling Date	----	-	-		1	1	1	1	1



Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				B6-3	B4-4	Elutriate Water EB2118023	----	----
Sampling date / time				28-Jun-2021 00:00	28-Jun-2021 00:00	28-Jun-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2120926-006	EB2120926-007	EB2120926-008	-----	-----
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	67.8	64.9	----	----	----
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES								
Nickel	7440-02-0	1.0	mg/kg	7.2	7.4	----	----	----
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)								
Seawater Sampling Date	----	-	-	1	1	1	----	----

QUALITY CONTROL REPORT

Work Order	: EB2120926	Page	: 1 of 3
Amendment	: 1		
Client	: BMT COMMERCIAL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DARREN RICHARDSON	Contact	: Kimberly Hilton-Barber
Address	: PO BOX 203 SPRING HILL BRISBANE QLD 4004	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Port of Brisbane - Sediment Sampling	Date Samples Received	: 22-Jul-2021
Order number	: ----	Date Analysis Commenced	: 28-Jul-2021
C-O-C number	: ----	Issue Date	: 27-Aug-2021
Sampler	: BRAD HILES		
Site	: ----		
Quote number	: BN/016/19		
No. of samples received	: 8		
No. of samples analysed	: 8		



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



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%.

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QC Lot: 3867223)									
EB2120926-001	B13-9	EG005-SDH: Nickel	7440-02-0	1	mg/kg	5.6	5.9	5.8	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3867224)									
EB2120926-001	B13-9	EA055: Moisture Content	----	0.1	%	63.2	62.8	0.8	0% - 20%
				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: 3822800)									
EB2120926-001	B13-9	EG093A-T: Nickel	7440-02-0	0.5	µg/L	0.6	0.8	16.0	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 Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 3867223)								
EG005-SDH: Nickel	7440-02-0	1	mg/kg	<1.0	3.88 mg/kg	109	70.0	128
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel) (QCLot: 3816448)								
EN68a-G: Seawater Sampling Date	----	----	-	1	----	----	----	----

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3822800)								
EG093A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	91.3	80.0	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number		MS	Low	High
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES (QCLot: 3867223)							
EB2120926-002	B15-1	EG005-SDH: Nickel	7440-02-0	50 mg/kg	87.5	70.0	130
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number		MS	Low	High
EG093T: Total Metals in Saline Water by ORC-ICPMS (QCLot: 3822800)							
EB2120926-002	B15-1	EG093A-T: Nickel	7440-02-0	1000 µg/L	93.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB2120926**

Page : 1 of 5

Amendment : **1**

Client : **BMT COMMERCIAL AUSTRALIA PTY LTD**

Laboratory : Environmental Division Brisbane

Contact : **DARREN RICHARDSON**

Telephone : +61-7-3243 7222

Project : Port of Brisbane - Sediment Sampling

Date Samples Received : 22-Jul-2021

Site : ----

Issue Date : 27-Aug-2021

Sampler : **BRAD HILES**

No. of samples received : 8

Order number : ----

No. of samples analysed : 8

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

- 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 : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	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 B13-9, B10-8B15-1,	----	----	----	26-Aug-2021	29-Jun-2021	58
Soil Glass Jar - Unpreserved B5-1, B6-3,B9-1, B4-4	----	----	----	26-Aug-2021	12-Jul-2021	45
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)						
Non-Volatile Leach: 14 day HT(e.g. SV organics) B13-9, B10-8B15-1,	28-Jul-2021	29-Jun-2021	29	----	----	----
Non-Volatile Leach: 14 day HT(e.g. SV organics) B5-1, B6-3, Elutriate Water - EB2118023B9-1, B4-4,	28-Jul-2021	12-Jul-2021	16	----	----	----

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
B13-9, B10-8	B15-1,	15-Jun-2021	----	----	----	26-Aug-2021	29-Jun-2021	✖
Soil Glass Jar - Unpreserved (EA055)								
B5-1, B6-3,	B9-1, B4-4	28-Jun-2021	----	----	----	26-Aug-2021	12-Jul-2021	✖

Page : 3 of 5
 Work Order : EB2120926 Amendment 1
 Client : BMT COMMERCIAL AUSTRALIA PTY LTD
 Project : Port of Brisbane - Sediment Sampling



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)-SDH: 1M HCl-Extractable Metals by ICPAES							
Soil Glass Jar - Unpreserved (EG005-SDH) B13-9, B10-8	B15-1, 15-Jun-2021	26-Aug-2021	12-Dec-2021	✔	26-Aug-2021	12-Dec-2021	✔
Soil Glass Jar - Unpreserved (EG005-SDH) B5-1, B6-3,	B9-1, B4-4 28-Jun-2021	26-Aug-2021	25-Dec-2021	✔	26-Aug-2021	25-Dec-2021	✔
EN68: Seawater Elutriate Testing Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN68a-G) B13-9, B10-8	B15-1, 15-Jun-2021	28-Jul-2021	29-Jun-2021	✖	----	----	----
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN68a-G) B5-1, B6-3, Elutriate Water - EB2118023	B9-1, B4-4 28-Jun-2021	28-Jul-2021	12-Jul-2021	✖	----	----	----

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG093T: Total Metals in Saline Water by ORC-ICPMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG093A-T)		28-Jul-2021	02-Aug-2021	24-Jan-2022	✔	02-Aug-2021	24-Jan-2022	✔
B13-9,	B15-1,							
B10-8,	B5-1,							
B9-1,	B6-3,							
B4-4,	Elutriate Water - EB2118023							



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)							
1M HCl Extractable Metals	EG005-SDH	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
1M HCl Extractable Metals	EG005-SDH	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
1M HCl Extractable Metals	EG005-SDH	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Seawater Elutriate Testing Procedure - Glass Leaching Vessel	EN68a-G	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
1M HCl Extractable Metals	EG005-SDH	1	7	14.29	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)							
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	8	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals in Saline Water Suite A by ORC-ICPMS	EG093A-T	1	8	12.50	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).
1M HCl Extractable Metals	EG005-SDH	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined via ICPAES following weak acid extraction. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3). LORs per NAGD. ALS is not NATA accredited for the analysis of Barium, Boron, Molybdenum and Strontium by this method.
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).
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.
1M HCl Extraction for Metals in Sediments (1 hour)	EN71	SOIL	In house: Referenced to In house, Allen (1993). 1g of sample is leached at room temperature for 1 hour in 10% hydrochloric acid. The resultant extract is filtered and bulked for analysis of extracted metals.

Appendix D Appendix D Sediment Quality Results – Secondary Laboratory

CERTIFICATE OF ANALYSIS

Certificate Number	B1044593-A [R00]	Page	1/6
Client	BMT Commercial Australia Pty Ltd	Registering Laboratory	Brisbane
Contact	Darren Richardson	Contact	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	Address	52 Brandl Street, Eight Mile Plains, QLD 4113
Telephone	07 3831 6744	Email	admin@symbiolabs.com.au
Order Number	---	Telephone	1300 703 166
Project ID	Sediment - Brisbane River	Date Samples Received	25/06/2021
Sampler	Customer	Date Analysis Commenced	25/06/2021
Client Job Reference	---	Issue Date	16/07/2021
No. of Samples Registered	2 Sampler: Customer	Receipt Temperature (°C)	2
Priority	Normal	Storage Temperature (°C)	4
		Quote Number	---

This report supersedes any previous revision with this reference. This document must not be reproduced, except in full. If samples were provided by the customer, results apply only to the samples 'as received' and responsibility for representative sampling rests with the customer. Water results are reported on an 'as is' basis. Soil and sediment results are reported on a 'dry weight' basis. For other matrices the basis of reporting will be confirmed in the 'Report Comments' section. Measurement Uncertainty is available upon request. If the laboratory was authorised to conduct testing on samples received outside of the specified conditions, all test results may be impacted. Details of samples received outside of the specified conditions are mentioned in the sample description section of this test report.

Definitions

| <: Less Than | >: Greater Than | RP: Result Pending | MPN: Most Probable Number | CFU: Colony Forming Units | ---: Not Received/Not Requested | NA: Not Applicable | ND: Not Detected | LOR: Limit of Reporting | [NT]: Not Tested |
| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR

Authorised By

Name	Position	Accreditation Category
Glen Rangott	Environmental Laboratory Manager, Brisbane	Environmental Chemistry
Hongmei Kuang	Chemistry Laboratory Manager, Brisbane	Environmental and Food Chemistry

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-A [R00]
Page	2/6

Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---



Sample Information - *Client/Sampler Supplied*

Sample ID	B1044593-A/1	B1044593-A/2
Sample Description	B6-2C	B10-6C
Sample Matrix	Sediments	Sediments

Client	BMT Commercial Australia Pty Ltd	Project ID	Sediment - Brisbane River
Certificate Number	B1044593-A [R00]	Sampler	Customer
Page	3/6	Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			---	---
Compound/Analyte	LOR	Units	B1044593-A/1	B1044593-A/2
			Results	Results
Total Organic Carbonin Soil				
BE6042-B - Total Organic Carbon in Soil and Sediment				
Total Organic Carbon(TOC)*	0.1	%w/w	1.5	2.1
Particle Size Distribution				
S023.03 - Particle Size Distribution by Hydrometer				
Particle Size Distribution	0.1	%	See attached	See attached
Acid Sulphate Soil - Cr Reduci				
ENV274 - Acid Sulphate Soil - Cr Reducible Sulphur Suite				
Chromium Reducible Sulphur	0.005	% S	---	0.250
pHkcl TAA	0.1	pH Units	---	8.7
ANCE (Acid Neutralising Capacity)	0.01	% CaCO3	---	3.90
Net Acid Soluble Sulpur	0.02	% S	---	NA
Acid trail Titratable Actual Acidity	2	mol H+/t	---	<2.00
Sulfidic - TAA equiv	0.003	% pyrite S	---	<0.003
Chromium Reducible Sulfur Acidity Units	3	mol H+/t	---	160.00
Sulfur - KCl Extractable	0.02	% S	---	NA
HCl Extractable Sulfur	0.02	% S	---	NA
Net Acid Soluble Sulfur Acidity Units	10	mol H+/t	---	NA
Net Acid Soluble Sulfur Equiv S% Pyrite	0.02	% S	---	NA

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-A [R00]
Page	4/6

Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			---	---
Compound/Analyte	LOR	Units	B1044593-A/1	B1044593-A/2
			Results	Results
Acid Sulphate Soil - Cr Reduci - Continued				
ENV274 - Acid Sulphate Soil - Cr Reducible Sulphur Suite - Continued				
Acid Neutralising Capacity Acid (ANCbt)	2	mol H+/t	---	780.00
Acid Neutralising Capacity Equiv S%	0.02	% S	---	1.30
ANC Fineness Factor	---	factor	---	1.50
Net Acidity (Sulfur Units)	0.02	% S	---	NA
Net Acidity (Acidity Units)	10	mol H+/t	---	NA
Liming Rate	1	kg CaCO3/t	---	<1.00
S004.09A Total Phosphorus				
S004.09 - Determination of Total Phosphorus				
Total Phosphorus^	1	mg/kg	---	390
S004.03A Total Nitrogen				
S004.03 - Determination of Total Nitrogen				
Total Nitrogen^	20	mg/kg	---	830
S004.08A NOx as N				
S004.08 - Determination of NOx as N				
NOx as N^	0.1	mg/kg	---	<0.1
S004.04A TKN				
S004.04 - Determination of Total Kjeldahl Nitrogen				
Total Kjeldahl Nitrogen^	20	mg/kg	---	830
Radiation Analysis*				
S014.00 - Determination of Gross Alpha and Beta				
Gross Alpha* (including K-40 correction)	0.08	Bq/g	---	0.171

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-A [R00]
Page	5/6

Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			---	---
Compound/Analyte	LOR	Units	B1044593-A/1	B1044593-A/2
			Results	Results
Radiation Analysis* - Continued				
S014.00 - Determination of Gross Alpha and Beta - Continued				
Gross Beta* (including K-40 correction)	0.25	Bq/g	---	0.52
General Tests				
ENV001_S - Soil Moisture Content				
Air Dry Soil Moisture Content	0.1	% w/w	1.8	1.9
ENV146 PCB in Soil				
ENV146 - ENV146 Polychlorinated Biphenyls in Soil				
PCB 1016	0.1	mg/kg	---	<0.1
PCB 1232	0.1	mg/kg	---	<0.1
PCB 1242	0.1	mg/kg	---	<0.1
PCB 1248	0.1	mg/kg	---	<0.1
PCB 1254	0.1	mg/kg	---	<0.1
PCB 1260	0.1	mg/kg	---	<0.1
PCB 1221	0.1	mg/kg	---	<0.1

Analysis Location

The following analysis was completed by Symbio Laboratories - Brisbane: BE6042_OB;ENV001_S;ENV146.

The following analysis was completed by a subcontract laboratory : ENV274;S004_03;S004_04;S004_08;S004_09;S014_00;S023_03B.

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-A [R00]
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Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---



Report Comments

Please note: Acid Sulphate Soil testing performed by an external subcontracted NATA certified Laboratory.

Accreditation No.: 1261 Report No: 807510-S

Please note: Particle Size Distribution testing performed by an external subcontracted Laboratory.

Report No: K8744

Please note: Total Phosphorus, Total Nitrogen, NOx as N and Total Kjeldahl Nitrogen testing performed by an external subcontracted Laboratory.

Report No: SAL27984

Please note: Gross Alpha and Beta testing performed by an external subcontracted Laboratory.

Report No: ME321311

Results reported on a "Dry Weight" basis.

CERTIFICATE OF ANALYSIS

Certificate Number	B1044593-B [R01]	Page	1/8
Client	BMT Commercial Australia Pty Ltd	Registering Laboratory	Brisbane
Contact	Brad Hiles	Contact	Customer Service Team
Address	Level 8 200 Creek Street Brisbane QLD 4000	Address	52 Brandl Street, Eight Mile Plains, QLD 4113
Telephone	07 3831 6744	Email	admin@symbiolabs.com.au
Order Number	---	Telephone	1300 703 166
Project ID	Sediment - Brisbane River	Date Samples Received	29/06/2021
Sampler	Customer	Date Analysis Commenced	29/06/2021
Client Job Reference	---	Issue Date	13/07/2021
No. of Samples Registered	2 Sampler: Customer	Receipt Temperature (°C)	2
Priority	Normal	Storage Temperature (°C)	4
		Quote Number	---



Accreditation No: 2455
Accredited for compliance
with ISO/IEC 17025 - Testing

This report supersedes any previous revision with this reference. This document must not be reproduced, except in full. If samples were provided by the customer, results apply only to the samples 'as received' and responsibility for representative sampling rests with the customer. Water results are reported on an 'as is' basis. Soil and sediment results are reported on a 'dry weight' basis. For other matrices the basis of reporting will be confirmed in the 'Report Comments' section. Measurement Uncertainty is available upon request. If the laboratory was authorised to conduct testing on samples received outside of the specified conditions, all test results may be impacted. Details of samples received outside of the specified conditions are mentioned in the sample description section of this test report.

Definitions

| <: Less Than | >: Greater Than | RP: Result Pending | MPN: Most Probable Number | CFU: Colony Forming Units | ---: Not Received/Not Requested | NA: Not Applicable | ND: Not Detected | LOR: Limit of Reporting | [NT]: Not Tested |
| ~: Estimated | ^ Subcontracted Analysis | TBA: To Be Advised | ** Potential Holding Time Concern | * Test not covered by NATA scope of accreditation | # Result derived from a calculation and includes results equal to or greater than the LOR

Authorised By

Name	Position	Accreditation Category
Harry Xia	Senior Laboratory Technician, Sydney	Environmental and Food Chemistry

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-B [R01]
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Project ID	Sediment - Brisbane River
Sampler	Customer
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Sample Information - *Client/Sampler Supplied*

Sample ID	B1044593-B/1	B1044593-B/2
Sample Description	B6-2C	B10-6C
Sample Date/Time	2021-06-24 00:00	2021-06-25 00:00
Sample Matrix	Sediments	Sediments

Client	BMT Commercial Australia Pty Ltd	Project ID	Sediment - Brisbane River
Certificate Number	B1044593-B [R01]	Sampler	Customer
Page	3/8	Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			24/06/2021 00:00	25/06/2021 00:00
Compound/Analyte	LOR	Units	B1044593-B/1	B1044593-B/2
			Results	Results
Moisture Content				
04-004 - Moisture by gravimetric, %				
Moisture Content	0.1	%	52	52
Trace Elements				
04-001 - Metals by ICP-OES				
Aluminium	5	mg/kg	15000	14000
Antimony	0.5	mg/kg	<0.5	<0.5
Arsenic	0.4	mg/kg	3.2	9.4
Cadmium	0.1	mg/kg	2.1	1.8
Chromium	0.1	mg/kg	30	35
Cobalt	0.5	mg/kg	12	15
Copper	0.1	mg/kg	28	21
Iron	5	mg/kg	24000	29000
Lead	0.5	mg/kg	16	19
Manganese	0.5	mg/kg	220	470
Nickel	0.1	mg/kg	18	21
Silver	0.1	mg/kg	<0.1	<0.1
Selenium	0.5	mg/kg	3.5	17
Vanadium	0.1	mg/kg	<0.1	<0.1
Zinc	0.5	mg/kg	98	91
04-002 - Mercury in sediment by CVAAS				
Mercury	0.01	mg/kg	0.036	0.029
Poly Aromatic Hydrocarbons				
04-022 - PAH in Sediment by GCMS (NAGD2009)				
Naphthalene	5	µg/kg	---	<5

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-B [R01]
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Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			24/06/2021 00:00	25/06/2021 00:00
Compound/Analyte	LOR	Units	B1044593-B/1	B1044593-B/2
			Results	Results
Poly Aromatic Hydrocarbons - Continued				
04-022 - PAH in Sediment by GCMS (NAGD2009) - Continued				
1-Methylnaphthalene	5	µg/kg	---	<5
2-Methylnaphthalene	5	µg/kg	---	<5
Acenaphthylene	5	µg/kg	---	<5
Acenaphthene	5	µg/kg	---	<5
Fluorene	5	µg/kg	---	<5
Phenanthrene	5	µg/kg	---	21
Anthracene	5	µg/kg	---	5.2
Fluoranthene	5	µg/kg	---	32
Pyrene	5	µg/kg	---	21
Benz(a)anthracene	5	µg/kg	---	23
Chrysene	5	µg/kg	---	12
Benzo(b)&(k)fluoranthene	10	µg/kg	---	50
Benzo(a)pyrene	5	µg/kg	---	20
Indeno(1,2,3-cd)pyrene	5	µg/kg	---	28
Dibenz(a,h)anthracene	5	µg/kg	---	<5
Benzo(g,h,i)perylene	5	µg/kg	---	18
Coronene	10	µg/kg	---	<10
Benzo(e)pyrene	5	µg/kg	---	16
Perylene	5	µg/kg	---	21
Total PAHs	5	µg/kg	---	270
Surrogate 1 Recovery	-	%	---	80

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-B [R01]
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Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			24/06/2021 00:00	25/06/2021 00:00
Compound/Analyte	LOR	Units	B1044593-B/1	B1044593-B/2
			Results	Results
Poly Aromatic Hydrocarbons - Continued				
04-022 - PAH in Sediment by GCMS (NAGD2009) - Continued				
Surrogate 2 Recovery	-	%	---	58
Surrogate 3 Recovery	-	%	---	64
Organochlorine Pesticides				
04-024 - OC & OP Pesticides in sediment by GCMS				
Aldrin	1	µg/kg	<1	<1
BHC-alpha	1	µg/kg	<1	<1
BHC-beta	1	µg/kg	<1	<1
BHC-gamma	1	µg/kg	<1	<1
BHC-delta	1	µg/kg	<1	<1
Chlordane-cis	1	µg/kg	<1	<1
Chlordane-trans	1	µg/kg	<1	<1
DDD-p,p	1	µg/kg	<1	<1
DDE-p,p	1	µg/kg	<1	<1
DDT-p,p	1	µg/kg	<1	<1
Dieldrin	1	µg/kg	<1	<1
Endosulfan-alpha	1	µg/kg	<1	<1
Endosulfan-beta	1	µg/kg	<1	<1
Endosulfan-sulfate	1	µg/kg	<1	<1
Endrin	1	µg/kg	<1	<1
Endrin-ketone	1	µg/kg	<1	<1
Endrin-aldehyde	1	µg/kg	<1	<1
Heptachlor	1	µg/kg	<1	<1
Heptachlor-epoxide	1	µg/kg	<1	<1

Client	BMT Commercial Australia Pty Ltd	Project ID	Sediment - Brisbane River
Certificate Number	B1044593-B [R01]	Sampler	Customer
Page	6/8	Order Number	---

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			24/06/2021 00:00	25/06/2021 00:00
Compound/Analyte	LOR	Units	B1044593-B/1	B1044593-B/2
			Results	Results
Organochlorine Pesticides - Continued				
04-024 - OC & OP Pesticides in sediment by GCMS - Continued				
Hexachlorobenzene	1	µg/kg	<1	<1
Methoxychlor	1	µg/kg	<1	<1
Oxychlordane*	1	µg/kg	<1	<1
Surrogate Recovery	-	%	71	85
Organotins in Soil & Sediment				
04-026 - Determination of Organotins in Sediment/Soil by GCMS				
Monobutyltin (MBT as Sn)	4	µgSn/kg	<4.0	<4.0
Dibutyltin (DBT as Sn)	2	µgSn/kg	<2.0	<2.0
Tributyltin (TBT as Sn)	0.5	µgSn/kg	<0.5	<0.5
Tripropyltin (SUR) *	---	%	86.0	82.0
Monobutyltin (MBT)	0.007	µg/kg	<0.007	<0.007
Dibutyltin (DBT)	0.01	µg/kg	<0.01	<0.01
Tributyltin (TBT)	0.01	µg/kg	<0.01	<0.01
TPH (C6-36)+TRH (C6-40)+BTEX				
04-020 - TRH (C10-C40) & TPH (C10-C36) in Sediment by GC-FID				
TRH >C10-C16 Fraction	10	mg/kg	---	<10
TRH >C16-C34 Fraction	50	mg/kg	---	58
TRH >C36-C40 Fraction	50	mg/kg	---	<50
TRH >C10-C40 Fraction (Sum)	50	mg/kg	---	58
TPH C10-C14 Fraction	10	mg/kg	---	<10
TPH C15-C25 Fraction	50	mg/kg	---	<50
TPH C29-C36 Fraction	50	mg/kg	---	<50

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-B [R01]
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Project ID	Sediment - Brisbane River
Sampler	Customer
Order Number	---

Analytical Results

Analytical Results			B6-2C	B10-6C
Client Sample Description				
Client Sampling date/time			24/06/2021 00:00	25/06/2021 00:00
Compound/Analyte	LOR	Units	B1044593-B/1	B1044593-B/2
			Results	Results
TPH (C6-36)+TRH (C6-40)+BTEX - Continued				
04-020 - TRH (C10-C40) & TPH (C10-C36) in Sediment by GC-FID - Continued				
TPH C10-C36 Fraction (Sum)	50	mg/kg	---	<50
Surrogate Pentacosane (50-150%)	-	%	---	79
04-021 - C6-C10 Hydrocarbons & BTEXN in soil, sed & solid P&T GCMS				
Benzene	0.2	mg/kg	---	<0.20
Ethylbenzene	0.2	mg/kg	---	<0.20
meta- & para-Xylene	0.4	mg/kg	---	<0.40
ortho-Xylene	0.2	mg/kg	---	<0.20
Toluene	0.2	mg/kg	---	<0.20
Total Xylene	0.6	mg/kg	---	<0.60
Total BTEX	1.2	mg/kg	---	<1.2
TRH C6-C10 Fraction	25	mg/kg	---	<25
TPH C6-C9 Fraction	25	mg/kg	---	<25
NEPM F1: C6-C10 minus BTEX	25	mg/kg	---	<25
Surrogate 1,2-DE (50-150%)*	-	%	---	88
Surrogate 4-BFB (50-150%)*	-	%	---	92
Surrogate Toluene-D8 (50-150%)	-	%	---	95

Analysis Location

All in-house analysis was completed by Symbio Laboratories - Sydney.

Client	BMT Commercial Australia Pty Ltd
Certificate Number	B1044593-B [R01]
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Project ID	Sediment - Brisbane River
Sampler	Customer
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Revision Comments

[R01] - Results updated: Organotins

GRAIN SIZE ANALYSIS (hydrometer techniques)

2 sediment samples supplied by Symbio Laboratories Pty Ltd on 1 July, 2021 - Lab Job No. K8744.

Analysis requested by Customer Service Team

PO Box 4312 EIGHT MILE PLAINS QLD 4113

SAMPLE ID	Lab Code	TEXTURE ISSS classification	MOISTURE CONTENT (105 °C) (% Moisture)	GRAVEL > 2 mm (%)	SAND > 20 µm ISSS (< 2 mm fraction)	SILT 2-20 µm ISSS (< 2 mm fraction)	CLAY < 2 µm (< 2 mm fraction)
B1044593-A-001	K8744/1	Clay Loam	48.6%	3.1%	58.0%	12.7%	29.3%
B1044593-A-002	K8744/2	Clay Loam	51.2%	0.2%	55.2%	13.2%	31.6%

Note:

1. The Hydrometer Analysis method was used to determine the percentage sand, silt and clay, modified from SOP meth004 (California Dept of Pesticide Regulation), using method of Gee & Bauder (1986)," & in Methods of Soil Analysis. Part 1 Agron. Monogr. 9 (2nd Ed). Klute, A., American Soc. of Agronomy Inc., Soil Sci. Soc. America Inc., Madison WI: 383-411.
2. The texture classification was based on the hydrometer results and the appropriate texture triangle.
3. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (see EAL website: scu.edu.au/eal).
4. This report is not to be reproduced except in full.
5. This report was issued on 09/07/2021



QUALITY CONTROL REPORT

Certificate Number	B1044593-A	Page	1 of 4
Client	BMT Commercial Australia Pty Ltd	Laboratory	Brisbane
Contact	Darren Richardson	Address	52 Brandl Street, Eight Mile Plains, QLD 4113
Address	Level 8 200 Creek Street	Contact	Customer Service Team
	Brisbane, QLD 4000	Email	admin@symbiolabs.com.au
Telephone		Telephone	1300 703 166
Order Number		Date Samples Received	25/06/2021 16:00
Client Job Reference		Date Analysis Commenced	25/06/2021
No of Samples Received	2		
No of Samples Analysed	2	Issue Date	16/07/2021

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

This Quality Control Report contains the following information:

1. Method Blank (MB) Report; Limit of Detection and QC Result
2. Method Laboratory Control Sample (LCS) Report; QC Result and Acceptance Criteria
3. Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits

General Comments

The analytical methods used by the Environmental Department have been developed from established internationally recognized methods such as those published by the USEPA, APHA, AS and NEPM. In-house developed analytical methods are employed in the absence of documented standards or by client request.

Where a reported less than (<) result is higher than the LOD, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOD of a reported result differs from standard LOD, this may be due to high moisture content

Abbreviation:

QC Sample = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CRM = Certified Referenced Material; Used to verify in-house LCS

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOD = Limit of detection

RPD = Relative Percentage Difference

Client	BMT Commercial Australia Pty Ltd
Contact	Darren Richardson
Certificate Number	B1044593-A-R00
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Method Blank 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.

Method:Compound / QC Sample ID	Analyte	LOD	Units	QC Result
Lab Method: BE6042_0B (BatchID - 0080620)				
Method Blank - 0080620	Total Organic Carbon	0.05	%w/w	<0.05
Lab Method: ENV146 (BatchID - 0081555)				
Method Blank - 0081555	PCB 1016	0.1	mg/kg	<0.1
Method Blank - 0081555	PCB 1232	0.1	mg/kg	<0.1
Method Blank - 0081555	PCB 1242	0.1	mg/kg	<0.1
Method Blank - 0081555	PCB 1248	0.1	mg/kg	<0.1
Method Blank - 0081555	PCB 1254	0.1	mg/kg	<0.1
Method Blank - 0081555	PCB 1260	0.1	mg/kg	<0.1

Client	BMT Commercial Australia Pty Ltd
Contact	Darren Richardson
Certificate Number	B1044593-A-R00
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Method Laboratory Control Sample Report

The quality control term Laboratory Control Sample (LCS) refers to a certified reference material (CRM) or a sample with known parameters that have been verified against a CRM. The quality control term Spike (SPK) refers to a known interference free matrix spiked with target analytes. The purpose of these QC parameters is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Method : Compound / QC Sample ID	Analyte	LOD	Units	QC Test Results	Expected Value	QC Recovery	QC Criteria
Lab Method: BE6042_0B (BatchID - 0080620 - LCS_EBNE00173)							
LCS_EBNE00173	Total Organic Carbon	0.05	%w/w	4.2	4.06	103%	90% - 110%
Lab Method: ENV146 (BatchID - 0081555 - LCS_EBNE00100)							
LCS_EBNE00100	PCB 1016	0.1	mg/kg	0.081	0.1	80%	50% - 150%
LCS_EBNE00100	PCB 1232	0.1	mg/kg	0.072	0.1	71%	50% - 150%
LCS_EBNE00100	PCB 1242	0.1	mg/kg	0.067	0.1	67%	50% - 150%
LCS_EBNE00100	PCB 1248	0.1	mg/kg	0.084	0.1	84%	50% - 150%
LCS_EBNE00100	PCB 1254	0.1	mg/kg	0.060	0.1	60%	50% - 150%
LCS_EBNE00100	PCB 1260	0.1	mg/kg	0.10	0.1	100%	50% - 150%

Client	BMT Commercial Australia Pty Ltd
Contact	Darren Richardson
Certificate Number	B1044593-A-R00
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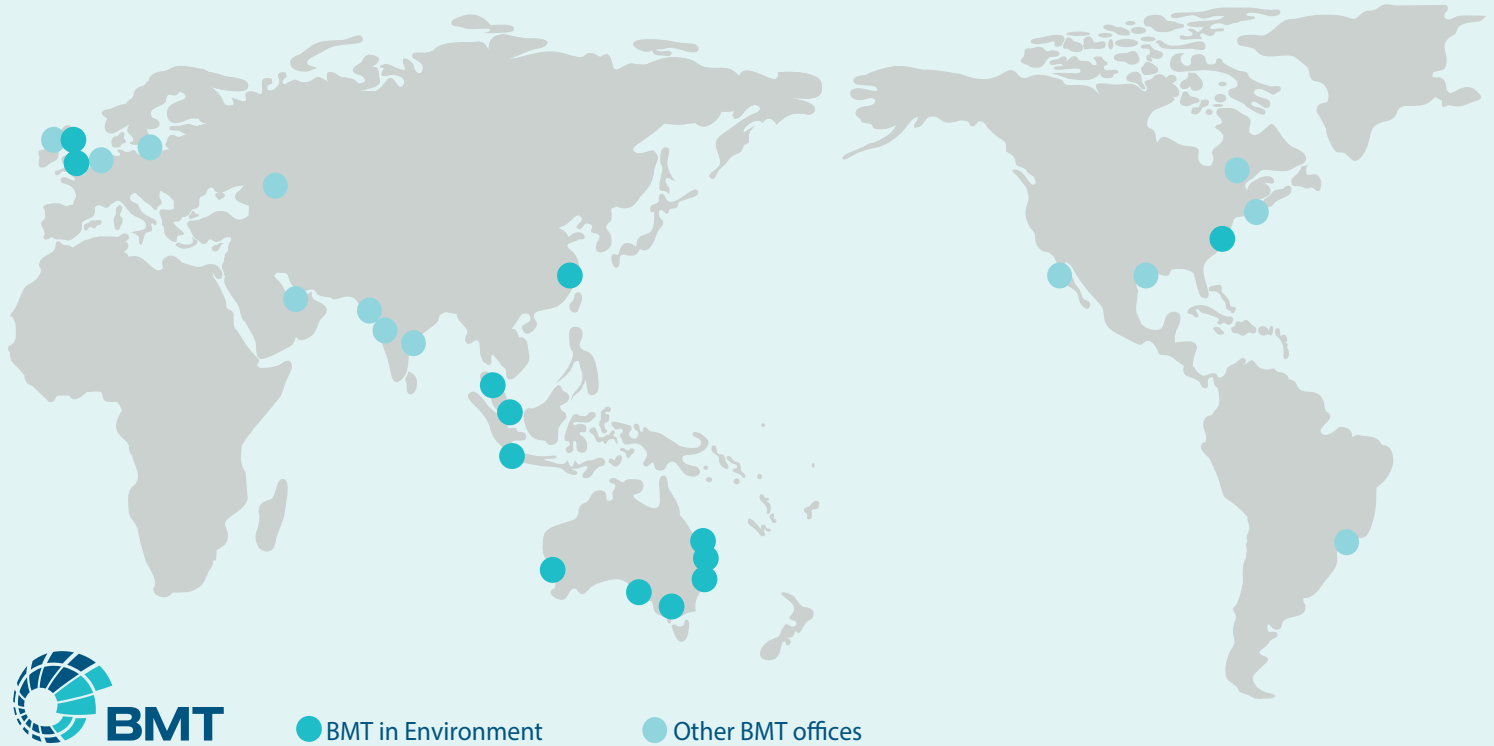
Laboratory Duplicate Report

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 the relevant technical method manuals and are dependent on the magnitude of results in comparison to the level of reporting.

Method : Compound / QC Sample ID	Analyte	LOD	Units	Original Result	Dup Result	RPD	RPD Acceptance Criteria
Lab Method: BE6042_OB (BatchID - 0080620)							
Laboratory Duplicate Sample - 0080620	Total Organic Carbon	0.05	%w/w	1.5	1.7	12.5%	<30%
Lab Method: ENV146 (BatchID - 0081555)							
Laboratory Duplicate Sample - 0081555	PCB 1016	0.1	mg/kg	<0.1	<0.1	-	N/A
Laboratory Duplicate Sample - 0081555	PCB 1232	0.1	mg/kg	<0.1	<0.1	-	N/A
Laboratory Duplicate Sample - 0081555	PCB 1242	0.1	mg/kg	<0.1	<0.1	-	N/A
Laboratory Duplicate Sample - 0081555	PCB 1248	0.1	mg/kg	<0.1	<0.1	-	N/A
Laboratory Duplicate Sample - 0081555	PCB 1254	0.1	mg/kg	<0.1	<0.1	-	N/A
Laboratory Duplicate Sample - 0081555	PCB 1260	0.1	mg/kg	<0.1	<0.1	-	N/A

BMT has a proven record in addressing today's engineering and environmental issues.

Our dedication to developing innovative approaches and solutions enhances our ability to meet our client's most challenging needs.



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