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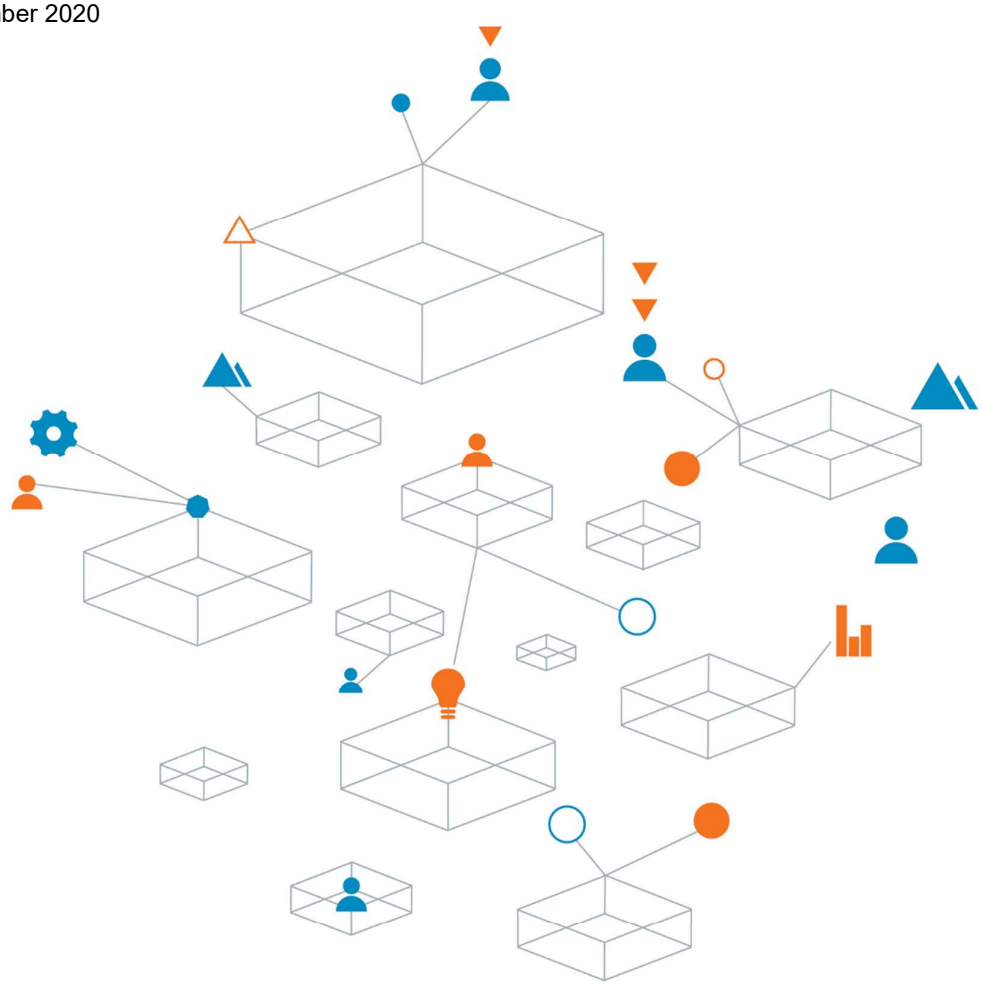
BlueCHP Limited

Detailed Site Investigation Report SYDEN282995-R01

20 and 22 Mindarie Street and 30 Pinnaroo Place, Lane Cove North NSW

15 December 2020



Trust is the cornerstone of all our projects

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Detailed Site Investigation Report

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1. Introduction

1.1. Background

BlueCHP Limited are redeveloping the property located at 20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW (the site). The redevelopment will be for high-density residential purposes.

NSW Land and Housing Corporation (LAHC) engaged Coffey Services Australia Pty Limited (Coffey) to undertake a Detailed Site Investigation (DSI) at the site in November 2019. Coffey's DSI report (reference SYDEN233878-R01-Rev1) was issued on 13 November 2019. With written approval from LAHC, Coffey has reissued this DSI report to BlueCHP in December 2020 to support an application for planning approval for redevelopment of the site. LAHC is the current land owner.

Coffey previously undertook a Phase 1 Preliminary Contamination Assessment (PCA) at the site, as detailed in the following report:

- Coffey (2017), Preliminary Contamination Assessment, 20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW, dated 20 January 2017, report ref. SYDEN198927-R06.

This PCA report identified a number of potential sources of contamination and recommended further investigations to be carried out. Specifically, it was recommended that a Hazardous Building Materials Survey (HAZMAT) and a Phase 2 DSI be undertaken for the site.

This DSI was undertaken in general accordance with the proposal submitted by Coffey to LAHC dated 5 September 2019, ref. SYDEN233876-P01. It is noted that a HAZMAT survey was also completed as part of this commission and is presented in the following report:

- Coffey (2019), Pre-Demolition Asbestos and Hazardous Materials Survey, 20-22 Mindarie Street and 30 Pinaroo Place, Lane Cove North NSW, 2066, dated 1 November 2019.

1.2. Objectives

The objectives of this DSI are to:

- Complete an investigation to collect data to enable an assessment of the areas of environmental concern identified in the PCA (Coffey, 2017).
- Provide an opinion on the suitability of the site for the proposed residential development in accordance with *SEPP 55 Remediation of Land*.

To meet these objectives, the DSI has been undertaken in general accordance of relevant guidelines (current in November 2019) including the NSW OEH (2011) 'Guidelines for Consultants Reporting on Contaminated Sites' and the NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM).

1.3. Scope of Works

The scope of works included the following:

- Safety planning including preparation of a Site-specific Safety Plan (SSP), Safe Work Method Statements (SWMS) and obtaining Dial-Before-You-Dig (DBYD) plans;
- Review the previous PCA Report (Coffey, 2017) for the site and previous environmental reports (if available).
- Engagement of a certified underground service locator to provide underground service clearance.
- Site attendance by a qualified and experienced Coffey Environmental Scientist or Engineer, who to undertake the following:

- Conduct a detailed site walkover inspection of the site to identify if site conditions have changed since the previous investigation.
- Collection of soil samples from 7 borehole locations. Boreholes were advanced using hand auger to a maximum depth of 1m or 0.5m into natural soils.
- Soil samples were screened in the field using a calibrated photo-ionisation detector (PID) to assess the potential presence of ionisable volatile organic compounds (VOC). Soil conditions were logged by the Coffey scientist/engineer in accordance with the Unified Soil Classification System (USCS).
- Laboratory analysis of selected soil samples for Contaminants of Potential Concern (COPCs) identified in the PCA.

- Data assessment and interpretation; and
- Preparation of a DSI report about soil contamination on the site (this document).

2. Site Information

2.1. Site Identification

The site identification details are summarised in Table 2-1.

Table 2-1: Site Identification Details

Site Address	20&22 Mindarie Street & 30 Pinaroo Place, Lane Cove North NSW. Figure 1 shows the location of the site.
Total Site Area	The assessment area is approximately 1,750m. Refer to Figure 2 for the assessment area.
Title Identification Details	Lots 81, 82 and 83 in DP 35865
Current Zoning	"R4 – high density residential" pursuant to the Lane Cove Local Environmental Plan 2009.
Current Site Use	Occupied by three residential dwellings.
Adjoining Site Uses	North: Mindarie Street followed by a high-density residential land uses. South: Low density residential. East: Pinaroo Place followed by high density residential land uses. West: Low density residential land uses.

2.2. Site Walkover Inspection

A site walkover inspection was carried out by a suitably qualified and experienced Coffey Environmental Scientist on 8 October 2019. The site conditions were observed to be broadly consistent with the conditions identified during the Coffey (2017) PCA investigation, which included the following:

- The site was occupied by three vacant residential houses. The land sloped relatively steeply to the south east.
- Each of the three lots were occupied by a residential dwelling. Building materials included brick, wood and tiled roof. Cement fibre sheeting were observed on the eaves of the buildings and in electrical boxes.

- Building conditions were in good condition with some evidence of depredation/weathering.
- The houses were surrounded by grassed lawn with signs of stress noted in places, however this was likely due to lack of maintenance. Areas of brown grass were observed in places around the perimeter of the site, likely associated with weed control.
- Fragments of asbestos fibre cement sheeting were observed on the ground surface beneath the dwellings at 20 and 22 Mindarie Street.
- A small, corrugated iron garden shed was identified at 22 Mindarie Street and was situated on a concrete pad. No chemicals or evidence of staining was identified within this shed.
- A large stockpile of mulch was observed on the driveway at 22 Mindarie Street.
- Driveways consisted of two concreted strips with exposed soil/grass within the middle.
- Pavements generally consisted of concrete driveways and paths and were in good condition, with no significant staining observed.
- With the exception of topsoil, no evidence of fill material was identified with current site buildings appearing to be 'cut' into the sloping site.
- There was no evidence of the presence of current or former underground septic or storage tanks on the site (including fill point, dip points, vent pipes or bowser plinth).
- No evidence of chemical storage or spills of fuel/oil and household chemicals was observed during the site walkover.

Selected site photographs are presented in Appendix E.

3. Previous Environmental Assessments

3.1. Preliminary Contamination Assessment (Coffey, 2017)

The PCA report presented a summary of the historical uses of the site based on a review of selected aerial photographs, NSW EPA public registers and Council planning records/certificates and identified the following:

- The site is underlain by Hawkesbury Sandstone (NSW Dept. of Mineral Resources, 1983; Scale 1:100,000). The Hawkesbury Sandstone is described as medium to course grained sandstone with very minor shale and laminate lenses.
- The depth of groundwater at the site is expected to be at depths (approximately > 10m bgl) within the weathered sandstone aquifer. Considering the topography of the site, groundwater is likely to flow in a south/south easterly direction towards Stringybark Creek which is a tributary for the Lane Cove River located west of the site.
- The elevation of the site ranges from 58mAHD (Australian Height Datum) within the north western corner or the site, dropping down to 50mAHD in the south eastern corner.
- Stringybark Creek is the nearest surface water receptor which is located approximately 160m south of the site. Sensitive human receptors include a nearby primary school located approximately 40m north and residential properties surrounding the site.
- A review of historical aerial photographs for the site indicated that the site was vacant land up until between the mid-1940s and mid-1950s. The site was then developed into residential land which resembles the current site layout. The site has remained relatively unchanged since.
- Building materials were identified to be brick and wood with fibre cement sheeting potentially containing asbestos identified on the eaves of the buildings and potential lead-based paint.

- The site was not identified as being listed on the NSW EPA contaminated land register or licenced under the POEO register, with previous land uses not identified as being significantly contaminating activities;
- Multiple nearby properties on the POEO register and historical land uses including service stations and mechanical workshops were identified within the surrounding area. However, due to These properties were located nearly 1km from the site and considering the inferred groundwater flow direction (south/south east), the risk for offsite contamination migration was considered to be negligible;
- Acid sulfate soils are not expected within the site.
- The following potential sources of contamination were identified:
  - Weathering of Hazardous building materials;
  - Potential for minor oil/fuel leaks from vehicles and storage of small quantities of fuel and oil; and
  - Historical and current use of pesticides and herbicides.

Based on the findings of the PCA, Coffey recommended a DSI and Hazardous Building Materials Survey be undertaken at the site.

4. Data Quality Objectives

As stated in Section 18 (Appendix B) of Schedule B2 'Guideline on Site Characterisation' of the *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM)* 2013, Data Quality Objectives (DQOs) are used to "define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site".

Data Quality Objectives (DQOs) were developed for this LSI and are summarised in Table 4-1.

Table 4-1: Data Quality Objectives

1. State the problem	The primary objective is to investigate the nature and extent of contamination at the site (if any) to assess if the site is suitable (or can be made suitable) for the proposed development. The main problems are: • How many boreholes should be sampled and where? • Are there access restrictions present that may affect the location of boreholes? • To what depths should the boreholes be drilled? • At what depth should soil samples be collected? • What are the contaminants of potential concern for soil?
2. Identify the decision	Is the site suitable for the proposed high-density residential land use.
3. Identify inputs to the decision	The primary inputs to assessing the above include: • Information gathered from a Preliminary Contamination Assessment (Coffey, 2017) of the site, including a review of site history, environmental setting and information gathered from a site walkover. • Field observations, PID screening results, and soil laboratory results • Relevant legislation and regulatory guidelines.

4. Define the boundaries of the study	The study boundaries are defined by the boundaries of the site as shown in Figure 2. The vertical boundary was approximately 1m below the existing ground surface or the observed depth of fill.
5. Develop a decision rule	The decision rule for soil for each chemical/layer to assess the suitability of the site will be as follows: *Health Investigation Levels and Health Screening Levels:* • Where data sets are not sufficiently populated to calculate a 95% UCL then individual results are to be less than the health-based assessment criteria. Where individual concentrations are more than the health-based assessment criteria then further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment. • Where the 95% UCL can be calculated, the 95% UCLs are to be less than the health based assessment criteria and no individual results in the data set are to be greater than 250% of the assessment criteria; and the standard deviation of the data set is to be within 50% of the assessment criteria. • Where the 95% UCL is less than the assessment criteria then further assessment and/or management would normally not be required. *Environmental Investigation Levels and Ecological Screening Levels (ESL)* • Data is to be compared directly to environmental based assessment criteria. Where individual concentrations are more than the EILs / ESLs, further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment. *Background Levels* • Coffey will review published background ranges to assess background concentrations for use in calculating EILs and ESLs. *Asbestos* • Visual observation for the presence of asbestos in the form of ACM during the investigation will be undertaken. Selected samples of fill will also be collected and submitted to the laboratory for asbestos analysis. • Should asbestos ACM be observed, or detected by the laboratory, then site specific factors will be considered and an approach for further investigation and/or remediation be assessed.
6. Acceptable limits on decision error	There are two main sources of decision errors: • Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and • Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction. Results may lead the decision maker to make the following errors: • Type I: deciding that the soil is not contaminated and, therefore, the site is suitable for the proposed high-density residential development when the reverse is true; and

	• Type II: deciding that the soil is contaminated and, therefore, the site is not suitable for the proposed high-density residential development when the reverse is true. An assessment will be made as to the likelihood of a Type I decision error being made based on the results of a QA/QC assessment and the closeness of the data to assessment criteria. Additionally, statistical methods may be utilised, where applicable, such as 95% Upper Confidence Limit (UCL) calculations. The investigation levels for assessment are nominated in Section 6. A Type II error would result in additional investigation which almost certainly would allow correction of that error.
7. Optimise the design for obtaining data	Based on the previous Steps 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in the following sections (i.e. proposed field and laboratory programs).

5. Sampling and Analysis Plan

In accordance with the NSW EPA (1995) *Sampling Design Guidelines, Contaminated Sites,* a total of 7[1] boreholes (BH1 – BH7) were drilled in accessible locations at the site, using hand auger to depths of 0.1 m to 0.4 m below ground surface (bgs) and terminated upon refusal on weathered sandstone bedrock. An additional three surface samples were collected (SS-01 to SS-03) for asbestos analysis.

The soil investigation locations are shown on Figure 2.

5.1. Soil Sampling

The investigation works followed the procedures outlined in Table 5-1.

Table 5-1: Site Investigation and Soil Sampling Procedures

Activity	Detail / Comments
Below Ground Service Clearance	Coffey reviewed Dial Before You Dig (DBYD) for the site to identify potential underground utilities in the vicinity of borehole locations. These were also provided to an accredited utilities locator who were engaged to locate the underground utilities on 8 October 2019.
Soil Sampling	Soil samples were collected directly from the hand auger using a clean pair of nitrile gloves for each sample. Samples were collected from the near surface and then at approximately 0.5m intervals to the base of the borehole.
Soil Logging	Soil was logged by a suitably qualified and experienced Coffey scientist/engineer in accordance with Coffey's relevant Standard Operating Practice (SOP), which is consistent with Section 7.3, Field Description of Soils, in Schedule B2 of the ASC NEPM. Evidence of anthropogenic material and contamination (i.e. odours or staining) were recorded on the logs which are presented in Appendix C.

[1] Based on a site area of 1,750m^2, 7 sampling locations allows for the detection of a 19.9m diameter hotspot with 95% confidence.

Soil Screening	Soil samples were screened in the field for the presence of ionisable VOCs using a PID fitted with a 10.6eV lamp. Calibration certificate is presented in Appendix D. Headspace screening results are recorded on borehole logs presented in Appendix C.
Sample Handling and Transportation	Sample collection, storage and transport were in general accordance with Coffey's SOP. Soil samples were placed into laboratory prepared and supplied glass jars, fitted with Teflon lined seals to limit possible volatile loss. Sample jars were filled to minimise headspace. Separate samples for asbestos analysis were collected and placed in double zip lock bags. The samples were placed into ice chilled coolers and dispatched to NATA accredited laboratories for analysis under chain of custody (CoC) control. CoC's are presented with the laboratory certificates included in Appendix F.
QA/QC Samples	To measure the accuracy and precision of the data generated by the field and laboratory procedures for this assessment, Coffey collected and analysed the following quality assurance / quality control (QA/QC) samples: • Two inter-laboratory duplicate soil samples; • One intra-laboratory duplicate soil samples; • One trip blank and one trip spike sample was included in the batch of samples to assess whether volatile organic contamination may have been introduced to the samples or volatile organic contamination may have been lost from the samples during shipping and field handling procedures.
Decontamination of sampling equipment	The hand auger was stopped when the target sample depth was reached and lifted to allow samples to be collected directly from the hand auger, decontamination of the hand auger was undertaken between sampling locations using Decon90 and rinsing with deionised water.

5.2. Analytical Suite

Samples were analysed by Eurofins | MGT (primary laboratory), and ALS (secondary laboratory). Both laboratories are NATA accredited for the analytes selected.

A selection of primary soil samples were submitted for laboratory analysis for a suite of chemicals of potential concern as summarised in Table 5-2. From each borehole a near surface sample (0.1mbgl) and a slightly deeper sample (0.5mbgl) was selected with the remaining sample placed on hold at the laboratory.

Table 5-2: Summary of Analysis

Chemical of Concern	No. Primary Soil Samples
Heavy metals (8 priority elements)	11
TRH	11
BTEXN	11
PCBs	3
PAH	3
Herbicides	7
OCP / OPP	7
Asbestos in soil (presence/ absence)	11

Copies of borehole logs are provided in Appendix C, with laboratory test certificates provided in Appendix F.

6. Assessment Criteria

Assessment criteria were selected for relevance to the proposed high-density residential land use. The criteria presented below are intended to apply as Tier 1 risk assessment criteria based on certain site-specific characteristics. Where concentrations of a contaminant exceed the generic assessment criteria, then further consideration of the specific exposure pathway is required which may warrant further investigation, assessment or the development of a strategy to mitigate the potential risks identified.

6.1. Health and Ecological Investigation Levels (soil)

Health and ecological investigation levels for soil presented in Schedule B1 of the ASC NEPM were selected as investigation levels for chemical contaminants in soil. Health and ecological investigation and screening levels are applicable to the first stage (Tier 1) of site assessment and are used to assist in the iterative development of a Conceptual Site Model (CSM). They are adopted as concentrations of a contaminant above which either further appropriate investigation and/or evaluation will be required, or development of an appropriate management strategy (including remediation).

Health Investigation Levels (HILs) are applicable for assessing human health risk via relevant exposure pathways. HILs were developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of 3m below the soil surface for residential sites.

Ecological Investigation Levels (EILs) are associated with selected metals and organic compounds and have been developed for assessing risk to terrestrial ecosystems under residential, open space and commercial/industrial land use scenarios. They apply to the top 2m of accessible soil, which corresponds to the root zone and habitation zone of many species. As the future site layout and design plans are currently not known, EILs have been applied to all soil samples as a conservative approach.

The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation after vapour intrusion into indoor air and direct contact with soil and groundwater. These HSLs depend on specific soil physicochemical properties, building configurations and land use scenarios.

The ESLs have been developed for selected petroleum compounds and fractions and are applicable for assessing risk to terrestrial ecosystems. The ESLs broadly apply to coarse and fine-grained soils

under various land use scenarios and are applicable to the top 2m of accessible soil. ESLs have been applied to all soil samples as a conservative approach.

6.2. Health-based Criteria

The intended future use of the site is considered consistent with the “Residential B” exposure scenario described in Schedule B7 of the ASC NEPM which allows for minimal opportunities for soil access and includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.

Chemicals with sufficient volatility to pose potential health risks via vapour inhalation pathway; namely TRH F1 and F2 fractions, BTEX and naphthalene concentrations were compared to the soil Health Screening Levels (HSLs) for vapour intrusion applicable to high density residential listed in Table 1A(3) in Schedule B1 of the ASC NEPM. Adopted values for health-based criteria are summarised in Table 6-1.

The adopted screening levels apply to a sandy soil.

The HILs for heavy metals, PAH, pesticides and PCBs in soils are selected from relevant values in Table 1A(1) in Schedule B1 of the ASC NEPM. Adopted values for health-based criteria are summarised in Table 6-1.

Table 6-1: Summary of HIL-B Soil Acceptance Criteria

Analyte	HILs for Residential B (mg/kg)
Arsenic (total)	500
Cadmium	150
Chromium (III)[1]	500
Copper	30,000
Lead	1,200
Mercury (inorganic)	120
Nickel	1,200
Zinc	60,000
Carcinogenic PAHs as Benzo(a)pyrene TEQ[2]	4
Total PAHs	400
Aldrin + Dieldrin	10
Chlordane	90
DDT+DDD+DDE	600
Endosulfan	400
Endrin	20
Chlorpyrifos	340
Heptachlor	10
HCB	15
Methoxchlor	500
Non-dioxin like PCB	1

[1] Laboratory Total Chromium results (or Total Chromium minus Chromium III) will be assessed against the HIL for Chromium VI as initial screening assessment.
[2] TEQ = Toxicity Equivalent Quotient

The HSLs for TRH, BTEX and naphthalene in soils are summarised in Table 6-2.

Based on the dominant soil texture, the HSLs for sandy soils have been adopted.

Table 6-2: Summary of HSL-A&B Health Screening Levels

Chemical	HSL A&B – Low-high density residential (for sandy soils) (mg/kg)	HSL-B Direct Contact[2] (mg/kg)	Intrusive Maintenance Worker[2/3] (mg/kg)
	0m to <1m		
Benzene	0.5	140	120,000 / NL
Toluene	160	21,000	85,000 / NL
Ethylbenzene	55	5,900	130,000 / NL
Xylenes	40	17,000	29,000 / NL
Naphthalene	3	2,200	1100 / 77
F1 (TPH C_6-C_{10} – BTEX)	45	5,600	82,000 / NL
F2 (TPH >C_{10}-C_{16} – Naphthalene)	110	4,200	62,000 / NL

Notes:
NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).
Soil type is sandy soils based on field observation.
1. *Table 1A(3) – Soil Health Screening Levels for Vapour Intrusion (Schedule B1, ASC NEPM - NEPC, 2013)*
2. *Table A4 - Soil Health Screening levels for Direct Contact and Intrusive Maintenance Worker (CRC CARE, 2011)*
3. *Table A3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC CARE, 2011)*

6.3. Asbestos

Qualitative testing (presence) was undertaken on soil samples to assess for potential asbestos impact.

For the purpose of this assessment, a criterion of “no asbestos fines or asbestos containing materials detected in soils” has been adopted. For clarity, asbestos fines includes free asbestos fibres in soil.

6.4. Ecological Investigation and Screening Levels

To assess the impact on ecosystems including site vegetation from contamination within the upper 2m of the subsurface, the ASC NEPM presents Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for different land uses (e.g. areas of ecological significance, urban residential/public open space, commercial/industrial).

The EILs derived for heavy metals in soils are summarised in Table 6-3.

Table 6-3: Summary of Ecological Investigation Levels in Soil

Chemical	Urban Residential / Public Open Space (mg/kg)		
	Contaminant Limit	Ambient Concentration[(4)]	EIL[(5)]
Arsenic	100	5	100
Chromium	190[(1)]	15	210
Copper	280[(6)]	30	310
Lead	1,100	160	1,260
Nickel	30[(2)]	5	40
Zinc	230[(3)]	120	350
Naphthalene	170	-	170

[1] Based on a (conservative) clay content 1%.
[2] Based on a cation exchange capacity of 5cmol$_c$/kg typical of a granular soil with minor clay
[3] Based on a cation exchange capacity of 5cmol$_c$/kg typical of a granular soil with minor clay and a pH of 6.5.
[4] Derived from Olszowy.H et al (1995) using 25%ile concentrations for an old suburb with high traffic in NSW.
[5] EIL = Contaminant Limit + Ambient Background Concentration, rounded.
[6] Based on a pH of 6.5.

The ESLs for TRH, BTEX and benzo(a)pyrene in soils from Schedule B1 in the ASC NEPM are summarised in Table 6-4. Based on the dominant soil texture, ESLs for coarse grained (sand) soils have been adopted as a conservative approach.

Table 6-4: Summary of ESLs in Soil

Chemical	ESL – Urban Residential and Public Open Space [1] (mg/kg)
F1 C_6-C_{10}	180
F2 C_{10}-C_{16}	120
F3 >C_{16}-C_{34}	300
F4 >C_{34}-C_{40}	2,800
Benzene	50
Toluene	85
Ethylbenzene	70
Xylenes	105
Benzo(a)pyrene	0.7

[1] Coarse grained soils have been adopted as a conservative approach.

6.5. Management Limits

In accordance with Section 2.9 of Schedule B1 of the ASC NEPM, consideration of Management Limits for petroleum hydrocarbons has been included to assess the potential for accumulation of explosive vapours, the potential risk to buried infrastructure, or the formation of phase separated hydrocarbons (PSH).

A summary of the adopted management limits for this site is provided in Table 6-5.

Table 6-5: Summary of Site Management Limits

Chemical	Soil Type	Residential, parkland and public open space (mg/kg)
F1: TRH C_6-C_{10}	Coarse	700
F2: TRH C_{10}-C_{16}	Coarse	1,000
F3: TRH C_{16}-C_{34}	Coarse	2,500
F4: TRH C_{34}-C_{40}	Coarse	10,000

6.6. Aesthetic Considerations

There are no quantitative guidelines for aesthetics, however site assessment requires balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the future land use and its sensitivity. General assessment considerations for this assessment include:

- That chemically discoloured soils or large quantities of various types of inert refuse, particularly if unsightly, may cause ongoing aesthetic concerns to site users.
- The depth of the materials, including chemical residues, in relation to the final surface of the site.
- The need for, and practicality of, any long-term management of foreign material.

6.7. Waste Classification Thresholds

Contaminant threshold (CT) values, specific contaminant concentration (SCC) and TCLP test values were adopted from Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA 2014) to provide an indication of waste classification status of soil for disposal at landfill, if required.

Asbestos is pre-classified as Special (Asbestos) Waste under the POEO Act 1997.

7. Quality Assurance / Quality Control

Coffey undertook a Quality Assurance and Quality Control (QA/QC) assessment to address data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations and the processes for assessment of data quality provided in Section 19 (Appendix G) of Schedule B2 Guideline on Site Characterisation of the ASC NEPM.

The field and laboratory QA/QC procedures adopted and summary of results for this assessment are provided in Appendix G. In summary the data is considered to be adequately complete, comparable, representative, precise, accurate and usable for the objective of the works.

8. Results

8.1. Site Specific Geology

Table 8-1: Summary of Site-Specific Geology

Material / Origin	Depth to Top of Unit (mbgs)	Thickness of Unit (m)	Material Description
Fill	0.0 to 0.1	0.1	A layer of topsoil fill material was encountered across the site and typically comprised heterogeneous mixtures of gravelly / silty sand, brown, fine grained with some organic matter. No anthropogenic inclusions, staining, odours or asbestos were observed.
Weathered Sandstone	0.1 - 0.4	Not Proven	Weathered sandstone was encountered in all boreholes and comprised clayey sand, orange / red / brown, fine to medium grained, some medium plasticity clay. No odour or staining was observed within the residual soil / weathered sandstone. Refusal was reached during hand augering, on sandstone bedrock.

			Groundwater was not observed.

The lithology encountered at each borehole location is shown on the borehole logs included within Appendix C.

8.2. Field Screening

Soil samples were screened for the presence of volatile hydrocarbons using a PID. The PID readings were between 0.1 ppm and 0.4 ppm, indicating that volatile hydrocarbons were unlikely to be present at reportable concentrations in the samples screened.

Individual PID readings are reported on the borehole logs presented in Appendix C.

8.3. Soil Results

8.3.1. Health-based Investigation and Screening Levels

Soil analytical results from boreholes BH01 to BH07 sampled on 8 October 2019 are presented in Table 1 (Appendix B). Chemical concentrations reported for soil samples were less than the adopted health-based investigation and screening levels in all samples analysed.

Copies of laboratory reports are provided in Appendix F.

8.3.2. Asbestos

Materials suspected to contain asbestos were not observed in any of the boreholes sampled during this soil investigation. Laboratory analysis of fill material did not identify the presence of asbestos within the samples.

Visible fragments of asbestos fibre cement sheeting were observed beneath the houses at 20 and 22 Mindarie Street, samples were collected during the HAZMAT investigation and laboratory analysis confirmed the material to contain asbestos (Coffey, 2019). The fragments were observed to be angular in size and were mixed within gravelly fill. The extent of asbestos fibre cement fragments beneath the houses is unknown due to access constraints. Access to soils beneath the house at 30 Pinaroo Place was not available.

8.3.3. Ecological-based Investigation and Screening Levels

Soil analytical results from boreholes BH01 to BH07 sampled on 8 October 2019 are presented in Table 1 (Appendix B). Chemical concentrations reported for soil samples were less than the adopted ecological-based investigation and screening levels in all samples analysed, with the exception of zinc in sample BH04_0.0-0.1 (410mg/kg) collected from topsoil material, which exceeded the EIL of 350mg/kg.

Copies of laboratory reports are provided in Appendix F.

8.3.4. Management Limits and Direct Contact

There were no exceedances above the soil criteria for direct contact of intrusive maintenance workers (CRC Care, 2011) or the management limits for petroleum hydrocarbons (NEPC, 2013).

8.3.5. Preliminary Waste Classification

The soil analytical results were compared to thresholds listed in the NSW EPA (2014) 'Waste Classification Guidelines - Part 1: Classifying Waste'. Based on this comparison, Coffey provides the following preliminary waste classification:

- The concentrations of chemicals in the topsoil fill material across the site (excluding gravelly fill beneath 20/22 Mindarie St) were found to be below the CT1 criteria, with the exception of lead in samples BH01_0.0-0.1, BH03_0.0-0.1, BH04_0.0-0.1. Further TCLP analysis was requested, which were below the TCLP1 waste threshold, indicating low leachability, classifying the remaining fill material as General Solid Waste (non-putrescible).

- Gravelly fill material beneath the houses at 20 and 22 Mindarie Street would classify as Special Waste – Asbestos Waste. Access to beneath the house at 30 Pinaroo Place was not available.

- A total of 4 samples of the residual were selected for analysis of the COPCs, with the reported concentrations of TRH and BTEXN being below the LOR. Concentrations of heavy metals were attributed to background levels resulting from historical development of the locality and were comparable with the range of concentrations listed in Olszowy. H et al (1995) Trace Element Concentrations in Soils from Rural and Urban Areas of Australia: Appendix 1, New South Wales, Old Suburb, high traffic. The underlying natural weathered sandstone bedrock would be classified as Virgin Excavated Natural Material (VENM). This classification would only apply where this is segregated from the fill material, and not mixed with other man-made materials or other wastes.

9. Conceptual Site Model

A conceptual site model (CSM) is a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is summarised in Table 9-1 below.

Table 9-1: Conceptual Site Model

Source	Contaminant & Known Location	Potential Transport Mechanisms	Exposure Pathway	Receptors
Bonded fragments of asbestos fibre cement sheeting	• Beneath the houses at 20 and 22 Mindarie Street. • Access to beneath the house at 30 Pinaroo Place was not available.	• Disturbance via construction/ maintenance subsurface works • Dispersion via wind if exposed	Inhalation of airborne fibres	Construction workers during redevelopment of the site. Users of adjoining land during excavation works (if undertaken) and future site users. Construction workers (future maintenance involving excavation) Future site users (residential)
Fill deposits impacted with zinc (EIL)	• Zinc in sample BH04_0.0-0.1 (410mg/kg)		Uptake from vegetation and terrestrial ecosystem	Terrestrial ecosystems and future landscaping. (potentially complete where fill containing zinc is used as planting medium for future landscaping

10. Discussion

The results of this DSI did not identify contamination concentrations exceeding the adopted human health criteria for high density residential land uses. An exceedance above the ecological criteria for zinc was reported in surface fill material at sampling location BH04 and may present a potential risk to ecological receptors should this soil be used for future landscaping. It is noted however that the surface topsoil will likely be removed from the site during redevelopment, and therefore the risk to the ecological receptors is considered to be low. It is recommended that landscaping areas (if proposed) are constructed using certified planting medium.

Asbestos fibre cement sheet fragments were observed on surface fill material beneath the houses at both 20 and 22 Mindarie Street. The source of the fragments is unknown but may be associated with building materials within each house. Appropriate waste classification and off-site disposal of this material is required following demolition of the site structures. It is noted that access to beneath the house at 30 Pinaroo Place was not available.

11. Conclusions and Recommendations

Based on a review of available data, observations made during fieldwork and an assessment of laboratory analytical data, Coffey makes the following conclusions:

- The site is currently occupied by three separate low-density residential dwellings, which were observed to be in good condition.
- The typical soil profile across the site consisted of a thin layer of topsoil fill material, underlain by weathered sandstone bedrock.
- Results of the soil investigation did not identify soil contamination concentrations exceeding the adopted human health criteria within soil samples analysed from the seven boreholes BH01 to BH07.
- An exceedance above the ecological criteria for zinc was reported in shallow material at one sampling location, presenting a potential risk to ecological receptors should this soil be used for future landscaping.

In summary, based on the findings of the investigation and in consideration of the key conclusions outlined above, Coffey concludes that the site can be made suitable for the proposed high-density residential land use, provided the following recommendations are implemented:

- **Remedial Action Plan (RAP)** – it is recommended that a RAP is developed that presents the preferred remedial strategy to manage contamination impacts (specifically, Asbestos) identified and thereby make the site suitable for the proposed use. The RAP should also include an Unexpected Finds Protocol (UFP) which will manage unexpected contamination encountered during redevelopment of the site, as well as a process for classifying surplus soil materials that will be removed from the site during redevelopment.
- **Asbestos Removal Control Plan** - which will outline how hazardous building materials will be removed prior to the demolition of site buildings in accordance with relevant legalisation, and to prevent potential cross contamination of the soils at the site.

This report should be read in conjunction with the attached “Important information about your Coffey Environmental Report”.

12. References

AS4482.1 (2005) Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil [Parts 1 and 2].

Coffey (2017), Preliminary Contamination Assessment, 20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW, dated 20 January 2017, report ref. SYDEN198927-R06.

Coffey (2019), Pre-Demolition Asbestos and Hazardous Materials Survey, 20-22 Mindarie Street and 30 Pinaroo Place, Lane Cove North NSW, 2066, dated 1 November 2019.

NEPC (2013); National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013). (ASC NEPM) National Environment Protection Council.

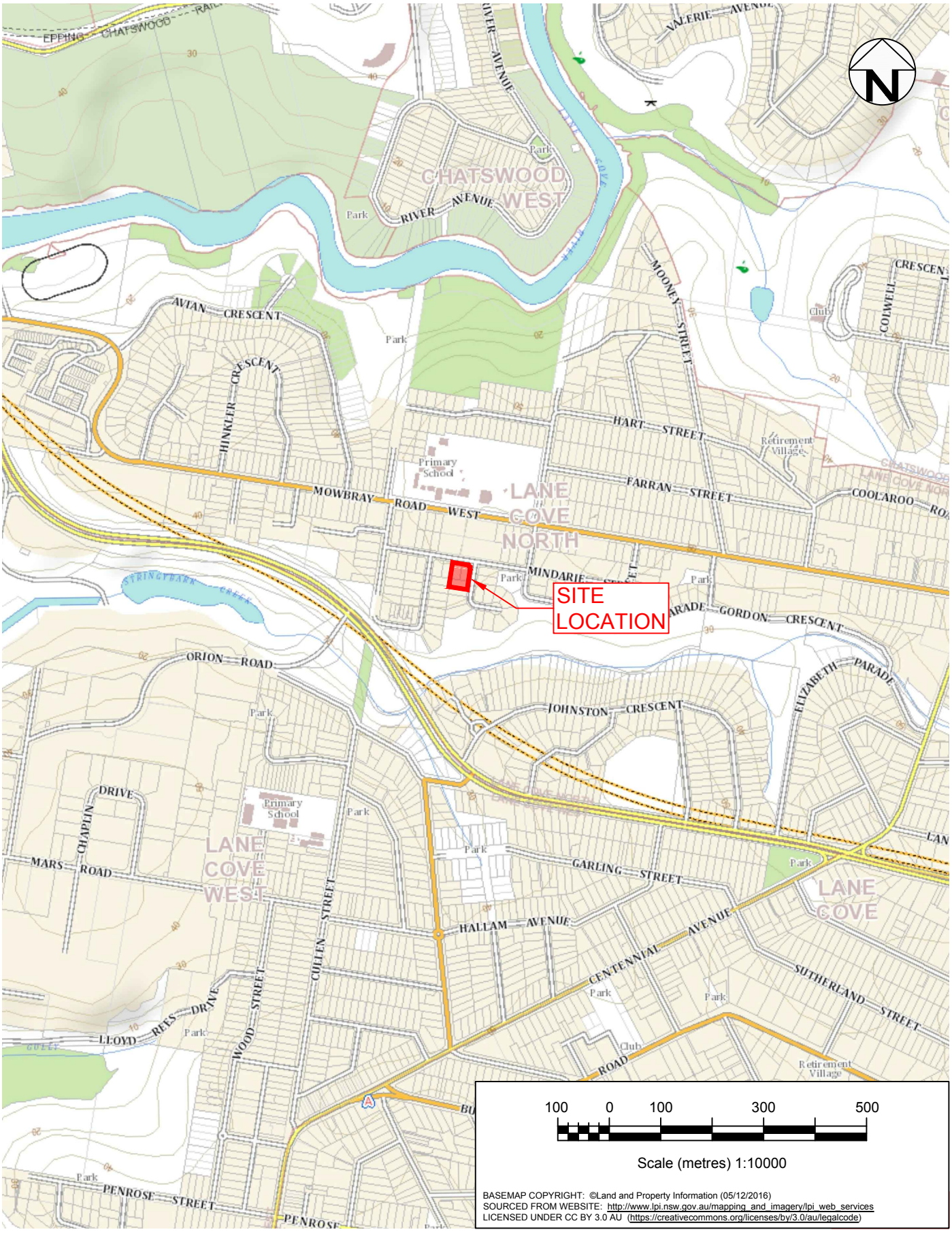
NSW OEH (2011); Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW Office of Environment and Heritage.[2]

NSW EPA (2014). Waste Classification Guidelines, Part 1: Classifying Waste. New South Wales Environment Protection Authority.

NSW EPA (1995) Sampling Design Guidelines, Contaminated Sites

[2] Note: this guideline has been replaced since this report was prepared. Coffey considers that the change in reporting guideline does not have a material effect on the current applicability of this report.

Appendix A – Figures



drawn	FA/JS/CGT
approved	-
date	23/10/19
scale	AS SHOWN
original size	A4

coffey
A TETRA TECH COMPANY

client: BlueCHP Limited

project: DETAILED SITE INVESTIGATION
20 & 22 MINDARIE STREET AND 30 PINNAROO PLACE
LANE COVE NORTH, NSW

title: SITE LOCATION

project no: SYDEN282995-R01 | figure no: FIGURE 1 | rev: A

PLOT DATE: 24/10/2019 3:44:19 PM DWG FILE: \\TTIS779FS1.TT.LOCAL\DATA\1. PROJECTS\1. SYDENENV\2019\SYDEN233878 - LAHC DSI AND HAZMAT\CAD\LANE COVE NTH\SYDEN233878-R01.DWG

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

10 0 10 20 30 40

Scale (metres) 1:750

drawn	FA/JS/CGT
approved	-
date	23/10/19
scale	AS SHOWN
original size	A3

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clien: BlueCHP Limited

project: DETAILED SITE INVESTIGATION
20 & 22 MINDARIE STREET AND 30 PINNAROO PLACE
LANE COVE NORTH, NSW

title: SITE LAYOUT

project no: SYDEN282995R01 | figure no: FIGURE 2 | rev: A

PLOT DATE: 24/10/2019 3:44:20 PM DWG FILE: \\TT-S779FS1.TT.LOCAL\DATA\1. PROJECTS\1. SYDENENV\2019\SYDEN233878 - LAHC DSI AND HAZMAT\CAD\LANE COVE NTH\SYDEN233878-R01.DWG

Appendix B – Tables

Blue CHP Limited
Detailed Site Investigation Report
20 22 Mindarie Street 30 Pinaroo
Place, Lane Cove North, NSW

		Asbestos	Physical Parameters			Heavy Metals									Total Recoverable Hydrocarbons												BTEX							PAHS		PCBs									Herbicides / Pesticides		
		Asbestos - Presence / Absence	Cation Exchange Capacity (CEC)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Arsenic	Cadmium	Chromium	Copper	Iron	Mercury	Nickel	Lead	Zinc	F1 (C6-C10)	F1 (C6-C10) less BTEX	F2 (C10-C16 Hydrocarbons)	F3 (C16-C34 Hydrocarbons)	F4 (C34-C40)	C10 - C40 (Sum of total)	F2 C10-C16 (minus Naphthalene)	C6 - C9	C10 - C14	C15 - C28	C29-C36	C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylenes Total	Xylene (o)	Xylenes (m & p)	Naphthalene	Benzo(a) pyrene	PAHs (Sum of total)	Aroclor 1260	Aroclor 1254	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1242	PCBs (Sum of total)	Herbicides	OCPs	OPPs
			meq/100g	%	pH_Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		Detected	0.05	1	0.1	2	0.4	5	5	20	0.1	5	5	5	20	20	50	100	100	100	50	20	20	50	50	50	0.1	0.1	0.1	0.3	0.1	0.2	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05
NEPC (2013) Table 1A(1) HILs Residential - B Soil						500	150		30000		120	1200	1200	60000																			1400								1			
NEPC (2013) Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m																45					110						0.5	55	160	40			3													
NEPC (2013) EILs Urban Residential / public open space (4), (5)						100		210 [6]	310 [3]			40 [7]	1260	350 [1]																			170										180 [2]		
NEPC (2013) Table 1B(6) ESLs for Urban Residential, Coarse Soil 0-2m																180		300	2800		120						50	70	85	105				0.7												
CRC CARE (2011) Residenital A (Direct Contact)															4400		4400	4500	6300								100	4500	14,000	12,000			1400													
NEPC (2013) Table 1B(7) Management Limits in Residential / Parkland, Coarse Soil															700		1000	2500	10000																											
Field_ID	**Sample_Depth_Range**	**Matrix_Description**	**Location_Code**																																											
BH01_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	9.4	-	5.1	<0.4	45	34	-	<0.1	39	120	92	<20	<20	<50	160	<100	160	<50	<20	<20	130	63	193	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR
BH01_0.3-0.4	0.3-0.4	NATURAL	Lane Cove North	-	4.6	13	7.2	11	<0.4	43	17	31,000	<0.1	<5	16	17	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	17	-	2.8	<0.4	9.4	39	-	<0.1	<5	32	51	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<LOR	<LOR	<LOR
BH02_0.1-0.2	0.1-0.2	NATURAL	Lane Cove North	-	3.8	11	6.3	2.3	<0.4	8.7	6.3	9300	<0.1	<5	12	12	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	16	-	3.8	0.7	13	29	-	<0.1	11	240	270	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<LOR	<LOR	<LOR
BH04_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	21	-	5.8	1.4	29	74	-	<0.1	8.8	230	410	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR
BH05_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	19	-	5	2.5	19	170	-	<0.1	<5	78	210	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR
BH05_0.1-0.2	0.1-0.2	NATURAL	Lane Cove North	-	-	18	-	5.6	1.3	15	87	-	<0.1	<5	39	110	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
BH06_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	21	-	9.6	<0.4	15	25	-	<0.1	6.5	89	300	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<LOR	<LOR	<LOR
BH07_0.0-01	0.0-0.1	FILL	Lane Cove North	ND	-	17	-	2.8	<0.4	10	5.8	-	<0.1	<5	45	47	<20	<20	<50	150	<100	150	<50	<20	<20	<50	130	130	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	-	-	-	-	-	-	-	-	-	<LOR	<LOR	<LOR
BH07_0.1-0.2	0.1-0.2	NATURAL	Lane Cove North	-	-	16	-	6.9	<0.4	37	6.1	-	<0.1	<5	29	59	<20	<20	<50	<100	<100	<100	<50	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.2	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
SS01	Surface	FILL	Lane Cove North	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	Surface	FILL	Lane Cove North	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03	Surface	FILL	Lane Cove North	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
ND - Not Detected
' - ' = Not analysed
NL - Non-Limiting
NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999
CRC Care (2011); Technical Report No. 10: Health Screening Levels for Petroleum Hydrocarbons in soil and groundwater
BTEX - Benzene, Toluene, Ethylbenzene, Xylene
HIL = Health Investigation Level
HSL = Health Screening Level
TRH - Total Recoverable Hydrocarbons
PAH - Polycyclic Aromatic Hydrocarbons
OCP - Organochlorine Pesticides
OPP - Organophosphate Pesticides
PCB - Polychlorinated Biphenyls
[1] based on a pH of 6.5. and cation exchange capacity of 5cmolc/kg
[2] EIL for DDT
[3] based on a pH of 6.5.
[4] Derived from Olszowy.H et al (1995) using 25%ile concentrations for an old suburb with high traffic in NSW.
[5] EIL = Contaminant Limit + Ambient Background Concentration, rounded.
[6] Based on a (conservative) clay content 1%.
[7] Based on a cation exchange capacity of 5cmolc/kg.

Field Blanks (soil)
Filter: ALL

SDG	8-Oct-19
Field ID	TB
Sampled_Date/Time	8/10/2019
Sample Type	Trip_B

Chem_Group	ChemName	Units	EQL	
BTEX	Benzene	mg/kg	0.1	<0.1
	Ethylbenzene	mg/kg	0.1	<0.1
	Toluene	mg/kg	0.1	<0.1
	Xylenes Total	mg/kg	0.3	<0.3
	Xylene (o)	mg/kg	0.1	<0.1
	Xylenes (m & p)	mg/kg	0.2	<0.2
	Total BTEX	mg/kg	0.2	
Total Petroleum Hydrocarbons	C6 - C9	mg/kg	10	<20
Total Recoverable Hydrocarbons	F1 (C6-C10)	mg/kg	10	<20
	F1 (C6-C10) less BTEX	mg/kg	10	<20

Field Blanks (water)
Filter: ALL

SDG	8-Oct-19
Field ID	RB01
Sampled_Date/Time	8/10/2019
Sample Type	Rinsate

Chem_Group	ChemName	Units	EQL	
BTEX	Benzene	µg/l	1	<1
	Ethylbenzene	µg/l	1	<1
	Toluene	µg/l	1	<1
	Xylenes Total	µg/l	3	<3
	Xylene (o)	µg/l	1	<1
	Xylenes (m & p)	µg/l	2	<2
Metals	Arsenic	mg/l	0.001	<0.001
	Cadmium	mg/l	0.0002	<0.0002
	Chromium	mg/l	0.001	<0.001
	Copper	mg/l	0.001	<0.001
	Mercury	mg/l	0.0001	<0.0001
	Nickel	mg/l	0.001	<0.001
	Lead	mg/l	0.001	<0.001
	Zinc	mg/l	0.005	<0.005
Total Petroleum Hydrocarbons	C6 - C9	µg/l	20	<20
	C10 - C14	µg/l	50	<50
	C15 - C28	µg/l	100	<100
	C29-C36	µg/l	100	<100
	+C10 - C36 (Sum of total)	µg/l	100	<100
Total Recoverable Hydrocarbons	F1 (C6-C10)	µg/l	20	<20
	F1 (C6-C10) less BTEX	µg/l	20	<20
	F2 (C10-C16 Hydrocarbons)	µg/l	50	<50
	F3 (C16-C34 Hydrocarbons)	µg/l	100	<100
	C34-C40	µg/l	100	<100
	C10 - C40 (Sum of total)	µg/l	100	<100
	F2 C10-C16 (minus Naphthalene)	µg/l	50	<50

Appendix C – Borehole Logs

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Environmental Log - Hand Auger

Hole ID.	**BH1**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH01_0.0-0.1	0.4				SP	**FILL: Gravelly SAND**: fine to medium grained, low plasticity, Brown, with some organic material.	M	VS	No asbestos, odour or staining.
							SC	**CLAYEY SAND**: fine to medium grained, medium to low plasticity, Orange/red, Weathered sandstone.		MD	No odour or staining
		E: BH01_0.3-0.4	0.4								
					0.5			Hand Auger BH1 terminated at 0.40 m Target depth Terminated on hard sandstone bedrock			
					1.0						
					1.5						

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: ENVIRONMENTAL 754-SYDEN233878.GPJ <<DrawingFile>> 22/10/2019 15:13

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	**BH2**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information						material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH02_0.0-0.1	0.4				SM	**FILL: SILTY SAND**: fine to medium grained, low liquid limit, Brown.	M	S	No asbestos, odour or staining
		E: BH02_0.1-0.2					SC	**Sandy CLAY**: fine to medium grained, low plasticity, orange / brown.		MD	No odour or staining
			0.4		0.5 1.0 1.5			Hand Auger BH2 terminated at 0.20 m Target depth Terminated on hard sandstone bedrock			

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

coffey
A TETRA TECH COMPANY

Environmental Log - Hand Auger

Hole ID.	**BH3**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH03_0.0-0.1	0.5				CI	**FILL: SILTY SAND**: fine to medium grained, medium liquid limit, Brown, Some organic material.	M	S	No asbestos, odour or staining
					0.5			Hand Auger BH3 terminated at 0.10 m Target depth Terminated on hard sandstone bedrock			
					1.0						
					1.5						

method
AD auger drilling*
AS auger screwing*
HA hand auger
MR mud rotary
W washbore

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nill

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
ALT air lift test
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
PID photoionization detector
R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

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Environmental Log - Hand Auger

Hole ID.	**BH4**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information						material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH04_0.0-0.1	0.5				SM	**FILL: SILTY SAND**: fine to medium grained, low liquid limit, Brown, with some organic material.	M	S	No asbestos, odour or staining
					0.5			Hand Auger BH4 terminated at 0.20 m Target depth Terminated on hard sandstone bedrock			
					1.0						
					1.5						

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: ENVIRONMENTAL 754-SYDEN233878.GPJ <<DrawingFile>> 22/10/2019 15:13

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

coffey
A TETRA TECH COMPANY

Environmental Log - Hand Auger

Hole ID.	**BH5**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH05_0.0-0.1	0.3				SM	**FILL: SILTY SAND**: fine to medium grained, low liquid limit, Brown, with some organic material.	M	S	No asbestos, odour or staining
		E: BH05_0.1-0.2	0.4				SC	**CLAYEY SAND**: fine to medium grained, low plasticity.		MD	No odour or staining
								Hand Auger BH5 terminated at 0.20 m Target depth Terminated on hard sandstone bedrock			

0.5

1.0

1.5

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: ENVIRONMENTAL 754-SYDEN233878.GPJ <<DrawingFile>> 22/10/2019 15:13

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	**BH6**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH06_0.0-0.1	0.4				SM	**FILL: SILTY SAND**: fine to medium grained, low to medium liquid limit, Brown, with some organic matter.	M	S	No asbestos, odour or staining
					0.5			Hand Auger BH6 terminated at 0.10 m Target depth Terminated on hard sandstone bedrock			
					1.0						
					1.5						

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	**BH7**
sheet:	1 of 1
project no.	**754-SYDEN282995**
date started:	**08 Oct 2019**
date completed:	**08 Oct 2019**
logged by:	**AC**
checked by:	**JS**

client: **Blue CHP Limited**

principal:

project: **Detailed Site Investigation**

location: **20 & 22 Mindarie Street & 30 Pinaroo Place, Lane Cove North, NSW**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: BH07_0.0-0.1	0.4				SM	**FILL: SILTY SAND**: fine to medium grained, low to medium liquid limit, Brown.	M	S	No asbestos, odour or staining
										MD	No odour or staining
		E: BH07_0.2-0.3	0.4				SC	**CLAYEY SAND**: fine to medium grained, low to medium plasticity, Mottled red/orange.			
					0.5			Hand Auger BH7 terminated at 0.40 m Target depth Terminated on hard sandstone bedrock			
					1.0						
					1.5						

method
AD auger drilling*
AS auger screwing*
HA hand auger
MR mud rotary
W washbore

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nill

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
ALT air lift test
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
WS water sample
HB hammer bouncing
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
PID photoionization detector
R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Appendix D – Calibration Certificates

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-115200**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Post sampling results

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92ppm Isobutylene	NATA	SY245		91.2ppm

Calibrated by: **Sen Philip**

Calibration date: **2/10/2019**

Next calibration due: **1/11/2019**

Appendix E – Photographs

Appendix E: Selected Site Photographs

Photograph 1:

Fragments of asbestos fibre cement sheeting beneath the dwelling located at 22 Mindarie Street.

Photograph 2:

Condition of soil surrounding the dwelling at 20 Mindarie Street.

Photograph 3:

Driveway and stockpile of mulch at 22 Mindarie Street.

Photograph 4:

Condition of external building at 22 Mindarie Street.

Photograph 5:

Condition of dwelling and grass lawn at 30 Pinaroo Place.

Photograph 6:

Sandstone outcrop observed on the eastern site boundary at 30 Pinaroo Place.

Photograph 7: Fill material encountered within borehole BH04

Photograph 8: Weathered sandstone bedrock encountered in BH01.

Appendix F – Analytical Laboratory Certificates

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Jessie Sixsmith**

Report **681323-W**
Project name LAHC DSI
Project ID SYDEN233878-LC
Received Date Oct 08, 2019

Client Sample ID			**RB01**
Sample Matrix			**Water**
Eurofins Sample No.			**S19-Oc11692**
Date Sampled			**Oct 08, 2019**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	142
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Oct 09, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Oct 09, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 09, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B6			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 09, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Melbourne	Oct 09, 2019	180 Days
- Method:			

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-01	Oct 08, 2019		Soil	S19-Oc11678	X						X	X	X			X	
2	BH01_0.3-0.4	Oct 08, 2019		Soil	S19-Oc11679			X	X					X	X		X	
3	BH02_0.0-01	Oct 08, 2019		Soil	S19-Oc11680	X					X	X	X	X		X		
4	BH02_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11681			X	X					X	X		X	
5	BH03_0.0-01	Oct 08, 2019		Soil	S19-Oc11682	X					X	X	X	X		X		
6	BH04_0.0-01	Oct 08, 2019		Soil	S19-Oc11683	X						X	X	X			X	
7	BH05_0.0-01	Oct 08, 2019		Soil	S19-Oc11684	X						X	X	X			X	
8	BH05_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11685									X			X	
9	BH06_0.0-01	Oct 08, 2019		Soil	S19-Oc11686	X					X	X	X	X		X		

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
10	BH07_0.0-01	Oct 08, 2019		Soil	S19-Oc11687	X						X	X	X			X	
11	BH07_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11688					X				X			X	
12	SS01	Oct 08, 2019		Soil	S19-Oc11689	X												
13	SS02	Oct 08, 2019		Soil	S19-Oc11690	X												
14	SS03	Oct 08, 2019		Soil	S19-Oc11691	X												
15	RB01	Oct 08, 2019		Water	S19-Oc11692												X	
16	TB	Oct 08, 2019		Soil	S19-Oc11693													X
17	TS	Oct 08, 2019		Soil	S19-Oc11694		X											
18	DUP01	Oct 08, 2019		Soil	S19-Oc11695									X			X	
19	DUP02	Oct 08, 2019		Soil	S19-Oc11696									X			X	
20	SPIKELAB	Oct 08, 2019		Soil	S19-Oc13433		X											
Test Counts						10	2	2	2	1	3	7	7	13	2	3	11	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

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

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

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

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	95			70-130	Pass	
TRH C10-C14	%	84			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	87			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
TRH >C10-C16	%	78			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	99			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	91			80-120	Pass	
Lead			%	96			80-120	Pass	
Mercury			%	94			75-125	Pass	
Nickel			%	95			80-120	Pass	
Zinc			%	89			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Oc11877	NCP	%	95			70-130	Pass	
TRH C10-C14	M19-Oc10407	NCP	%	86			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Oc11877	NCP	%	101			70-130	Pass	
Toluene	M19-Oc11877	NCP	%	96			70-130	Pass	
Ethylbenzene	M19-Oc11877	NCP	%	91			70-130	Pass	
m&p-Xylenes	M19-Oc11877	NCP	%	82			70-130	Pass	
o-Xylene	M19-Oc11877	NCP	%	86			70-130	Pass	
Xylenes - Total	M19-Oc11877	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Oc11877	NCP	%	96			70-130	Pass	
TRH C6-C10	M19-Oc11877	NCP	%	93			70-130	Pass	
TRH >C10-C16	M19-Oc10407	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Oc10982	NCP	%	99			75-125	Pass	
Cadmium	M19-Oc10982	NCP	%	101			75-125	Pass	
Chromium	M19-Oc10982	NCP	%	101			75-125	Pass	
Copper	M19-Oc10982	NCP	%	85			75-125	Pass	
Lead	M19-Oc10982	NCP	%	97			75-125	Pass	
Mercury	M19-Oc10982	NCP	%	90			70-130	Pass	
Nickel	M19-Oc10982	NCP	%	98			75-125	Pass	
Zinc	M19-Oc10982	NCP	%	87			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc11893	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M19-Oc10406	NCP	mg/L	0.41	0.48	14	30%	Pass	
TRH C15-C28	M19-Oc10406	NCP	mg/L	0.9	0.6	38	30%	Fail	Q15
TRH C29-C36	M19-Oc10406	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Oc11893	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Oc11893	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Oc11893	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Oc11893	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Oc11893	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Oc11893	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Oc11893	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M19-Oc11893	NCP	mg/L	< 0.02	0.02	170	30%	Fail	Q15
TRH >C10-C16	M19-Oc10406	NCP	mg/L	0.53	0.54	2.0	30%	Pass	
TRH >C16-C34	M19-Oc10406	NCP	mg/L	0.6	0.4	47	30%	Fail	Q15
TRH >C34-C40	M19-Oc10406	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Oc10982	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M19-Oc10982	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M19-Oc10982	NCP	mg/L	0.003	0.003	8.0	30%	Pass	
Copper	M19-Oc10982	NCP	mg/L	0.13	0.13	1.0	30%	Pass	
Lead	M19-Oc10982	NCP	mg/L	0.001	0.001	6.0	30%	Pass	
Mercury	M19-Oc10982	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M19-Oc10982	NCP	mg/L	0.002	0.002	1.0	30%	Pass	
Zinc	M19-Oc10982	NCP	mg/L	0.097	0.10	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Jessie Sixsmith**

Report **681323-S**
Project name LAHC DSI
Project ID SYDEN233878-LC
Received Date Oct 08, 2019

Client Sample ID			**BH01_0.0-01**	**BH01_0.3-0.4**	**BH02_0.0-01**	**BH02_0.1-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-Oc11678**	**S19-Oc11679**	**S19-Oc11680**	**S19-Oc11681**
Date Sampled			**Oct 08, 2019**	**Oct 08, 2019**	**Oct 08, 2019**	**Oct 08, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	160	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	160	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	130	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	63	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	193	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	94	53	62	127
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			BH01_0.0-01	BH01_0.3-0.4	BH02_0.0-01	BH02_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11678	S19-Oc11679	S19-Oc11680	S19-Oc11681
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	70	-
p-Terphenyl-d14 (surr.)	1	%	-	-	76	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	92	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	77	-	73	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-

Client Sample ID			BH01_0.0-01	BH01_0.3-0.4	BH02_0.0-01	BH02_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11678	S19-Oc11679	S19-Oc11680	S19-Oc11681
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	101	-	84	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	73	-
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-DB	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-T	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-TP	0.5	mg/kg	< 0.5	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	< 0.5	-
Dicamba	0.5	mg/kg	< 0.5	-	< 0.5	-
Dichlorprop	0.5	mg/kg	< 0.5	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	< 0.5	-
Dinoseb	0.5	mg/kg	< 0.5	-	< 0.5	-
MCPA	0.5	mg/kg	< 0.5	-	< 0.5	-
MCPB	0.5	mg/kg	< 0.5	-	< 0.5	-
Mecoprop	0.5	mg/kg	< 0.5	-	< 0.5	-
Warfarin (surr.)	1	%	107	-	120	-

Client Sample ID			BH01_0.0-01	BH01_0.3-0.4	BH02_0.0-01	BH02_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11678	S19-Oc11679	S19-Oc11680	S19-Oc11681
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	54	-	55
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	7.2	-	6.3
% Moisture	1	%	9.4	13	17	11
Heavy Metals						
Arsenic	2	mg/kg	5.1	11	2.8	2.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	45	43	9.4	8.7
Copper	5	mg/kg	34	17	39	6.3
Iron	20	mg/kg	-	31000	-	9300
Lead	5	mg/kg	120	16	32	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	39	< 5	< 5	< 5
Zinc	5	mg/kg	92	17	51	12
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	4.6	-	3.8

Client Sample ID			BH03_0.0-01	BH04_0.0-01	BH05_0.0-01	BH05_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11682	S19-Oc11683	S19-Oc11684	S19-Oc11685
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	118	114	86

Client Sample ID			BH03_0.0-01	BH04_0.0-01	BH05_0.0-01	BH05_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11682	S19-Oc11683	S19-Oc11684	S19-Oc11685
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	70	-	-	-
p-Terphenyl-d14 (surr.)	1	%	80	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	83	97	93	-
Tetrachloro-m-xylene (surr.)	1	%	75	121	121	-

Client Sample ID			BH03_0.0-01	BH04_0.0-01	BH05_0.0-01	BH05_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11682	S19-Oc11683	S19-Oc11684	S19-Oc11685
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	< 2	< 2	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	< 2	< 2	< 2	-
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Omethoate	2	mg/kg	< 2	< 2	< 2	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	90	98	98	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	83	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	75	-	-	-

Client Sample ID			BH03_0.0-01	BH04_0.0-01	BH05_0.0-01	BH05_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11682	S19-Oc11683	S19-Oc11684	S19-Oc11685
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-DB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-T	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-TP	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Actril (loxynil)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dicamba	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dichlorprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dinoseb	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
MCPA	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
MCPB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Mecoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Warfarin (surr.)	1	%	113	118	105	-
% Moisture	1	%	16	21	19	18
Heavy Metals						
Arsenic	2	mg/kg	3.8	5.8	5.0	5.6
Cadmium	0.4	mg/kg	0.7	1.4	2.5	1.3
Chromium	5	mg/kg	13	29	19	15
Copper	5	mg/kg	29	74	170	87
Lead	5	mg/kg	240	230	78	39
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	8.8	< 5	< 5
Zinc	5	mg/kg	270	410	210	110

Client Sample ID			BH06_0.0-01	BH07_0.0-01	BH07_0.1-0.2	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11686	S19-Oc11687	S19-Oc11688	S19-Oc11693
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	150	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	150	< 100	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	130	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	130	< 50	-

Client Sample ID			BH06_0.0-01	BH07_0.0-01	BH07_0.1-0.2	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11686	S19-Oc11687	S19-Oc11688	S19-Oc11693
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	99	69	91
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	95	-	74	-
p-Terphenyl-d14 (surr.)	1	%	112	-	81	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	0.07	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	0.46	-	-

Client Sample ID			BH06_0.0-01	BH07_0.0-01	BH07_0.1-0.2	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11686	S19-Oc11687	S19-Oc11688	S19-Oc11693
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	0.53	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	0.53	-	-
Dibutylchlorendate (surr.)	1	%	80	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	100	101	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	< 2	-	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	< 2	-	-
Naled	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate	2	mg/kg	< 2	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	138	87	-	-

Client Sample ID			BH06_0.0-01	BH07_0.0-01	BH07_0.1-0.2	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc11686	S19-Oc11687	S19-Oc11688	S19-Oc11693
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	80	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	100	-	-	-
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-DB	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-T	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	< 0.5	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	< 0.5	-	-
Dicamba	0.5	mg/kg	< 0.5	< 0.5	-	-
Dichlorprop	0.5	mg/kg	< 0.5	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	< 0.5	-	-
Dinoseb	0.5	mg/kg	< 0.5	< 0.5	-	-
MCPA	0.5	mg/kg	< 0.5	< 0.5	-	-
MCPB	0.5	mg/kg	< 0.5	< 0.5	-	-
Mecoprop	0.5	mg/kg	< 0.5	< 0.5	-	-
Warfarin (surr.)	1	%	84	124	-	-
% Moisture	1	%	21	17	16	-
Heavy Metals						
Arsenic	2	mg/kg	9.6	2.8	6.9	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	15	10	37	-
Copper	5	mg/kg	25	5.8	6.1	-
Lead	5	mg/kg	89	45	29	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	6.5	< 5	< 5	-
Zinc	5	mg/kg	300	47	59	-

Client Sample ID			DUP01	DUP02
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Oc11695	S19-Oc11696
Date Sampled			Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100

Client Sample ID			DUP01	DUP02
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Oc11695	S19-Oc11696
Date Sampled			Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	110
TRH C10-C36 (Total)	50	mg/kg	< 50	110
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	90
% Moisture	1	%	20	19
Heavy Metals				
Arsenic	2	mg/kg	4.1	2.9
Cadmium	0.4	mg/kg	1.1	< 0.4
Chromium	5	mg/kg	14	9.2
Copper	5	mg/kg	64	5.3
Lead	5	mg/kg	170	34
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	8.0	< 5
Zinc	5	mg/kg	320	42

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Oct 09, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B6			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 11, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Melbourne	Oct 11, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B7			
Polycyclic Aromatic Hydrocarbons	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B14			
Organochlorine Pesticides	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)			
Polychlorinated Biphenyls	Melbourne	Oct 11, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Acid Herbicides	Melbourne	Oct 11, 2019	14 Days
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Oct 09, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Heavy Metals	Melbourne	Oct 09, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Oct 09, 2019	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Oct 10, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Melbourne	Oct 08, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
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Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-01	Oct 08, 2019		Soil	S19-Oc11678	X						X	X	X			X	
2	BH01_0.3-0.4	Oct 08, 2019		Soil	S19-Oc11679			X	X					X	X		X	
3	BH02_0.0-01	Oct 08, 2019		Soil	S19-Oc11680	X					X	X	X	X		X		
4	BH02_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11681			X	X					X	X		X	
5	BH03_0.0-01	Oct 08, 2019		Soil	S19-Oc11682	X					X	X	X	X		X		
6	BH04_0.0-01	Oct 08, 2019		Soil	S19-Oc11683	X						X	X	X			X	
7	BH05_0.0-01	Oct 08, 2019		Soil	S19-Oc11684	X						X	X	X			X	
8	BH05_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11685									X			X	
9	BH06_0.0-01	Oct 08, 2019		Soil	S19-Oc11686	X					X	X	X	X		X		

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Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
10	BH07_0.0-01	Oct 08, 2019		Soil	S19-Oc11687	X						X	X	X			X	
11	BH07_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11688					X				X			X	
12	SS01	Oct 08, 2019		Soil	S19-Oc11689	X												
13	SS02	Oct 08, 2019		Soil	S19-Oc11690	X												
14	SS03	Oct 08, 2019		Soil	S19-Oc11691	X												
15	RB01	Oct 08, 2019		Water	S19-Oc11692												X	
16	TB	Oct 08, 2019		Soil	S19-Oc11693													X
17	TS	Oct 08, 2019		Soil	S19-Oc11694		X											
18	DUP01	Oct 08, 2019		Soil	S19-Oc11695									X			X	
19	DUP02	Oct 08, 2019		Soil	S19-Oc11696									X			X	
20	SPIKELAB	Oct 08, 2019		Soil	S19-Oc13433		X											
Test Counts						10	2	2	2	1	3	7	7	13	2	3	11	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

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

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

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

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	87			70-130	Pass	
TRH C6-C10	%	102			70-130	Pass	
TRH >C10-C16	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
TRH C10-C14	%	109			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	104			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	109			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
Xylenes - Total	%	106			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	101			70-130	Pass	
Acenaphthylene	%	102			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	94			70-130	Pass	
Benzo(a)pyrene	%	104			70-130	Pass	
Benzo(b&j)fluoranthene	%	120			70-130	Pass	
Benzo(g.h.i)perylene	%	104			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	%	129			70-130	Pass	
Chrysene	%	103			70-130	Pass	
Dibenz(a.h)anthracene	%	109			70-130	Pass	
Fluoranthene	%	102			70-130	Pass	
Fluorene	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	108			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	110			70-130	Pass	
Pyrene	%	103			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	79			70-130	Pass	
4.4'-DDD	%	128			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	76			70-130	Pass	
a-BHC	%	85			70-130	Pass	
Aldrin	%	84			70-130	Pass	
b-BHC	%	82			70-130	Pass	
d-BHC	%	82			70-130	Pass	
Dieldrin	%	83			70-130	Pass	
Endosulfan I	%	77			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	78			70-130	Pass	
Endrin	%	78			70-130	Pass	
Endrin aldehyde	%	88			70-130	Pass	
Endrin ketone	%	83			70-130	Pass	
g-BHC (Lindane)	%	86			70-130	Pass	
Heptachlor	%	81			70-130	Pass	
Heptachlor epoxide	%	77			70-130	Pass	
Hexachlorobenzene	%	88			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	106			70-130	Pass	
Dimethoate	%	75			70-130	Pass	
Ethion	%	99			70-130	Pass	
Fenitrothion	%	102			70-130	Pass	
Methyl parathion	%	111			70-130	Pass	
Mevinphos	%	89			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	77			70-130	Pass	
2.4-DB	%	80			70-130	Pass	
2.4.5-T	%	77			70-130	Pass	
2.4.5-TP	%	92			70-130	Pass	
Actril (loxynil)	%	87			70-130	Pass	
Dicamba	%	91			70-130	Pass	
Dichlorprop	%	105			70-130	Pass	
Dinitro-o-cresol	%	81			70-130	Pass	
Dinoseb	%	102			70-130	Pass	
MCPA	%	72			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
MCPB			%	72			70-130	Pass	
Mecoprop			%	86			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	106			80-120	Pass	
Cadmium			%	90			80-120	Pass	
Chromium			%	110			80-120	Pass	
Copper			%	114			80-120	Pass	
Iron			%	117			80-120	Pass	
Lead			%	116			80-120	Pass	
Mercury			%	94			75-125	Pass	
Nickel			%	110			80-120	Pass	
Zinc			%	107			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Oc13294	NCP	%	79			70-130	Pass	
TRH C6-C10	M19-Oc13294	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Oc13294	NCP	%	89			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Oc13294	NCP	%	90			70-130	Pass	
Toluene	M19-Oc13294	NCP	%	78			70-130	Pass	
Ethylbenzene	M19-Oc13294	NCP	%	88			70-130	Pass	
m&p-Xylenes	M19-Oc13294	NCP	%	87			70-130	Pass	
o-Xylene	M19-Oc13294	NCP	%	88			70-130	Pass	
Xylenes - Total	M19-Oc13294	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Oc14500	NCP	%	78			70-130	Pass	
4.4'-DDD	M19-Oc14500	NCP	%	96			70-130	Pass	
4.4'-DDE	M19-Oc14500	NCP	%	85			70-130	Pass	
4.4'-DDT	M19-Oc14500	NCP	%	92			70-130	Pass	
a-BHC	M19-Oc14500	NCP	%	76			70-130	Pass	
Aldrin	M19-Oc14500	NCP	%	78			70-130	Pass	
b-BHC	M19-Oc14500	NCP	%	97			70-130	Pass	
d-BHC	M19-Oc14500	NCP	%	72			70-130	Pass	
Dieldrin	M19-Oc14500	NCP	%	81			70-130	Pass	
Endosulfan I	M19-Oc14500	NCP	%	93			70-130	Pass	
Endosulfan II	M19-Oc14500	NCP	%	82			70-130	Pass	
Endosulfan sulphate	M19-Oc14500	NCP	%	80			70-130	Pass	
Endrin	M19-Oc14500	NCP	%	88			70-130	Pass	
Endrin aldehyde	M19-Oc14500	NCP	%	101			70-130	Pass	
Endrin ketone	M19-Oc14500	NCP	%	84			70-130	Pass	
g-BHC (Lindane)	M19-Oc14500	NCP	%	93			70-130	Pass	
Heptachlor	M19-Oc14500	NCP	%	86			70-130	Pass	
Heptachlor epoxide	M19-Oc14500	NCP	%	71			70-130	Pass	
Hexachlorobenzene	M19-Oc14500	NCP	%	78			70-130	Pass	
Methoxychlor	M19-Oc07334	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S19-Oc12822	NCP	%	130			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dimethoate	S19-Oc12822	NCP	%	92			70-130	Pass	
Ethion	S19-Oc12822	NCP	%	95			70-130	Pass	
Fenitrothion	S19-Oc12822	NCP	%	90			70-130	Pass	
Methyl parathion	S19-Oc12822	NCP	%	73			70-130	Pass	
Mevinphos	S19-Oc12822	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	M19-Oc10957	NCP	%	58			70-130	Fail	Q08
Actril (loxynil)	M19-Oc10957	NCP	%	101			70-130	Pass	
Dichlorprop	M19-Oc10957	NCP	%	112			70-130	Pass	
MCPA	M19-Oc10957	NCP	%	60			70-130	Fail	Q08
MCPB	M19-Oc10957	NCP	%	43			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	S19-Oc08209	NCP	%	83			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	S19-Oc08428	NCP	%	182			75-125	Fail	Q08
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M19-Oc14504	NCP	%	81			70-130	Pass	
Aroclor-1260	M19-Oc14504	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-Oc11686	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Oc11686	CP	%	106			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Oc11686	CP	%	87			75-125	Pass	
Cadmium	S19-Oc11686	CP	%	84			75-125	Pass	
Chromium	S19-Oc11686	CP	%	104			75-125	Pass	
Copper	S19-Oc11686	CP	%	209			75-125	Fail	Q08
Lead	S19-Oc11686	CP	%	86			75-125	Pass	
Mercury	S19-Oc11686	CP	%	94			70-130	Pass	
Nickel	S19-Oc11686	CP	%	97			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Oc11688	CP	%	77			70-130	Pass	
Acenaphthylene	S19-Oc11688	CP	%	80			70-130	Pass	
Anthracene	S19-Oc11688	CP	%	79			70-130	Pass	
Benz(a)anthracene	S19-Oc11688	CP	%	76			70-130	Pass	
Benzo(a)pyrene	S19-Oc11688	CP	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Oc11688	CP	%	85			70-130	Pass	
Benzo(g.h.i)perylene	S19-Oc11688	CP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S19-Oc11688	CP	%	76			70-130	Pass	
Chrysene	S19-Oc11688	CP	%	77			70-130	Pass	
Dibenz(a.h)anthracene	S19-Oc11688	CP	%	96			70-130	Pass	
Fluoranthene	S19-Oc11688	CP	%	77			70-130	Pass	
Fluorene	S19-Oc11688	CP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Oc11688	CP	%	82			70-130	Pass	
Naphthalene	S19-Oc11688	CP	%	76			70-130	Pass	
Phenanthrene	S19-Oc11688	CP	%	77			70-130	Pass	
Pyrene	S19-Oc11688	CP	%	71			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Oc12824	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-Oc12824	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-Oc12824	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-Oc12824	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Terbufos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-Oc12824	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M19-Oc10956	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	M19-Oc06747	NCP	uS/cm	260	300	13	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M19-Oc06747	NCP	pH Units	9.8	9.7	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Oc11680	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Oc11680	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Oc11680	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Oc11680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Oc11680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Oc11680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Oc11680	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Oc11680	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Oc11680	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Phenanthrene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Oc12824	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S19-Oc12824	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Oc11683	CP	%	21	21	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-Oc11685	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Oc11685	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Oc11685	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-Oc11685	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Oc11685	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Oc11685	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	M19-Oc19491	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Oc11686	CP	mg/kg	9.6	10	5.0	30%	Pass	
Cadmium	S19-Oc11686	CP	mg/kg	< 0.4	0.4	6.0	30%	Pass	
Chromium	S19-Oc11686	CP	mg/kg	15	16	6.0	30%	Pass	
Copper	S19-Oc11686	CP	mg/kg	25	27	6.0	30%	Pass	
Iron	S19-Oc11686	CP	mg/kg	34000	36000	4.0	30%	Pass	
Lead	S19-Oc11686	CP	mg/kg	89	93	4.0	30%	Pass	
Mercury	S19-Oc11686	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Oc11686	CP	mg/kg	6.5	7.0	7.0	30%	Pass	
Zinc	S19-Oc11686	CP	mg/kg	300	310	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Ursula Long	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highwa
Chatswood
NSW 2067

Attention:	Jessie Sixsmith
Report	681323-AID
Project Name	LAHC DSI
Project ID	SYDEN233878-LC
Received Date	Oct 08, 2019
Date Reported	Oct 15, 2019

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name LAHC DSI
Project ID SYDEN233878-LC
Date Sampled Oct 08, 2019
Report 681323-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01_0.0-01	19-Oc11678	Oct 08, 2019	Approximate Sample 261g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH02_0.0-01	19-Oc11680	Oct 08, 2019	Approximate Sample 186g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH03_0.0-01	19-Oc11682	Oct 08, 2019	Approximate Sample 137g Sample consisted of: Dark brown fine-grained soil, bituminous material, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH04_0.0-01	19-Oc11683	Oct 08, 2019	Approximate Sample 130g Sample consisted of: Dark brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH05_0.0-01	19-Oc11684	Oct 08, 2019	Approximate Sample 128g Sample consisted of: Dark brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH06_0.0-01	19-Oc11686	Oct 08, 2019	Approximate Sample 112g Sample consisted of: Dark brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH07_0.0-01	19-Oc11687	Oct 08, 2019	Approximate Sample 139g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
SS01	19-Oc11689	Oct 08, 2019	Approximate Sample 109g Sample consisted of: Dark brown fine-grained soil, bituminous material and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SS02	19-Oc11690	Oct 08, 2019	Approximate Sample 152g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
SS03	19-Oc11691	Oct 08, 2019	Approximate Sample 144g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Oct 08, 2019	Indefinite

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NATA # 1261 Site # 20794

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Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-01	Oct 08, 2019		Soil	S19-Oc11678	X						X	X	X			X	
2	BH01_0.3-0.4	Oct 08, 2019		Soil	S19-Oc11679			X	X					X	X		X	
3	BH02_0.0-01	Oct 08, 2019		Soil	S19-Oc11680	X					X	X	X	X		X		
4	BH02_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11681			X	X					X	X		X	
5	BH03_0.0-01	Oct 08, 2019		Soil	S19-Oc11682	X					X	X	X	X		X		
6	BH04_0.0-01	Oct 08, 2019		Soil	S19-Oc11683	X						X	X	X			X	
7	BH05_0.0-01	Oct 08, 2019		Soil	S19-Oc11684	X						X	X	X			X	
8	BH05_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11685									X			X	
9	BH06_0.0-01	Oct 08, 2019		Soil	S19-Oc11686	X					X	X	X	X		X		

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Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
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Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
10	BH07_0.0-01	Oct 08, 2019		Soil	S19-Oc11687	X						X	X	X			X	
11	BH07_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11688					X				X			X	
12	SS01	Oct 08, 2019		Soil	S19-Oc11689	X												
13	SS02	Oct 08, 2019		Soil	S19-Oc11690	X												
14	SS03	Oct 08, 2019		Soil	S19-Oc11691	X												
15	RB01	Oct 08, 2019		Water	S19-Oc11692												X	
16	TB	Oct 08, 2019		Soil	S19-Oc11693													X
17	TS	Oct 08, 2019		Soil	S19-Oc11694		X											
18	DUP01	Oct 08, 2019		Soil	S19-Oc11695									X			X	
19	DUP02	Oct 08, 2019		Soil	S19-Oc11696									X			X	
20	SPIKELAB	Oct 08, 2019		Soil	S19-Oc13433		X											
Test Counts						10	2	2	2	1	3	7	7	13	2	3	11	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
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NATA # 1261
Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	BH01_0.0-01	Oct 08, 2019		Soil	S19-Oc11678	X						X	X	X			X	
2	BH01_0.3-0.4	Oct 08, 2019		Soil	S19-Oc11679			X	X					X	X		X	
3	BH02_0.0-01	Oct 08, 2019		Soil	S19-Oc11680	X					X	X	X	X		X		
4	BH02_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11681			X	X					X	X		X	
5	BH03_0.0-01	Oct 08, 2019		Soil	S19-Oc11682	X					X	X	X	X		X		
6	BH04_0.0-01	Oct 08, 2019		Soil	S19-Oc11683	X						X	X	X			X	
7	BH05_0.0-01	Oct 08, 2019		Soil	S19-Oc11684	X						X	X	X			X	
8	BH05_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11685									X			X	
9	BH06_0.0-01	Oct 08, 2019		Soil	S19-Oc11686	X					X	X	X	X		X		

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Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI
Project ID: SYDEN233878-LC

Order No.:
Report #: 681323
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 8, 2019 5:12 PM
Due: Oct 15, 2019
Priority: 5 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	CANCELLED	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Polychlorinated Biphenyls	Acid Herbicides	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B6	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271								X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X									X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
10	BH07_0.0-01	Oct 08, 2019		Soil	S19-Oc11687	X						X	X	X			X	
11	BH07_0.1-0.2	Oct 08, 2019		Soil	S19-Oc11688					X				X			X	
12	SS01	Oct 08, 2019		Soil	S19-Oc11689	X												
13	SS02	Oct 08, 2019		Soil	S19-Oc11690	X												
14	SS03	Oct 08, 2019		Soil	S19-Oc11691	X												
15	RB01	Oct 08, 2019		Water	S19-Oc11692												X	
16	TB	Oct 08, 2019		Soil	S19-Oc11693													X
17	TS	Oct 08, 2019		Soil	S19-Oc11694		X											
18	DUP01	Oct 08, 2019		Soil	S19-Oc11695									X			X	
19	DUP02	Oct 08, 2019		Soil	S19-Oc11696									X			X	
20	SPIKELAB	Oct 08, 2019		Soil	S19-Oc13433		X											
Test Counts						10	2	2	2	1	3	7	7	13	2	3	11	1

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Melbourne
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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Coffey Environments Pty Ltd NSW**
Contact name:	Jessie Sixsmith
Project name:	LAHC DSI
Project ID:	SYDEN233878-LC
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Oct 8, 2019 5:12 PM
Eurofins reference:	**681323**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 12.4 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☑ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Please be advised that trip spikes and blanks reached their expiry on 08/03/2019. Trip01 (1 jar) forwarded to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Jessie Sixsmith - jessie.sixsmith@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of ___ **8498**

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Consigning Office: Chatswood			
Report Results to: Jessie Sixsmith.	Mobile:	Email:	@coffey.com
Invoices to: C/of General admin.	Phone:	Email:	@coffey.com

Project No: SYDEN198927_LB Task No: Lab

Project Name: LAHC DSI Laboratory: Eurofins

Sampler's Name: Adrian Project Manager: Jessie Sixsmith

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B6	Suite B14	Herbicides	Asbestos (P/A)	BTEX / TRH	PCB	PAH	Ph, Moist, CEC						NOTES
	BH01-0.0-0.1	8/10		Soil	J, B	5 day.	✓	✓	✓	✓										
	BH01-0.3-0.4	↓		↓	J	↓	✓							✓						
	BH02_0.0-0.1				J, B		✓	✓	✓	✓		✓	✓							
	BH02_0.1-0.2				J		✓							✓						
	BH03_0.0-0.1				J, B		✓	✓	✓	✓		✓	✓							
	BH04_0.0-0.1				J, B		✓	✓	✓	✓										
	BH05-0.0-0.1				J, B		✓	✓	✓	✓										
	BH05-0.1-0.2				J		✓													
	BH06-0.0-0.1				J, B		✓	✓	✓	✓		✓	✓							
	BH07-0.0-0.1				J, B		✓	✓	✓	✓										
	BH07-0.1-0.2				J		✓						✓							
	~~ACM01~~ SS01				B					X										
	~~ACM02~~ SS02				B					X										
	~~ACM03~~ SS03				B					X										
	RB01						✓													
	TB										✓									
	TS	↓		↓		↓					✓									

RELINQUISHED BY		→	RECEIVED BY		Sample Receipt Advice: (Lab Use Only)	
Name: Adrian C	Date: 8/10	→	Name: Grace Tanswell	Date: 8/10	All Samples Recieved in Good Condition	☑
Coffey Environments	Time: 3:15		Company: Eurofins	Time: 5:12	All Documentation is in Proper Order	☑
Name:	Date:	→	Name:	Date:	Samples Received Properly Chilled	☑
Company:	Time:		Company:	Time:	Lab. Ref/Batch No. 681323	

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 8499

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Consigning Office:

Report Results to: Mobile: Email: @coffey.com

Invoices to: Phone: Email: @coffey.com

Project No: SYDEN 198927_LC Task No:

Project Name: Laboratory:

Sampler's Name: Project Manager:

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B6	NOTES
	DUP01	8/10		Soil	J	5day	X	
	DUP02	↓		↓	J	↓	X	
	Trip01	↓		↓	J	↓	X	Trip to ALS

RELINQUISHED BY

Name: Adrian C Date: 8/10 →

Coffey Environments Time: 3:15

Name: Date: →

Company: Time:

RECEIVED BY

Name: Grace Tuckwell Date: 8/10

Company: Eurofins Time: 5:12

Name: Date:

Company: Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☑

All Documentation is in Proper Order ☑

Samples Received Properly Chilled ☑

Lab. Ref/Batch No. 681323

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

#AU04_Enviro_Sample_NSW

From: Sixsmith, Jessie <Jessie.Sixsmith@coffey.com>
Sent: Thursday, 10 October 2019 9:21 AM
To: #AU04_Enviro_Sample_NSW
Cc: Christie, Adrian
Subject: RE: Attention: Eurofins Sample Receipt Advice - Report 681323 : Site LAHC DSI (SYDEN198927_LB)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Eurofins,

Could I please request the Coffey Job number is changed to SYDEN233878-LC.

Thanks,

Kind regards,

Jessie Sixsmith
Senior Environmental Scientist

t: +61 2 9406 1000
m: +61 438 271 821

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Tuesday, 8 October 2019 5:42 PM
To: Sixsmith, Jessie <Jessie.Sixsmith@coffey.com>
Subject: Attention: Eurofins Sample Receipt Advice - Report 681323 : Site LAHC DSI (SYDEN198927_LB)

Dear Valued Client,

Please be advised that trip spikes and blanks reached their expiry on 08/03/2019. Trip01 (1 jar) forwarded to ALS.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Grace Tuckwell
Sample Receipt

Eurofins | Environment Testing
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 29900 8421

Email: EnviroSampleNSW@eurofins.com
Website:environment.eurofins.com.au

EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Jessie Sixsmith**

Report **683624-L**
Project name LAHC DSI - ADDITIONAL
Project ID SYDEN233878-LC
Received Date Oct 21, 2019

Client Sample ID			**BH01_0.0-0.1**	**BH03_0.0-0.1**	**BH04_0.0-0.1**
Sample Matrix			**US Leachate**	**US Leachate**	**US Leachate**
Eurofins Sample No.			**M19-Oc30798**	**M19-Oc30799**	**M19-Oc30800**
Date Sampled			**Oct 08, 2019**	**Oct 08, 2019**	**Oct 08, 2019**
Test/Reference	LOR	Unit			
Heavy Metals					
Lead	0.01	mg/L	0.03	0.06	0.02
USA Leaching Procedure					
Leachate Fluid[C01]		comment	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.5	8.4	6.5
pH (Leachate fluid)	0.1	pH Units	5.0	5.0	5.0
pH (off)	0.1	pH Units	5.0	5.1	5.0
pH (USA HCl addition)	0.1	pH Units	1.6	1.4	1.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Melbourne	Oct 21, 2019	180 Days

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

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NATA # 1261 Site # 20794

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2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Coffey Environments Pty Ltd NSW	**Order No.:**		**Received:**	Oct 21, 2019 1:09 PM
Address:	Level 20, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	683624	**Due:**	Oct 23, 2019
		Phone:	+61 2 9406 1000	**Priority:**	2 Day
		Fax:	+61 2 9406 1004	**Contact Name:**	Jessie Sixsmith
Project Name:	LAHC DSI - ADDITIONAL				
Project ID:	SYDEN233878-LC				

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH01_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30798	X	X
2	BH03_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30799	X	X
3	BH04_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30800	X	X
Test Counts						3	3

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

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

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

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

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M19-Oc30106	NCP	%	103			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M19-Oc30106	NCP	mg/L	0.03	0.03	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Ursula Long	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: LAHC DSI - ADDITIONAL
Project ID: SYDEN233878-LC

Order No.:
Report #: 683624
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Oct 21, 2019 1:09 PM
Due: Oct 23, 2019
Priority: 2 Day
Contact Name: Jessie Sixsmith

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH01_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30798	X	X
2	BH03_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30799	X	X
3	BH04_0.0-0.1	Oct 08, 2019		US Leachate	M19-Oc30800	X	X
Test Counts						3	3

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Coffey Environments Pty Ltd NSW**
Contact name:	Jessie Sixsmith
Project name:	LAHC DSI - ADDITIONAL
Project ID:	SYDEN233878-LC
COC number:	Not provided
Turn around time:	2 Day
Date/Time received:	Oct 21, 2019 1:09 PM
Eurofins reference:	**683624**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 12.4 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Jessie Sixsmith - jessie.sixsmith@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Appendix G – Data Quality Assessment

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN282995 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

I. SAMPLE HANDLING

	Yes	No (Comment below)
1. Were the sample **holding times** met?	☒	☐
2. Were the samples in **proper custody** between the field and reaching the laboratory?	☒	☐
3. Were the samples **properly and adequately** preserved? *This includes keeping the samples chilled, where applicable.*	☒	☐
4. Were the samples received by the laboratory in good condition?	☒	☐

COMMENTS:

Sample Handling was:

☒ Satisfactory ☐ Unsatisfactory

☐ Partially Satisfactory

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN282995 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

II PRECISION/ACCURACY ASSESSMENT

	Yes	No (Comment below)
1. Was a NATA registered laboratory used?	☒	☐
2. Did the laboratory perform the requested tests?	☒	☐
3. Were the laboratory methods adopted NATA endorsed?	☒	☐
4. Were the appropriate test procedures followed?	☒	☐
5. Were the reporting limits satisfactory?	☒	☐
6. Was the NATA Seal on the reports?	☒	☐
7. Were the reports signed by an authorised person?	☒	☐

COMMENTS:

Precision/Accuracy of the Laboratory Report	☒ Satisfactory ☐ Partially Satisfactory	☐ Unsatisfactory

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN282995 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

III. FIELD QA/QC

1.	Number of Primary Samples Analysed	Soil	11
2.	Number of Days of Sampling:	Soil	1

3. Number and Type of QA/QC Samples Collected:

Quality Control Sample Type	No.	% Total No. Samples
Intra-lab Duplicates (Soil)	2	18%
Inter-lab Duplicates (Soil)	1	9%
Trip Blanks	1	-
Trip Spike	0	-
Equipment Rinsate	1	-

4. FIELD DUPLICATES

	Yes	**No** (Comment below)
A. Were an Adequate Number of field duplicates analysed for each chemical?	☒	☐
B. Were RPDs within Control Limits?		
a. Organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☒	☐
b. Metals/Inorganics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒
c. Volatile & semi volatile organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☒	☐

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN282995 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

COMMENTS:

Exceedances above the RPD were reported for heavy metal chromium between primary sample BH04_0.0-0.1 and inter-laboratory duplicate DUP01 and cadmium, chromium and zinc between sample BH04_0.0-0.1 and intra-laboratory duplicate TRIP-01. The exceedances are attributed to the heterogeneity of the fill material. As the concentrations of heavy metals are below the adopted site criteria, these exceedances are not expected to affect the outcome of the assessment

IV. TRIP BLANKS (TB) AND TRIP SPIKES (TS)

	Yes	No (Comment below)
A. Were an Adequate Number of trip blanks and spikes analysed?	☒	☐
B. Were the trip blanks free of contaminants and trip spike were within acceptance limit?	☒	☐
C. Were the trip spikes reported within acceptable recoveries?	☐	☒

COMMENTS:

Trip blank results are presented in Table 3. A trip spike was submitted however was not analysed as it was outside of the holding time. Considering no volatile compounds were detected during this investigation, the absence of a trip spike is not expected to influence the overall outcome of the investigation.

6. EQUIPMENT RINSATE SAMPLES

	Yes	No (Comment below)
A. Were an adequate number of Equipment Rinsate Samples collected?	☒	☐
B. Were the Equipment Rinsate Samples free of contaminants?	☒	☐

Field QA/QC was:	☒ Satisfactory	☐ Unsatisfactory

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN282995 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

V LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

1. Type of QA/QC Samples

	Yes	No
Laboratory Blanks/Reagent Blanks	☒	☐
Laboratory Duplicates	☒	☐
Matrix Spikes/Matrix Spike Duplicates	☒	☐
Laboratory Control Spike	☒	☐
Surrogate (where appropriate)*	☒	☐

	Yes	**No** (Comment below)
2 Were the laboratory blanks/reagents blanks free of contamination?	☒	☐
3. Were the spike recoveries within control limits?		
a. Organics (70% to 130%)	☒	☐
b. Metals/Inorganic (70% to 130%)	☐	☒
4. Were the RPDs of the laboratory duplicates within control limits?	☐	☒
5. Were the surrogate recoveries within control limits?	☒	☐

COMMENTS:

Spike recoveries failed for lead in sample S19-Oct14899 due to matrix interference, with an acceptable recovery obtained for the laboratory control samples.

The RPD for the duplicate sample for lead (S19-Oct14898) was outside of the acceptance range of 30%, however the RPD was found to have passed Eurofins Acceptance criteria as the results were <10 the LOR.

The laboratory internal QA/QC was:	☒ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

Coffey Services Australia Pty Ltd

ABN: 55 139 460 521

DATA VALIDATION SYDEN2829958 – Detailed Site Investigation, 20 & 22 Mindarie Street & Pinaroo Place, Lane Cove North, NSW

Soil Analysis - Lab Batch References: 681323, 683624 and ES1932932

VI DATA USABILITY

1.	Data Directly Usable	☒
2.	Data Usable with the following considerations	☐
3.	Data Not Usable.	☐

COMMENTS:

No inter-laboratory duplicate sample was analysed however is not considered to affect the overall outcome of the investigation.

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