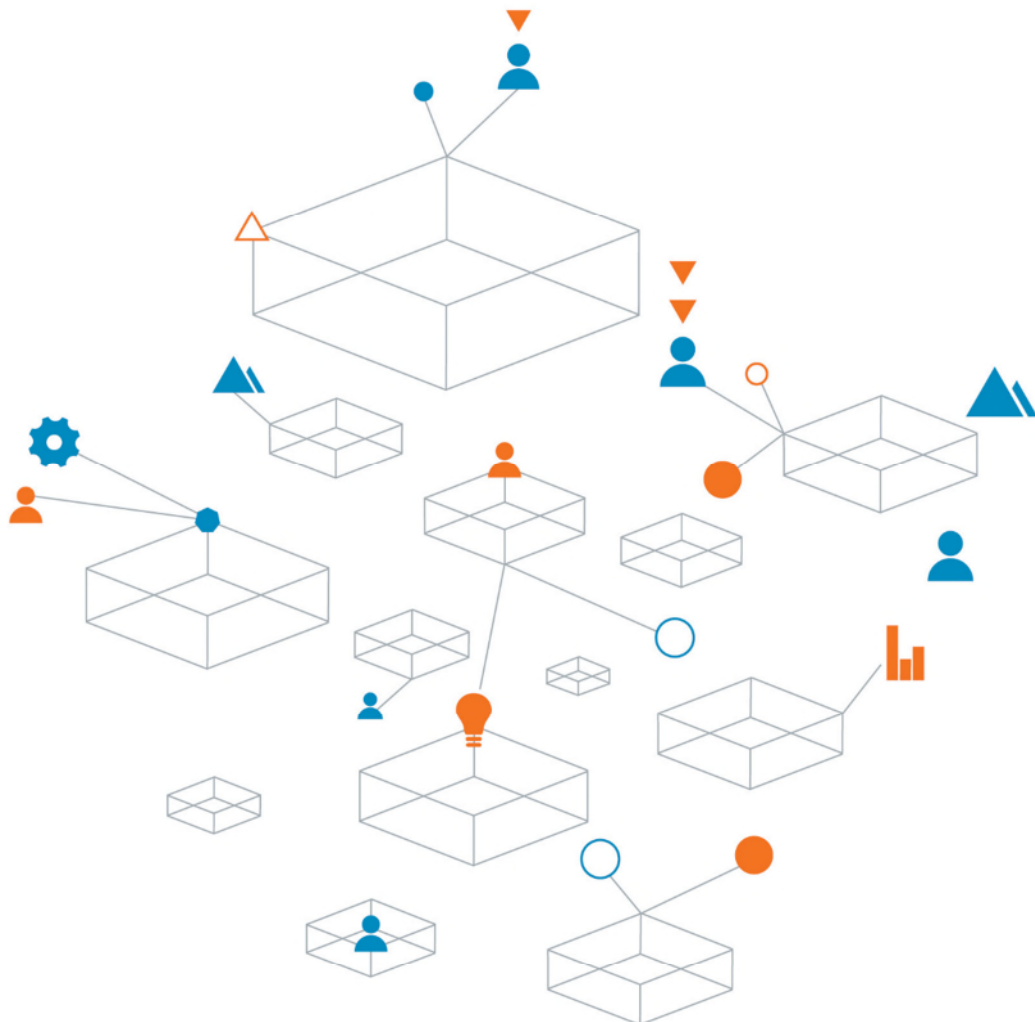


Gray Puksand
Jindabyne Central School Upgrade
Geotechnical & Environmental Investigation Report

22 March 2019



Trust is the
cornerstone
of all our
projects

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Jindabyne Central School Upgrade

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1. Introduction

This report presents the results of geotechnical and environmental (geo-environmental) investigation completed by Coffey Services Australia Pty Ltd (Coffey) to support the detailed design of the proposed upgrades at Jindabyne Central School, Jindabyne NSW.

The investigation was commissioned by Gray Puksand Pty Ltd (Gray Puksand), and carried out in general accordance with the methodology presented within our proposal (Ref: 754-CBREN21957-P02-Rev02, dated 3 July 2018).

The objective of our investigation was to assess surface and subsurface conditions across the site and provide geo-environmental advice to inform civil / structural design works.

2. Site description

2.1. Site location

Site identification information and surrounding land uses are summarised in Table 2.1. The site location plan is shown in Figure 1. The layout of the current (pre-development) site configuration is shown in Figure 2, while the proposed developments are shown in figure 3.

Table 2.1 - Site summary table

Street Address	8-20 Park Road, Jindabyne, NSW 2627
Title Identifiers	Lot 9, DP 219584
District/Division Name	Jindabyne
Area	Approximately 3.14Ha
Local Environment Plan	Snowy River Local Environmental Plan 2013
Current Zoning	R1 – General Residential
Current Site Use	Jindabyne Central School
Proposed Site Use	Continued operation of the Jindabyne Central School – with possible developments that may include two new buildings at the site.
Surrounding Land Use	North: Clyde St, commercial, residential area
	East: Kalkite St, commercial, residential area
	South: Park Rd, general residential area
	West: Bent St, general residential area

2.2. Topography and hydrology

Topographic data from the NSW Department of Finance, Services and Innovation (2018) indicates that the site lies at elevations ranging from approximately 930m to 940m above Australian Height

Datum (AHD), and gently slopes towards the North-East. Surface runoff is expected to flow towards the North-East direction approximately 450m, eventually flowing into Jindabyne Lake.

2.3. Regional geology and soils

The Bega/Mallacoota 1:250,000 Geological Series Sheet 8824 (1995) indicates that the site is underlain by the Jindabyne Tonalite, which is the Palaeozoic coarse-grained igneous rock comprising mafics, felsic minerals, and plagioclase.

The Jindabyne 1:100,000 soil landscapes sheet (1994) also indicates that the site lies within the multicyclic erosional landscape, comprising tenosols with granite outcrops.

A search of the driller's log data relevant to the registered borehole within the site indicated that decomposed granite from 0m to 8m, coarse hard granite from 8m to 54m, fractured soft granite with quartz from 54m to 78m.

Coffey carried out a geotechnical investigation in conjunction with this assessment. The investigation involved a geotechnical desktop review and drilling of seven boreholes with soil / rock samples taken up to 10m across the site. The founding result will be reported in Coffey detailed site investigation report.

2.4. Regional hydrogeology

According to the Hydrogeology Map of Australia (Geoscience Australia, 1987), the site is underlain by Palaeozoic fractured or fissured rock aquifers of low to moderate productivity.

3. Method of investigation

3.1. Fieldwork

3.1.1. Geotechnical

Coffey understand that the possible developments at the school may have new buildings between two and four levels high. As such our scope has been prepared on this basis.

Fieldwork for the geotechnical investigation was carried out between 17 and 19 July 2018 and included the following:

- Site walkover to observe / characterise surface conditions;
- Completion of 2 Dynamic Cone Penetrometer (DCP) tests to a depth 0.8 m;
- Drilling of 5 auger holes to depths of between 3 m and 5.5 m;
- Drilling of 2 cored boreholes to depths of between 8.51 m and 10.89 m; and
- Sampling of subsurface conditions.

Figure 1 shows the approximate investigation locations, which were located by Coffey with a handheld GPS (accurate to ± 5 m). Some investigation locations were offset from client nominated locations due to inadequate access or underground services.

Boreholes were drilled using a track mounted drilling rig, and initially advanced using solid flight augers and Tungsten Carbide (TC) drill bit until nominated target depths or practical refusal within bedrock. BH1 and BH3 were subsequently extended into the underlying bedrock using NMLC diamond coring techniques to the nominated target depth.

At the request of our client, BH3 was advanced beyond the originally nominated target depth due to the presence of extremely weathered, very low strength bedrock conditions.

On completion, boreholes were backfilled with excavated materials and the surface reinstated to match surrounds.

3.1.2. Environmental

Environmental fieldwork for the baseline contamination assessment was carried out concurrently with the geotechnical investigation and included the following:

- Site walkover to observe areas of potential environmental contamination
- Collection of soil samples into laboratory supplied containers to a maximum depth of 2.0m (i.e. approximately where rock was encountered) within all boreholes. Samples were taken consistently at depth intervals of 0.05m-0.15m, 0.4m-0.5m, 0.9m-1.0m, 1.9m-2.0m.
- Quality control samples (intra/inter laboratory samples, rinsate samples, trip blank samples) will be collected and analysed to ensure data usability.
- All sampling glass jar will immediately sealed with Teflon lined caps after filled with soil to lower the potential for loss of volatile contaminants. Samples were then labelled and placed directly into an ice-filled cooler box.
- Field headspace screening using a photo ionisation detector (PID)

3.2. Laboratory testing

On completion of fieldwork, the following laboratory analysis were carried out on selected soil samples. A summary of the respective geotechnical and environmental tests performed is provided in the following subsections.

3.2.1. Geotechnical

- 2 No California Bearing Ratio (CBR) test and Natural Moisture Content
- 3 No. Atterberg Limit Index
- 2 No. Soil Aggressivity (pH, sulphate, chloride and electrical conductivity)

Following photography, Point Load Strength Index (Is50) tests were carried out on rock cores at approximately 1 m spacings or due to changes in lithology, test results are included on the attached Engineering Borehole Logs, included as Appendix C.

Geotechnical Laboratory test results are summarised in Section 4 and test certificates are provided within Appendix E.

3.2.2. Environmental

A minimum of two primary samples from each borehole will be selected and analysis in accordance to the adopted baseline contamination assessment listed in Coffey proposal (Coffey 2018b) 1 from the shallow soils. The remaining soil samples were on hold at the analytical laboratory. Table 3.1 presented the analysis plan for baseline contamination assessment.

Table 3.1 Analysis plan for baseline contamination assessment.

Item	No. of soil samples
Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);	14
Polycyclic aromatic hydrocarbons (PAHs);	11
Total recoverable hydrocarbons (TRH);	11
Benzene, toluene, ethylbenzene and xylenes (BTEX);	11
Organochlorine and organophosphorus compounds (OCP/OPP)	6
Polychlorinated Biphenyls (PCB)	6
Phenols	4
Volatile halogenated compounds (VHCs)	4
Herbicides	3
Asbestos	7
pH	4

All primary and intra laboratory (duplicate) soil samples were sent to the analytical laboratory Eurofins MGT Environmental Testing Australia Pty Ltd (Eurofins). The inter-laboratory secondary (triplicate) soil sample collected was submitted to the analytical laboratory ALS Global (ALS). Eurofins and ALS are NATA accredited for all analysis requested.

3.2.3. Data quality objectives / indicators

As stated in Section 18 (Appendix B) of Schedule B2 'Guideline on Site Characterisation' of the NEPM (1999, amended 2013), Data Quality Objectives (DQOs) are used to "define the type, quality, and quantity of data needed to support decisions relating to the environmental condition of a site". The specific DQOs and field and laboratory data quality indicators (DQIs) for this assessment are provided in Appendix H.

3.3. Environmental assessment criteria

The soil investigation levels (SILs) presented in the following reference are the primary criteria used when setting acceptance criteria for chemical contamination in soil:

- Schedule B (1) 'Guideline on the Investigation Levels for Soil and Groundwater' of the National Environmental Protection (Assessment of Site Contamination) Measure as amended (NEPC, 2013).

The amended NEPM provides health-based investigation and screening levels (HILs / HSLs) and ecological investigation and screening levels (EILs / ESLs) for different land uses (e.g. industrial/commercial, residential, recreational, etc.). Based on the understanding that the site is to be upgraded and continue used as mixed school with primary school and high school. Coffey consider that the following exposure settings are appropriate.

- Residential with garden/accessible soil (primary school)

- Public open space (high school)

However, on this basis that both primary and high students would use the site the more sensitive land use screening level (i.e. residential) has been applied for the investigation.

3.3.1. Health Investigation Levels (HILs)

Based on the use of the site for mixed use and applying the more sensitive land use screening level, chemical concentrations, excluding TRH, BTEX and naphthalene, were assessed against the HILs applicable to the following:

- Residential with garden/accessible soil (HIL A) from the amended NEPM (NEPC, 2013) which consisted soil with home grown produce <10% fruit and vegetable intake, (no poultry), also included children's day care centres, preschools and primary school

3.3.2. Health Screening Levels (HSLs)

TRH, BTEX and naphthalene concentrations were assessed against the soil HSL for vapour intrusion from the relevant depth and soil matrix applicable to:

- 'Low density residential' (HSL A) from the amended NEPM (NEPC, 2013)

Based on the expected subsurface conditions, the CRC 2011 HSLs – Direct contact and intrusive maintenance worker (0-<2m, sand matrix) have also been adopted.

3.3.3. Ecological investigation Levels (EILs)

To assess the impact on site vegetation from contamination within the upper 2m of the subsurface, contaminant concentrations, excluding TRH, BTEX and naphthalene, were assessed against the EILs applicable to the following:

- 'Urban residential / public open space' from the amended NEPM (NEPC, 2013)

3.3.4. Ecological Screening Levels (ESLs)

TRH, BTEX and benzo (a) pyrene concentrations were assessed against the ESLs applicable to the following:

- 'Urban residential / public open space' from amended NEPM (NEPC, 2013)

3.3.5. Management Limits

In accordance with Section 2.9 of Schedule B1 of the amended NEPM (NEPC,2013), consideration of Management limits has been undertaken to assess whether the reported soil conditions have the potential to pose a risk to buried infrastructure, or the formation of non-aqueous phase liquids (NAPL).

3.3.6. Asbestos

As visible asbestos containing material was not encountered during qualitative testing, further detailed sampling and analysis in accordance with the guidance provided in Section 4.10 of Schedule B(1) of the amended NEPM (NEPC, 2013) was not considered necessary.

Qualitative laboratory microscopy analysis was undertaken on selected samples to assess the presence of asbestos fibres within shallow soils. For the purpose of this assessment, a conservative criterion of "no asbestos fines or asbestos containing materials detected in soils" has been adopted.

3.3.7. Adopted assessment criteria

Based on the above rationale and site specific information, the assessment criteria selected for site investigation are listed in Table 3.2.

Table 3.2 Assessment criteria – soil

Contaminant of concern	Human Health Investigation and Screening Levels – Residential A (mg/kg)	Human Health Screening Level Sand Soils for Vapour Intrusion Residential A & B	Ecological Investigation and Screening Levels (mg/kg)	Management Limits (mg/kg)
Arsenic (total)	100	-	100	-
Cadmium	20	-	-	-
Chromium	100	-	410*	-
Copper	6000	-	230*	-
Lead	300	-	1,100	-
Mercury	40	-	-	-
Nickel	400	-	270*	-
Zinc	7400	-	770*	-
Total PAHs	300	-	-	-
Carcinogenic PAHs	3	-		-
Phenol	3000	-	-	-
Aldrin + Dieldrin	6	-	-	-
Chalordane	50	-	-	-
DDT+DDE+DDD	240	-	180	-
Endrin	10	-	-	-
Pentachlorophenol	100	-	-	-
PCBs	1	-	-	-
Chlorpyrifos-methyl	160	-	-	-
Toxaphene	20	-	-	-
Methoxychlor	300	-	-	-
Hexachlorobenzene	10	-	-	-
Heptachlor	6	-	-	-
Endosulfan	270	-	-	-
2,4,5-Trichlorophenoxy acetic acid	600	-	-	-

Contaminant of concern	Human Health Investigation and Screening Levels – Residential A (mg/kg)	Human Health Screening Level Sand Soils for Vapour Intrusion Residential A & B	Ecological Investigation and Screening Levels (mg/kg)	Management Limits (mg/kg)
2,4-Dichlorophenoxy acetic acid	900	-	-	-
2-Methyl-4-chlorophenoxy acetic acid	600	-	-	-
2-Methyl-4-Chlorophenoxy butanoic acid	600	-	-	-
Mecoprop	600	-	-	-
Pentachlorophenol	100	-	-	-
C6-C9		-	180	-
C10 – C16	3300	110	120	-
C16-C34	4500	-	1,300	-
C34-C40	6300	-	5,600	-
Benzene	100	0.5	65	-
Ethylbenzene	4500	57	125	-
Toluene	14000	160	105	-
Xylene Total	12000	40	45	-
Naphthalene	1400	3	170	-
Benzo(a)pyrene	-	-	1	-
F1: TRH C6-C10	-	-	-	800
F1 C6 – C10 less BTEX	4400	44	-	-
F2: TRH C10-C16	-	-	-	1000
F2 C10 – C16 less Naphthalene	-	-	-	-
F3: TRH C16-C34	-	-	-	3,500
F4: TRH C34-C40	-	-	-	10,000

* Calculated in accordance with CSIRO (2010) and adopting:

- An estimate average cation exchange capacity of 20meq/100g (given the absence of laboratory data); and
- An average pH of 6.7 based on reported laboratory results; and
- An organic content of 0.3% based on Part 1, Section 7.3.3 of CRC Technical Report 10 (Friebel, E & Nadebaum, P, 2011) which states that the HSL derivation uses 0.3% to represent soils on developed sites.

3.4. Quality Assurance / Quality Control (QA/QC)

A data validation assessment was undertaken to assess DQIs for field and laboratory data collected for this project. As part of this assessment the following tables relating to QA/QC are included in Appendix B:

- Comparison between field duplicates– Table B (QA/QC).
- Results of equipment rinsate samples - Table C (Rinsate).
- Results of trip blanks – Table C (trip blank).

Analytical laboratory reports for soil samples are included in Appendix B.

We consider the works undertaken have been completed in accordance with the Coffey SOPs and where deviations have occurred, they are justified through the sampling conducted in accordance with the NEPM (1999, amended 2013) as detailed below in Section 'Field quality control procedures'. Data validation is provided in Appendix B.

The following sections discuss and summarise the key results of this assessment along with any non-conformances identified. The material effect of non-conformances on the conclusions of this report was also assessed.

Field quality control procedures

Field quality control was consistent with the quality control plan presented in the Coffey SOPs, and included the following:

- Sampling being performed by qualified Coffey environmental professionals generally in accordance with the procedures outlined in Coffey's Standard Operating Procedures (SOPs), which are based on industry accepted protocols for environmental sampling and are consistent with Schedule B (2) of the NEPM (1999, amended 2013).
- Calibration of field instruments in accordance with manufacturer's instructions. The calibration certificates are included in Appendix H.
- Samples being placed in appropriately preserved containers, supplied by the contract laboratories, and labelled with a unique identifying number.
- Carrying into the field two trip blank samples including dispatch to the laboratory for analysis of volatile compounds to assess the potential for loss of, or cross contamination by, volatile contaminants during transport and sample preparation at the laboratory (Table C in Appendix B).
- Collection of two rinsate samples to verify the effectiveness of equipment decontamination:
- Collection of duplicate and triplicate soil samples being:
 - Soil samples split by taking small representative amounts and placing an amount in each jar/bottle until the jar/bottle had been filled to practical capacity.
 - Collection and analysis of two (2) intra-laboratory duplicates and two (2) inter-laboratory duplicates blind coded soil duplicates. A summary of inter-laboratory and intra-laboratory duplicate soil samples collected and analysed is provided in Table 3.3, below. Relative Percentage Differences (RPDs) calculated between primary and inter-laboratory and intra-laboratory duplicate soil samples are provided in Table B in Appendix B.

Table 3.3: Summary of duplicate soil samples

Analyte	Total number of samples tested			
	Primary samples	Total duplicates (inter- and intra-laboratory) (% of primary)	Intra-laboratory duplicate samples (% of total duplicates)	Inter-laboratory duplicate samples

				(% of total duplicates)
Total number of samples tested	16	4 (25%)	2 (13%)	2 (13%)
TRH	11	2 (18%)	1 (9%)	1 (9%)
BTEX	11	2 (18%)	1 (9%)	1 (9%)
PAH	11	2 (18%)	1 (9%)	1 (9%)
OCP/OPP	6	1 (17%)	-	1 (17%)
Metals	14	3 (21%)	1 (7%)	2 (14%)

Intra- and inter- laboratory duplicates collected for soil both exceeded the minimum required frequency (outlined in Appendix H) of one sample per 20 primary samples. Therefore, replicability is deemed to have been adequately assessed. Soil samples were transported in ice-cooled insulated chests, under chain of custody control, to the nominated NATA accredited analytical laboratories. Eurofins Environmental Laboratories (Eurofins) was selected as the primary laboratory for sample analysis (including inter-lab duplicate samples) whereas Australia Laboratory Services (ALS) was selected to analyse quality control samples (inter-laboratory duplicates). Chain of custody records for all samples are included in Appendix D.

3.4.2. Laboratory quality control

The field and laboratory quality control (QC) data was assessed against criteria described in the relevant sampling and analysis quality assurance / quality control plans. The following QC issues were identified:

Sample Handling:

The laboratory did not advise of any handling issues for the project.

Precision/Accuracy

PID screening measurements were generally consistent with reported laboratory concentrations where volatile hydrocarbons were encountered.

Field QA/QC (duplicates, rinsate samples, trip blanks)

RPDs exceeding the upper control limits were not recorded in the soil duplicate/triplicate pairs and are summarised in Table B in Appendix B. Although there were a number of different value between duplicate and triplicate results. They were below the laboratory detection limits, therefore Coffey did not consider that as RPD exceedance affected the usability of the data.

Laboratory QA/QC

- A reduced frequency of duplicates, matrix spikes and/or laboratory control spikes was applied for batches containing less than 10 samples.
- For all the batches, the laboratory quality control samples (spikes, duplicates, blanks, etc.) met the predetermined control limits established by the laboratories, or (in the case of duplicates) met with Coffey's acceptable limits.

Considering the above discussion, Coffey concludes that the analytical results are representative of the characteristics of the soil at the sample locations at the time of sampling.

4. Results of investigation

4.1. The site

Figure 1 shows the site footprint, which comprises a developed mixed use primary and high school in an approximate square parcel of land, occupying about 3.14 Ha. The site is accessed off Clyde Street to the south, is bounded by Kalkite Street and Park road to the East and South boundary and residential / playing fields to the west.

The site generally slopes gently to the north with an elevation change of about 7 m (RL 926 m to RL 933 m). The slope is stepped with areas of localised filling to create level ground for foundations associated with previous builds.

4.2. Local Subsurface conditions

Table 4.1 below provides a summary of subsurface conditions observed at the site, for detailed conditions, reference should be made to the Engineering Borehole logs and accompanying explanation sheets, included as Appendix C.

Table 4.1 - Inferred geotechnical model

Unit	Material	Description	Depth to Top of Unit (m)	Range of Unit Thickness (m)
1	Topsoil/Fill	Described as predominantly root affected sandy SILT or Sandy gravel and gravelly sand	0.0	0.1 to 0.6
2	Residual Soil	SILTY sand, fine to coarse grained, typically medium dense or better	0.1 to 0.6	0.4 to 1.0
3	Granite Bedrock	Extremely and highly weathered, very low to low strength	0.6 to 1.25	6.0 to Unproven
		Moderately to slightly weathered, medium to very high strength	7.2 ¹	Unproven

Table Notes

1. Only observed in BH 1

4.3. Groundwater levels

Groundwater inflow was not encountered during augering within any of the boreholes at the time of our investigation. Subsequent observation of standing groundwater was not possible during coring within BH1 and BH3 as water was added to the borehole to assist drilling within bedrock. Installation

of groundwater standpipes and subsequent groundwater observation did not form part of our scope of works.

4.4. Field soil headspace screening

PID readings recorded on –site ranged from 0.0ppm to 37.2ppm which indicates that detectable concentrations of ionisable volatile organic compounds may be present in soils vicinity the this low to moderate PID reading. The other sample locations are unlikely to be present within the samples collected for analysis. The highest PID reading was recorded in top soil of borehole 7 (0.05-0.15m). No hydrocarbon odours or discolouration were encountered within the subsurface during fieldwork.

4.5. Laboratory results

4.5.1. Geotechnical

Laboratory test results are summarised in Tables 4.2 and 4.3 below.

Table 4.2 - Summary of Atterberg Limit and CBR test results

Borehole	Depth (m)	PI (%)	PL (%)	LL (%)	LS (%)	MDD (t/m ³)	OMC (%)	CBR (%)
BH 1	1.0	22	17	39	9.0			
BH 1	0.3					1.71	12.7	12
BH 2	0.3					1.93	12.5	14
BH 4	1.0	14	17	31	6.5			
BH 6	1.0	12	20	32	6.5			

Table 4.3 - Summary of soil aggressivity test results

Borehole	Depth (m)	Chloride (mg/kg)	pH	Sulphate (mg/kg)	Conductivity (1:5 water dS/m)
BH 3	1.0	20.0	7.0	<10	0.02
BH 7	1.0	30.0	6.9	<10	0.02

4.5.2. Environmental

Health Investigation and Screening Level

The results of the laboratory analysis indicated the following:

- Soil samples reported heavy metals at concentrations below the adopted HILs.
- Soil samples reported BTEX, and naphthalene at concentrations below the adopted HSLs.
- TRH F1 fraction indicated concentrations above HSLs A/B from near surface soil samples at BH03 (0.05m-0.15m in field duplicate QC6A). TRH F2 fraction C₁₀-C₁₆, indicated concentrations above HSLs A/B from near surface soil samples at BH03 (0.05m-0.15m), and BH07 (0.05m-0.15m). All remaining soil samples analysed for TRH were below the adopted screening levels or laboratory limit of reporting (LOR).
- Soil samples reported PAH, OCPs, OPPs and PCBs at concentrations below the laboratory LOR and the adopted HILs.

Ecological Investigation and Screening Levels

- Soil samples reported heavy metals below the adopted EILs.
- Soil samples reported BTEX and TRH at concentrations below the adopted ESLs, except TRH fraction C₁₀-C₁₆ and C₁₆-C₃₄, indicated concentrations above ESLs screening levels from near surface soil samples at BH03 (0.05m-0.15m).
- Soil samples reported naphthalene at concentrations below the adopted EILs, and benzo (a) pyrene at concentrations below the adopted ESLs.
- Soil samples reported DDT at concentrations below the adopted EILs.

Management Limits

Samples reported TRH concentrations below the adopted (NEPC, 2013) management limits.

Asbestos

No fragments of potential asbestos containing material were observed on the surface of the site and samples from intrusive investigation. Asbestos was not detected in any of the samples submitted for analysis.

5. Discussion and recommendations

5.1. Summary of site considerations

The findings of our investigation indicate the subsurface profile across the site is relatively consistent, comprising variable thicknesses of Unit 1 Topsoil/Fill, and Unit 2 Residual soils overlying Unit 3 Bedrock. No groundwater was encountered during our investigation.

Based on the investigation findings, the following summarises the main considerations that are of relevance to future upgrades and development:

Geotechnical

- Presence of underground services and associated backfill trenches.
- Fill is current condition with no compaction records should be considered uncontrolled, as such should not be used as a foundation for pavements or footings in current condition.
- Poor trafficability during construction for clayey subgrades.
- Effect of adjacent structures during construction.

Environmental

- Near surface (0.05-0.15m) soil samples collected at two locations BH3 (in the current carpark northern end of site) and BH7 (south end of site) reported concentrations of TRH F2 fraction C₁₀-C₁₆ above HSL A/B. At sample location BH3_0.05-0.15m, TRH F1 C₆-C₁₀ exceedances were recorded in the filed duplicate sample only. ESL screening levels were also exceeded for the BH3_0.05-0.15m sample for TRHC₁₀₋₁₆ and C₁₆₋₃₄. It is likely that the identified elevated concentrations may have been from surface leaks/minor spills from vehicle / traffic at these two site locations.
- All remaining soil samples collected reported concentrations of chemicals of potential concern below the adopted site screening levels based on the future continued use of the site for mixed (primary and secondary) school use.

- No visible potential or actual asbestos containing material was observed within the subsurface during fieldwork or subsequent microscopic analysis of soil samples.

Near surface soils in the near vicinity of BH3 (northern carpark) and BH7 (southern end of site) with elevated petroleum hydrocarbon concentrations should be appropriately managed during site construction works, with follow-up localised assessment/management of the shallow near surface soils recommended. In the other areas assessed, based on the results of this investigation there appears to be generally low potential risk to human health and the environment of gross impacts as result of chemical substances present in the ground. The baseline assessment however was designed to support the proposed site upgrade and the assessment was not designed to investigate all potential areas of environmental concern.

Coffey note that due to the nature of contaminated site investigation that the degree of variability in site conditions cannot be known completely and no sampling and analysis program can eliminate all uncertainty concerning the condition of a site, including those statistically based and substantially following guidelines made or approved by the relevant regulatory authorities. As such it is recommended an unexpected finds plan be prepared as part of the construction management process should any non-specific and specific unexpected finds. Non-specific unexpected finds refers to any possible occurrence within any area of the site not investigated. The second category refers to areas of the site where, for example, contamination was identified yet the source or the extent was not confirmed.

Further commentary related to the above and other factors is provided within the following subsections.

5.2. Earthworks

5.2.1. Existing fill

Unless there are records confirming that the existing fill has been compacted in accordance with an engineering specification, the existing fill should be classified as uncontrolled and should not be used as a foundation for structures or pavements due to the potential for differential settlement.

Where existing fill is to be stripped prior to placement of Engineered Fill, the exposed natural soils should be subject to a proof-roll with an appropriate roller, any excessively soft or wet zones should be treated as advised by the project geotechnical consultant.

5.2.2. Site preparation and fill placement

Where filling is required to form the foundation for structures or pavements, the ground shall be prepared by stripping organic soils, root affected zones and unsuitable materials (e.g. uncontrolled fill). Benching of the ground surface should be undertaken so that fill can be placed in near horizontal layers with consistent compactive effort. Fill forming batters should be over-placed, and subsequently trimmed back to allow compaction through the fill layer thickness.

Unit 1a Topsoil and Unit 1b Fill was encountered in the investigation up to about 0.5 m thick and typically comprised landscaped areas underlain by SILTY sand. Within areas of pavement or proposed structures, Unit 1 should be stripped and stockpiled and its re-use limited to landscaping applications only.

Removal of Unit 1 is expected to expose Unit 2 Residual generally comprising natural silty SAND soils or Unit 3a Bedrock.

Subgrade preparatory earthworks may include further localised excavations should thicker areas of unsuitable material be encountered during site preparatory works. Where such zones are encountered, the affected area should be improved by appropriate methods, such as:

- Excavation of the affected soil and replacement with imported engineered fill: or

- Following removal of unsuitable material, tining and moisture controlling of the in-situ material and compaction to achieve the criteria given below for engineered fill.

The extent of subgrade treatment will largely depend of upon preceding weather conditions and construction methodology; and should be treated as advised by the project geotechnical consultant.

Bulk fill for embankments supporting structures or pavements should be compacted to at least 98% Standard Maximum Dry Density (SMDD). Engineered fill should be spread in layers not exceeding 300 mm loose thickness and moisture conditioned to Standard Optimum Moisture Content (SOMC) $\pm$ 2 %, then compacted without delay with appropriate compaction plant.

Fill within 0.3 m depth of floor slab / pavement subgrade level should be compacted to at least 100% SMDD.

Preparation for and construction of engineered fill should be carried out under Level 1 Geotechnical Inspection and Testing as defined in Section 8.2 of AS 3798 – 2007 'Guidelines on earthworks for commercial and residential developments'.

It is recommended that due the nature of site soils and generally flat topography, installation of superficial (for example, sand bags, sediment fences) scour / erosion protection measures and promotion of surficial drainage may be prudent during construction to protect earthworks during and following periods of wet weather.

5.2.3. Subgrade trafficability

As mentioned in section 5.2.2 removal of topsoil and fill is expected to expose a subgrade comprising of residual silty SAND. These materials are expected to behave poorly if exposed to heavy construction traffic, particularly when wet. A platform of granular material such as road base or crushed concrete may be needed to support construction plant. Where heavy plant such as piling rigs, or mobile cranes are to traffic to site, specific analysis of working platform requirements may be needed to assess working platform thickness.

To help reduce, but not eliminate trafficability issues associated with wet weather, exposed subgrades should be graded such that they promote surface drainage and prevent ponding.

5.2.4. Re-use of site won materials

From a geotechnical perspective, site soils (excluding topsoils and construction waste) are considered likely suitable for use as engineered fill, provided that all materials such as organics, wet waste (refuse) or oversized particles are removed. Fill that is excessively sandy may be difficult to recompact and deemed unsuitable by the project geotechnical consultant.

The project geotechnical consultant should verify the suitability of excavated material for re-use as engineered fill during construction.

5.3. Excavations

It is expected that the majority of the development will be at or close to existing grade, with some localised excavations associated with the creation of level building areas, footings, service installation and minor boxing out for pavements.

5.3.1. Excavation conditions

All site soils and Unit 3a Bedrock should be able to be excavated or ripped using conventional earthmoving plant such as a large excavator with rock teeth or a bulldozer fitted with a ripper. Excavation contractors should be provided with the engineering borehole logs and be required to make their own assessment on the suitability and productivity of excavation plant.

5.3.2. Unsupported excavations

Unsupported excavations may be practicable where there is sufficient space and where sensitive structures, or underground services are not located within a distance from the crest equal to the depth of the excavation. The batter slopes in Table 5.1 can be assumed for design of unsupported excavations. Final selection of excavation batter slopes is the responsibility of the site operator.

Table 5.1 - Recommended unsupported batter slopes

Unit	Material / Origin	Temporary Batters	Permanent Batters
1	Topsoil / Uncontrolled Fill	2:1V	3H:1V
	Controlled Fill	1H:1V	2H:1V
2	Residual	1.5H:1V	2H:1V
3	Bedrock	1H:1V	1.5:1V

The recommended maximum batters are based on there being no structures or surcharges located at or near the crest of the cuts. Steeper slopes in the fill, soil or weathered rock materials would require engineering design retaining structures. Site specific advice should be sought for unsupported cuts greater than 3 m in height.

5.3.3. Potential effect on adjacent structures

The location, footing type, layout and founding depth for adjacent structures should be determined before excavation commences. Where adjacent structures are located within the zone of influence (nominally a line extending at a slope of 1H:1V up from the base of the proposed excavation), the foundation stratum may experience horizontal and vertical movements from excavation induced ground movements due to retention deformation and this should be adequately assessed as part of excavation retention design.

Additionally, the potential effects of noise and vibration on adjacent structures resulting from excavation equipment and methods, particularly if hard rock is present, will need to be carefully considered by the contractor as part of the construction management plan.

It may be necessary to limit the size of excavation plant such as impact hammers and/or to limit the use of impact hammers within certain distanced of vibration sensitive receptors.

The vibration limits in Table 5.2 are commonly recommended to reduce risk of vibration damage to sensitive receptors.

Table 5.2 - Ground vibration limits for various types of structure

Type of Structure	Peak Particle Velocity mm/s
Historic buildings or monuments	2
Residential or low-rise buildings in good condition	10
Reinforced concrete commercial and industrial buildings in good condition	25

Dilapidation surveys should be carried out on neighbouring structures or sensitive services prior to commencing excavations. Vibration trials should be carried out to assess appropriate distances for the plant to be used on site to limit vibration. Vibration monitoring should continue during site works to confirm that the limits are not exceeded.

Excavations will cause some ground movements. Many factors can influence the size of these movements, from ground conditions to design and construction quality. If this aspect is critical, we can assess likely ground movements during design of the shoring system.

It is likely the site has sensitive structures or services nearby, a relatively stiff shoring with bracing and/or tie-back anchors design to resist pressures higher than active earth pressures may be required. Such cases should be specifically addressed by Coffey during detailed design when adjacent footing layouts and loadings are known.

5.4. Foundation design

5.4.1. Site classification

In accordance with table 2.1 of AS 2870 – 2011 “Residential Slabs and Footings”, we consider that the site would typically classify as Class S (slightly reactive), with a characteristic surface movement – y_s or between ≤ 20 mm.

However, it should be noted that AS2870-2011 relates to specific residential structures.

Where uncontrolled fill extends to a depth greater than 0.4 m, the site would classify as Class ‘P’ (problem site), per AS2870-2011.

Where shallow footings are founded on underlying Unit 4 Bedrock, the site can be classified as Class A with little or no ground movement from moisture changes.

The above classification must be reassessed should the soil profile change because of site excavations or additional fill being added. Refer to the attached CSIRO Sheet BTF 18 ‘Foundation Maintenance & Footing Performance’ for comments about gardens, landscaping and trees on the performance of foundation soils.

5.4.2. Shallow foundations

High level pad and strip footings are expected to be designed for working loads of about 50 kN. Shallow footings may be proportioned to achieve the following bearing pressures, outlined in Table 5.3.

Table 5.3 - Recommended allowable bearing pressures

Unit	Material / Origin	Allowable Bearing Pressure (kPa)
	Controlled Fill	100
2	Residual	150
3	Bedrock	500

The above values assumed all footings extend a minimum of 0.5 m below the prepared surface levels. Isolated footings will need to be dimensioned to consider uplift and lateral loads.

To reduce potential for differential settlement between building footings, we recommend that all footings be founded in the same geotechnical unit. Footings proportioned in accordance with the above recommendation should have load induced settlements of no greater than 1% of the minimum footing width. Footing design will need to consider the presence of existing site services and associated trenches.

The recommended allowable bearing pressure provided assume that the bearing surfaces are clean and free from spoil and other soft and loose material, and free of water at the time of placement of concrete. We recommend that concrete for pad footings be poured on a blinding layer of concrete be placed on any founding surfaces as soon as is practical to limit disturbance to the surface and any degradation of the exposed materials.

It is recommended that footing excavations be assessed by a Coffey engineering geologist or geotechnical engineer during construction to confirm founding conditions are consistent with design assumptions.

5.4.3. Deep foundations

Column loads are expected to be between 600 kN and 3500 kN.

Where uncontrolled filling or site soils are present to an uneconomical depth, or where design loads exceed the above provided allowable bearing pressures; piled footings may be required to transfer column loads to the underlying Unit 3 bedrock.

It is noted that for the footing to be classed as a pile it must have a length to diameter ratio of greater than 5 ($L/d > 5$), where d = footing diameter).

The parameters provided below (Table 5.4) are the indicative ultimate limit state geotechnical design parameters that can be adopted for the displacement / non-displacement pile foundation design with pile spacing not less than 5 times pile diameter. For the design of piles, a limit state method must be adopted to comply with the piling code AS2159-2009. The following notations used in the table are defined as follows:

- γ_b - Bulk unit weight
- f_b - Ultimate end bearing capacity
- f_s - Ultimate skin friction
- E_{sv}' - Young's modulus for axial response
- p_y - Ultimate lateral yield pressure

Table 5.4 - Geotechnical foundation design parameters for Non-Displacement Piles

Unit	γ_b (kN/m ³)	f_b (MPa)	f_s (kPa)	E_{sv}' (MPa)
Engineered Fill	18	-	20	4
2 - Residual	19	-	50	18
3a - Bedrock	22	2.5	120	100
3b - Bedrock	23	20	400	1,500

To assess pile capacity, a geotechnical strength reduction factor (ϕ_g) value is applied to the above ultimate unit stresses presented in accordance with AS2159-2009 "Piling – Design and Installation". The appropriate (ϕ_g) value will depend on many factors associated with the site, design, installation and testing, some of which are not known at the time of preparing this report. The various factors to be considered include the following:

- Geological complexity of the site
- Extent of the geotechnical investigation with consideration of pile founding levels;
- Available geotechnical data and method of assessment of geotechnical parameters
- Design experience and methods adopted
- Level of construction control and performance monitoring
- Pile testing undertaken

Based on some typical broad assumptions regarding the use of bored piles at this location, it is considered that a ϕ_g of 0.40 be adopted for design of piles. This is assuming that no load testing of constructed piles is to be undertaken. It is expected this could be improved to say 0.55 – 0.60 subject to additional geotechnical investigations and geotechnical supervision during piling. However, designers should make their own assessment of appropriate (ϕ_g) values based on risk circumstances,

experience and testing regime appropriate for their design. Should load testing be undertaken, then a higher (ϕ_g) value may be adopted in accordance with AS2159-2009.

An appropriate structural load factor also needs to be applied to the pile loading.

The ultimate values presented above are applicable to piles founded in Unit 3 bedrock assuming that similar or better-quality material exists to a depth of at least 5 pile diameters depth below the founding level.

Side friction should only be considered for piles that penetrate at least 2 pile diameters into the founding material profile. For the above shaft adhesion value to be adopted, the pile shaft must be free of clay smear and rough. A suitable roughness is grooves and scratches about 5 mm deep at an average spacing of 100 mm to 200 mm. With good drilling practices this level of roughness is generally achieved without the need for additional roughening.

5.5. Soil aggressivity

The results of soil aggressivity were assessed in accordance with Australian Standard AS2159-2009 Piling – “Design and Installation”. Limited chemical tests indicated non-aggressive ground conditions to buried elements.

5.6. Earthquake design

Based on AS 1170.4 - 2007 the following parameters should be adopted for seismic design:

- Seismic Hazard Factor (Z) 0.08
- Sub-Soil Class B_e (Rock)

5.7. Pavement design CBR

5.7.1. Discussion of design subgrade conditions

The expected subgrade materials generally comprise Unit 3 Residual Soils (silty SAND). CBR testing was carried out using 4-day soaking at two locations (BH1 & BH2), and returned values of 12% and 14%.

Furthermore, DCP testing was carried out and were compared to guidance from AGPT02/2012 with respect to CBR estimates. Reference should be made to BH11 and BH2 for a description of each material type at subgrade locations.

We recommended that provision be allowed for the project geotechnical consultant to observe and assess the prepared subgrade to confirm the design value presented below is consistent with observed conditions.

The design CBR value is provided on the basis that the boxed-out pavement construction will be provided with subsurface drains, allowing free drainage of the formation and pavement layers.

5.7.2. Pavement thickness design

No traffic data was available for the site. It is our understanding that an occasional refuse removal truck (say weekly) and occasional bus service (say twice daily) would utilise the pavement. On this basis, and with reference to AGPT02/12 Section 12 (for lightly trafficked pavements), we have utilised a design traffic estimate for a road classification of “Local Access with Buses”, which allows 15 heavy vehicle movements per day for heavy vehicles such as school buses and refuse trucks. The associated design traffic is 8×10^4 ESA over 20 years.

As no traffic data is available, the principal proponent of the works must confirm that the design traffic adopted is appropriate for the project, prior to construction, or otherwise.

On the basis of AGPT02/12 Section 12 the recommended pavement structure for the design CBR 8% subgrade is 250mm thick comprising:

- 40mm dense graded asphalt (AC14) over a tack coat;
- Base - Min. 110mm crushed rock (DGB20 specification) to 102% SMDD and 60 – 90% OMC
- Subbase - Min. 100mm crushed rock (DGS20 specification) to 102% SMDD and 60 – 90% OMC.

If asphalt is not desired for the pavement surfacing, then the base course minimum thickness shall be increased to 150mm. A spray seal will be sensitive to heavy vehicle tyre movements such as turning, screwing, braking and standing, which may significantly damage the spray seal.

6. Limitations

Subsurface conditions can vary over relatively short distances, depth and over time. Our inferred geotechnical model is based upon discrete test locations. We draw your attention to the attached “Important Information about your Coffey Report”

Important information about your Coffey Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept apprised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statutes and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and

Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Appendix A - Figures

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Scale (metres) 1:10000

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approved	MC		project:	UPGRADE WORKS FOR JINDABYNE CENTRAL SCHOOL JINDABYNE, NSW		
date	22 / 08 / 18		title:	SITE LOCATION PLAN		
scale	AS SHOWN		project no:	754-CBREN219571	figure no:	FIGURE 1
original size	A4				rev:	A



revision	no.	description		drawn	approved	date
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Scale (metres) 1:1000

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approved	MC
date	22 / 08 / 18
scale	AS SHOWN
original size	A3

coffey

A TETRA TECH COMPANY

client: GRAY PUKSAND	
project: UPGRADE WORKS FOR JINDABYNE CENTRAL SCHOOL JINDABYNE, NSW	
title: SITE LAYOUT PLAN	
project no: 754-CBREN219571	figure no: FIGURE 2
rev: A	

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	A	ORIGINAL ISSUE		BY	MC	22/08/18		approved	MC		project:	UPGRADE WORKS FOR JINDABYNE CENTRAL SCHOOL JINDABYNE, NSW		
								date	22 / 08 / 18		title:	PROPOSED DEVELOPMENT PLAN		
								scale	AS SHOWN		project no:	754-CBREN219571	figure no:	FIGURE 3
								original size	A3		rev: A			

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Appendix B - Soil Analytical Data tables

Table A
Soil Analytical Result
Jindabyne Central School proposed development area

				Field_ID		BH01_0.05-0.15	BH01_0.4-0.5	BH01_0.9-1.0	BH02_0.05-0.15	QC5	QC5A	BH02_0.4-0.5	BH03_0.05-0.15	QC6	QC6A	BH03_0.4-0.5					
				LocCode		BH01	BH01	BH01	BH02	QC5		BH02	BH03	QC6		BH03					
				Sample_Depth_Range		0.05-0.15	0.4-0.5	0.9-1	0.05-0.15			0.4-0.5	0.05-0.15			0.4-0.5					
				Sampled_Date-Time		19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	18/07/2018	18/07/2018	18/07/2018	19/07/2018	18/07/2018	18/07/2018					
				Matrix_Description																	
				NEPM 2013 EIL - Urban residential and public open space	NEPM 2013 ESL - Urban residential and public open space	CRC 2011 HSL- A Residential (Low Density) Direct Contact	NEPM 2013 HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	CRC 2011, HSL- intrusive maintenance worker (trench), 0 to <2m, Sand for Intrusion	NEPM 2013 HILs Residential A Soil	NEPM 2013, Management Limit	Borehole	Borehole	Borehole	Borehole	Duplicate of BH02_0.05- 0.15	Triplicate of BH02_0.05- 0.15	Borehole	Borehole	Duplicate of BH03_0.05- 0.15	Triplicate of BH03_0.05- 0.15	Borehole
Chem_Group	ChemName	Units	EQL																		
Inorganics	Moisture Content (dried @ 103°C)	%	1								5.8	5.8	3.8	7	8.2	7.2	7.8	10	8.9	9.7	3.7
	pH (aqueous extract)	pH_Units	0.1								-	-	-	7.2	-	-	-	-	-	-	-
Asbestos		g									77	-	-	88	-	-	-	35	-	-	-
	asbestos	-									ND	-	-	ND	-	-	-	ND	-	-	-
Metals	Arsenic	mg/kg	2	100					100		8.4	15	-	<2	<2	<5	16	6.2	-	7	6.2
	Cadmium	mg/kg	0.4						20		<0.4	<0.4	-	<0.4	<0.4	<1	<0.4	<0.4	-	<1	<0.4
	Chromium	mg/kg	2						23		23	9.3	-	35	24	22	16	13	-	9	12
	Copper	mg/kg	5	160					6000		15	10	-	27	14	19	13	23	-	15	8.6
	Lead	mg/kg	5	1100					300		11	8.3	-	19	17	13	10	15	-	12	8.6
	Mercury	mg/kg	0.1						40		<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Nickel	mg/kg	2	270					400		9.1	<5	-	14	9.4	10	6.4	6.2	-	5	<5
	Zinc	mg/kg	5	770					7400		48	38	-	61	47	45	53	68	-	52	31
TPH	C6 - C9	mg/kg	10								<20	-	<20	<20	-	-	-	<20	<20	<10	-
	C10 - C14	mg/kg	20								<20	-	<20	<20	-	-	-	84	62	80	-
	C15 - C28	mg/kg	50								<50	-	<50	78	-	-	-	620	460	370	-
	C29 - C36	mg/kg	50								<50	-	<50	190	-	-	-	460	290	270	-
	C10 - C36 (Sum of total)	mg/kg	50								<50	-	<50	268	-	-	-	1164	812	720	-
TRH	C6 - C10	mg/kg	10		180	4400		NL	800		<20	-	<20	<20	-	-	-	<20	<20	61	-
	C6-C10 less BTEX (F1)	mg/kg	10				45				<20	-	<20	<20	-	-	-	<20	<20	61	-
	C10-C16	mg/kg	50		120	3300		NL	1000		<50	-	<50	<50	-	-	-	140	120	110	-
	F2-NAPHTHALENE	mg/kg	50				110				<50	-	<50	<50	-	-	-	140	120	110	-
	C16-C34	mg/kg	100		300	4500			3500		<100	-	<100	240	-	-	-	850	570	510	-
	C34-C40	mg/kg	100		2800	6300			10,000		<100	-	<100	<100	-	-	-	120	<100	130	-
	C10 - C40 (Sum of total)	mg/kg	50								-	-	-	-	-	-	-	-	-	750	-
BTEX	Benzene	mg/kg	0.1		50	100	0.5	77			<0.1	-	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.2	-
	Ethylbenzene	mg/kg	0.1		70	4500	55	NL			<0.1	-	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.5	-
	Toluene	mg/kg	0.1		85	14000	160	NL			<0.1	-	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.5	-
	Total BTEX	mg/kg	0.2								-	-	-	-	-	-	-	-	-	<0.2	-
	Xylene (m & p)	mg/kg	0.2								<0.2	-	<0.2	<0.2	-	-	-	<0.2	<0.2	<0.5	-
	Xylene (o)	mg/kg	0.1								<0.1	-	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.5	-
	Xylene Total	mg/kg	0.3		105	12000	40	NL			<0.3	-	<0.3	<0.3	-	-	-	<0.3	<0.3	<0.5	-
Phenol	2,4,5-trichlorophenol	mg/kg	1								-	-	-	<1	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	1								-	-	-	<1	-	-	-	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	2,4-dimethylphenol	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	2,4-dinitrophenol	mg/kg	5								-	-	-	<5	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	2-methylphenol	mg/kg	0.2								-	-	-	<0.2	-	-	-	-	-	-	-
	2-nitrophenol	mg/kg	1								-	-	-	<1	-	-	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.4								-	-	-	<0.4	-	-	-	-	-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20								-	-	-	<20	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	1								-	-	-	<1	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	5								-	-	-	<5	-	-	-	-	-	-	-
	Dinoseb	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1						100		-	-	-	<1	-	-	-	-	-	-	-
	Phenol	mg/kg	0.5						3000		-	-	-	<0.5	-	-	-	-	-	-	-
	Phenols (Total Halogenated)	mg/kg	1								-	-	-	<1	-	-	-	-	-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20								-	-	-	<20	-	-	-	-	-	-	-
PAH	Acenaphthene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Anthracene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo(a)anthracene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo(a)pyrene	mg/kg	0.5		0.7						<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5								0.6	-	0.6	0.6	-	-	-	0.6	0.6	0.6	-
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5								1.2	-	1.2	1.2	-	-	-	1.2	1.2	1.2	-
	Benzo(g,h,i)perylene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo(k)fluoranthene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Chrysene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Benzo[b+j]fluoranthene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Dibenz(a,h)anthracene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Fluoranthene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Fluorene	mg/kg	0.5								<0.5	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg																			

Table A
Soil Analytical Result
Jindabyne Central School proposed development area

											Field_ID	BH01_0.05-0.15	BH01_0.4-0.5	BH01_0.9-1.0	BH02_0.05-0.15	QC5	QC5A	BH02_0.4-0.5	BH03_0.05-0.15	QC6	QC6A	BH03_0.4-0.5	
											LocCode	BH01	BH01	BH01	BH02	QC5		BH02	BH03	QC6		BH03	
											Sample_Depth_Range	0.05-0.15	0.4-0.5	0.9-1	0.05-0.15			0.4-0.5	0.05-0.15			0.4-0.5	
											Sampled_Date-Time	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	18/07/2018	18/07/2018	18/07/2018	19/07/2018	18/07/2018	18/07/2018	
											Matrix_Description												
				NEPM 2013 EIL - Urban residential and public open space	NEPM 2013 ESL - Urban residential and public open space	CRC 2011 HSL- A Residential (Low Density) Direct Contact	NEPM 2013 HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	CRC 2011, HSL- intrusive maintenance worker (trench), 0 to <2m, Sand for Intrusion	NEPM 2013 HILs Residential A Soil	NEPM 2013, Management Limit	Borehole	Borehole	Borehole	Borehole	Duplicate of BH02_0.05- 0.15	Triplicate of BH02_0.05- 0.15	Borehole	Borehole	Duplicate of BH03_0.05- 0.15	Triplicate of BH03_0.05- 0.15	Borehole		
Chem_Group	ChemName	Units	EQL																				
Herbicides	2,4,5-Trichlorophenoxy acetic acid	mg/kg	0.5						600		-	-	-	<0.5	-	-	-	-	-	-	-		
	2,4,5-TP (Silvex)	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-		
	2,4-Dichlorophenoxy acetic acid	mg/kg	0.5						900		-	-	-	<0.5	-	-	-	-	-	-	-		
	2,4-Dichlorprop	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-		
	4-(2,4-Dichlorophenoxy) butyric acid (2,4-D)	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-		
	Actril (loxynil)	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-		
	Dicamba	mg/kg	0.5								-	-	-	<0.5	-	-	-	-	-	-	-		
	2-Methyl-4-chlorophenoxy acetic acid	mg/kg	0.5						600		-	-	-	<0.5	-	-	-	-	-	-	-		
	2-Methyl-4-Chlorophenoxy butanoic acid	mg/kg	0.5						600		-	-	-	<0.5	-	-	-	-	-	-	-		
Mecoprop	mg/kg	0.5						600		-	-	-	<0.5	-	-	-	-	-	-	-			
OCP	4,4-DDE	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	a-BHC	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Aldrin	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Aldrin + Dieldrin	mg/kg	0.05						6		<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	b-BHC	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Chlordane	mg/kg	0.05						50		<0.1	-	-	<0.1	-	<0.05	-	-	-	-	-		
	cis-Chlordane	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	d-BHC	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	DDD	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	DDT	mg/kg	0.05	180							<0.05	-	-	<0.05	-	<0.2	-	-	-	-	-		
	DDT+DDE+DDD	mg/kg	0.05						240		<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Dieldrin	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endosulfan	mg/kg	0.05						270		-	-	-	-	-	<0.05	-	-	-	-	-		
	Endosulfan I	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endosulfan II	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endosulfan sulphate	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endrin	mg/kg	0.05						10		<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endrin aldehyde	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Endrin ketone	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	g-BHC (Lindane)	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Heptachlor	mg/kg	0.05						6		<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Heptachlor epoxide	mg/kg	0.05								<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Hexachlorobenzene	mg/kg	0.05						10		<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-		
	Methoxychlor	mg/kg	0.05						300		<0.05	-	-	<0.05	-	<0.2	-	-	-	-	-		
Toxaphene	mg/kg	1						20		<1	-	-	<1	-	-	-	-	-	-	-			
trans-chlordane	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-			
Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1								<0.1	-	-	<0.1	-	-	-	-	-	-	-			
Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1								<0.1	-	-	<0.1	-	-	-	-	-	-	-			
OPP	Azinophos methyl	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Bolstar (Sulprofos)	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Bromophos-ethyl	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	Carbophenothion	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	Chlorfenvinphos	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Chlorpyrifos	mg/kg	0.05						160		<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Chlorpyrifos-methyl	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Coumaphos	mg/kg	2								<2	-	-	<2	-	-	-	-	-	-	-		
	Demeton-O	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Demeton-S	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Demeton-S-methyl	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	Diazinon	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Dichlorvos	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Dimethoate	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Disulfoton	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Ethion	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Ethoprop	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Fenamiphos	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	Fenitrothion	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Fensulfothion	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Fenthion	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Malathion	mg/kg	0.05								<0.2	-	-	<0.2	-	<0.05	-	-	-	-	-		
	Merphos	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Methyl parathion	mg/kg	0.2								<0.2	-	-	<0.2	-	<0.2	-	-	-	-	-		
	Mevinphos (Phosdrin)	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Monocrotophos	mg/kg	0.2								<2	-	-	<2	-	<0.2	-	-	-	-	-		
	Naled (Dibrom)	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Omethoate	mg/kg	2								<2	-	-	<2	-	-	-	-	-	-	-		
	Parathion	mg/kg	0.2								<0.2	-	-	<0.2	-	<0.2	-	-	-	-	-		
	Phorate	mg/kg	0.2								<0.2	-	-	<0.2	-	-	-	-	-	-	-		
	Pirimphos-ethyl	mg/kg	0.05								-	-	-	-	-	<0.05	-	-	-	-	-		
	Prothiofos	mg/kg	0.05								-	-	-	-	-	<							

Table A
Soil Analytical Result
Jindabyne Central School proposed development area



																Field_ID	BH01_0.05-0.15	BH01_0.4-0.5	BH01_0.9-1.0	BH02_0.05-0.15	QC5	QC5A	BH02_0.4-0.5	BH03_0.05-0.15	QC6	QC6A	BH03_0.4-0.5
																LocCode	BH01	BH01	BH01	BH02			BH02	BH03			BH03
																Sample_Depth_Range	0.05-0.15	0.4-0.5	0.9-1	0.05-0.15			0.4-0.5	0.05-0.15			0.4-0.5
																Sampled_Date-Time	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	18/07/2018	18/07/2018	18/07/2018	19/07/2018	18/07/2018	18/07/2018
																Matrix_Description											
				NEPM 2013 EIL - Urban residential and public open space	NEPM 2013 ESL - Urban residential and public open space	CRC 2011 HSL-A Residential (Low Density) Direct Contact	NEPM 2013 HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	CRC 2011, HSL-intrusive maintenance worker (trench), 0 to <2m, Sand for	NEPM 2013 HILs Residential A Soil	NEPM 2013, Management Limit	Borehole	Borehole	Borehole	Borehole	Duplicate of BH02_0.05-0.15	Triplicate of BH02_0.05-0.15	Borehole	Borehole	Duplicate of BH03_0.05-0.15	Triplicate of BH03_0.05-0.15	Borehole						
Chem_Group	ChemName	Units	EQL																								
Pesticides Polychlorinated Biphenyls	Pirimiphos-methyl	mg/kg	0.2											<0.2	-	-	-	-	-	-	-	-					
	Aroclor 1221	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1016	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1232	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1242	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1248	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1254	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
	Aroclor 1260	mg/kg	0.1											<0.1	-	-	-	-	-	-	-	-					
PCBs (Sum of total)	mg/kg	0.1						1					<0.1	-	-	<0.1	-	-	-	-	-	-					
SVOCs	EPN	mg/kg	0.2										<0.2	-	-	-	-	-	-	-	-	-					
VHC	1,1,1,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,1,1-trichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,1,2,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,1,2-trichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,1-dichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,1-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,2-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,2-dichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,2-dichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,3-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,3-dichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	1,4-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Bromoform	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Bromomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Carbon tetrachloride	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Chlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Chloroform	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Chloromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	cis-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Dibromomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Dichloromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Iodomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Trichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Tetrachloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	trans-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Trichlorofluoromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					
	Vinyl chloride	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-					

ND = non detect

Table A
Soil Analytical Result
Jindabyne Central School proposed development area

				Sample BH04 0.05-0.15 BH04 0.4-0.5 BH04 0.9-1.0 BH05 0.05-0.15 BH05 0.4-0.5 BH05 0.9-1.0 BH06 0.05-0.15 BH06 0.4-0.5 BH07 0.05-0.15 BH07 0.9-1.0															
				BH04 BH04 BH04 BH05 BH05 BH05 BH06 BH06 BH07 BH07															
				0.05-0.15 0.4-0.5 0.9-1 0.05-0.15 0.4-0.5 0.9-1 0.05-0.15 0.4-0.5 0.05-0.15 0.9-1															
				18/07/2018 18/07/2018 18/07/2018 17/07/2018 17/07/2018 17/07/2018 18/07/2018 18/07/2018 17/07/2018 17/07/2018															
				Sample Ma Borehole Borehole Borehole Borehole Borehole Borehole Borehole Borehole Borehole Borehole															
Chem_Group	ChemName	Units	EQL	NEPM 2013 EIL - Urban residential and public open space	NEPM 2013 ESL - Urban residential and public open space	CRC 2011 HSL-A Residential (Low Density) Direct Contact	NEPM 2013 HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	CRC 2011, HSL-intrusive maintenance worker (trench), 0 to <2m, Sand for	NEPM 2013 HILs Residential A Soil	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole
Inorganics	Moisture Content (dried @ 103°C)	%	1							6.7	11	5.2	15	14	15	14	10	10	7.8
	pH (aqueous extract)	pH_Units	0.1							7.1	-	-	6.3	-	-	6.4	-	6.2	6.8
Asbestos		g								106	-	-	44	-	-	58	-	49	-
	asbestos	-								ND	-	-	ND	-	-	ND	-	ND	-
Metals	Arsenic	mg/kg	2	100					100	2.1	-	8.4	2.9	-	<2	<2	<2	<2	2.8
	Cadmium	mg/kg	0.4						20	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	2							29	-	11	14	-	19	17	17	12	16
	Copper	mg/kg	5	160					6000	20	-	45	17	-	14	17	18	13	42
	Lead	mg/kg	5	1100					300	12	-	<5	9.1	-	7.9	11	10	8.9	18
	Mercury	mg/kg	0.1						40	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2	270					400	12	-	5.1	5.2	-	8.7	7.5	7.1	5.2	7.2
	Zinc	mg/kg	5	770					7400	49	-	59	79	-	68	58	62	51	88
TPH	C6 - C9	mg/kg	10							<20	<20	-	<20	<20	-	<20	-	<20	<20
	C10 - C14	mg/kg	20							<20	<20	-	<20	<20	-	<20	-	41	<20
	C15 - C28	mg/kg	50							<50	<50	-	83	<50	-	<50	-	420	<50
	C29 - C36	mg/kg	50							<50	<50	-	67	<50	-	<50	-	280	<50
	C10 - C36 (Sum of total)	mg/kg	50							<50	<50	-	150	<50	-	<50	-	741	<50
TRH	C6 - C10	mg/kg	10		180	4400		NL		<20	<20	-	<20	<20	-	<20	-	<20	<20
	C6-C10 less BTEX (F1)	mg/kg	10				45			<20	<20	-	<20	<20	-	<20	-	<20	<20
	C10-C16	mg/kg	50		120	3300		NL		<50	<50	-	<50	<50	-	<50	-	170	<50
	F2-NAPHTHALENE	mg/kg	50				110			<50	<50	-	<50	<50	-	<50	-	170	<50
	C16-C34	mg/kg	100		300	4500				<100	<100	-	100	<100	-	<100	-	490	<100
	C34-C40	mg/kg	100		2800	6300				<100	<100	-	<100	<100	-	<100	-	<100	<100
	C10 - C40 (Sum of total)	mg/kg	50							-	-	-	-	-	-	-	-	-	-
BTEX	Benzene	mg/kg	0.1		50	100	0.5	77		<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1		70	4500	55	NL		<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
	Toluene	mg/kg	0.1		85	14000	160	NL		<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
	Total BTEX	mg/kg	0.2							-	-	-	-	-	-	-	-	-	-
	Xylene (m & p)	mg/kg	0.2							<0.2	<0.2	-	0.3	<0.2	-	<0.2	-	0.6	<0.2
	Xylene (o)	mg/kg	0.1							<0.1	<0.1	-	0.2	<0.1	-	<0.1	-	0.4	<0.1
	Xylene Total	mg/kg	0.3		105	12000	40	NL		<0.3	<0.3	-	0.5	<0.3	-	<0.3	-	1	<0.3
Phenol	2,4,5-trichlorophenol	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.5							<0.5	-	-	<0.5	-	-	-	-	-	-
	2,4-dimethylphenol	mg/kg	0.5							<0.5	-	-	<0.5	-	-	-	-	-	-
	2,4-dinitrophenol	mg/kg	5							<5	-	-	<5	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.5							<0.5	-	-	<0.5	-	-	-	-	-	-
	2-chlororophenol	mg/kg	0.5							<0.5	-	-	<0.5	-	-	-	-	-	-
	2-methylphenol	mg/kg	0.2							<0.2	-	-	<0.2	-	-	-	-	-	-
	2-nitrophenol	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.4							<0.4	-	-	<0.4	-	-	-	-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	0.5							<5	-	-	<0.5	-	-	<0.5	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20							<20	-	-	<20	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-
	4-nitrophenol	mg/kg	5							<5	-	-	<5	-	-	-	-	-	-
	Dinoseb	mg/kg	0.5							<20	-	-	<0.5	-	-	<0.5	-	-	-
	Pentachlorophenol	mg/kg	1						100	<1	-	-	<1	-	-	-	-	-	-
	Phenol	mg/kg	0.5						3000	<0.5	-	-	<0.5	-	-	-	-	-	-
	Phenols (Total Halogenated)	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20							<20	-	-	<20	-	-	-	-	-	-
PAH	Acenaphthene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Anthracene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5							0.6	0.6	-	0.6	0.6	-	0.6	-	0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5							1.2	1.2	-	1.2	1.2	-	1.2	-	1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Chrysene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Fluoranthene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Fluorene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Naphthalene	mg/kg	0.5	170		1400	3			<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Phenanthrene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Pyrene	mg/kg	0.5							<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
	Total PAHs	mg/kg	0.5						300	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Halogenated	tetrachlorophenols	mg/kg	1							<1	-	-	<1	-	-	-	-	-	-

Table A
Soil Analytical Result
Jindabyne Central School proposed development area

										BH04_0.05-0.15	BH04_0.4-0.5	BH04_0.9-1.0	BH05_0.05-0.15	BH05_0.4-0.5	BH05_0.9-1.0	BH06_0.05-0.15	BH06_0.4-0.5	BH07_0.05-0.15	BH07_0.9-1.0	
										BH04_0.05-0.15	BH04_0.4-0.5	BH04_0.9-1	BH05_0.05-0.15	BH05_0.4-0.5	BH05_0.9-1	BH06_0.05-0.15	BH06_0.4-0.5	BH07_0.05-0.15	BH07_0.9-1	
										18/07/2018	18/07/2018	18/07/2018	17/07/2018	17/07/2018	17/07/2018	18/07/2018	18/07/2018	17/07/2018	17/07/2018	
										Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	Borehole	
Chem_Group	ChemName	Units	EQL	NEPM 2013 EIL - Urban residential and public open space	NEPM 2013 ESL - Urban residential and public open space	CRC 2011 HSL- A Residential (Low Density) Direct Contact	NEPM 2013 HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	CRC 2011, HSL- intrusive maintenance worker (trench), 0 to <2m, Sand for Maintenance	NEPM 2013 HILs Residential A Soil											
Herbicides	2,4,5-Trichlorophenoxy acetic acid	mg/kg	0.5						600	-	-	-	<0.5	-	-	<0.5	-	-	-	
	2,4,5-TP (Silvex)	mg/kg	0.5							-	-	-	<0.5	-	-	<0.5	-	-	-	
	2,4-Dichlorophenoxy acetic acid	mg/kg	0.5						900	-	-	-	<0.5	-	-	<0.5	-	-	-	
	2,4-Dichlorprop	mg/kg	0.5							-	-	-	<0.5	-	-	<0.5	-	-	-	
	4-(2,4-Dichlorophenoxy) butyric acid (2,4-DE)	mg/kg	0.5							-	-	-	<0.5	-	-	<0.5	-	-	-	
	Actril (loxynil)	mg/kg	0.5							-	-	-	<0.5	-	-	<0.5	-	-	-	
	Dicamba	mg/kg	0.5							-	-	-	<0.5	-	-	<0.5	-	-	-	
	2-Methyl-4-chlorophenoxy acetic acid	mg/kg	0.5						600	-	-	-	<0.5	-	-	<0.5	-	-	-	
OCP	2-Methyl-4-Chlorophenoxy butanoic acid	mg/kg	0.5						600	-	-	-	<0.5	-	-	<0.5	-	-	-	
	Mecoprop	mg/kg	0.5						600	-	-	-	<0.5	-	-	<0.5	-	-	-	
	4,4-DDE	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	a-BHC	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Aldrin	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Aldrin + Dieldrin	mg/kg	0.05						6	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	b-BHC	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Chlordane	mg/kg	0.05						50	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-	
	cis-Chlordane	mg/kg	0.05							-	-	-	-	-	-	-	-	-	-	
	d-BHC	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	DDD	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	DDT	mg/kg	0.05	180						<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	DDT+DDE+DDD	mg/kg	0.05						240	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Dieldrin	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endosulfan	mg/kg	0.05						270	-	-	-	-	-	-	-	-	-	-	
	Endosulfan I	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endosulfan II	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endosulfan sulphate	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endrin	mg/kg	0.05						10	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endrin aldehyde	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Endrin ketone	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	g-BHC (Lindane)	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Heptachlor	mg/kg	0.05						6	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Heptachlor epoxide	mg/kg	0.05							<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Hexachlorobenzene	mg/kg	0.05						10	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Methoxychlor	mg/kg	0.05						300	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	
	Toxaphene	mg/kg	1						20	<1	-	-	<1	-	-	<1	-	<1	-	
	trans-chlordane	mg/kg	0.05								-	-	-	-	-	-	-	-	-	
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1								<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1								<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	OPP	Azinophos methyl	mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
		Bolstar (Sulprofos)	mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
Bromophos-ethyl		mg/kg	0.05							-	-	-	-	-	-	-	-	-	-	
Carbophenothion		mg/kg	0.05							-	-	-	-	-	-	-	-	-	-	
Chlorfenvinphos		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Chlorpyrifos		mg/kg	0.05						160	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Chlorpyrifos-methyl		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Coumaphos		mg/kg	2							<2	-	-	<2	-	-	<2	-	<2	-	
Demeton-O		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Demeton-S		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Demeton-S-methyl		mg/kg	0.05							-	-	-	-	-	-	-	-	-	-	
Diazinon		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Dichlorvos		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Dimethoate		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Disulfoton		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Ethion		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Ethoprop		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Fenamiphos		mg/kg	0.05							-	-	-	-	-	-	-	-	-	-	
Fenitrothion		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Fensulfothion		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Fenthion		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Malathion		mg/kg	0.05							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Merphos		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Methyl parathion		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Mevinphos (Phosdrin)		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Monocrotophos		mg/kg	0.2							<2	-	-	<2	-	-	<2	-	<2	-	
Naled (Dibrom)		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Omethoate		mg/kg	2							<2	-	-	<2	-	-	<2	-	<2	-	
Parathion		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Phorate		mg/kg	0.2							<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Pirimphos-ethyl		mg/kg	0.05								-	-	-	-	-	-	-	-	-	
Prothiofos		mg/kg	0.05								-	-	-	-	-	-	-	-	-	
Pyrazophos		mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
Ronnel		mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
Terbufos		mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
Trichloronate		mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
Tetrachlorvinphos	mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	
Tokuthion	mg/kg	0.2								<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	

ND = non detect

Table B
Quality Control
Jindabyne Central School proposed development area

ChemName	Units	EQL	BH02_0.05-0.15	QC5	RPDs	BH02_0.05-0.15	QC5A	RPDs	BH03_0.05-0.15	QC6	RPDs	BH03_0.05-0.15	QC6A	RPDs
			BH02	QC5		BH02			BH03	QC6		BH03		
			0.05-0.15			0.05-0.15			0.05-0.15			0.05-0.15		
			19/07/2018	19/07/2018		19/07/2018	18/07/2018		18/07/2018	19/07/2018		18/07/2018	18/07/2018	
			Borehole	Duplicate of BH02_0.05-0.15		Borehole	Triplicate of BH02_0.05-0.15		Borehole	Duplicate of BH03_0.05-0.15		Borehole	Triplicate of BH03_0.05-0.15	
Moisture Content (dried @ 103°C)	%	1	7	8.2	16	7	7.2	3	10	8.9	12	10	9.7	3
pH (aqueous extract)	pH_Units	0.1	7.2	-	-	7.2	-	-	-	-	-	-	-	-
Arsenic	mg/kg	2	<2	<2	0	<2	<5	86	6.2	-	-	6.2	7	12
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<1	86	<0.4	-	-	<0.4	<1	120
Chromium	mg/kg	2	35	24	37	35	22	46	13	-	-	13	9	36
Copper	mg/kg	5	27	14	63	27	19	5	23	-	-	23	15	42
Lead	mg/kg	5	19	17	11	19	13	38	15	-	-	15	12	22
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	-	-	<0.1	<0.1	0
Nickel	mg/kg	2	14	9.4	39	14	10	33	6.2	-	-	6.2	5	21
Zinc	mg/kg	5	61	47	26	61	45	30	68	-	-	68	52	27
C6 - C9	mg/kg	10	<20	-	-	<20	-	-	<20	<20	0	<20	<10	67
C10 - C14	mg/kg	20	<20	-	-	<20	-	-	84	62	30	84	80	5
C15 - C28	mg/kg	50	78	-	-	78	-	-	620	460	30	620	370	51
C29 - C36	mg/kg	50	190	-	-	190	-	-	460	290	45	460	270	52
C10 - C36 (Sum of total)	mg/kg	50	268	-	-	268	-	-	1164	812	36	1164	720	47
C6 - C10	mg/kg	10	<20	-	-	<20	-	-	<20	<20	0	<20	61	-
C6-C10 less BTEX (F1)	mg/kg	10	<20	-	-	<20	-	-	<20	<20	0	<20	61	-
C10-C16	mg/kg	50	<50	-	-	<50	-	-	140	120	15	140	110	24
F2-NAPHTHALENE	mg/kg	50	<50	-	-	<50	-	-	140	120	15	140	110	24
C16-C34	mg/kg	100	240	-	-	240	-	-	850	570	39	850	510	50
C34-C40	mg/kg	100	<100	-	-	<100	-	-	120	<100	-	120	130	8
C10 - C40 (Sum of total)	mg/kg	50	-	-	-	-	-	-	-	-	-	-	750	-
Benzene	mg/kg	0.1	<0.1	-	-	<0.1	-	-	<0.1	<0.1	0	<0.1	<0.2	67
Ethylbenzene	mg/kg	0.1	<0.1	-	-	<0.1	-	-	<0.1	<0.1	0	<0.1	<0.5	133
Toluene	mg/kg	0.1	<0.1	-	-	<0.1	-	-	<0.1	<0.1	0	<0.1	<0.5	133
Total BTEX	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	<0.2	-
Xylene (m & p)	mg/kg	0.2	<0.2	-	-	<0.2	-	-	<0.2	<0.2	0	<0.2	<0.5	86
Xylene (o)	mg/kg	0.1	<0.1	-	-	<0.1	-	-	<0.1	<0.1	0	<0.1	<0.5	133
Xylene Total	mg/kg	0.3	<0.3	-	-	<0.3	-	-	<0.3	<0.3	0	<0.3	<0.5	57
Acenaphthene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)anthracene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	0.6	-	-	0.6	-	-	0.6	0.6	0	0.6	0.6	0
Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5	1.2	-	-	1.2	-	-	1.2	1.2	0	1.2	1.2	0
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Chrysene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Fluorene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Pyrene	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
Total PAHs	mg/kg	0.5	<0.5	-	-	<0.5	-	-	<0.5	<0.5	0	<0.5	<0.5	0
4,4-DDE	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
a-BHC	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Aldrin	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
b-BHC	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Chlordane	mg/kg	0.05	<0.1	-	-	<0.1	<0.05	67	-	-	-	-	-	-
cis-Chlordane	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
DDD	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
DDT	mg/kg	0.05	<0.05	-	-	<0.05	<0.2	120	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Dieldrin	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endosulfan	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-

Table B
Quality Control
Jindabyne Central School proposed development area

			BH02_0.05-0.15	QC5	RPDs	BH02_0.05-0.15	QC5A	RPDs	BH03_0.05-0.15	QC6	RPDs	BH03_0.05-0.15	QC6A	RPDs
			BH02	QC5		BH02			BH03	QC6		BH03		
			0.05-0.15			0.05-0.15			0.05-0.15			0.05-0.15		
			19/07/2018	19/07/2018		19/07/2018	18/07/2018		18/07/2018	19/07/2018		18/07/2018	18/07/2018	
			Borehole	Duplicate of BH02_0.05-0.15		Borehole	Triplicate of BH02_0.05-0.15		Borehole	Duplicate of BH03_0.05-0.15		Borehole	Triplicate of BH03_0.05-0.15	
ChemName	Units	EQL												
Endosulfan I	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endrin	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Heptachlor	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05	<0.05	-	-	<0.05	<0.05	0	-	-	-	-	-	-
Methoxychlor	mg/kg	0.05	<0.05	-	-	<0.05	<0.2	120	-	-	-	-	-	-
Toxaphene	mg/kg	1	<1	-	-	<1	-	-	-	-	-	-	-	-
trans-chlordane	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Bolstar (Sulprofos)	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Coumaphos	mg/kg	2	<2	-	-	<2	-	-	-	-	-	-	-	-
Demeton-O	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Demeton-S	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Dimethoate	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Disulfoton	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Ethoprop	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Fenitrothion	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Fensulfothion	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Malathion	mg/kg	0.05	<0.2	-	-	<0.2	<0.05	120	-	-	-	-	-	-
Merphos	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2	<0.2	-	-	<0.2	<0.2	0	-	-	-	-	-	-
Mevinphos (Phosdrin)	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2	<2	-	-	<2	<0.2	164	-	-	-	-	-	-
Naled (Dibrom)	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Omethoate	mg/kg	2	<2	-	-	<2	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.2	<0.2	-	-	<0.2	<0.2	0	-	-	-	-	-	-
Phorate	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-
Pyrazophos	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Ronnel	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Terbufos	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Trichloronate	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Tokuthion	mg/kg	0.2	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1016	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1232	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1242	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1248	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1254	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor 1260	mg/kg	0.1	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	<0.1	-	-	<0.1	<0.1	0	-	-	-	-	-	-

Table C
Rinsate Trip Blank results
Jindabyne Central School proposed development area



				Field_ID	QC7	QC-R3	QC-R4	QC-R5
				LocCode	QC7	QC	QC	QC
				WellCode		R3	R4	R5
Sampled Date-Time					19/07/2018	17/07/2018	18/07/2018	19/07/2018
					Trip Blank	Rinsate	Rinsate	Rinsate
Chem_Gro	ChemNam	Units	EQL					
BTEX	Benzene	µg/L	1	<1	<1	-	<1	<1
	Ethylbenzene	µg/L	1	<1	<1	-	<1	<1
	Toluene	µg/L	1	<1	<1	-	<1	<1
	Xylene (m)	µg/L	2	<2	<2	-	<2	<2
	Xylene (o)	µg/L	1	<1	<1	-	<1	<1
	Xylene Tot	µg/L	3	<3	<3	-	<3	<3
	C6-C10 less	mg/L	0.02	<0.02	<0.02	-	<0.02	<0.02
Metals	Arsenic	mg/L	0.001	-	<0.001	<0.001	-	-
	Cadmium	mg/L	0.0002	-	<0.0002	<0.0002	-	-
	Chromium	mg/L	0.001	-	<0.001	<0.001	-	-
	Copper	mg/L	0.001	-	<0.001	<0.001	-	-
	Lead	mg/L	0.001	-	<0.001	<0.001	-	-
	Mercury	mg/L	0.0001	-	<0.0001	<0.0001	-	-
	Nickel	mg/L	0.001	-	<0.001	<0.001	-	-
PAH	Zinc	mg/L	0.005	-	<0.005	<0.005	-	-
	Acenaphth	µg/L	1	-	<1	-	<1	<1
	Acenaphth	µg/L	1	-	<1	-	<1	<1
	Anthracene	µg/L	1	-	<1	-	<1	<1
	Benzo(a)ar	µg/L	1	-	<1	-	<1	<1
	Benzo(a)py	µg/L	1	-	<1	-	<1	<1
	Benzo(g,h,i)	µg/L	1	-	<1	-	<1	<1
	Benzo(k)flu	µg/L	1	-	<1	-	<1	<1
	Chrysene	µg/L	1	-	<1	-	<1	<1
	Benzo[b+j]	mg/L	0.001	-	<0.001	-	<0.001	<0.001
	Dibenz(a,h)	µg/L	1	-	<1	-	<1	<1
	Fluoranthene	µg/L	1	-	<1	-	<1	<1
	Fluorene	µg/L	1	-	<1	-	<1	<1
	Indeno(1,2,3-cd)	µg/L	1	-	<1	-	<1	<1
	Naphthalene	µg/L	1	<10	<1	-	<1	<1
	Phenanthrene	µg/L	1	-	<1	-	<1	<1
	Pyrene	µg/L	1	-	<1	-	<1	<1
	Total PAHs	µg/L	1	-	<1	-	<1	<1
TPH	F2-NAPHTH	mg/L	0.05	-	<0.05	-	<0.05	<0.05
	C6 - C9	µg/L	20	<20	<20	-	<20	<20
	C10 - C14	µg/L	50	-	<50	-	<50	<50
	C15 - C28	µg/L	100	-	<100	-	<100	<100
	C29 - C36	µg/L	100	-	<100	-	<100	<100
	C10 - C36 (	µg/L	100	-	<100	-	<100	<100
	C10-C16	mg/L	0.05	-	<0.05	-	<0.05	<0.05
	C16-C34	mg/L	0.1	-	<0.1	-	<0.1	<0.1
	C34-C40	mg/L	0.1	-	<0.1	-	<0.1	<0.1
	C6 - C10	mg/L	0.02	<0.02	<0.02	-	<0.02	<0.02

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Appendix C - Engineering Borehole Logs and Core Photographs

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID. **BH1**

sheet: 1 of 2

project no. **754 CBREN219571**

date started: **19 Jul 2018**

date completed: **19 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645046; N: 5968515 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
AD/T N	1 2 3	Not Observed	SPT 13, 20, 24 N=44		1.0	<							

Borehole BH1 continued as cored hole

method	support	samples & field tests	classification symbol & soil description	consistency / relative density
AD auger drilling* AS auger screwing* HA hand auger W washbore	M mud C casing penetration water 	B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	based on Unified Classification System moisture D dry M moist W wet Wp plastic limit Wl liquid limit	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

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

Engineering Log - Cored Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID. **BH1**

sheet: 2 of 2

project no. **754 CBREN219571**

date started: **19 Jul 2018**

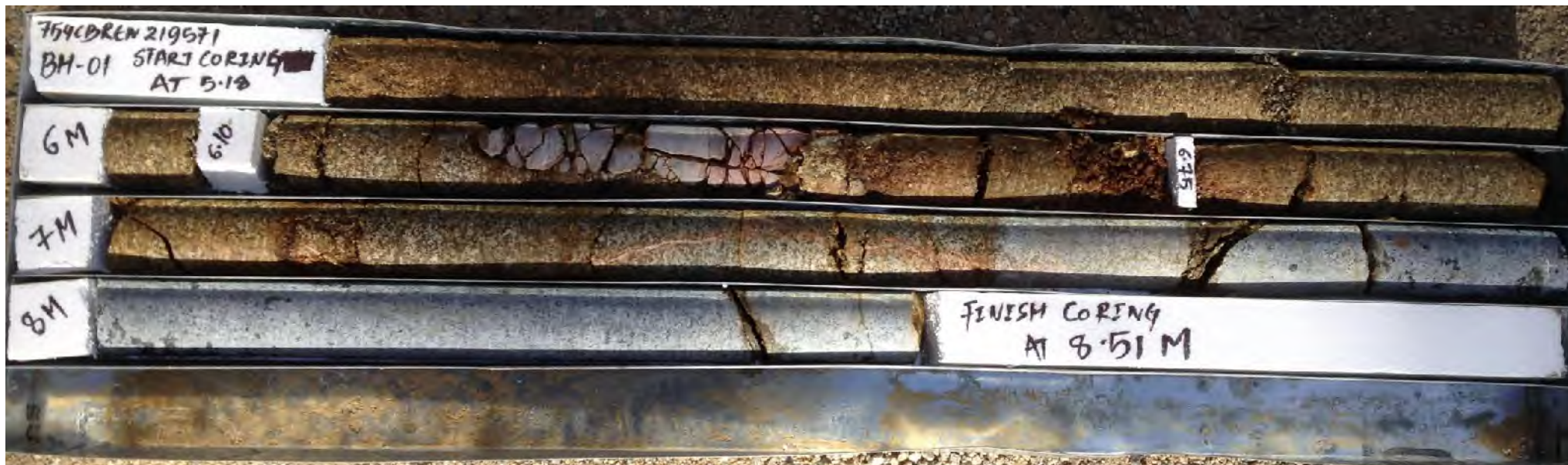
date completed: **19 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645046; N: 5968515 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90°
drill model: Scout, Track mounted drilling fluid: Water hole diameter: 100 mm vane id.:

drilling information				material substance				rock mass defects			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)
			1.0								
			2.0								
			3.0								
			4.0								
			5.0								
			5.18		start coring at 5.18m						
			6.0		GRANITE: fine to coarse grained, grey-white, interbedded with a meta-sedimentary inclusion between 6.3 m to 6.5 m.	XW		a=0.02 d=0.03	0%		
			7.0					a=0.08 d=0.10	0%		
			8.0		GRANITE: fine to coarse grained, grey-white.	MW to SW		a=0.27 d=0.40	69%		JT, 50°, CU, RO, Rock fragments, Clay, Sand SN JT, 50°, CU, RO, Rock fragments, Clay, Sand SN JT, 50°, CU, RO, Rock fragments, Clay, Sand SN JT, 90°, CU, RO, Rock fragments, Clay, Sand SN PT, 30°, ST, RO, Sand VN
			8.51		BH1 terminated at 8.51 m			a=6.06 d=5.39			JT, 40°, CU, RO, Clay and Crushed Rock VN
								d=6.25			
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLONMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test				water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown		graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)		weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high EH extremely high		defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough planarity PL planar CU curved UN undulating ST stepped IR irregular coating CN clean SN stain VN veneer CO coating	



drawn	BY		client:	Gray Puksand Pty Ltd	
approved	DB		project:	Jindabyne Central School	
date	18/07/18		title:	CORE PHOTO BH01: 5.18 – 8.51 m	
scale	NTS		project no:	754-CBREN219571	Photo no: BH01 1 of 1
original size	A4				

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH2**

sheet: 1 of 1

project no. **754 CBREN219571**

date started: **18 Jul 2018**

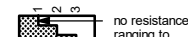
date completed: **18 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645058; N: 5969518 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: N/A hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/100 mm)	structure and additional observations
AD/T N	1 2 3	Not Observed	SPT 12, 19, 24 N=43		1.0	ML	Sandy SILT: low liquid limit, grey-brown, fine to coarse grained sand, trace of fine to medium, sub-angular gravel, trace of rootlets.	<WL M					FILL
													RESIDUAL SOIL
AD/T N	1 2 3	Not Observed	SPT 12, 17, 18 N=35		2.0	SM	SILTY SAND: fine to coarse grained, brown, low plasticity fines.						BEDROCK
AD/T N	1 2 3	Not Observed			3.0		GRANITE: fine to coarse grained, grey, extremely weathered, very low strength, remoulds to sandy gravel soil.						
AD/T N	1 2 3	Not Observed			4.0								
AD/T N	1 2 3	Not Observed			5.0		BH2 terminated at 5.0 m						
AD/T N	1 2 3	Not Observed			6.0								
AD/T N	1 2 3	Not Observed			7.0								
AD/T N	1 2 3	Not Observed			8.0								

method AD auger drilling* AS auger screwing* HA hand auger W washbore	support M mud N nil C casing	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System	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
penetration 		moisture D dry M moist W wet Wp plastic limit Wl liquid limit		
* bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit				

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID. **BH3**

sheet: 1 of 3

project no. **754 CBREN219571**

date started: **18 Jul 2018**

date completed: **18 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645069; N: 5968507 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/100 mm)	structure and additional observations
AD/T N	1 2 3	Not Observed	SPT 9, 20, 22 N=42		1.0	SM		SILT: low liquid limit, brown, fine to coarse grained sand, trace of rootlets, occasional wood pieces and leaves. SILTY SAND: fine to coarse grained, brown, low plasticity fines, trace of fine to medium gravel at 0.5 m to 1.0 m.	<WI M	MD			TOPSOIL
					2.0			GRANITE: fine to coarse grained, grey-brown, extremely weathered, very low strength, remoulds to sandy gravel soil.					RESIDUAL SOIL
AD/T N	1 2 3	Not Observed	SPT 10, 20, 23 N=43		3.0								HB
					4.0								BEDROCK
AD/T N	1 2 3	Not Observed			5.0								
					6.0								
AD/T N	1 2 3	Not Observed			7.0								
					8.0								
AD/T N	1 2 3	Not Observed						Borehole BH3 continued as cored hole					

method AD auger drilling* AS auger screwing* HA hand auger W washbore		support M mud N nil C casing		samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing		classification symbol & soil description based on Unified Classification System		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	
penetration 		water 		moisture D dry M moist W wet Wp plastic limit WL liquid limit					

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

Engineering Log - Cored Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH3**

sheet: 2 of 3

project no: **754 CBREN219571**

date started: **18 Jul 2018**

date completed: **18 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645069; N: 5968507 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90°
drill model: Scout, Track mounted drilling fluid: Water hole diameter: 100 mm vane id.:

drilling information				material substance				rock mass defects			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)
			1.0								
			2.0								
			3.0								
			4.0								
			5.0								
			6.0								
			7.0								
			8.0								
					start coring at 5.21m						
					GRANITE: fine to coarse grained, pale brown, extremely weathered, very low strength, remoulds to sandy gravel soil.	XW			0%		
									0%		
									0%		

method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test	water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown	graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)	weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high EH extremely high	defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough	planarity PL planar CU curved UN undulating ST stepped IR irregular coating CN clean SN stain VN veneer CO coating
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Engineering Log - Cored Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH3**

sheet: 3 of 3

project no. **754 CBREN219571**

date started: **18 Jul 2018**

date completed: **18 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645069; N: 5968507 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90°
drill model: Scout, Track mounted drilling fluid: Water hole diameter: 100 mm vane id.:

drilling information				material substance		rock mass defects					
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)
NMLC Not Observed			10.0	+	GRANITE: fine to coarse grained, pale brown, extremely weathered, very low strength, remoulds to sandy gravel soil. (continued)	XW			0%		
			11.0	+					0%		
			12.0		BH3 terminated at 10.89 m						
			13.0								
			14.0								
			15.0								
			16.0								
			17.0								

method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test	water  10/10/12, water level on date shown  water inflow  complete drilling fluid loss  partial drilling fluid loss  water pressure test result (lugeons) for depth interval shown	graphic log / core recovery  core recovered (graphic symbols indicate material)  no core recovered core run & RQD  barrel withdrawn RQD = Rock Quality Designation (%)	weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high EH extremely high	defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough	planarity PL planar CU curved UN undulating ST stepped IR irregular coating CN clean SN stain VN veneer CO coating
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drawn	BY		client: Gray Puksand Pty Ltd	
approved	LC		project: Jindabyne Central School	
date	1/6/18		title: CORE PHOTO BH02: 5.21 – 10 m	
scale	NTS		project no: 754-CANB00156AB	
original size	A4		Photo no: BH03 1 of 2	



drawn	BY		client:	Gray Puksand Pty Ltd	
approved	DB		project:	Jindabyne Central School	
date	18/07/18		title:	CORE PHOTO BH03: 10 – 0.89 m	
scale	NTS		project no:	754-CBREN219571	Photo no: BH03 2 of 2
original size	A4				

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH4**

sheet: 1 of 1

project no. **754 CBREN219571**

date started: **18 Jul 2018**

date completed: **18 Jul 2018**

logged by: **BY**

checked by: **DB**

position: E: 645046; N: 5968505 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: N/A hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/100 mm)	structure and additional observations
ADT N	1 2 3	Not Observed	SPT 10, 16, 17 N=33		1.0	+	SM	SAND: fine to coarse grained, grey-brown, fine to medium gravel. SILTY SAND: grey-brown, low plasticity fines.	D to M M	MD	100 200 300 400	2 4 6 8 10	FILL
													RESIDUAL SOIL
ADT N	1 2 3	Not Observed	SPT 16, 28, 28 N=56		2.0	+		GRANITE: fine to coarse grained, brown, extremely weathered, very low strength, remoulds to sandy gravel soil.					BEDROCK
ADT N	1 2 3	Not Observed			3.0	+							
ADT N	1 2 3	Not Observed			4.0	+							
ADT N	1 2 3	Not Observed			5.0	+							
ADT N	1 2 3	Not Observed			6.0			BH4 terminated at 5.5 m					
ADT N	1 2 3	Not Observed			7.0								
ADT N	1 2 3	Not Observed			8.0								

method		support		samples & field tests		classification symbol & soil description		consistency / relative density	
AD	auger drilling*	M mud	N nil	B	bulk disturbed sample	based on Unified Classification System		VS	very soft
AS	auger screwing*	C casing		D	disturbed sample			S	soft
HA	hand auger			E	environmental sample			F	firm
W	washbore			SS	split spoon sample			St	stiff
		penetration		U##	undisturbed sample ##mm diameter	moisture D dry M moist W wet Wp plastic limit Wl liquid limit		VSt	very stiff
				HP	hand penetrometer (kPa)			H	hard
		water		N	standard penetration test (SPT)			Fb	friable
				N*	SPT - sample recovered			VL	very loose
				Nc	SPT with solid cone			L	loose
				VS	vane shear; peak/remoulded (kPa)			MD	medium dense
				R	refusal			D	dense
				HB	hammer bouncing			VD	very dense
* bit shown by suffix									
e.g.	AD/T								
B	blank bit								
T	TC bit								
V	V bit								

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

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH5**

sheet: 1 of 1

project no. **754 CBREN219571**

date started: **17 Jul 2018**

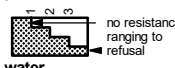
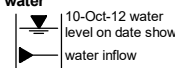
date completed: **17 Jul 2018**

logged by: **TX**

checked by: **DB**

position: E: 645069; N: 5968381 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: N/A hole diameter : 100 mm

drilling information					material substance														
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)				DCP (blows/100 mm)				structure and additional observations
											100	200	300	400	2	4	6	8	
AD/T N	1 2 3	Not Observed	SPT 4, 11, 13 N=24 SPT 8, 14, 19 N=33		1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0		ML	SILT : low liquid limit, dark brown, trace of rootlets.	<WI	MD								TOPSOIL	
								CLAYEY SAND : fine to medium grained, grey-brown, low plasticity clay.	M								RESIDUAL SOIL		
									GRANITE : fine to coarse grained, grey-brown, extremely weathered, very low strength, remoulds to sandy gravel soil.									BEDROCK	
								BH5 terminated at 5.5 m											

method AD auger drilling* AS auger screwing* HA hand auger W washbore * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI 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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Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID. **BH6**

sheet: 1 of 1

project no. **754 CBREN219571**

date started: **18 Jul 2018**

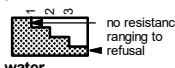
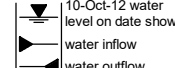
date completed: **18 Jul 2018**

logged by: **TX**

checked by: **DB**

position: E: 645097; N: 5968404 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: N/A hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/100 mm)	structure and additional observations
AD/T N Not Observed	1				0.0		ML	Sandy SILT: low liquid limit, dark brown, fine to medium grained sand, trace of rootlets.	<WI				TOPSOIL
	2				1.0		SM	SILTY SAND: fine coarse grained, grey-brown, low plasticity fines.	D to M	MD			RESIDUAL SOIL
	3				2.0			GRANITE: fine to coarse grained, grey-brown, extremely weathered, very low strength, remoulds to sandy gravel soil.					BEDROCK
					3.0			BH6 terminated at 3.0 m					
					4.0								
					5.0								
					6.0								
					7.0								
					8.0								

method AD auger drilling* AS auger screwing* HA hand auger W washbore * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI 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
--	---	--	--	--

Engineering Log - Borehole

client: **Gray Puksand Pty Ltd**

principal:

project: **Jindabyne Central School Upgrade**

location: **Jindabyne, NSW**

Borehole ID: **BH7**

sheet: 1 of 1

project no: **754 CBREN219571**

date started: **17 Jul 2018**

date completed: **17 Jul 2018**

logged by: **TX**

checked by: **DB**

position: E: 645087; N: 5968391 (Datum Not Specified) surface elevation: Not Specified angle from horizontal: 90° DCP id.:
drill model: Scout, Track mounted drilling fluid: N/A hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/100 mm)	structure and additional observations
ADT N	1 2 3	Not Observed	SPT 3, 18, 26 N=44		1.0		ML	SILT: low liquid limit, dark brown, trace of rootlets.	<WI				TOPSOIL
							SM	SAND with Boulders: fine grained, grey-brown, trace of fine to medium, sub rounded gravel.	D to M	MD			RESIDUAL SOIL
								GRANITE: fine to coarse grained, grey-brown, extremely weathered, very low strength, remoulds to sandy gravel soil.					BEDROCK
			SPT 7, 9, 14 N=23		2.0								
					3.0								
					4.0								
					5.0								
					6.0			BH7 terminated at 5.5 m					
					7.0								
					8.0								

method AD auger drilling* AS auger screwing* HA hand auger W washbore * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI 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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Appendix D - Environmental Laboratory Test Results

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
Project ID: CBREN219571

Order No.:
Report #: 609250
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	BH01_0.05-0.15	Jul 19, 2018		Soil	M18-JI28675	X					X		X	X			
2	BH01_0.4-0.5	Jul 19, 2018		Soil	M18-JI28676					X			X				
3	BH01_0.9-1.0	Jul 19, 2018		Soil	M18-JI28677								X		X		
4	BH02_0.05-0.15	Jul 19, 2018		Soil	M18-JI28678	X		X	X		X		X			X	
5	BH02_0.4-0.5	Jul 18, 2018		Soil	M18-JI28679					X			X				
6	BH03_0.05-0.15	Jul 18, 2018		Soil	M18-JI28680	X						X	X	X			
7	BH03_0.4-0.5	Jul 18, 2018		Soil	M18-JI28681					X			X				

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
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Project ID: CBREN219571

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
8	BH04_0.05-0.15	Jul 18, 2018		Soil	M18-JI28682	X		X			X	X	X			X	
9	BH04_0.4-0.5	Jul 18, 2018		Soil	M18-JI28683								X		X		
10	BH04_0.9-1.0	Jul 18, 2018		Soil	M18-JI28684					X			X				
11	BH05_0.05-0.15	Jul 17, 2018		Soil	M18-JI28685	X		X	X		X	X	X			X	
12	BH05_0.4-0.5	Jul 17, 2018		Soil	M18-JI28686								X		X		
13	BH05_0.9-1.0	Jul 17, 2018		Soil	M18-JI28687					X			X				
14	BH06_0.05-0.15	Jul 18, 2018		Soil	M18-JI28688	X		X	X		X		X	X			
15	BH06_0.4-0.5	Jul 18, 2018		Soil	M18-JI28689					X			X				
16	BH07_0.05-0.15	Jul 17, 2018		Soil	M18-JI28690	X		X			X	X	X	X			

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
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Contact Name: Michael Carbone

Sample Detail

Sample Detail						BTEXN and Volatile TRH
						Eurofins mgt Suite B7A
						Eurofins mgt Suite B4
						Eurofins mgt Suite B7
						Moisture Set
						Halogenated Volatile Organics
						Eurofins mgt Suite B15
						Metals M8
						Acid Herbicides
						pH (1:5 Aqueous extract at 25°C as rec.)
						HOLD
						Asbestos - AS4964
Melbourne Laboratory - NATA Site # 1254 & 14271						X
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
17	BH07_0.9-1.0	Jul 17, 2018		Soil	M18-JI28691	
18	QC-R3	Jul 17, 2018		Water	M18-JI28692	
19	QC-R4	Jul 18, 2018		Water	M18-JI28693	
20	QC-R5	Jul 19, 2018		Water	M18-JI28694	
21	QC5	Jul 19, 2018		Soil	M18-JI28695	
22	QC6	Jul 19, 2018		Soil	M18-JI28696	
23	QC7	Jul 19, 2018		Water	M18-JI28697	X
24	BH01_1.9-2.0	Jul 19, 2018		Soil	M18-JI28698	
25	BH02_0.9-1.0	Jul 18, 2018		Soil	M18-JI28699	
26	BH02_1.9-2.0	Jul 18, 2018		Soil	M18-JI28700	
27	BH03_0.9-1.0	Jul 18, 2018		Soil	M18-JI28701	
28	BH03_1.9-2.0	Jul 18, 2018		Soil	M18-JI28702	

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
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Order No.:
Report #: 609250
Phone: +61 2 6124 5600
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Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
29	BH04_1.9-2.0	Jul 18, 2018		Soil	M18-JI28703		X										
30	BH05_1.9-2.0	Jul 17, 2018		Soil	M18-JI28704		X										
31	BH06_0.9-1.0	Jul 17, 2018		Soil	M18-JI28705		X										
32	BH06_1.9-2.0	Jul 18, 2018		Soil	M18-JI28706		X										
33	BH07_0.4-0.5	Jul 17, 2018		Soil	M18-JI28707		X										
34	BH07_1.9-2.0	Jul 17, 2018		Soil	M18-JI28708		X										
Test Counts						7	11	6	3	9	6	4	19	5	6	3	1

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 2

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Consigning Office: FyshwickReport Results to: Michael CarboneMobile: 0422 350 209Email: michael.carbone@coffey.comInvoices to: "Phone: "Email: "

@coffey.com

Project No: CBREN219571Task No: Tindabynne - P2Project Name: Tindabynne CS - P2Laboratory: Eurofins MGTSampler's Name: TYProject Manager: MC

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	BH01-0.05-0.15	19.07	Am	Soil	Tar	STD
	BH01-0.4-0.5					
	BH01-0.9-1.0					
	BH01-1.9-2.0					
	BH02-0.05-0.15	18.07	Pm			
	BH02-0.4-0.5					
	BH02-0.9-1.0					
	BH02-1.9-2.0					
	BH03-0.05-0.15					
	BH03-0.4-0.5					
	BH03-0.9-1.0					
	BH03-1.9-2.0					
	BH04-0.05-0.15		Am			
	BH04-0.4-0.5					
	BH04-0.9-1.0					
	BH04-1.9-2.0					
	BH05-0.05-0.15	17.07	Pm			
	BH05-0.4-0.5	17.07	Pm			

Analysis Request Section	Notes
Bm	
B1-TRH/BTEX	
B4-TRH/BTEX	
B7-TRH/BTEX	
B7A	
B15-Dep 1ppm	
VICs	
Asbestos	
P4	
Herbicides	

RELINQUISHED BY

Name: Michael Carbone Date: →

Coffey Environments Time: →

Name: → Date: →

Company: → Time: →

RECEIVED BY

Name: Elvis Date: 24/7/18

Company: Eurofins Time: 1:28pm

Name: → Date: 25/7/18

Company: Eurofins Time: 8:40am

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☒

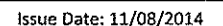
All Documentation is in Proper Order ☒

Samples Received Properly Chilled ☒

Lab. Ref/Batch No. 609250

*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

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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd ACT**
Contact name: **Michael Carbone**
Project name: **JINDABYNE CS-P2**
Project ID: **CBREN219571**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jul 24, 2018 1:28 PM**
Eurofins | mgt reference: **609250**

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 | mgt
Sample Receipt : 12.1 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).

Contact notes

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

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Michael Carbone - Michael.Carbonate@coffey.com.

Certificate of Analysis



NATA Accredited
Accreditation Number 1261
Site Number 1254

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 ACT
16 Mildura Street
Fyshwick
ACT 2609

Attention: Michael Carbone
Report 609250-AID
Project Name JINDABYNE CS-P2
Project ID CBREN219571
Received Date Jul 24, 2018
Date Reported Jul 31, 2018

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 AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "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". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the 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, June 2011.

Project Name JINDABYNE CS-P2
Project ID CBREN219571
Date Sampled Jul 17, 2018 to Jul 19, 2018
Report 609250-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
BH01_0.05-0.15	18-JI28675	Jul 19, 2018	Approximate Sample 77g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH02_0.05-0.15	18-JI28678	Jul 19, 2018	Approximate Sample 88g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH03_0.05-0.15	18-JI28680	Jul 18, 2018	Approximate Sample 35g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH04_0.05-0.15	18-JI28682	Jul 18, 2018	Approximate Sample 106g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH05_0.05-0.15	18-JI28685	Jul 17, 2018	Approximate Sample 44g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH06_0.05-0.15	18-JI28688	Jul 18, 2018	Approximate Sample 58g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BH07_0.05-0.15	18-JI28690	Jul 17, 2018	Approximate Sample 49g Sample consisted of: Brown coarse grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres 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 (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 25, 2018	Indefinite

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
Project ID: CBREN219571

Order No.:
Report #: 609250
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	BH01_0.05-0.15	Jul 19, 2018		Soil	M18-JI28675	X					X		X	X			
2	BH01_0.4-0.5	Jul 19, 2018		Soil	M18-JI28676					X			X				
3	BH01_0.9-1.0	Jul 19, 2018		Soil	M18-JI28677								X		X		
4	BH02_0.05-0.15	Jul 19, 2018		Soil	M18-JI28678	X		X	X		X		X			X	
5	BH02_0.4-0.5	Jul 18, 2018		Soil	M18-JI28679					X			X				
6	BH03_0.05-0.15	Jul 18, 2018		Soil	M18-JI28680	X						X	X	X			
7	BH03_0.4-0.5	Jul 18, 2018		Soil	M18-JI28681					X			X				

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
8	BH04_0.05-0.15	Jul 18, 2018		Soil	M18-JI28682	X		X			X	X	X			X	
9	BH04_0.4-0.5	Jul 18, 2018		Soil	M18-JI28683								X		X		
10	BH04_0.9-1.0	Jul 18, 2018		Soil	M18-JI28684					X			X				
11	BH05_0.05-0.15	Jul 17, 2018		Soil	M18-JI28685	X		X	X		X	X	X			X	
12	BH05_0.4-0.5	Jul 17, 2018		Soil	M18-JI28686								X		X		
13	BH05_0.9-1.0	Jul 17, 2018		Soil	M18-JI28687					X			X				
14	BH06_0.05-0.15	Jul 18, 2018		Soil	M18-JI28688	X		X	X		X		X	X			
15	BH06_0.4-0.5	Jul 18, 2018		Soil	M18-JI28689					X			X				
16	BH07_0.05-0.15	Jul 17, 2018		Soil	M18-JI28690	X		X			X	X	X	X			

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
17	BH07_0.9-1.0	Jul 17, 2018		Soil	M18-JI28691			X		X			X		X		
18	QC-R3	Jul 17, 2018		Water	M18-JI28692									X			
19	QC-R4	Jul 18, 2018		Water	M18-JI28693					X							
20	QC-R5	Jul 19, 2018		Water	M18-JI28694										X		
21	QC5	Jul 19, 2018		Soil	M18-JI28695					X			X				
22	QC6	Jul 19, 2018		Soil	M18-JI28696								X		X		
23	QC7	Jul 19, 2018		Water	M18-JI28697												X
24	BH01_1.9-2.0	Jul 19, 2018		Soil	M18-JI28698		X										
25	BH02_0.9-1.0	Jul 18, 2018		Soil	M18-JI28699		X										
26	BH02_1.9-2.0	Jul 18, 2018		Soil	M18-JI28700		X										
27	BH03_0.9-1.0	Jul 18, 2018		Soil	M18-JI28701		X										
28	BH03_1.9-2.0	Jul 18, 2018		Soil	M18-JI28702		X										

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
Project ID: CBREN219571

Order No.:
Report #: 609250
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
29	BH04	1.9-2.0	Jul 18, 2018	Soil	M18-JI28703		X										
30	BH05	1.9-2.0	Jul 17, 2018	Soil	M18-JI28704		X										
31	BH06	0.9-1.0	Jul 17, 2018	Soil	M18-JI28705		X										
32	BH06	1.9-2.0	Jul 18, 2018	Soil	M18-JI28706		X										
33	BH07	0.4-0.5	Jul 17, 2018	Soil	M18-JI28707		X										
34	BH07	1.9-2.0	Jul 17, 2018	Soil	M18-JI28708		X										
Test Counts						7	11	6	3	9	6	4	19	5	6	3	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. 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	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

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
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Environments Pty Ltd ACT
16 Mildura Street
Fyshwick
ACT 2609



NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Attention: Michael Carbone

Report 609250-S
Project name JINDABYNE CS-P2
Project ID CBREN219571
Received Date Jul 24, 2018

Client Sample ID			BH01_0.05-0.15 Soil	BH01_0.4-0.5 Soil	BH01_0.9-1.0 Soil	BH02_0.05-0.15 Soil
Sample Matrix						
Eurofins mgt Sample No.			M18-JI28675	M18-JI28676	M18-JI28677	M18-JI28678
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50	78
TRH C29-C36	50	mg/kg	< 50	-	< 50	190
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50	268
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	58	-	148	64
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 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	-	< 100	240
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			BH01_0.05-0.15 Soil M18-JI28675 Jul 19, 2018	BH01_0.4-0.5 Soil M18-JI28676 Jul 19, 2018	BH01_0.9-1.0 Soil M18-JI28677 Jul 19, 2018	BH02_0.05-0.15 Soil M18-JI28678 Jul 19, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	113	-	77	73
p-Terphenyl-d14 (surr.)	1	%	121	-	87	73
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
Dibutylchloroendate (surr.)	1	%	89	-	-	67
Tetrachloro-m-xylene (surr.)	1	%	101	-	-	60
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

Client Sample ID			BH01_0.05-0.15 Soil M18-JI28675 Jul 19, 2018	BH01_0.4-0.5 Soil M18-JI28676 Jul 19, 2018	BH01_0.9-1.0 Soil M18-JI28677 Jul 19, 2018	BH02_0.05-0.15 Soil M18-JI28678 Jul 19, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
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	%	105	-	-	79
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchloredate (surr.)	1	%	89	-	-	67
Tetrachloro-m-xylene (surr.)	1	%	101	-	-	60
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	-	< 0.5
2,4-DB	0.5	mg/kg	-	-	-	< 0.5
2,4,5-T	0.5	mg/kg	-	-	-	< 0.5
2,4,5-TP	0.5	mg/kg	-	-	-	< 0.5
Actril (loxynil)	0.5	mg/kg	-	-	-	< 0.5
Dicamba	0.5	mg/kg	-	-	-	< 0.5
Dichlorprop	0.5	mg/kg	-	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	-	-	-	< 0.5
Dinoseb	0.5	mg/kg	-	-	-	< 0.5
MCPA	0.5	mg/kg	-	-	-	< 0.5
MCPB	0.5	mg/kg	-	-	-	< 0.5
Mecoprop	0.5	mg/kg	-	-	-	< 0.5
Warfarin (surr.)	1	%	-	-	-	89

Client Sample ID			BH01_0.05-0.15 Soil M18-JI28675 Jul 19, 2018	BH01_0.4-0.5 Soil M18-JI28676 Jul 19, 2018	BH01_0.9-1.0 Soil M18-JI28677 Jul 19, 2018	BH02_0.05-0.15 Soil M18-JI28678 Jul 19, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2,4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2,4,5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2,4,6-Trichlorophenol	1.0	mg/kg	-	-	-	< 1
2,6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	-	< 1
Pentachlorophenol	1.0	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	1.0	mg/kg	-	-	-	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4,6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4,6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2,4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2,4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	71
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	7.2
% Moisture	1	%	5.8	5.8	3.8	7.0
Heavy Metals						
Arsenic	2	mg/kg	8.4	15	-	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	23	9.3	-	35
Copper	5	mg/kg	15	10	-	27
Lead	5	mg/kg	11	8.3	-	19
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	9.1	< 5	-	14
Zinc	5	mg/kg	48	38	-	61

Client Sample ID			BH02_0.4-0.5 Soil M18-JI28679 Jul 18, 2018	BH03_0.05-0.15 Soil M18-JI28680 Jul 18, 2018	BH03_0.4-0.5 Soil M18-JI28681 Jul 18, 2018	BH04_0.05-0.15 Soil M18-JI28682 Jul 18, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	84	-	< 20
TRH C15-C28	50	mg/kg	-	620	-	< 50
TRH C29-C36	50	mg/kg	-	460	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	1164	-	< 50

Client Sample ID			BH02_0.4-0.5 Soil	BH03_0.05-0.15 Soil	BH03_0.4-0.5 Soil	BH04_0.05-0.15 Soil
Sample Matrix			M18-JI28679	M18-JI28680	M18-JI28681	M18-JI28682
Eurofins mgt Sample No.			Jul 18, 2018	Jul 18, 2018	Jul 18, 2018	Jul 18, 2018
Date Sampled						
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	131	-	106
Halogenated Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromoform	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chloroform	0.5	mg/kg	-	< 0.5	-	< 0.5
Chloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibromomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Iodomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	< 0.5
Trichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	131	-	106
Toluene-d8 (surr.)	1	%	-	127	-	99

Client Sample ID			BH02_0.4-0.5 Soil M18-JI28679 Jul 18, 2018	BH03_0.05-0.15 Soil M18-JI28680 Jul 18, 2018	BH03_0.4-0.5 Soil M18-JI28681 Jul 18, 2018	BH04_0.05-0.15 Soil M18-JI28682 Jul 18, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
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	-	140	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	140	-	< 50
TRH >C16-C34	100	mg/kg	-	850	-	< 100
TRH >C34-C40	100	mg/kg	-	120	-	< 100
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	%	-	78	-	81
p-Terphenyl-d14 (surr.)	1	%	-	78	-	84
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID			BH02_0.4-0.5 Soil	BH03_0.05-0.15 Soil	BH03_0.4-0.5 Soil	BH04_0.05-0.15 Soil
Sample Matrix			M18-JI28679	M18-JI28680	M18-JI28681	M18-JI28682
Eurofins mgt Sample No.			Jul 18, 2018	Jul 18, 2018	Jul 18, 2018	Jul 18, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorodate (surr.)	1	%	-	-	-	73
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	84
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	89

Client Sample ID			BH02_0.4-0.5 Soil	BH03_0.05-0.15 Soil	BH03_0.4-0.5 Soil	BH04_0.05-0.15 Soil
Sample Matrix			M18-JI28679	M18-JI28680	M18-JI28681	M18-JI28682
Eurofins mgt Sample No.			Jul 18, 2018	Jul 18, 2018	Jul 18, 2018	Jul 18, 2018
Date Sampled						
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
Dibutylchloredate (surr.)	1	%	-	-	-	73
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	84
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2,4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2,4,5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2,4,6-Trichlorophenol	1.0	mg/kg	-	-	-	< 1
2,6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	-	< 1
Pentachlorophenol	1.0	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	1.0	mg/kg	-	-	-	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4,6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4,6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2,4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2,4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	79
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	7.1
% Moisture	1	%	7.8	10	3.7	6.7
Heavy Metals						
Arsenic	2	mg/kg	16	6.2	6.2	2.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	13	12	29
Copper	5	mg/kg	13	23	8.6	20
Lead	5	mg/kg	10	15	8.6	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.4	6.2	< 5	12
Zinc	5	mg/kg	53	68	31	49

Client Sample ID			BH04_0.4-0.5 Soil	BH04_0.9-1.0 Soil	BH05_0.05-0.15 Soil	BH05_0.4-0.5 Soil
Sample Matrix			M18-JI28683	M18-JI28684	M18-JI28685	M18-JI28686
Eurofins mgt Sample No.			Jul 18, 2018	Jul 18, 2018	Jul 17, 2018	Jul 17, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	-	83	< 50
TRH C29-C36	50	mg/kg	< 50	-	67	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	-	150	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	0.3	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	0.2	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	0.5	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	-	93	83
Halogenated Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromoform	0.5	mg/kg	-	-	< 0.5	-
Bromomethane	0.5	mg/kg	-	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Chloroform	0.5	mg/kg	-	-	< 0.5	-
Chloromethane	0.5	mg/kg	-	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Dibromomethane	0.5	mg/kg	-	-	< 0.5	-
Iodomethane	0.5	mg/kg	-	-	< 0.5	-
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Trichloroethene	0.5	mg/kg	-	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			BH04_0.4-0.5 Soil	BH04_0.9-1.0 Soil	BH05_0.05-0.15 Soil	BH05_0.4-0.5 Soil
Sample Matrix			M18-JI28683	M18-JI28684	M18-JI28685	M18-JI28686
Eurofins mgt Sample No.			Jul 18, 2018	Jul 18, 2018	Jul 17, 2018	Jul 17, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Halogenated Volatile Organics						
4-Bromofluorobenzene (surr.)	1	%	-	-	93	-
Toluene-d8 (surr.)	1	%	-	-	90	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 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	-	100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	77	-	74	79
p-Terphenyl-d14 (surr.)	1	%	81	-	72	82
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID			BH04_0.4-0.5	BH04_0.9-1.0	BH05_0.05-0.15	BH05_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28683	M18-JI28684	M18-JI28685	M18-JI28686
Date Sampled			Jul 18, 2018	Jul 18, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorobenzene (surr.)	1	%	-	-	117	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	84	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	73	-

Client Sample ID			BH04_0.4-0.5	BH04_0.9-1.0	BH05_0.05-0.15	BH05_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28683	M18-JI28684	M18-JI28685	M18-JI28686
Date Sampled			Jul 18, 2018	Jul 18, 2018	Jul 17, 2018	Jul 17, 2018
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	-
Dibutylchloredate (surr.)	1	%	-	-	117	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	84	-
Acid Herbicides						
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4-DB	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
2,4,5-TP	0.5	mg/kg	-	-	< 0.5	-
Actril (loxynil)	0.5	mg/kg	-	-	< 0.5	-
Dicamba	0.5	mg/kg	-	-	< 0.5	-
Dichlorprop	0.5	mg/kg	-	-	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	-	-	< 0.5	-
Dinoseb	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	77	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2,4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2,4,5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2,4,6-Trichlorophenol	1.0	mg/kg	-	-	< 1	-
2,6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	< 1	-
Pentachlorophenol	1.0	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	1.0	mg/kg	-	-	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4,6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4,6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1.0	mg/kg	-	-	< 1	-
2,4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2,4-Dinitrophenol	5	mg/kg	-	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	71	-

Client Sample ID			BH04_0.4-0.5	BH04_0.9-1.0	BH05_0.05-0.15	BH05_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28683	M18-JI28684	M18-JI28685	M18-JI28686
Date Sampled			Jul 18, 2018	Jul 18, 2018	Jul 17, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	6.3	-
% Moisture	1	%	11	5.2	15	14
Heavy Metals						
Arsenic	2	mg/kg	-	8.4	2.9	-
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	-
Chromium	5	mg/kg	-	11	14	-
Copper	5	mg/kg	-	45	17	-
Lead	5	mg/kg	-	< 5	9.1	-
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	-
Nickel	5	mg/kg	-	5.1	5.2	-
Zinc	5	mg/kg	-	59	79	-

Client Sample ID			BH05_0.9-1.0	BH06_0.05-0.15	BH06_0.4-0.5	BH07_0.05-0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28687	M18-JI28688	M18-JI28689	M18-JI28690
Date Sampled			Jul 17, 2018	Jul 18, 2018	Jul 18, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	41
TRH C15-C28	50	mg/kg	-	< 50	-	420
TRH C29-C36	50	mg/kg	-	< 50	-	280
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	741
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	-	0.6
o-Xylene	0.1	mg/kg	-	< 0.1	-	0.4
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	1.0
4-Bromofluorobenzene (surr.)	1	%	-	84	-	111
Halogenated Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			BH05_0.9-1.0 Soil M18-JI28687 Jul 17, 2018	BH06_0.05-0.15 Soil M18-JI28688 Jul 18, 2018	BH06_0.4-0.5 Soil M18-JI28689 Jul 18, 2018	BH07_0.05-0.15 Soil M18-JI28690 Jul 17, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Halogenated Volatile Organics						
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	-	111
Toluene-d8 (surr.)	1	%	-	-	-	108
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	-	170
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	-	< 50	-	170
TRH >C16-C34	100	mg/kg	-	< 100	-	490
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
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

Client Sample ID			BH05_0.9-1.0 Soil M18-JI28687 Jul 17, 2018	BH06_0.05-0.15 Soil M18-JI28688 Jul 18, 2018	BH06_0.4-0.5 Soil M18-JI28689 Jul 18, 2018	BH07_0.05-0.15 Soil M18-JI28690 Jul 17, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	92	-	102
p-Terphenyl-d14 (surr.)	1	%	-	93	-	91
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
Dibutylchloroendate (surr.)	1	%	-	86	-	68
Tetrachloro-m-xylene (surr.)	1	%	-	95	-	74
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

Client Sample ID			BH05_0.9-1.0 Soil M18-JI28687 Jul 17, 2018	BH06_0.05-0.15 Soil M18-JI28688 Jul 18, 2018	BH06_0.4-0.5 Soil M18-JI28689 Jul 18, 2018	BH07_0.05-0.15 Soil M18-JI28690 Jul 17, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
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	%	-	90	-	89
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	86	-	68
Tetrachloro-m-xylene (surr.)	1	%	-	95	-	74
Acid Herbicides						
2,4-D	0.5	mg/kg	-	< 0.5	-	-
2,4-DB	0.5	mg/kg	-	< 0.5	-	-
2,4,5-T	0.5	mg/kg	-	< 0.5	-	-
2,4,5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	101	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	6.4	-	6.2
% Moisture	1	%	15	14	10	10

Client Sample ID			BH05_0.9-1.0	BH06_0.05-0.15	BH06_0.4-0.5	BH07_0.05-0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28687	M18-JI28688	M18-JI28689	M18-JI28690
Date Sampled			Jul 17, 2018	Jul 18, 2018	Jul 18, 2018	Jul 17, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	17	17	12
Copper	5	mg/kg	14	17	18	13
Lead	5	mg/kg	7.9	11	10	8.9
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.7	7.5	7.1	5.2
Zinc	5	mg/kg	68	58	62	51

Client Sample ID			BH07_0.9-1.0	QC5	QC6
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28691	M18-JI28695	M18-JI28696
Date Sampled			Jul 17, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	62
TRH C15-C28	50	mg/kg	< 50	-	460
TRH C29-C36	50	mg/kg	< 50	-	290
TRH C10-36 (Total)	50	mg/kg	< 50	-	812
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	%	101	-	98
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	-	120
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	-	120
TRH >C16-C34	100	mg/kg	< 100	-	570
TRH >C34-C40	100	mg/kg	< 100	-	< 100
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

Client Sample ID			BH07_0.9-1.0	QC5	QC6
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			M18-JI28691	M18-JI28695	M18-JI28696
Date Sampled			Jul 17, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
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	%	78	-	79
p-Terphenyl-d14 (surr.)	1	%	86	-	80
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.8	-	-
% Moisture	1	%	7.8	8.2	8.9
Heavy Metals					
Arsenic	2	mg/kg	2.8	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-
Chromium	5	mg/kg	16	24	-
Copper	5	mg/kg	42	14	-
Lead	5	mg/kg	18	17	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-
Nickel	5	mg/kg	7.2	9.4	-
Zinc	5	mg/kg	88	47	-

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 (regarding both quality and NATA accreditation).

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	Jul 27, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jul 27, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 27, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins mgt Suite B7A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 27, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 27, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Jul 27, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Jul 27, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Jul 27, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Halogenated Volatile Organics	Melbourne	Jul 27, 2018	7 Day
- Method: USEPA 8260 MGT 350A Halogenated Volatile Organics			
Acid Herbicides	Melbourne	Jul 27, 2018	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Jul 27, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Eurofins mgt Suite B15			
Organochlorine Pesticides	Melbourne	Jul 27, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jul 27, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Jul 27, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Melbourne	Jul 25, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
Project ID: CBREN219571

Order No.:
Report #: 609250
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	BH01_0.05-0.15	Jul 19, 2018		Soil	M18-JI28675	X					X		X	X			
2	BH01_0.4-0.5	Jul 19, 2018		Soil	M18-JI28676					X			X				
3	BH01_0.9-1.0	Jul 19, 2018		Soil	M18-JI28677								X		X		
4	BH02_0.05-0.15	Jul 19, 2018		Soil	M18-JI28678	X		X	X		X		X			X	
5	BH02_0.4-0.5	Jul 18, 2018		Soil	M18-JI28679					X			X				
6	BH03_0.05-0.15	Jul 18, 2018		Soil	M18-JI28680	X						X	X	X			
7	BH03_0.4-0.5	Jul 18, 2018		Soil	M18-JI28681					X			X				

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
8	BH04_0.05-0.15	Jul 18, 2018		Soil	M18-JI28682	X		X			X	X	X			X	
9	BH04_0.4-0.5	Jul 18, 2018		Soil	M18-JI28683								X		X		
10	BH04_0.9-1.0	Jul 18, 2018		Soil	M18-JI28684					X			X				
11	BH05_0.05-0.15	Jul 17, 2018		Soil	M18-JI28685	X		X	X		X	X	X			X	
12	BH05_0.4-0.5	Jul 17, 2018		Soil	M18-JI28686								X		X		
13	BH05_0.9-1.0	Jul 17, 2018		Soil	M18-JI28687					X			X				
14	BH06_0.05-0.15	Jul 18, 2018		Soil	M18-JI28688	X		X	X		X		X	X			
15	BH06_0.4-0.5	Jul 18, 2018		Soil	M18-JI28689					X			X				
16	BH07_0.05-0.15	Jul 17, 2018		Soil	M18-JI28690	X		X			X	X	X	X			

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
17	BH07_0.9-1.0	Jul 17, 2018		Soil	M18-JI28691			X		X			X		X		
18	QC-R3	Jul 17, 2018		Water	M18-JI28692									X			
19	QC-R4	Jul 18, 2018		Water	M18-JI28693					X							
20	QC-R5	Jul 19, 2018		Water	M18-JI28694										X		
21	QC5	Jul 19, 2018		Soil	M18-JI28695					X			X				
22	QC6	Jul 19, 2018		Soil	M18-JI28696								X		X		
23	QC7	Jul 19, 2018		Water	M18-JI28697												X
24	BH01_1.9-2.0	Jul 19, 2018		Soil	M18-JI28698		X										
25	BH02_0.9-1.0	Jul 18, 2018		Soil	M18-JI28699		X										
26	BH02_1.9-2.0	Jul 18, 2018		Soil	M18-JI28700		X										
27	BH03_0.9-1.0	Jul 18, 2018		Soil	M18-JI28701		X										
28	BH03_1.9-2.0	Jul 18, 2018		Soil	M18-JI28702		X										

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
29	BH04_1.9-2.0	Jul 18, 2018		Soil	M18-JI28703		X										
30	BH05_1.9-2.0	Jul 17, 2018		Soil	M18-JI28704		X										
31	BH06_0.9-1.0	Jul 17, 2018		Soil	M18-JI28705		X										
32	BH06_1.9-2.0	Jul 18, 2018		Soil	M18-JI28706		X										
33	BH07_0.4-0.5	Jul 17, 2018		Soil	M18-JI28707		X										
34	BH07_1.9-2.0	Jul 17, 2018		Soil	M18-JI28708		X										
Test Counts						7	11	6	3	9	6	4	19	5	6	3	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/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							
Halogenated Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
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&i)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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2,4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2,4,5-Trichlorophenol	mg/kg	< 1			1	Pass	
2,4,6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2,6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4,6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4,6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2,4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2,4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	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	
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 - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	92			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	87			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	106			70-130	Pass	
m&p-Xylenes	%	109			70-130	Pass	
Xylenes - Total	%	110			70-130	Pass	
LCS - % Recovery							
Halogenated Volatile Organics							
1,1-Dichloroethene	%	70			70-130	Pass	
1,1,1-Trichloroethane	%	83			70-130	Pass	
1,2-Dichlorobenzene	%	110			70-130	Pass	
1,2-Dichloroethane	%	101			70-130	Pass	
Trichloroethene	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	96			70-130	Pass	
TRH C6-C10	%	95			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	70			70-130	Pass	
Anthracene	%	97			70-130	Pass	
Benz(a)anthracene	%	71			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	82			70-130	Pass	
Benzo(g,h,i)perylene	%	101			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	72			70-130	Pass	
Dibenz(a,h)anthracene	%	100			70-130	Pass	
Fluoranthene	%	72			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	103			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	73			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4,4'-DDD	%	112			70-130	Pass	
4,4'-DDE	%	109			70-130	Pass	
4,4'-DDT	%	93			70-130	Pass	
a-BHC	%	111			70-130	Pass	
Aldrin	%	111			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	104			70-130	Pass	
Dieldrin	%	115			70-130	Pass	
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	110			70-130	Pass	
Endosulfan sulphate	%	108			70-130	Pass	
Endrin	%	80			70-130	Pass	
Endrin aldehyde	%	122			70-130	Pass	
Endrin ketone	%	117			70-130	Pass	
g-BHC (Lindane)	%	110			70-130	Pass	
Heptachlor	%	97			70-130	Pass	
Heptachlor epoxide	%	110			70-130	Pass	
Hexachlorobenzene	%	108			70-130	Pass	
Methoxychlor	%	88			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	126			70-130	Pass	
Dimethoate	%	79			70-130	Pass	
Ethion	%	120			70-130	Pass	
Fenitrothion	%	102			70-130	Pass	
Methyl parathion	%	98			70-130	Pass	
Mevinphos	%	120			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	75			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2,4-D	%	117			70-130	Pass	
2,4-DB	%	116			70-130	Pass	
2,4,5-T	%	118			70-130	Pass	
2,4,5-TP	%	115			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Actril (Ioxynil)				%	120			70-130	Pass	
Dicamba				%	118			70-130	Pass	
Dichlorprop				%	126			70-130	Pass	
Dinitro-o-cresol				%	110			70-130	Pass	
Dinoseb				%	121			70-130	Pass	
MCPA				%	116			70-130	Pass	
MCPB				%	119			70-130	Pass	
Mecoprop				%	120			70-130	Pass	
LCS - % Recovery										
Phenols (Halogenated)										
2-Chlorophenol				%	66			30-130	Pass	
2,4-Dichlorophenol				%	69			30-130	Pass	
2,4,5-Trichlorophenol				%	61			30-130	Pass	
2,4,6-Trichlorophenol				%	67			30-130	Pass	
2,6-Dichlorophenol				%	64			30-130	Pass	
4-Chloro-3-methylphenol				%	64			30-130	Pass	
Pentachlorophenol				%	45			30-130	Pass	
Tetrachlorophenols - Total				%	61			30-130	Pass	
LCS - % Recovery										
Phenols (non-Halogenated)										
2-Cyclohexyl-4,6-dinitrophenol				%	30			30-130	Pass	
2-Methyl-4,6-dinitrophenol				%	31			30-130	Pass	
2-Methylphenol (o-Cresol)				%	65			30-130	Pass	
2-Nitrophenol				%	63			30-130	Pass	
2,4-Dimethylphenol				%	71			30-130	Pass	
2,4-Dinitrophenol				%	30			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)				%	61			30-130	Pass	
4-Nitrophenol				%	41			30-130	Pass	
Dinoseb				%	39			30-130	Pass	
Phenol				%	66			30-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	111			80-120	Pass	
Cadmium				%	112			80-120	Pass	
Chromium				%	118			80-120	Pass	
Copper				%	109			80-120	Pass	
Lead				%	112			80-120	Pass	
Mercury				%	104			75-125	Pass	
Nickel				%	108			80-120	Pass	
Zinc				%	109			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 C10-C14	M18-JI30439	NCP	%	102				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1						
TRH >C10-C16	M18-JI30439	NCP	%	97				70-130	Pass	
Spike - % Recovery										
Organochlorine Pesticides				Result 1						
4,4'-DDD	M18-JI27697	NCP	%	113				70-130	Pass	
4,4'-DDE	M18-JI27697	NCP	%	123				70-130	Pass	
4,4'-DDT	M18-JI27697	NCP	%	125				70-130	Pass	
a-BHC	M18-JI27697	NCP	%	107				70-130	Pass	
Aldrin	M18-JI27697	NCP	%	116				70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-BHC	M18-JI27697	NCP	%	107			70-130	Pass	
d-BHC	M18-JI27697	NCP	%	109			70-130	Pass	
Dieldrin	M18-JI27697	NCP	%	101			70-130	Pass	
Endosulfan I	M18-JI27697	NCP	%	99			70-130	Pass	
Endosulfan II	M18-JI27697	NCP	%	111			70-130	Pass	
Endosulfan sulphate	M18-JI27697	NCP	%	108			70-130	Pass	
Endrin	M18-JI27697	NCP	%	123			70-130	Pass	
Endrin aldehyde	M18-JI27697	NCP	%	116			70-130	Pass	
Endrin ketone	M18-JI27697	NCP	%	106			70-130	Pass	
g-BHC (Lindane)	M18-JI27697	NCP	%	111			70-130	Pass	
Heptachlor	M18-JI27697	NCP	%	107			70-130	Pass	
Heptachlor epoxide	M18-JI27697	NCP	%	112			70-130	Pass	
Hexachlorobenzene	M18-JI27697	NCP	%	111			70-130	Pass	
Methoxychlor	M18-JI27697	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S18-JI28363	NCP	%	93			70-130	Pass	
Dimethoate	M18-JI28973	NCP	%	105			70-130	Pass	
Ethion	M18-JI28973	NCP	%	78			70-130	Pass	
Fenitrothion	M18-JI28973	NCP	%	106			70-130	Pass	
Methyl parathion	M18-JI28973	NCP	%	96			70-130	Pass	
Mevinphos	M18-JI28973	NCP	%	121			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-JI29747	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-JI28678	CP	%	118			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-JI28678	CP	%	102			70-130	Pass	
Toluene	M18-JI28678	CP	%	97			70-130	Pass	
Ethylbenzene	M18-JI28678	CP	%	113			70-130	Pass	
m&p-Xylenes	M18-JI28678	CP	%	114			70-130	Pass	
o-Xylene	M18-JI28678	CP	%	114			70-130	Pass	
Xylenes - Total	M18-JI28678	CP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-JI28678	CP	%	96			70-130	Pass	
TRH C6-C10	M18-JI28678	CP	%	127			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2,4-D	M18-JI24548	NCP	%	84			70-130	Pass	
Actril (loxynil)	M18-JI24548	NCP	%	117			70-130	Pass	
Dichlorprop	M18-JI24548	NCP	%	123			70-130	Pass	
MCPA	M18-JI24548	NCP	%	87			70-130	Pass	
MCPB	M18-JI24548	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-JI28685	CP	%	114			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-JI28685	CP	%	106			70-130	Pass	
Toluene	M18-JI28685	CP	%	104			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	M18-JI28685	CP	%	87			70-130	Pass	
m&p-Xylenes	M18-JI28685	CP	%	87			70-130	Pass	
o-Xylene	M18-JI28685	CP	%	83			70-130	Pass	
Xylenes - Total	M18-JI28685	CP	%	86			70-130	Pass	
Spike - % Recovery									
Halogenated Volatile Organics				Result 1					
1.1-Dichloroethene	M18-JI28685	CP	%	75			70-130	Pass	
1.1.1-Trichloroethane	M18-JI28685	CP	%	73			70-130	Pass	
1.2-Dichlorobenzene	M18-JI28685	CP	%	84			70-130	Pass	
1.2-Dichloroethane	M18-JI28685	CP	%	112			70-130	Pass	
Trichloroethene	M18-JI28685	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-JI28685	CP	%	77			70-130	Pass	
TRH C6-C10	M18-JI28685	CP	%	115			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-JI28685	CP	%	84			75-125	Pass	
Cadmium	M18-JI28685	CP	%	88			75-125	Pass	
Chromium	M18-JI28685	CP	%	84			75-125	Pass	
Copper	M18-JI28685	CP	%	71			75-125	Fail	Q08
Lead	M18-JI28685	CP	%	87			75-125	Pass	
Mercury	M18-JI28685	CP	%	94			70-130	Pass	
Nickel	M18-JI28685	CP	%	91			75-125	Pass	
Zinc	M18-JI28685	CP	%	120			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-JI28691	CP	%	97			70-130	Pass	
Acenaphthylene	M18-JI28691	CP	%	95			70-130	Pass	
Anthracene	M18-JI28691	CP	%	111			70-130	Pass	
Benz(a)anthracene	M18-JI28691	CP	%	74			70-130	Pass	
Benzo(a)pyrene	M18-JI28691	CP	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	M18-JI28691	CP	%	88			70-130	Pass	
Benzo(g,h,i)perylene	M18-JI28691	CP	%	96			70-130	Pass	
Benzo(k)fluoranthene	M18-JI28691	CP	%	105			70-130	Pass	
Chrysene	M18-JI28691	CP	%	112			70-130	Pass	
Dibenz(a,h)anthracene	M18-JI28691	CP	%	92			70-130	Pass	
Fluoranthene	M18-JI28691	CP	%	111			70-130	Pass	
Fluorene	M18-JI28691	CP	%	97			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M18-JI28691	CP	%	95			70-130	Pass	
Naphthalene	M18-JI28691	CP	%	95			70-130	Pass	
Phenanthrene	M18-JI28691	CP	%	83			70-130	Pass	
Pyrene	M18-JI28691	CP	%	113			70-130	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	M18-JI28677	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-JI28677	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-JI28677	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-JI28677	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate								
BTX				Result 1	Result 2	RPD		
Benzene	M18-JI28677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M18-JI28677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M18-JI28677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M18-JI28677	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M18-JI28677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	M18-JI28677	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M18-JI28677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M18-JI28677	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	M18-JI28677	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	M18-JI28677	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	M18-JI28677	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	M18-JI28678	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	M18-JI28678	CP	mg/kg	78	68	14	30%	Pass
TRH C29-C36	M18-JI28678	CP	mg/kg	190	170	12	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	M18-JI28678	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	M18-JI28678	CP	mg/kg	240	210	12	30%	Pass
TRH >C34-C40	M18-JI28678	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Acid Herbicides				Result 1	Result 2	RPD		
2,4-D	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4-DB	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4,5-T	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4,5-TP	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Actril (loxynil)	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dicamba	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorprop	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinitro-o-cresol	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dinoseb	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	M18-JI28966	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Halogenated Volatile Organics				Result 1	Result 2	RPD		
1,1-Dichloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1-Dichloroethene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,1-Trichloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,1,2-Tetrachloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,2-Trichloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,1,2,2-Tetrachloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dibromoethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichlorobenzene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichloroethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2-Dichloropropane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,2,3-Trichloropropane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,3-Dichlorobenzene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,3-Dichloropropane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1,4-Dichlorobenzene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromodichloromethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Halogenated Volatile Organics				Result 1	Result 2	RPD		
Bromoform	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromomethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Carbon Tetrachloride	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chlorobenzene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloroform	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloromethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1.2-Dichloroethene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1.3-Dichloropropene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromochloromethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromomethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Iodomethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Methylene Chloride	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Tetrachloroethene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1.2-Dichloroethene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1.3-Dichloropropene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichloroethene	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichlorofluoromethane	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Vinyl chloride	M18-JI27568	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	M18-JI28682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	M18-JI28682	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	M18-JI28682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M18-JI28682	CP	%	6.7	6.4	5.0	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-JI28684	CP	mg/kg	8.4	9.5	13	30%	Pass
Cadmium	M18-JI28684	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M18-JI28684	CP	mg/kg	11	13	14	30%	Pass
Copper	M18-JI28684	CP	mg/kg	45	50	12	30%	Pass
Lead	M18-JI28684	CP	mg/kg	< 5	5.5	14	30%	Pass
Mercury	M18-JI28684	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M18-JI28684	CP	mg/kg	5.1	5.8	12	30%	Pass
Zinc	M18-JI28684	CP	mg/kg	59	67	13	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract at 25°C as rec.)	M18-JI28685	CP	pH Units	6.3	6.1	pass	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-JI28685	CP	mg/kg	2.9	3.0	2.0	30%	Pass
Cadmium	M18-JI28685	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M18-JI28685	CP	mg/kg	14	14	3.0	30%	Pass
Copper	M18-JI28685	CP	mg/kg	17	17	1.0	30%	Pass
Lead	M18-JI28685	CP	mg/kg	9.1	9.4	3.0	30%	Pass
Mercury	M18-JI28685	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M18-JI28685	CP	mg/kg	5.2	5.3	2.0	30%	Pass
Zinc	M18-JI28685	CP	mg/kg	79	80	2.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	M18-JI28690	CP	mg/kg	41	40	3.0	30%	Pass
TRH C15-C28	M18-JI28690	CP	mg/kg	420	410	3.0	30%	Pass
TRH C29-C36	M18-JI28690	CP	mg/kg	280	290	3.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	M18-JI28690	CP	mg/kg	170	150	9.0	30%	Pass
TRH >C16-C34	M18-JI28690	CP	mg/kg	490	490	<1	30%	Pass
TRH >C34-C40	M18-JI28690	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M18-JI28690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	M18-JI28690	CP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethyl parathion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfthion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	M18-JI28690	CP	mg/kg	< 2	< 2	<1	30%	Pass
Naled	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Omethoate	M18-JI28690	CP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tetrachlorvinphos	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	M18-JI28690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M18-JI28695	CP	%	8.2	8.0	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.
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

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Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Environments Pty Ltd ACT
16 Mildura Street
Fyshwick
ACT 2609



NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Attention: Michael Carbone

Report 609250-W
Project name JINDABYNE CS-P2
Project ID CBREN219571
Received Date Jul 24, 2018

Client Sample ID			QC-R3 Water	QC-R4 Water	QC-R5 Water	QC7 Water
Sample Matrix			M18-JI28692	M18-JI28693	M18-JI28694	M18-JI28697
Eurofins mgt Sample No.			Jul 17, 2018	Jul 18, 2018	Jul 19, 2018	Jul 19, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	-	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	-	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	-	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	-	< 0.05	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	-	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	< 0.1	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	-	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	-	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	-	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	-	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-	< 0.1	-
BTEX						
Benzene	0.001	mg/L	< 0.001	-	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	-	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	-	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	-	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	-	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	-	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	59	-	61	58
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	-	< 0.001	-
Acenaphthylene	0.001	mg/L	< 0.001	-	< 0.001	-
Anthracene	0.001	mg/L	< 0.001	-	< 0.001	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	< 0.001	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	< 0.001	-
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001	-	< 0.001	-
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	-	< 0.001	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	< 0.001	-
Chrysene	0.001	mg/L	< 0.001	-	< 0.001	-
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	-	< 0.001	-
Fluoranthene	0.001	mg/L	< 0.001	-	< 0.001	-
Fluorene	0.001	mg/L	< 0.001	-	< 0.001	-
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001	-	< 0.001	-

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	QC-R3 Water M18-JI28692 Jul 17, 2018	QC-R4 Water M18-JI28693 Jul 18, 2018	QC-R5 Water M18-JI28694 Jul 19, 2018	QC7 Water M18-JI28697 Jul 19, 2018
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	-	< 0.001	-
Phenanthrene	0.001	mg/L	< 0.001	-	< 0.001	-
Pyrene	0.001	mg/L	< 0.001	-	< 0.001	-
Total PAH*	0.001	mg/L	< 0.001	-	< 0.001	-
2-Fluorobiphenyl (surr.)	1	%	75	-	86	-
p-Terphenyl-d14 (surr.)	1	%	113	-	118	-
Heavy Metals						
Arsenic	0.001	mg/L	< 0.001	< 0.001	-	-
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	-	-
Chromium	0.001	mg/L	< 0.001	< 0.001	-	-
Copper	0.001	mg/L	< 0.001	< 0.001	-	-
Lead	0.001	mg/L	< 0.001	< 0.001	-	-
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Nickel	0.001	mg/L	< 0.001	< 0.001	-	-
Zinc	0.005	mg/L	< 0.005	< 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 (regarding both quality and NATA accreditation).

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 - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Jul 26, 2018	7 Day
Total Recoverable Hydrocarbons - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Jul 26, 2018	7 Day
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Jul 27, 2018	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Jul 26, 2018	14 Day
Eurofins mgt Suite B7A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Jul 27, 2018	7 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Jul 27, 2018	7 Day
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jul 26, 2018	28 Days

Company Name: Coffey Environments Pty Ltd ACT
Address: 16 Mildura Street
Fyshwick
ACT 2609
Project Name: JINDABYNE CS-P2
Project ID: CBREN219571

Order No.:
Report #: 609250
Phone: +61 2 6124 5600
Fax: +61 2 6260 7211

Received: Jul 24, 2018 1:28 PM
Due: Jul 31, 2018
Priority: 5 Day
Contact Name: Michael Carbone

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID												
1	BH01_0.05-0.15	Jul 19, 2018		Soil	M18-JI28675	X					X		X	X			
2	BH01_0.4-0.5	Jul 19, 2018		Soil	M18-JI28676					X			X				
3	BH01_0.9-1.0	Jul 19, 2018		Soil	M18-JI28677								X		X		
4	BH02_0.05-0.15	Jul 19, 2018		Soil	M18-JI28678	X		X	X		X		X			X	
5	BH02_0.4-0.5	Jul 18, 2018		Soil	M18-JI28679					X			X				
6	BH03_0.05-0.15	Jul 18, 2018		Soil	M18-JI28680	X						X	X	X			
7	BH03_0.4-0.5	Jul 18, 2018		Soil	M18-JI28681					X			X				

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
8	BH04_0.05-0.15	Jul 18, 2018		Soil	M18-JI28682	X		X			X	X	X			X	
9	BH04_0.4-0.5	Jul 18, 2018		Soil	M18-JI28683								X		X		
10	BH04_0.9-1.0	Jul 18, 2018		Soil	M18-JI28684					X			X				
11	BH05_0.05-0.15	Jul 17, 2018		Soil	M18-JI28685	X		X	X		X	X	X			X	
12	BH05_0.4-0.5	Jul 17, 2018		Soil	M18-JI28686								X		X		
13	BH05_0.9-1.0	Jul 17, 2018		Soil	M18-JI28687					X			X				
14	BH06_0.05-0.15	Jul 18, 2018		Soil	M18-JI28688	X		X	X		X		X	X			
15	BH06_0.4-0.5	Jul 18, 2018		Soil	M18-JI28689					X			X				
16	BH07_0.05-0.15	Jul 17, 2018		Soil	M18-JI28690	X		X			X	X	X	X			

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
17	BH07_0.9-1.0	Jul 17, 2018		Soil	M18-JI28691			X		X			X		X		
18	QC-R3	Jul 17, 2018		Water	M18-JI28692									X			
19	QC-R4	Jul 18, 2018		Water	M18-JI28693					X							
20	QC-R5	Jul 19, 2018		Water	M18-JI28694										X		
21	QC5	Jul 19, 2018		Soil	M18-JI28695					X			X				
22	QC6	Jul 19, 2018		Soil	M18-JI28696								X		X		
23	QC7	Jul 19, 2018		Water	M18-JI28697												X
24	BH01_1.9-2.0	Jul 19, 2018		Soil	M18-JI28698		X										
25	BH02_0.9-1.0	Jul 18, 2018		Soil	M18-JI28699		X										
26	BH02_1.9-2.0	Jul 18, 2018		Soil	M18-JI28700		X										
27	BH03_0.9-1.0	Jul 18, 2018		Soil	M18-JI28701		X										
28	BH03_1.9-2.0	Jul 18, 2018		Soil	M18-JI28702		X										

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Sample Detail						Asbestos - AS4964	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Acid Herbicides	Metals M8	Eurofins mgt Suite B15	Halogenated Volatile Organics	Moisture Set	Eurofins mgt Suite B7	Eurofins mgt Suite B4	Eurofins mgt Suite B7A	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											
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
29	BH04_1.9-2.0	Jul 18, 2018		Soil	M18-JI28703		X										
30	BH05_1.9-2.0	Jul 17, 2018		Soil	M18-JI28704		X										
31	BH06_0.9-1.0	Jul 17, 2018		Soil	M18-JI28705		X										
32	BH06_1.9-2.0	Jul 18, 2018		Soil	M18-JI28706		X										
33	BH07_0.4-0.5	Jul 17, 2018		Soil	M18-JI28707		X										
34	BH07_1.9-2.0	Jul 17, 2018		Soil	M18-JI28708		X										
Test Counts						7	11	6	3	9	6	4	19	5	6	3	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.01			0.01	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	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							
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							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
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							

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions										
Naphthalene				%	110			70-130	Pass	
Naphthalene				%	110			70-130	Pass	
TRH C6-C10				%	111			70-130	Pass	
TRH C6-C10				%	111			70-130	Pass	
TRH >C10-C16				%	89			70-130	Pass	
LCS - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions										
TRH C6-C9				%	109			70-130	Pass	
TRH C10-C14				%	82			70-130	Pass	
LCS - % Recovery										
BTEX										
Benzene				%	100			70-130	Pass	
Toluene				%	92			70-130	Pass	
Ethylbenzene				%	96			70-130	Pass	
m&p-Xylenes				%	96			70-130	Pass	
Xylenes - Total				%	96			70-130	Pass	
LCS - % Recovery										
Polycyclic Aromatic Hydrocarbons										
Acenaphthene				%	98			70-130	Pass	
Acenaphthylene				%	99			70-130	Pass	
Anthracene				%	117			70-130	Pass	
Benz(a)anthracene				%	93			70-130	Pass	
Benzo(a)pyrene				%	108			70-130	Pass	
Benzo(b&j)fluoranthene				%	118			70-130	Pass	
Benzo(g,h,i)perylene				%	77			70-130	Pass	
Benzo(k)fluoranthene				%	117			70-130	Pass	
Chrysene				%	94			70-130	Pass	
Dibenz(a,h)anthracene				%	72			70-130	Pass	
Fluoranthene				%	117			70-130	Pass	
Fluorene				%	108			70-130	Pass	
Indeno(1,2,3-cd)pyrene				%	76			70-130	Pass	
Naphthalene				%	93			70-130	Pass	
Phenanthrene				%	116			70-130	Pass	
Pyrene				%	113			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	89			80-120	Pass	
Cadmium				%	87			80-120	Pass	
Chromium				%	85			80-120	Pass	
Copper				%	87			80-120	Pass	
Lead				%	87			80-120	Pass	
Mercury				%	82			75-125	Pass	
Nickel				%	86			80-120	Pass	
Zinc				%	90			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						
TRH >C10-C16	M18-JI25873	NCP	%	89				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1						
TRH C10-C14	M18-JI25873	NCP	%	123				70-130	Pass	
Spike - % Recovery										
Polycyclic Aromatic Hydrocarbons				Result 1						

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	M18-JI28287	NCP	%	104			70-130	Pass	
Acenaphthylene	M18-JI28287	NCP	%	107			70-130	Pass	
Anthracene	M18-JI28287	NCP	%	116			70-130	Pass	
Benz(a)anthracene	M18-JI28287	NCP	%	118			70-130	Pass	
Benzo(a)pyrene	M18-JI28287	NCP	%	119			70-130	Pass	
Benzo(b&j)fluoranthene	M18-JI28287	NCP	%	125			70-130	Pass	
Benzo(g,h,i)perylene	M18-JI28287	NCP	%	87			70-130	Pass	
Benzo(k)fluoranthene	M18-JI28287	NCP	%	130			70-130	Pass	
Chrysene	M18-JI28287	NCP	%	119			70-130	Pass	
Dibenz(a,h)anthracene	M18-JI28287	NCP	%	84			70-130	Pass	
Fluoranthene	M18-JI28287	NCP	%	125			70-130	Pass	
Fluorene	M18-JI28287	NCP	%	112			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M18-JI28287	NCP	%	87			70-130	Pass	
Naphthalene	M18-JI28287	NCP	%	81			70-130	Pass	
Phenanthrene	M18-JI28287	NCP	%	122			70-130	Pass	
Pyrene	M18-JI28287	NCP	%	128			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-JI28693	CP	%	97			75-125	Pass	
Cadmium	M18-JI28693	CP	%	100			75-125	Pass	
Chromium	M18-JI28693	CP	%	99			75-125	Pass	
Copper	M18-JI28693	CP	%	98			75-125	Pass	
Lead	M18-JI28693	CP	%	99			75-125	Pass	
Mercury	M18-JI28693	CP	%	94			70-130	Pass	
Nickel	M18-JI28693	CP	%	98			75-125	Pass	
Zinc	M18-JI28693	CP	%	98			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-JI29668	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Naphthalene	S18-JI29668	NCP	mg/L	< 0.01	**	<1	30%	Pass	
TRH C6-C10	S18-JI29668	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C6-C10	S18-JI29668	NCP	mg/L	< 0.02	**	<1	30%	Pass	
TRH >C10-C16	M18-JI25872	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M18-JI25872	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-JI25872	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-JI29668	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M18-JI25872	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M18-JI25872	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-JI25872	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-JI29668	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S18-JI29668	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S18-JI29668	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S18-JI29668	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S18-JI29668	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S18-JI29668	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	M18-JI24404	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-JI28693	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M18-JI28693	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M18-JI28693	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M18-JI28693	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Lead	M18-JI28693	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M18-JI28693	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M18-JI28693	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc	M18-JI28693	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM1811877

Client : COFFEY ENVIRONMENTS PTY LTD Contact : MR MICHAEL CARBONE Address : UNIT 2 16 MILDURA STREET FYSHWICK ACT, AUSTRALIA 2609 E-mail : Michaelangelo.Carbone@coffey.com Telephone : +61 08 8375 4400 Facsimile : +61 08 8375 4499 Project : CBREN219571 Order number : Jindabyne ESA P2 C-O-C number : 4289 Site : Sampler : TX	Laboratory : Environmental Division Melbourne Contact : Bronwyn Sheen Address : 4 Westall Rd Springvale VIC Australia 3171 E-mail : bronwyn.sheen@alsglobal.com Telephone : +61-3-8549 9636 Facsimile : +61-3-8549 9626 Page : 1 of 2 Quote number : ES2018COFENV0007 (EN/222) QC Level : NEPM 2013 B3 & ALS QC Standard
---	---

Dates

Date Samples Received : 26-Jul-2018 08:45	Issue Date : 26-Jul-2018
Client Requested Due : 02-Aug-2018	Scheduled Reporting Date : 02-Aug-2018
Date :	

Delivery Details

Mode of Delivery : Carrier	Security Seal : Not Available
No. of coolers/boxes : 1	Temperature : 2.8°C - Ice present
Receipt Detail :	No. of samples received / analysed : 2 / 2

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Sample(s) received in non-ALS container(s).**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-13 OC/OP/PCB	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1811877-001	18-Jul-2018 00:00	QC5A	✓	✓	✓	
EM1811877-002	18-Jul-2018 00:00	QC6A	✓			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

MICHAEL CARBONE

- *AU Certificate of Analysis - NATA (COA)	Email	Michaelangelo.Carbone@coffey.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Michaelangelo.Carbone@coffey.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Michaelangelo.Carbone@coffey.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Michaelangelo.Carbone@coffey.com
- A4 - AU Tax Invoice (INV)	Email	Michaelangelo.Carbone@coffey.com
- Chain of Custody (CoC) (COC)	Email	Michaelangelo.Carbone@coffey.com
- EDI Format - ENMRG (ENMRG)	Email	Michaelangelo.Carbone@coffey.com
- EDI Format - ESDAT (ESDAT)	Email	Michaelangelo.Carbone@coffey.com

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 4289



Consigning Office: Fyshwick Email: Michael.Carbonate @coffey.com
Report Results to: Michael.Carbonate Mobile: 04 22 350 209 @coffey.com
Invoices to: Phone: " " " "

Project No: CBREN219571 Task No: Indobypne ESA-P2
Project Name: Indobypne CS Pr ESA Laboratory: ALS
Sampler's Name: TK Project Manager: MC

Special Instructions:

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil... etc)	Container Type & Preservative*	T-A-T (specify)
1	AC4A SA	18.07	Pm	Soil	Jar	STD
2	AC4A 6A	18.07	Pm	Soil	Jar	STD

NOTES

Environmental Division
Melbourne
Work Order Reference
EM1811877



Telephone : + 61-3-8540 9800

Sample Receipt Advice: (Lab Use Only)

☐ All Samples Received in Good Condition
☐ All Documentation is in Proper Order
☐ Samples Received Properly Chilled
Lab. Ref/Batch No.

RECEIVED BY

Name: ELVIS D Date: 24 AUG
Company: Eurofins Time: 1:28 PM
Name: MARN Date: 26/7
Company: ACS Time: 8:50

RELINQUISHED BY

Name: Michael Carbonate Date: 26/7/18
Coffey Environments Time: 8:00am
Name: D JONES Date: 26/7/18
Company: Eurofins/MCT Time: 8:00am

*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

Issue Date: 11/08/2014

Version: 5

Coffey Environments

CERTIFICATE OF ANALYSIS

Work Order : **EM1811877**
Client : **COFFEY ENVIRONMENTS PTY LTD**
Contact : MR MICHAEL CARBONE
Address : UNIT 2 16 MILDURA STREET
FYSHWICK ACT, AUSTRALIA 2609
Telephone : +61 08 8375 4400
Project : CBREN219571
Order number : Jindabyne ESA P2
C-O-C number : 4289
Sampler : TX
Site :
Quote number : EN/222
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 7
Laboratory : Environmental Division Melbourne
Contact : Bronwyn Sheen
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9636
Date Samples Received : 26-Jul-2018 08:45
Date Analysis Commenced : 26-Jul-2018
Issue Date : 01-Aug-2018 16:40



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

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

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

- EP080: Particular sample (EM-1811877-002) shows positive hit of C6-C10 band due to alpha-Pinene.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC5A	QC6A	----	----	----
Client sampling date / time					18-Jul-2018 00:00	18-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1811877-001	EM1811877-002	-----	-----	-----
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		7.2	9.7	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	7	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		22	9	----	----	----
Copper	7440-50-8	5	mg/kg		19	15	----	----	----
Lead	7439-92-1	5	mg/kg		13	12	----	----	----
Nickel	7440-02-0	2	mg/kg		10	5	----	----	----
Zinc	7440-66-6	5	mg/kg		45	52	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				QC5A	QC6A	----	----	----
Client sampling date / time				18-Jul-2018 00:00	18-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM1811877-001	EM1811877-002	-----	-----	-----
				Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC5A	QC6A	----	----	----
Client sampling date / time					18-Jul-2018 00:00	18-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1811877-001	EM1811877-002	-----	-----	-----
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		----	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	1.2	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	80	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	370	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	270	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	720	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	61	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	61	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	110	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	510	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	130	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	750	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	110	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC5A	QC6A	----	----	----
Client sampling date / time					18-Jul-2018 00:00	18-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1811877-001	EM1811877-002	-----	-----	-----
					Result	Result	----	----	----
EP080: BTEXN - Continued									
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		95.8	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		101	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		92.5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	84.0	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	88.5	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		----	86.5	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	86.0	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	98.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	92.4	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	79.2	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	86.7	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	113	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2,4,6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM1811877	Page	: 1 of 5
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR MICHAEL CARBONE	Telephone	: +61-3-8549 9636
Project	: CBREN219571	Date Samples Received	: 26-Jul-2018
Site	:	Issue Date	: 01-Aug-2018
Sampler	: TX	No. of samples received	: 2
Order number	: Jindabyne ESA P2	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP068B: Organophosphorus Pesticides (OP)	QC-1833993-001	----	Pirimphos-ethyl	23505-41-1	64.1 %	68-119%	Recovery less than lower control limit
Matrix Spike (MS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	EM1811884--001	Anonymous	4.4'-DDT	50-29-3	0.323 %	20-133%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QC5A, QC6A	18-Jul-2018	----	----	----	26-Jul-2018	01-Aug-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC5A, QC6A	18-Jul-2018	27-Jul-2018	14-Jan-2019	✓	27-Jul-2018	14-Jan-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC5A, QC6A	18-Jul-2018	27-Jul-2018	15-Aug-2018	✓	30-Jul-2018	15-Aug-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) QC5A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) QC5A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) QC5A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC6A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QC6A	18-Jul-2018	26-Jul-2018	01-Aug-2018	✓	27-Jul-2018	01-Aug-2018	✓
Soil Glass Jar - Unpreserved (EP071) QC6A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) QC6A	18-Jul-2018	26-Jul-2018	01-Aug-2018	✓	27-Jul-2018	01-Aug-2018	✓
Soil Glass Jar - Unpreserved (EP071) QC6A	18-Jul-2018	27-Jul-2018	01-Aug-2018	✓	30-Jul-2018	05-Sep-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC6A	18-Jul-2018	26-Jul-2018	01-Aug-2018	✓	27-Jul-2018	01-Aug-2018	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: EM1811877	Page	: 1 of 9
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR MICHAEL CARBONE	Contact	: Bronwyn Sheen
Address	: UNIT 2 16 MILDURA STREET FYSHWICK ACT, AUSTRALIA 2609	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 08 8375 4400	Telephone	: +61-3-8549 9636
Project	: CBREN219571	Date Samples Received	: 26-Jul-2018
Order number	: Jindabyne ESA P2	Date Analysis Commenced	: 26-Jul-2018
C-O-C number	: 4289	Issue Date	: 01-Aug-2018
Sampler	: TX		
Site	:		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		



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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1831019)									
EM1811862-001	Anonymous	EA055: Moisture Content	----	0.1	%	9.6	9.6	0.00	No Limit
EM1811862-008	Anonymous	EA055: Moisture Content	----	0.1	%	7.0	6.7	5.26	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1833162)									
EM1811832-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	13	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	28	29	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	13	44.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	56	70	21.3	0% - 50%
EM1811852-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	15	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	7	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	14	71.5	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	7	39.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1833161)									
EM1811832-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1811852-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1833994)									
EM1811892-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1833993)									
EM1811892-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1833993) - continued									
EM1811892-001	Anonymous	EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1833993)									
EM1811892-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1833991)									
EM1811871-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1811892-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1830985)									
EM1811877-002	QC6A	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1811891-019	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1833992)									
EM1811871-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1833992) - continued									
EM1811871-001	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1811892-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1830985)									
EM1811877-002	QC6A	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	61	<10	144	No Limit
EM1811891-019	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1833992)									
EM1811871-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1811892-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1830985)									
EM1811877-002	QC6A	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1811891-019	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Method Blank (MB) Report

Spike

Spike Recovery (%)

Recovery Limits (%)

EP068B: Organophosphorus Pesticides (OP) (QCLot: 1833993)



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1833993) - continued								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	85.8	63	127
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.2	53	137
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	14.6	10	136
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	73.3	56	127
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	70.3	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	70	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	74.6	50	132
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	77.9	63	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	70	122
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	80.7	58	123
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	73.1	56	119
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	# 64.1	68	119
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	76.0	45	122
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	78.8	67	116
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	64.6	50	127
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	79.9	68	121
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	66.2	60	123
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	68	122
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	72.2	24	113
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1833991)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	90.1	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	100	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	88.9	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	90.9	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	94.9	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.7 mg/kg	91.8	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	95.9	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	98.7	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	94.1	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	89.1	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	93.0	71	124
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	92.4	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	88.5	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	85.1	71	128
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	86.3	72	126
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	80.4	68	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1830985)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	106	70	127

Method Blank (MB) Report

Spike

Spike Recovery (%)

Recovery Limits (%)

Matrix Spike (MS) Report

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report

Sub-Matrix: SOIL				Matrix Spike (mg/kg)			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1833162)							
EM1811852-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	98.6	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.1	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	96.7	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	96.7	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	95.2	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	96.4	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	95.4	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1833161)							
EM1811852-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	85.2	76	116
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1833994)							



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1833994) - continued							
EM1811892-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	76.5	44	144
EP068A: Organochlorine Pesticides (OC) (QCLot: 1833993)							
EM1811884-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	42.7	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	40.5	18	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	96.2	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	84.9	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	51.5	23	146
		EP068: 4,4'-DDT	50-29-3	0.5 mg/kg	# 0.323	20	133
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1833993)							
EM1811884-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	91.3	49	135
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	67.5	41	127
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	86.9	47	133
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	65.5	45	133
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	83.1	40	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1833991)							
EM1811871-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	90.4	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	98.0	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1830985)							
EM1811890-001	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	83.6	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1833992)							
EM1811871-003	Anonymous	EP071: C10 - C14 Fraction	----	806 mg/kg	95.1	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	101	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	96.1	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1830985)							
EM1811890-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	82.8	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1833992)							
EM1811871-003	Anonymous	EP071: >C10 - C16 Fraction	----	1160 mg/kg	96.6	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	100	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	91.1	44	126
EP080: BTEXN (QCLot: 1830985)							
EM1811890-001	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	93.1	50	136
		EP080: Toluene	108-88-3	2 mg/kg	98.8	56	139

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Appendix E - Geotechnical Laboratory Test Results



A TETRA TECH COMPANY

Canberra Laboratory

Coffey Services Australia Pty Ltd
ABN 55 139 460 521
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 6124 5660

Report No: ASM:CANB18W01400

Issue No: 1

Material Test Report

Client: Coffey Services Australia Pty Ltd (Canberra)
16 Mildura Street
Fyshwick ACT 2609

Principal:

Project No.: 754-CANB00179AA

Project Name: 754-CBREN219571 - 754-S-NSW Schools Investigation

Lot No.: TRN:

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.

NATA
WORLD RECOGNISED
ACCREDITATION

Jason McGurgan
Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number: 431
Date of Issue: 2/08/2018

Material Details

Source	Borehole	Sampled From	
Description	Investigation	Location	Jindabyne, NSW
Specification	Investigation	Sampling Method	Sampled by Coffey Geotechnics

Sample Details

Sample ID	CANB18S-03289	CANB18S-03290	CANB18S-03291	CANB18S-03292
Field Sample ID	00001	00002	00003	00004
Date Sampled	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Submitted:	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Sample Location:	BH1	BH2	BH4	BH6

Other Test Results

Description	Method	Results			Limits
Sample History	AS 1289.1.1	Oven-dried	Oven-dried	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	Dry Sieved	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	9.0	6.5	6.5	
Mould Length (mm)		254	254	254	
Liquid Limit (%)	AS 1289.3.1.2	39	31	32	
Method		One Point	One Point	One Point	
Plastic Limit (%)	AS 1289.3.2.1	17	17	20	
Plasticity Index (%)	AS 1289.3.3.1	22	14	12	
Standard Maximum Dry Density (t/m ³)	AS 1289.5.1.1	1.71	1.93		
Standard Optimum Moisture Content (%)		12.5	12.5		
Oversize Sieve (mm)		19.0	19.0		
Oversize Material (%)			1		
Compactive Effort		Standard	Standard		

Comments

N/A

Report No: ASM:CANB18W01400

Issue No: 1

Material Test Report

Client:	Coffey Services Australia Pty Ltd (Canberra) 16 Mildura Street Fyshwick ACT 2609
Principal:	
Project No.:	754-CANB00179AA
Project Name:	754-CBREN219571 - 754-S-NSW Schools Investigation
Lot No.:	TRN:

 NATA WORLD RECOGNISED ACCREDITATION	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. <i>Jason McGurgan</i> Approved Signatory: Jason McGurgan (Laboratory Manager) NATA Accredited Laboratory Number: 431 Date of Issue: 2/08/2018

Material Details

Source	Borehole	Sampled From	
Description	Investigation	Location	Jindabyne, NSW
Specification	Investigation	Sampling Method	Sampled by Coffey Geotechnics

Sample Details

Sample ID	CANB18S-03289	CANB18S-03290	CANB18S-03291	CANB18S-03292
Field Sample ID	00001	00002	00003	00004
Date Sampled	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Submitted:	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Sample Location:	BH1	BH2	BH4	BH6

Other Test Results

Description	Method	Results		Limits
CBR At 5.0mm (%)	AS 1289.6.1.1	12	14	
Maximum Dry Density (t/m ³)		1.71	1.93	
Optimum Moisture Content (%)		12.7	12.5	
Dry Density before Soaking (t/m ³)		1.73	1.92	
Density Ratio before Soaking (%)		101	100	
Moisture Content before Soaking (%)		12.3	12.7	
Moisture Ratio before Soaking (%)		97	101	
Dry Density after Soaking (t/m ³)		1.71	1.91	
Density Ratio after Soaking (%)		100	99	
Swell (%)		1.0	0.5	
Moisture Content of Top 30mm (%)		16.8	16.7	
Moisture Content of Remaining Depth (%)		16.7	15.4	
Compactive Effort		Standard	Standard	
Surcharge Mass (kg)		4.50	4.50	
Period of Soaking (Days)		4	4	
Oversize Material		Excluded	Excluded	
Oversize Material (%)		0.3	1.1	
Curing Time (Hrs)				
Method of Plasticity Used				

Comments

N/A

CERTIFICATE OF ANALYSIS

Work Order : **CA1804400**
Client : **Coffey Environments**
Contact : **Bharat Yadar**
Address : **16 Mildura Street, Fyshwick
Canberra ACT 2609**
Telephone : **----**
Project : **Soil Samples**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **BH3 & BH7**
Quote number : **----**
No. of samples received : **2**
No. of samples analysed : **2**

Page : 1 of 2
Laboratory : ALS Water Resources Group
Contact : Client Services
Address : 16B Lithgow Street Fyshwick ACT Australia 2609
Telephone : +61 2 6202 5404
Date Samples Received : 20-Jul-2018 11:00
Date Analysis Commenced : 26-Jul-2018
Issue Date : 27-Jul-2018 16:07



Accreditation No. 992
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Geetha Ramasundara	Chemistry Teamleader	Inorganics, Fyshwick, ACT
Kai Squires	Laboratory Manager	Administration, Fyshwick, ACT



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

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

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

- For samples collected by ALS WRG, sampling was carried out in accordance with Procedure EN67
- ED040S Performed at ALS Sydney
- ED045G Performed at ALS Sydney

Analytical Results

Sub-Matrix: **SOLID**
 (Matrix: **SOLID**)

Client sample ID

				----	----	----	----	----
				BH-3	BH-7			
Client sampling date / time				20-Jul-2018 00:00	20-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	CA1804400-001	CA1804400-002	-----	-----	-----
				Result	Result	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.0	6.9	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	0.01	dS/m	0.02	0.02	----	----	----
ED045G: Chloride by Discrete Analyser								
ø Chloride	16887-00-6	10	mg/kg	20	30	----	----	----
MAJOR CATIONS & ANIONS - SOLUBLE								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	----	----	----

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Appendix F - Selected Site Photographs

Appendix F – Selected site photographs



Photo 1: View of the school gardening/farming area, looking towards south-west.



Photo 2: View of the school gardening/farming area, looking towards south.

Appendix F – Selected site photographs



Photo 3: Drilling of borehole 7, looking towards north-west.



Photo 4: drilling of borehole 4, looking north west

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Appendix G - Equipment Calibration Certificate



FIELD EQUIPMENT CALIBRATION DETAILS

Job/Site Details:

Project Name: <i>Jindabyne Central School</i>	Project Number: <i>CBREN219571</i>
Fieldwork Date(s): <i>17.07-18.07-2018</i>	Work Completed By: <i>Terry Xu, Benoit</i>
Type of Work (eg. ESA, GME, etc): <i>ESA</i>	

NB When completing service calibration details, refer to the calibration certificate which accompanies the equipment.

Photoionisation Detector (PID):

Equipment Description: <i>RAGE 3000</i>	Equipment ID: <i>Fysh-PID001</i>		
Calibration Frequency Required by Manufacturer:	Last Service Date:	Calibrated by: <i>TX</i>	
Challenge Gas Standard: <i>100ppm</i>	Gas Batch #:	Gas Expiry date: <i>Jan 2019</i>	
Field Challenge Details:			
1) Date/Time: <i>17.07.18 104.6</i>	4) Date/Time:	7) Date/Time:	10) Date/Time:
2) Date/Time: <i>18.07.18 100.4</i>	5) Date/Time:	8) Date/Time:	11) Date/Time:
3) Date/Time:	6) Date/Time:	9) Date/Time:	12) Date/Time:

Lower Explosive Level Meter (LEL):

Equipment Description:	Equipment ID:		
Calibration Frequency Required by Manufacturer:	Last Service Date:	Calibrated by:	
Challenge Gas Standard:	Gas Batch #:	Gas Expiry date:	
Field Challenge Details:	☐ Tick if recorded elsewhere on Hot Work Permit (No. _____)		
1) Date/Time:	4) Date/Time:	7) Date/Time:	10) Date/Time:
2) Date/Time:	5) Date/Time:	8) Date/Time:	11) Date/Time:
3) Date/Time:	6) Date/Time:	9) Date/Time:	12) Date/Time:

Water Quality Meter:

Equipment Description:	Equipment ID:				
Calibration Frequency Required by Manufacturer:	Last Service Date:		Calibrated by:		
Calibration Standards:					
Field Calibration Record					
Date Calibrated	DO Probe	Conductivity	pH 4.0	pH 6.88	Temperature

Interface Probe (IP) :

Equipment Description:	Equipment ID:		
Calibration Frequency Required by Manufacturer:	Last Service Date:	Calibrated by:	
Field Challenge Details:			
1) Date/Time:	4) Date/Time:	7) Date/Time:	10) Date/Time:
2) Date/Time:	5) Date/Time:	8) Date/Time:	11) Date/Time:
3) Date/Time:	6) Date/Time:	9) Date/Time:	12) Date/Time:

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Appendix H – Data quality objectives

Data quality objectives

As stated in Section 18 (Appendix B) of Schedule B2 'Guideline on Site Characterisation' of the NEPM (1999, amended 2013), the following Data Quality Objectives (DQOs) are used to "define the type, quality, and quantity of data needed to support decisions relating to the environmental condition of a site". The specific DQOs for this project are summarised in table H1, below.

Table H1: Data quality objectives

Step	Comment
1. State the problem	The primary objective of the intrusive works was to conduct a baseline contamination investigation for the area of proposed development (concurrently with the geotechnical activities) at the site, to allow Jindabyne Central School to proceed with the proposed upgrade development & construction work.
2. Identify the decision	Are the analytes for baseline contamination assessment exceeding the limits of the 2013 national guidelines for mixed (primary & high) school development?
3. Identify inputs to the decision	Inputs to the decision were to include: - Identify and confirm the concern of potential contamination; - Delineation of the environmental impacts vertically and laterally; - Complete pre-demolition hazardous materials assessment of structures proposed for demolition; - Field observations and investigations, soil laboratory results; - Outcome of a quality assurance assessment of relevant data; and - Applicable NSW EPA endorsed guidelines.
4. Define the boundaries of the study	The boundaries of the assessment works were laterally defined by the boundaries of the site, Lot 9, DP 219584. Vertically, the study boundary was defined by the vertical extent of the proposed sampling depth of 2m.
5. Develop a decision rule	The decision statements are: - The 95% Upper Confidence Limits (or UCL) concentrations of COPC are to be less than the adopted health and ecological based investigation levels in the areas of environmental concern. - Where 95% UCL concentration are more than the health based investigation levels, then further assessment and/or management may be required. <i>Health Investigation Levels (HILs) and Health Screening Levels (HSLs)</i> - Where data sets are not sufficiently populated to calculate a 95% UCL, then individual results are to be less than the HILs / HSLs. Where individual concentrations are more than the HILs / HSLs, then further assessment and/or management may be required. - Where the 95% UCL can be calculated, the 95% UCLs are to be less than the HILs / HSLs, no individual results in the data set are to be greater than 250% of the investigation levels, and the standard deviation of the data set is to be within 50% of the investigation levels. - Where the 95% UCL is more than the HILs / HSLs, then further assessment and/or management may be required.

Step	Comment
	<i>Environmental Investigation Levels (EILs) and Ecological Screening Levels (ESL)</i> - Data is to be compared directly to EILs / ESLs. Where individual concentrations are more than the EILs / ESLs, further assessment and/or management may be required. <i>Background Levels</i> - Coffey will review published background ranges and utilise data held by Coffey relevant to the site geological and soil profile to assess background concentrations for use in calculating EILs / ESLs. <i>Asbestos</i> - Visual observation of presence of asbestos in the form of asbestos containing material (ACM) during test pitting will be undertaken. Should asbestos ACM be observed then site specific factors will be considered and an approach for further investigation will be assessed. This could include adoption of amended NEPM (NEPC, 2013) and WA Department of Health (DoH) (2009) methodology for calculation of % asbestos. Should evidence of asbestos fines and/or friable asbestos (FA) be observed then criteria (and methodology) in the amended NEPM (NEPC, 2013) and Western Australia Department of Health (WA DoH) (2009) guidelines will be adopted.
6. Acceptable limits on decision error	There are two types 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 reporting. The null hypothesis for this study is: - Contaminant concentrations within the subsurface of the site are above the proposed validation acceptance criteria. This error may lead the decision maker to make the following errors: - Deciding that the subsurface is not contaminated when the reverse is true; and - Deciding that the subsurface is contaminated when the reverse is true. An assessment will be made as to the likelihood of a decision error being made based on the results of a quality assurance / quality control (QA/QC) assessment and the closeness of concentrations to the validation acceptance criteria. Additionally, where applicable, statistical methods may be utilised such as 95% UCL calculations.

Step	Comment
7. Optimise the design for obtaining data	The design for obtaining data will generally meet or exceed requirements of the 2013 national guidelines as amended (NEPM 2013) Schedule (B1 <i>Investigation levels for soil and groundwater</i>).

Data Quality Indicators

A summary of the field and laboratory data quality indicators (DQIs) for this assessment are provided in table H2, below.

Table H2: Data quality indicators.

Field Considerations	Details	Laboratory Considerations	Details
Completeness			
Samples collected from all investigation locations	Samples will be collected as per the above report	All analytes analysed according to the Proposal	Samples will be analysed as per baseline contamination assessment listed in our proposal
Standard Operating Procedures (SOPs) appropriate and complied with	Coffey SOPs will be implemented during fieldwork	Appropriate methods and limit of reporting (LORs)	Samples will be analysed by NATA accredited laboratories for the analyses to be performed and appropriate methods will be used. LORs will be less than assessment criteria where practicable. Where this is not practicable, the implications to the quality of the data will be assessed on a case by case basis
Experienced sampler(s)	Experienced Coffey scientist will conduct the fieldworks	Sample documentation complete	Chain of custody (COC) forms will be returned, signed and dated by laboratory. NATA endorsed laboratory certificates will be completed in accordance with the amended ASC NEPM (NEPC, 2013)
Documentation correct	Samples will be handled and transported under appropriate chain of custody (COC) forms.	Sample holding times complied with.	Samples will be analysed within holding times specified by the

Field Considerations	Details	Laboratory Considerations	Details
	Sample Receipt Notifications from the laboratory will be reviewed to assess that samples were received cool and in good condition. Calibration certificates for field equipment will be provided on a daily basis.		amended ASC NEPM (NEPC, 2013)
Comparability			
Same SOPs to be used on each occasion	Coffey SOPs will be implemented	Same sample analytical methods used	The same NATA accredited laboratory will be used to undertake analyses of all primary samples collected for this study. The laboratory will use the same analytical methods for each sample for each analytical parameter
Experienced sampler(s)	An experienced Coffey Environmental scientist will conduct the sampling	Same sample LORs	As above
Climatic conditions (temperature, rainfall, wind...)	Climatic conditions are not expected to causes issues for comparability of data	Same laboratories	As above
Same types of samples collected	Samples will be collected in the appropriate laboratory supplied container specific to the analyses performed.	Same units	As above
Representativeness			
Appropriate media sampled according to sample plan	Samples will be collected as per the Section 2.12	All analytes analysed according to the proposal	Samples will be analysed as per proposal
All media identified in sample plan	Samples will be collected as per the RAP	-	-
Precision			
SOPs appropriate and complied with	Coffey SOPs will be implemented	Analysis of: laboratory replicates	Laboratory replicates will be analysed in general accordance with the amended ASC NEPM

Field Considerations	Details	Laboratory Considerations	Details
-	-	Analysis of: field replicates	Replicates will be analysed as per baseline contamination assessment in proposal RPDs will be calculated and compared to relevant acceptance criteria Result <10 times LOR – no limit Result between 10-20 times LOR control limit 50% Result >20 times LOR control limit 30%
Accuracy			
Rinsate blank	Where reusable sampling equipment is utilised (if any) a rinsate blank will be analysed and results compared against the LOR. One rinsate will be collected per day of sampling where this applies.	Analysis of method blank	Method blanks will be analysed as per the amended ASC NEPM. Results to be compared to LOR
SOP appropriate and complied with	Coffey SOPs will be implemented	Analysis of field blanks	A laboratory prepared trip blank will be analysed for soil and groundwater sampling. Results are to be assessed against the LOR
-	-	Analysis of matrix spike	Matrix spike will be analysed as per the amended ASC NEPM. Results to be within acceptable limits
-	-	Analysis of matrix spike duplicate	Matrix spikes will be analysed as per the amended ASC NEPM. Results to be within acceptable limits
-	-	Analysis of surrogate spike	Surrogates will be analysed as per the amended ASC NEPM.

Field Considerations	Details	Laboratory Considerations	Details
			Results to be within acceptable limits
-	-	Analysis of laboratory control samples	Laboratory control samples will be analysed as per the amended ASC NEPM. Results to be within laboratory acceptance limits
-	-	Analysis of laboratory-prepared spikes or trip blanks	Internal laboratory spikes or trip blanks will be analysed as per ASDC NEPM. Recovery results will be compared to laboratory acceptance limits.