

Friday, 6 October 2023

CH1440-D230311

Manuel Donebus
Demasa Pty Ltd
PO Box 5664
Wagga Wagga, NSW 2650

Dear Sir,

Re: Addendum to DSI – 66-82 Murray Street and 185 Morgan Street, Wagga Wagga, NSW

1.0 Introduction

Compliance Health & Environmental Consulting Pty Ltd (CHEC) were engaged by Demasa Pty Ltd to undertake an additional contamination assessment of the Site at 66-82 Murray Street and 185 Morgan Street, Wagga Wagga, NSW. The additional work was necessary due to a revision of the proposed development footprint of Stage 3A, subsequent to the Detailed Site Investigation (DSI) previously undertaken by CHEC (Ref CH1440-D230125).

This report shall be read in conjunction with the DSI provided by CHEC in May 2023.

2.0 Previous Investigation

The DSI undertaken in April 2023 identified elevated carcinogenic PAH and TRH concentrations within fill below the southern car park and at one location northern car park. A Remedial Action Plan (RAP) was recommended by CHEC as a result of the findings due to the exceedances of the land use assessment criteria provided by the National Environmental Protection Council (NEPC) in the *National Environmental Protection (Assessment of Site Contamination) amended Measure, 2013 (NEPM, 2013)* for residential developments. The investigation data indicated that the underlying natural soils had not been impacted by the contamination in the fill material.

3.0 Data Quality Objectives

3.1 State the Problem

A revised development strategy for the retail complex basement carpark has resulted in the proposed building footprint extending the west of the previous investigation area. Additional sample locations were necessary to supplement the previous report to determine the potential for contamination.

3.2 Goal of the Study

Obtain representative samples for the assessment of soils within the extended investigation area to enable a determination to be made on land use suitability. If soils are not found to be compliant with land use suitability criteria, recommendations for management/remediation will be provided.



3.3 Information Inputs

Information has been obtained from the following sources:

- Previous geotechnical and environmental investigations
- Site observations utilising a drilling rig in three representative locations
- Surrounding site conditions
- Data from soil sample analysis

3.4 Study Boundaries

This study is limited to 0.5m below natural soil level or the extent of suspected contamination sources within the south western portion of Lot 1 DP 550746, identified as Stage 3A of the proposed development, and marked on **Figure 2**. The surrounding community and potential future receptors within and nearby to the Site are also considered.

3.5 Analytical Approach

The resultant data was intended for inclusion with the whole study area from the DSI. That study adopted a probabilistic approach to determine if the average concentrations of contaminants were less than Tier 1 criteria provided by NEPM, 2013.

Analysis of the identified potential contaminants of concern was undertaken from 16 representative locations. Further detail on the analytical scope is provided in Section 6.0 and 7.2 of the DSI.

3.6 Performance and Acceptance Criteria

3.6.1 Site Acceptance Criteria

The null hypothesis being tested is $H_0 =$ the 95% Upper Confidence Limit (UCL) for the average soil concentration $>$ NEPM, 2013 Tier 1 criteria for Residential land use. The 'Pro UCL' software package was utilised to determine the best method to calculate the UCL using goodness of Fit (GOF) testing.

In addition to average concentrations being compliant, NEPM also requires that standard deviation of each contaminant is less than 50% of the Tier 1 criteria and that no individual concentration exceeds the Tier 1 criteria by more than 250%.

As a conservative approach, where laboratory analysis had measured concentrations to be below detection limits, half of the detection limit was used to provide a greater sample size and add reliability to the statistical tests.

3.6.2 Statistical Performance

A Site under investigation is assumed to be contaminated until statistically proven otherwise (eg: $H_0 =$ soil concentrations $>$ acceptance criteria), therefore two types of error are possible:

Type 1 error – Where the site is assessed to be uncontaminated when it is actually is. The probability of this occurring = α . Type 2 error when the Site is assessed to be contaminated though is actually not. The probability of this occurring = β .

Environmental investigations regularly use α of 0.05 as this provides a reasonable compromise between detecting contamination and incurring unnecessary cost.

3.7 Obtaining Data



Three representative sampling locations were selected within the extended investigation area to supplement the systematic pattern of the previous investigation. Boreholes were drilled utilising a 100mm solid flight auger attached to a Ute mounted drilling rig. At each location, samples were collected from fill soil and a representative natural samples was obtained from the upper 0.1m of the natural soil horizon. A total of seven chemical samples were obtained from the three boreholes locations.

Soil samples were obtained in accordance with CHEC's standard sampling procedures (QPG9-5) and methods provided by the Australian Standards Guide to the investigation and sampling of sites with potentially contaminated soils AS 4482.1 – 2005 (Non-volatile and semi volatile) and AS 4482.2 – 1999 (Volatile samples).

Chemical samples were analysed for heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), Total Recoverable Hydrocarbons (TRH's), Poly Aromatic Hydrocarbons (PAH's), Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene (BTEXN). Fill samples were subject to field gravimetric analysis using a 7mm stainless steel sieve to determine the presence of Asbestos Containing Material (ACM). Laboratory analysis was undertaken on 500mL bulk soil samples in accordance with the method provided by NEPM, 2013.

Acceptance criteria were sourced from NEPM 2013. The most appropriate criteria based on the potential receptors is considered to be HIL/HSL B - Residential with minimal opportunity for soil access.

Where volatile hydrocarbons occur in soils, the exposure risk is related to the vapour intrusion potential, which in turn is dependent on the depth of contamination, relative to the nearest receptor, and the soil type. for this assessment Health Screening Levels (HSL) for depths of < 1m in a sand type soil have been referenced.

Ecological criteria were derived using the previous investigation's pH and CEC's to develop a representative ESL. Ecological criteria for Benzo(a)Pyrene were derived from the high reliability criteria within CRC Care Technical Report no. 39 (2017).

3.7.1 Quality Control

To monitor the level of error being introduced into the data collection process the following quality indicators were implemented:

Table - 1: Data Quality Indictors

Data Precision and Accuracy	
Adequate Sampling Density	Soil sampling frequency determined in accordance with the NSW EPA <i>Contaminated Sites: Sample Design Part 1 - Application 2022</i> .
Appropriate Analytical Techniques	Use of analytical laboratories with adequately trained and experienced testing staff experienced in the analyses undertaken, with appropriate NATA certification.
Acceptable field and laboratory Relative Percentage Difference (RPD) for duplicate comparison	>10 x LOR: 30% inorganics; 50% organics (Field) < 10 x LOR: Assessed on individual basis (Field) >5 x LOR: 50% (laboratory) < 5 x LOR: No Limit (laboratory)
Trip Spikes	Recoverable concentrations of volatiles between 60 – 140%
Adequate laboratory performance	Based on acceptance criteria of laboratory as specified on certificate of analysis: includes: blank samples, matrix spikes, control samples, and surrogate spike samples



Data Representativeness	
Sample and analysis selection	Representativeness of all potential contaminants
Trip Blanks/ Rinsate Blanks	No Detection above LOR
Trip Spikes	Recoverable concentrations of volatiles between 60 – 140%
Duplicate Samples	Adequate duplicate, split, rinsate and trip blank sample numbers
Laboratory selection	Adequate laboratory internal quality control and quality assurance methods, complying with the NEPM.
Documentation Completeness	
Chain of custody records	Laboratory sample receipt information received confirming receipt of samples intact and appropriate chain of custody
	NATA registered laboratory results certificates provided
Data Completeness	
Analytical Suites	Analysis for all potential contaminants of concern.
Confidence Levels	Field duplicate sample numbers complying with AS4482.1 - 2005
Transport and Handling	Trip spike samples prepared and sent with field samples regularly
Comparability	
Analytical Standards	Use of NATA registered laboratories
Data Quality	Test methods consistent for each sample in accordance with the Sampling Analysis and Quality Plan
Traceability	Detailed logs of all sample locations to be recorded
Analytical Methods	Test methods comparable between primary and secondary laboratory
Confidence Levels	Acceptable RPD's between original samples and field duplicates and inter-laboratory triplicate samples.

4.0 Results

4.1 Field Observations

The investigation covered an additional area of approximately 1,000m² and is identified in **Figure 2** – Sampling Layout. The area consisted of concrete covered car park to the west of the previous instigation of the southern car park area.

The observed soil profile consisted of a dark brown silty sandy clay fill to a depth ranging between 0.7-1.2m. A thin layer of brick was encountered at a depth of 0.9-1.0m in BH14. BH16 contained minor inclusions of crushed pipe overlying natural clays at a depth of 1.0-1.2m. A natural black organic / grey silty clay was noted to underlay the fill at all locations, which was consistent with the previous investigation in the adjacent area. No observed soils exhibited any sign of gross contamination such as odours or staining.

A 10L soil sample was passed through a 7mm sieve at each location, with material retained in the sieve thoroughly inspected for the presence of ACM. Aside from the inclusions of brick and tile, other materials to be retained on the sieve included rounded to sub-angular gravels. No ACM or material suspected as ACM was identified.



4.2 Analytical Results

4.2.1 Fill Soils

The results summarised in **Table 1** indicate that heavy metal contaminant concentrations did not exceed the HIL by more than 250% in any single sample. Standard deviations were all calculated to be less than 50% the HIL and the 95% UCL of all metals were less than the HIL. Zinc minorly exceeded the EIL of 400mg/kg with a concentration of 400mg/kg in sample BH4-2.

Previous results were discussed in detail in the DSI, though have been included in the data summary presented below in Table 2 for consideration with the additional data incorporated. For details of individual results refer to Appendix A – Results Summary Tables and NATA Certified Laboratory Results.

Visual assessment did not identify any asbestos containing material (ACM) within the subject soils, which was supported by laboratory analysis that did not detect asbestos in any samples.

Table 1 – Results of Heavy Metals and Asbestos Analysis in Soils

Parameter	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Asb
n	23	23	23	23	23	23	23	23	12
Detections	23	5	19	19	19	1	19	19	0
Max	17	1.3	35	31	350	0.1	30	440	ND
Std Dev	3.4	--	12.9	7.5	77.8	--	6.4	109.4	--
95% UCL	9.6	--	28.8	20.3	89.4	--	17.6	162	--
HIL-B	500	150	500	30000	1200	120	1,200	60000	0.001%
EIL	100	--	400	95	1,100	--	170	400	0

ND: No detection above the Laboratory Limit of Reporting



Results from the additional samples indicated that soils were measured to contain minor concentrations of F3 hydrocarbon at BH15 and BH16, with a maximum of 610mg/kg. As with the concentration of F2 at BH16, the concentrations are compliant with the NEPM HSL's. BaP (TEQ) was elevated at BH15; having a concentration of 2.6mg/kg; however complied with the NEPM HIL of 4mg/kg.

Exceedances of the NEPM HSL's for BaP and BaP (TEQ) and petroleum hydrocarbons at BH12 and BH-13 remain relevant when the amended building footprint is considered. These results were discussed in detail in the DSI, though have been included in the data summary presented below in Table 2 for consideration with the additional data incorporated. For details of individual results refer to Appendix A – Results Summary Tables and NATA Certified Laboratory Results.

Table 2 - Analytical Results of Organic Contaminants (mg/kg)

Parameter	BTEX	F1	F2	F3	F4	Naph	BaP	BaP TEQ	Total PAH
n	23	23	23	23	23	23	23	23	23
Detections	1	0	4	6	6	2	9	23	17
Max	0.4	0	1181	5100	1100	19	140	220	2400
Std Dev	--	--	460	1,628	347	9	43	45	561
95% UCL	--	--	175	822	205	2	19	29	312
HSL/HIL -B	40	45	110	5k	10k	1900	--	4	400
ESL	45	180	120	1300	5,600	170	33	--	--

ND: No detection above the Laboratory Limit of Reporting

4.2.2 Natural Soils

BH15-2 was incorporated into the previous data and is generally consistent with contaminant concentrations observed from the other locations within the Stage 3A footprint area.

Laboratory analysis indicates that heavy metal concentrations in the natural soil samples were generally indicative of background concentrations, notwithstanding a compliant concentration anomaly of zinc. No detections of organic contaminants greater than the LOR were reported in any of the natural soils that were sampled.

Table 3 - Summary of Heavy Metal Results in Natural Soils.

Sample ID	Depth	As	Cd	Cr	Cu	Pb	Hg	Ni	Zi
BH4-3	0.6	13	< 0.4	30	14	28	< 0.1	23	200
BH9-2	0.4	4.7	< 0.4	28	17	21	< 0.1	20	61
BH11-2	0.4	5.6	< 0.4	23	18	20	< 0.1	23	40
BH13-2	0.6	6.1	< 0.4	34	26	29	< 0.1	28	77
BH15-2	0.7	8.9	<0.4	41	12	19	<0.1	9.1	23
n		5	5	5	5	5	5	5	5
Detections		5	0	5	5	5	0	5	5
Max		13	<0.4	41	26	29	<0.1	28	200
HIL-B		500	150	500	30k	1200	120	1,200	60k
EIL		100	--	400	95	1,100	--	170	400

Refer to **Appendix A** for Full results summary and NATA Certified Laboratory Reports.



5.0 Discussion/Conclusion

CHEC developed and implemented a sampling strategy to provide a high level of confidence for determination of land use suitability prior to investigations that were reported in the DSI and, which remained consistent for the additional investigation. The findings presented in this report must be considered in the context of the previous DSI undertaken by CHEC.

The consistency between both investigation data sets indicates the resultant data from this investigation was representative of the actual contaminant concentrations at the additional locations. The data is considered sufficiently reliable to support a decision regarding the potential risk to human health and the environment.

Contaminant concentrations in natural soil samples were measured to be indicative of expected background levels. Analytical data from fill soil samples were measured to be compliant with the adopted Site Acceptance Criteria (SAC). When combined with the overall Site data, conclusions presented in the DSI remain consistent and no further exceedances of the SAC can be implied.

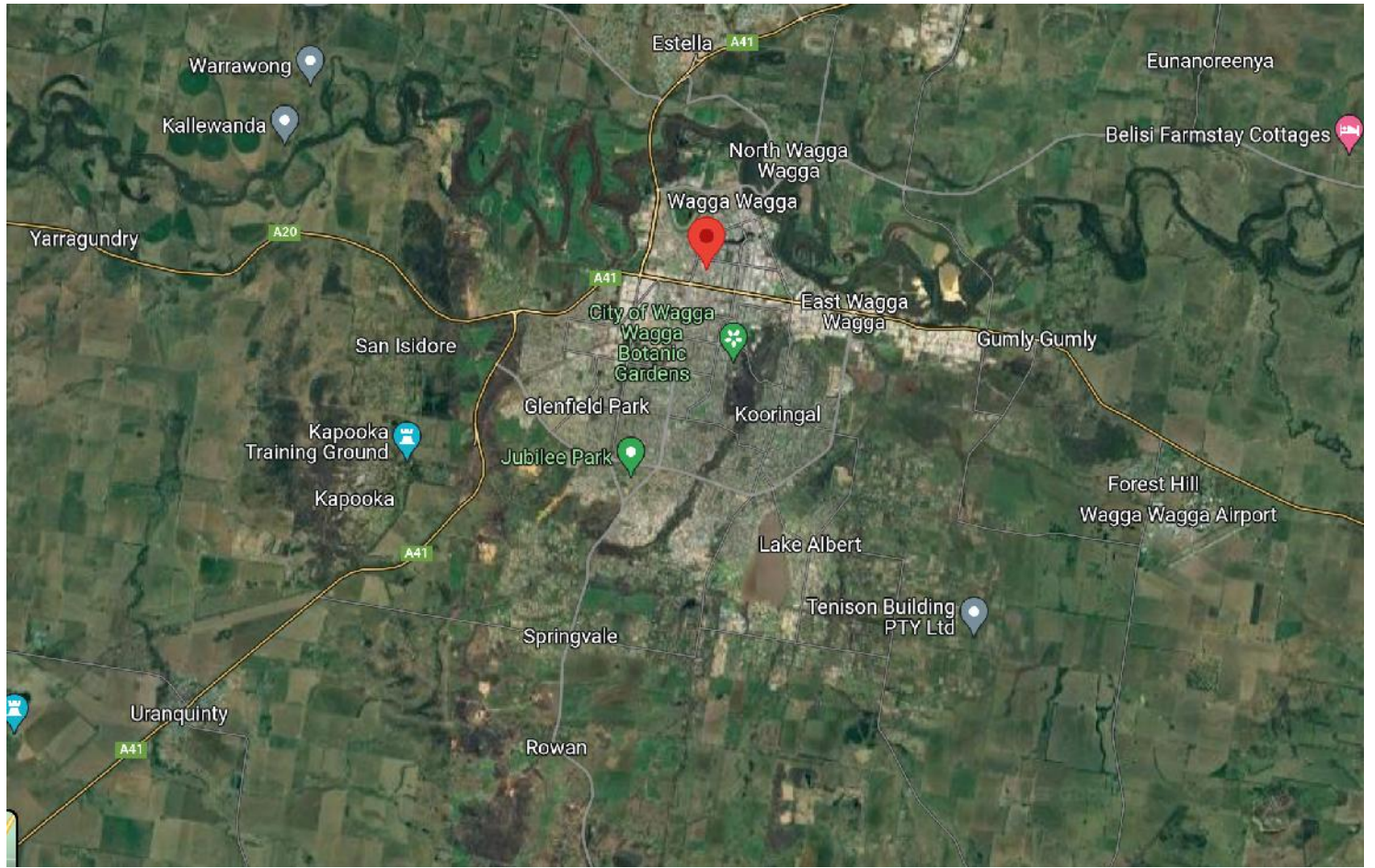
Based on the findings of this report and with consideration for the previous investigation outcomes, it is considered that **the Site can be made suitable for the intended land use** as a mixed-use retail and residential development with basement car parking **with the development and implementation of a Site Remedial Action Plan (RAP)**.

Regards,

A handwritten signature in black ink, appearing to read 'J. Gross'.

Jayden Gross
Environmental Consultant
Compliance Health & Environmental Consulting

Figure 1 – Site Location



Title		Site Location					
Site Address	66-82 Murray Street & 185 Morgan Street, Wagga Wagga NSW	Project No.	CH1440	Figure No.	1	Date	06/10/2023
Client	Damasa Pty Ltd	Scale	NTS	Compiled	CV	Revision	Rev. 1



Figure 2 - Sampling Layout



Appendix A – Results Summary Tables and NATA Certified Laboratory Data

Chemical Analysis of Organic Contaminants (mg/kg)

Sample ID	Depth (m)	B	T	E	X	F1	F2	F3	F4	Naph	BaP	BaP TEQ	Total PAH
BH1-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH2-1	0.3	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH3-1	0.2	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	0.6
BH4-1	0.2	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	390	150	< 0.5	5.7	9	66
BH4-2	0.5	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	0.6	1	5
BH4-3	0.6	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH5-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	0.6	1.1	7.2
BH6-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	0.6
BH7-1	0.2	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH7-1A	0.2	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH7-2	0.5	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	0.7	1.1	6.3
BH8-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	1
BH8-2	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	1.7
BH9-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	0.6
BH9-2	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH10-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH11-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	0.6
BH11-2	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH12-1	0.15	< 0.1	< 0.1	< 0.1	< 0.3	< 20	60	770	220	< 0.5	9.9	15	110
BH12-2	0.75	< 0.1	< 0.1	< 0.1	< 0.3	< 20	220	1700	520	< 0.5	18	28	320
BH12-3	1.2	0.3	0.3	< 0.1	0.4	< 20	1181	5100	1100	19	140	220	2400
BH13-1	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	880	210	1	10	15	120
BH13-2	0.6	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH14-1	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	2.5
BH15-1	0.4	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	1.7	2.6	19
BH15-2	0.7	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	160	< 100	< 0.5	< 0.5	0.6	< 0.5
BH16-1	0.2	< 0.1	< 0.1	< 0.1	< 0.3	< 20	99	610	100	< 0.5	< 0.5	0.6	0.6
BH16-2	0.7	< 0.1	< 0.1	< 0.1	< 0.3	< 20	< 50	< 100	< 100	< 0.5	< 0.5	0.6	< 0.5
BH16-3	1.1	--	--	--	--	--	--	--	--	--	--	--	--
n		28	28	28	28	28	28	28	28	28	28	28	28
Detections		1	1	0	1	0	4	7	6	2	9	28	17
Max		0.3	0.3	< 0.1	0.4	< 20	1181	5100	1100	19	140	220	2400
Std Dev		--	--	--	--	--	460	1,587	347	9	43	41	561
95% UCL		--	--	--	--	--	148	701	191	2	15	24	256
HSL/HIL -B		0.5	160	55	40	45	110	5k	10k	1900	--	4	400
ESL		65	105	125	45	180	120	1300	5,600	170	33	--	--

NA=Not Analysed *Soil Saturation adopted as screening value where contaminant is Not Limiting

Heavy Metal and Asbestos Analysis(mg/kg)

Sample ID	Depth	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Asb (%w/w)
BH1-1	0.15	9.3	1.3	29	31	180	< 0.1	30	320	--
BH2-1	0.3	4.9	< 0.4	14	7.1	18	< 0.1	11	36	--
BH3-1	0.2	6.9	0.6	26	29	200	< 0.1	18	260	--
BH4-1	0.2	17	< 0.4	30	22	37	< 0.1	30	120	--
BH4-2	0.5	11	0.7	35	30	350	0.1	22	440	--
BH4-3	0.6	13	< 0.4	30	14	28	< 0.1	23	200	--
BH5-1	0.15	6.1	< 0.4	17	19	58	< 0.1	15	110	--
BH6-1	0.15	4.1	< 0.4	16	8.3	19	< 0.1	11	50	ND
BH7-1	0.2	7.6	< 0.4	13	8	23	< 0.1	8.5	59	ND
BH7-1A	0.2	8.2	< 0.4	14	8.4	23	< 0.1	9	57	ND
BH7-2	0.5	9.6	< 0.4	29	19	67	< 0.1	21	89	--
BH8-1	0.15	6.8	< 0.4	26	16	26	< 0.1	21	75	ND
BH8-2	0.4	10	< 0.4	33	20	34	< 0.1	24	80	--
BH9-1	0.15	5.4	0.4	18	23	61	< 0.1	13	100	ND
BH9-2	0.4	4.7	< 0.4	28	17	21	< 0.1	20	61	--
BH10-1	0.15	5.9	< 0.4	22	19	28	< 0.1	17	68	ND
BH11-1	0.15	4.2	< 0.4	13	10	25	< 0.1	7.1	53	ND
BH11-2	0.4	5.6	< 0.4	23	18	20	< 0.1	23	40	--
BH12-1	0.15	3.9	< 0.4	15	27	22	< 0.1	11	36	--
BH12-2	0.4	12	< 0.4	17	15	42	< 0.1	15	54	--
BH12-3	1	14	0.9	24	26	85	< 0.1	15	330	--
BH13-1	0.4	5.6	< 0.4	20	14	25	< 0.1	11	73	--
BH13-2	0.6	6.1	< 0.4	34	26	29	< 0.1	28	77	--
BH14-1	0.4	7.6	< 0.4	72	14	15	< 0.1	11	22	ND
BH15-1	0.4	10	< 0.4	33	18	30	< 0.1	15	76	ND
BH15-2	0.7	8.9	< 0.4	41	12	19	< 0.1	9.1	23	--
BH16-1	0.2	13	< 0.4	6.2	6.6	13	< 0.1	< 5	22	ND
BH16-2	0.7	9.8	< 0.4	32	14	20	< 0.1	11	57	ND
BH16-3	1.1	--	--	--	--	--	--	--	--	ND
n		28	28	28	28	28	28	28	28	12
Detections		28	5	28	28	28	1	27	28	0
Max		17	1.3	72	31	350	0.1	30	440	ND
Std Dev		3.3	0.3	12.2	7.1	72.0	--	6.6	103.4	--
95% UCL		9.3	--	29.4	19.9	77.8	--	18.4	140.6	--
HIL-B		500	150	500	30000	1200	120	1,200	60000	0.001%
EIL		100	--	400	95	1,100	--	170	400	0

ND=Not Detected Above Limit of Reporting



CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 006 085 521

Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1 21 Smallwood Place Murarie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

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

Company	CHEC		Project No	1440		Project Manager	CU		Sampler(s)	W									
Address			Project Name	Wagga		EDD Format	ESdat, EQUS etc		Handed over by	W									
Contact Name			Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.									Email for Invoice							
Phone No												Email for Results							
Special Directions												Containers Change container type & size if necessary.				Required Turnaround Time (TAT) Default will be 5 days if not ticked.			
Purchase Order												<input type="checkbox"/> Overnight (reporting by 9am) ♦ <input type="checkbox"/> Same day ♦ <input type="checkbox"/> 1 day ♦ <input type="checkbox"/> 2 days ♦ <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 5 days (Standard) <input type="checkbox"/> Other ()							
Quote ID No			B7									Other (Asbestos AS4964, WA Guidelines)							

No	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)																	Sample Comments / Dangerous Goods Hazard Warning
1	BH14-1	26/09	S	X																
2	BH15-1	↓	↓	↓																
3	BH15-2																			
4	BH16-1																			
5	BH16-2																			
6																				
7																				
8																				
9																				
10																				
Total Counts																				

Method of Shipment	<input type="checkbox"/> Courier (#)	<input type="checkbox"/> Hand Delivered	<input type="checkbox"/> Postal	Name	Cody V	Signature	CU	Date	26/09	Time	3pm
Eurofins mgt Laboratory Use Only	Received By	Branthall	SYD BNE MEL PER ADL NTL DRW	Signature		Date	26/09	Time	3:02	Temperature	87
	Received By		SYD BNE MEL PER ADL NTL DRW	Signature		Date		Time		Report No	

Compliance Health & Environmental Consulting P/L
 PO Box 275
 Gosford
 NSW 2250



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: RESULTS - ALL SRAS HERE ONLY - NO INVOICES

Report 1029391-S-V2
 Project name WAGGA
 Project ID 1440
 Received Date Sep 26, 2023

Client Sample ID			BH14-1	BH15-2	BH15-1	BH16-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-Se0060607	S23-Se0060608	S23-Se0060609	S23-Se0060610
Date Sampled			Sep 26, 2023	Sep 26, 2023	Sep 26, 2023	Sep 26, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	22
TRH C15-C28	50	mg/kg	< 50	< 50	110	590
TRH C29-C36	50	mg/kg	< 50	< 50	75	110
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	185	722
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	99
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	99
TRH >C16-C34	100	mg/kg	< 100	< 100	160	610
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	160	809
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	61	83	93	69
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	2.3	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	2.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	2.8	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	1.6	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	1.7	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	1.0	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	1.8	< 0.5
Chrysene	0.5	mg/kg	0.6	< 0.5	2.0	< 0.5

Client Sample ID			BH14-1	BH15-2	BH15-1	BH16-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-Se0060607	S23-Se0060608	S23-Se0060609	S23-Se0060610
Date Sampled			Sep 26, 2023	Sep 26, 2023	Sep 26, 2023	Sep 26, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.8	< 0.5	3.3	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	1.8	0.6
Pyrene	0.5	mg/kg	1.1	< 0.5	3.6	< 0.5
Total PAH*	0.5	mg/kg	2.5	< 0.5	19	0.6
2-Fluorobiphenyl (surr.)	1	%	106	106	121	109
p-Terphenyl-d14 (surr.)	1	%	118	122	144	112
Heavy Metals						
Arsenic	2	mg/kg	7.6	8.9	10	13
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	72	41	33	6.2
Copper	5	mg/kg	14	12	18	6.6
Lead	5	mg/kg	15	19	30	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	9.1	15	< 5
Zinc	5	mg/kg	22	23	76	22
Sample Properties						
% Moisture	1	%	13	12	17	5.8

Client Sample ID			BH16-2
Sample Matrix			Soil
Eurofins Sample No.			S23-Se0060611
Date Sampled			Sep 26, 2023
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	56
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	56
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	70

Client Sample ID			BH16-2
Sample Matrix			Soil
Eurofins Sample No.			S23-Se0060611
Date Sampled			Sep 26, 2023
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115
p-Terphenyl-d14 (surr.)	1	%	115
Heavy Metals			
Arsenic	2	mg/kg	9.8
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	32
Copper	5	mg/kg	14
Lead	5	mg/kg	20
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	11
Zinc	5	mg/kg	57
Sample Properties			
% Moisture	1	%	9.8

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 30, 2023	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 30, 2023	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 30, 2023	14 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Sydney	Sep 30, 2023	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 30, 2023	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 30, 2023	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Sep 26, 2023	14 Days



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Company Name:	Compliance Health & Environmental Consulting P/L	Order No.:		Received:	Sep 26, 2023 3:02 PM
Address:	PO Box 275 Gosford NSW 2250	Report #:	1029391	Due:	Oct 4, 2023
Project Name:	WAGGA	Phone:	02 4304 0091	Priority:	5 Day
Project ID:	1440	Fax:		Contact Name:	RESULTS - ALL SRAS HERE
Eurofins Analytical Services Manager : Bonnie Pu					

Sample Detail						Moisture Set	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH14-1	Sep 26, 2023		Soil	S23-Se0060607	X	X
2	BH15-2	Sep 26, 2023		Soil	S23-Se0060608	X	X
3	BH15-1	Sep 26, 2023		Soil	S23-Se0060609	X	X
4	BH16-1	Sep 26, 2023		Soil	S23-Se0060610	X	X
5	BH16-2	Sep 26, 2023		Soil	S23-Se0060611	X	X
Test Counts						5	5

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

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

Results <10 times the LOR: No Limit

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

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

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- 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.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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							
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	
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							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
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							
TRH C6-C9	%	76			70-130	Pass	

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
TRH C10-C14	%	125	70-130	Pass			
TRH C6-C10	%	76	70-130	Pass			
TRH >C10-C16	%	128	70-130	Pass			
LCS - % Recovery							
BTEX							
Benzene	%	84	70-130	Pass			
Toluene	%	78	70-130	Pass			
Ethylbenzene	%	77	70-130	Pass			
m&p-Xylenes	%	85	70-130	Pass			
o-Xylene	%	84	70-130	Pass			
Xylenes - Total*	%	85	70-130	Pass			
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	89	70-130	Pass			
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	96	70-130	Pass			
Acenaphthylene	%	92	70-130	Pass			
Anthracene	%	93	70-130	Pass			
Benz(a)anthracene	%	90	70-130	Pass			
Benzo(a)pyrene	%	93	70-130	Pass			
Benzo(b&j)fluoranthene	%	96	70-130	Pass			
Benzo(g,h,i)perylene	%	90	70-130	Pass			
Benzo(k)fluoranthene	%	88	70-130	Pass			
Chrysene	%	95	70-130	Pass			
Dibenz(a,h)anthracene	%	94	70-130	Pass			
Fluoranthene	%	85	70-130	Pass			
Fluorene	%	94	70-130	Pass			
Indeno(1,2,3-cd)pyrene	%	98	70-130	Pass			
Naphthalene	%	99	70-130	Pass			
Phenanthrene	%	94	70-130	Pass			
Pyrene	%	85	70-130	Pass			
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108	80-120	Pass			
Cadmium	%	111	80-120	Pass			
Chromium	%	114	80-120	Pass			
Copper	%	114	80-120	Pass			
Lead	%	112	80-120	Pass			
Mercury	%	114	80-120	Pass			
Nickel	%	114	80-120	Pass			
Zinc	%	113	80-120	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							
Total Recoverable Hydrocarbons				Result 1			
TRH C10-C14	S23-Se0056942	NCP	%	72	70-130	Pass	
TRH >C10-C16	R23-Se0051912	NCP	%	72	70-130	Pass	
Spike - % Recovery							
Polycyclic Aromatic Hydrocarbons				Result 1			
Acenaphthene	S23-Se0058786	NCP	%	85	70-130	Pass	
Anthracene	S23-Se0058786	NCP	%	76	70-130	Pass	
Benz(a)anthracene	S23-Se0058786	NCP	%	78	70-130	Pass	
Benzo(a)pyrene	S23-Se0058786	NCP	%	89	70-130	Pass	
Benzo(b&j)fluoranthene	S23-Se0058786	NCP	%	72	70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene	S23-Se0058786	NCP	%	83			70-130	Pass	
Benzo(k)fluoranthene	S23-Se0058786	NCP	%	98			70-130	Pass	
Chrysene	S23-Se0058786	NCP	%	93			70-130	Pass	
Dibenz(a,h)anthracene	S23-Se0058786	NCP	%	80			70-130	Pass	
Fluoranthene	S23-Se0058786	NCP	%	85			70-130	Pass	
Fluorene	S23-Se0058786	NCP	%	85			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S23-Se0058786	NCP	%	79			70-130	Pass	
Naphthalene	S23-Se0058786	NCP	%	83			70-130	Pass	
Phenanthrene	S23-Se0058786	NCP	%	75			70-130	Pass	
Pyrene	S23-Se0058786	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S23-Se0067724	NCP	%	96			75-125	Pass	
Cadmium	S23-Se0067724	NCP	%	97			75-125	Pass	
Chromium	S23-Se0067724	NCP	%	97			75-125	Pass	
Copper	S23-Se0067724	NCP	%	99			75-125	Pass	
Lead	S23-Se0067724	NCP	%	96			75-125	Pass	
Mercury	S23-Se0067724	NCP	%	99			75-125	Pass	
Nickel	S23-Se0067724	NCP	%	98			75-125	Pass	
Zinc	S23-Se0067724	NCP	%	116			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S23-Se0060608	CP	%	87			70-130	Pass	
TRH C6-C10	S23-Se0060608	CP	%	86			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S23-Se0060608	CP	%	100			70-130	Pass	
Toluene	S23-Se0060608	CP	%	86			70-130	Pass	
Ethylbenzene	S23-Se0060608	CP	%	98			70-130	Pass	
m&p-Xylenes	S23-Se0060608	CP	%	97			70-130	Pass	
o-Xylene	S23-Se0060608	CP	%	95			70-130	Pass	
Xylenes - Total*	S23-Se0060608	CP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S23-Se0060608	CP	%	87			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthylene	S23-Oc0003918	NCP	%	80			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S23-Se0060634	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S23-Se0060676	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S23-Se0060676	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S23-Se0060676	NCP	mg/kg	97	87	11	30%	Pass	
TRH C6-C10	S23-Se0060634	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S23-Se0060676	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S23-Se0060676	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S23-Se0060676	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S23-Se0060634	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S23-Se0060634	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S23-Se0060634	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S23-Se0060634	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S23-Se0060634	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S23-Se0060634	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S23-Se0060634	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S23-Se0067732	NCP	mg/kg	4.5	3.0	39	30%	Fail	Q15
Cadmium	S23-Se0067732	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S23-Se0067732	NCP	mg/kg	12	5.9	66	30%	Fail	Q15
Copper	S23-Se0067732	NCP	mg/kg	5.7	5.2	8.7	30%	Pass	
Lead	S23-Se0067732	NCP	mg/kg	24	21	11	30%	Pass	
Mercury	S23-Se0067732	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S23-Se0067732	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S23-Se0067732	NCP	mg/kg	20	20	1.3	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-Se0060624	NCP	%	3.9	3.7	5.2	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S23-Se0060610	CP	mg/kg	0.6	0.5	8.2	30%	Pass	
Pyrene	S23-Se0060610	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

V2- The client sample IDs for samples 23-Se0060608 and 23-Se0060609 have been corrected per request after a sample check

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
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Bonnie Pu	Analytical Services Manager
Fang Yee Tan	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile



Glenn Jackson
Managing Director

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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CHAIN OF CUSTODY RECORD

ASET JOB NO: ASET 112700/115880/1-5		Contact Name: CHEC	Asbestos in Material	Asbestos in Soil (+/-)	Asbestos WA/ NEPM 500mL	Asbestos Fibre Count	Asbestos in Water	Asbestos in Dust	Lead Analysis
Name/ Company Name: CHEC		Job No: 1440							
Address:		Project Name: Wagga Wagga							
Contact Ph:		Purchase Order:							
		Email Results to:							

	Sample ID	Date	Type	Container	Sample Location							
1	BH14-1	26/09	S	Bag				X				
2	BH15-1	↓	↓	↓				↓				
3	BH16-1	↓	↓	↓				↓				
4	BH16-2	↓	↓	↓				↓				
5	BH16-3	↓	↓	↓				↓				
6												
7												
8												
9												
10												

RECEIVED
26 SEP 2023

BY: **AD**

Relinquished By: C Vincent	Received By: ANALISA	Turn around time					Shipment Method
Date & Time: 26/09/2023	Date & Time: 4.00	Same Day	24 hrs	48 hrs	3 Days	5 days	
Signature:	Signature:					X	



Our ref : ASET112700 / 115880 / 1-5
Your ref : 1440 – Wagga Wagga
NATA Accreditation No: 14484



28 September 2023

Compliance Health & Environmental Consulting
PO Box 275
Gosford NSW 2250

Accredited for compliance with ISO/IEC 17025 - Testing.

Attn: Mr Richard Case

Dear Richard

Asbestos Identification

This report presents the results of five samples, forwarded by Compliance Health & Environmental Consulting on 26 September 2023, for analysis for asbestos.

1.Introduction: Five samples forwarded were examined and analysed for the presence of asbestos on 27 September 2023.

2. Methods: The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction**) (**Qualitative Analysis only**).

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF** (Asbestos Fines), **FA** (Friable Asbestos) and **ACM** (Asbestos Containing Material), also satisfying the requirements of the NEPM Guidelines.

3. Results : **Sample No. 1. ASET112700 / 115880 / 1. BH14-1.**
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 481.0 g.
The sample consisted of a mixture of clayish soil, stone, plant matter and organic fibres.
No asbestos detected.

Sample No. 2. ASET112700 / 115880 / 2. BH15-1.
Approx dimensions 10.0 cm x 10.0 cm x 5.3 cm
Approximate total dry weight of soil = 548.0 g.
The sample consisted of a mixture of clayish soil, stone, plant matter and organic fibres.
No asbestos detected.

Sample No. 3. ASET112700 / 115880 / 3. BH16-1.
Approx dimensions 10.0 cm x 10.0 cm x 5.5 cm
Approximate total dry weight of soil = 582.0 g.
The sample consisted of a mixture of clayish soil, stone, plant matter and organic fibres.
No asbestos detected.

Sample No. 4. ASET112700 / 115880 / 4. BH16-2.
Approx dimensions 10.0 cm x 10.0 cm x 5.5 cm
Approximate total dry weight of soil = 587.0 g.
The sample consisted of a mixture of clayish soil, stone, plant matter and organic fibres.
No asbestos detected.

Sample No. 5. ASET112700 / 115880 / 5. BH16-3.

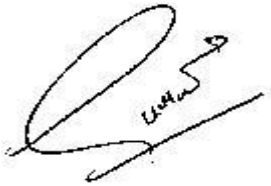
Approx dimensions 10.0 cm x 10.0 cm x 5.9 cm

Approximate total dry weight of soil = 652.0 g.

The sample consisted of a mixture of clayish soil, stone, plant matter and organic fibres.

No asbestos detected.

Reported by,



Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory



Accredited for compliance with ISO/IEC 17025 - Testing.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service.

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages if given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust.

*** denotes asbestos detected in ACM in bonded form.**

denotes friable asbestos as soft fibro plaster, fragments of ACM smaller than 7mm which are considered as friable and / or highly weathered ACM that will easily crumble.

λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.

Ω Sample volume criteria of 500mL have not been satisfied.



The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by AS4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

*Estimation of asbestos weights involves the use of following assumptions;
Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.*

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.



Appendix B – Soil Profile Logs

Soil Log Profile Descriptions				
Test Pit	Depth (m)	Soil Description	Soil Type	Samples
BH1	0-0.15	Concrete		
	0.15-0.25	Coarse Sand	Fill	BH1-1
	0.25+	Natural silty clay with dark grey organics	Natural	
BH2	0-0.15	Concrete		
	0.15-0.45	Coarse Sand	Fill	BH2-1
	0.45+	Natural silty clay with dark grey organics	Natural	
BH3	0-0.2	Coarse Sand	Fill	BH3-1
	0.2+	Natural silty clay with dark grey organics	Natural	
BH4	0-0.1	Concrete		
	0.1-0.4	Sandy gravelly clay	Fill	BH4-1
	0.4-0.6	Silty Clay fill	Fill	BH4-2
	0.6+	Silty Clay	Natural	BH4-3
BH5	0-0.1	Concrete		
	0.1-0.2	Coarse Sand	Fill	
	0.2-0.5	Clay fill	Fill	BH5-1
	0.5+	Natural grey clay	Natural	
BH6	0-0.3	Silty sandy topsoil	Fill	BH6-1
	0.3-0.5	Natural grey clay with orange mottle	Natural	
BH7	0-0.4	Silty sandy topsoil	Fill	BH7-1 BH7-1A
	0.4-0.6	Natural grey clay with orange mottle	Natural	BH7-2
BH8	0-0.3	Clayey sandy topsoil	Fill	BH8-1
	0.3-0.5	Natural grey clay with orange mottle	Natural	BH8-2
BH9	0-0.3	Clayey sandy topsoil	Fill	BH9-1
	0.3-0.5	Natural grey clay with orange mottle	Natural	BH9-2
BH10	0-0.3	Clayey sandy topsoil	Fill	BH10-1
	0.3-0.5	Natural grey clay with orange mottle	Natural	
BH11	0-0.3	Clayey sandy topsoil	Fill	BH11-1
	0.3-0.5	Natural grey clay with orange mottle	Natural	BH11-2
BH12	0-0.1	Concrete		
	0.1-0.2	Coarse Sand	Fill	BH12-1
	0.2-0.75	Gravelly clay	Fill	BH12-2
	0.75-1.2	Gravelly clay with traces of Asphalt Bitumen	Fill	BH12-3
	1.2-1.3	Natural silty clay	Natural	
BH13	0-0.1	Concrete		
	0.1-0.2	Coarse Sand	Fill	
	0.2-0.6	Light brown grey fill	Fill	BH13-1
	0.6+	Natural silty clay	Natural	BH13-2
BH14	0-0.1	Concrete		
	0.1-0.9	Brown Silty Clay	Fill	BH14-1
	0.9-1.0	Brick	Fill	
	1.0+	Dark brown organic silty clay	Natural	BH14-2
BH15	0-0.1	Concrete		
	0.1-0.7	Brown silty clay	Fill	BH15-1
	0.7+	Dark brown organic silty clay	Natural	BH15-2
BH16	0-0.1	Concrete		
	0.1-0.3	Brown/yellow sandy clay	Fill	BH16-1
	0.3-1.0	Brown silty clay	Fill	BH16-2
	1.0-1.2	Brown silty clay with crushed pipe	Fill	BH16-3
	1.2+	Black organic silty clay	Natural	BH16-4