Harvest Scientific Services
Environmental and Earth Science Consultants

DETAILED ENVIRONMENTAL SITE ASSESSMENT

CHELSEA GARDENS, MOSS VALE

Prepared for:

Prime Moss Vale Pty Ltd

Job reference: 201577

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Executive summary

Harvest Scientific Services was engaged by Prime Moss Vale Pty Ltd to conduct a Detailed Site Investigation at the Chelsea Gardens Development site located just south of Moss Vale.

The scope of works included the following:

- A review of Preliminary Environmental Site Assessment findings;
- A site inspection;
- Excavation of test pits across areas of concern;
- Collection of representative soil samples;
- Laboratory analysis of representative samples for contaminants of concern, and
- Reporting in accordance with the associated legislations and guidelines.

The Scope of Work was guided by the recommendations provided in a Phase 1 Contamination Assessment by Harvest Scientific Services in 2019 and an endorsed Sampling Analysis and Quality Plan (SAQP) by Zoic Environmental Pty Ltd in 2020.

Based on the above investigation it was found that:

- All samples were reported by the laboratory to have contaminant concentrations below the adopted residential site assessment criteria; and

- The sampling and handling procedures adopted produced QA/QC results within the adopted criterion indicating that data is of acceptable quality and suitable for use in site characterisation. Laboratory quality control reports indicate that the laboratory was achieving levels of performance within its recommended limits during the period when the samples from this program were analysed. On this basis, the data acquired is of an acceptable quality upon which to draw conclusions regarding the contamination status of the site.

Based on the evidence from this assessment, it is considered that from a contamination perspective, the site is suited to the intended residential subdivision.

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1.0 INTRODUCTION

A Detailed Site Investigation – DSI (or Phase 2 Environmental Assessment) has been undertaken on Stage 1 of the Chelsea Gardens development ('the Property') located near Moss Vale on behalf of Prime Moss Vale Pty Ltd (Figure 1).

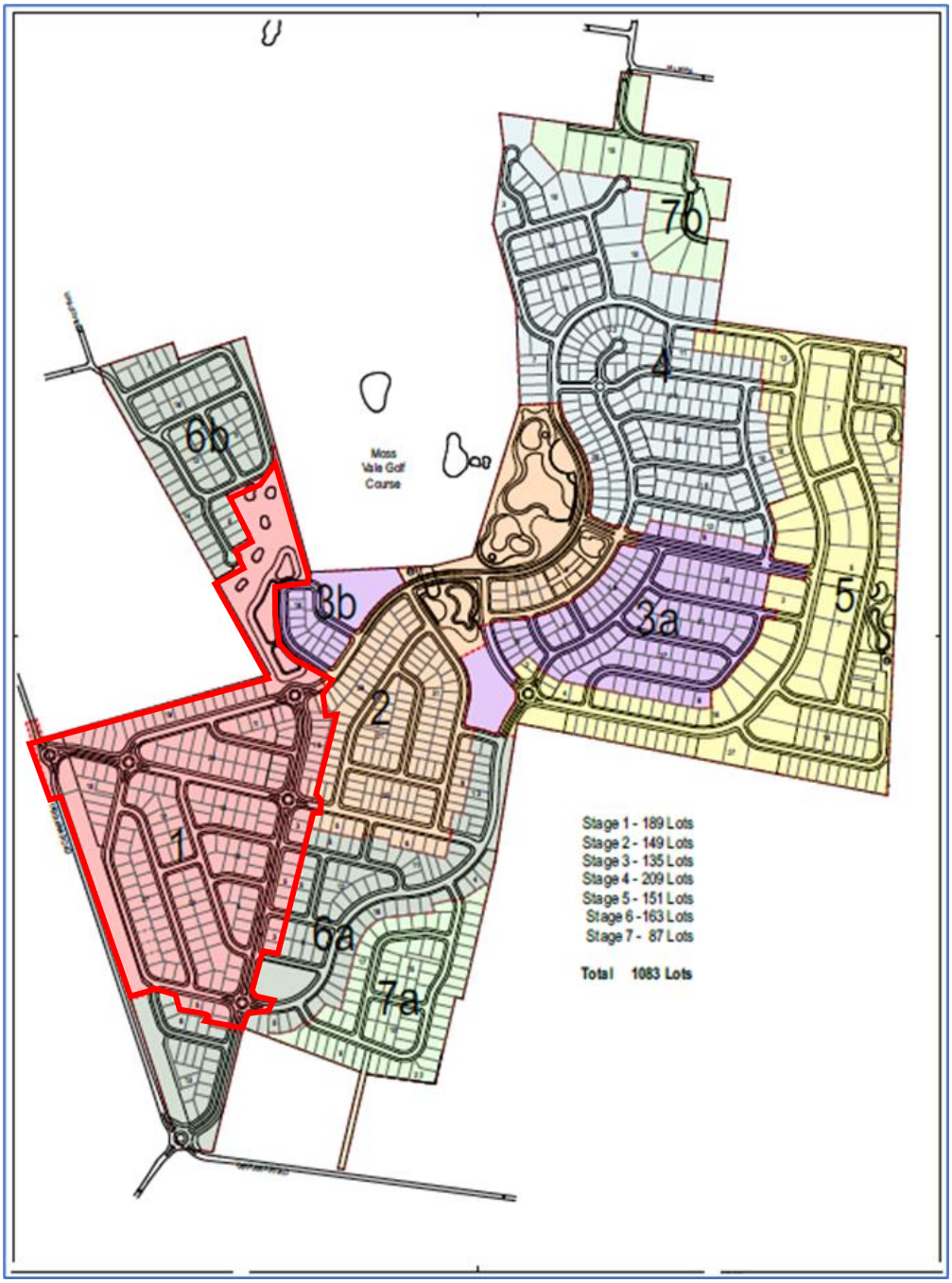

Figure 1: Chelsea Gardens Development showing Stage 1(red shading)

The DSI was carried out following a Phase 1 Environmental Assessment carried out by Harvest Scientific Services (Harvest Scientific Services, 2019) on the Property in 2019. This assessment identified a number of Areas of Environmental Concern (AEC), the locations of which are illustrated in Figure 3. A summary of each AEC is given in Table 1.

The DSI was carried out in September 2020 and entailed a visual assessment, the excavation of a number of test pits and collection of representative soil samples from the areas of concern. Details of the findings are presented within the body of this report, as well as an assessment of significance with regards to the findings of the investigation.

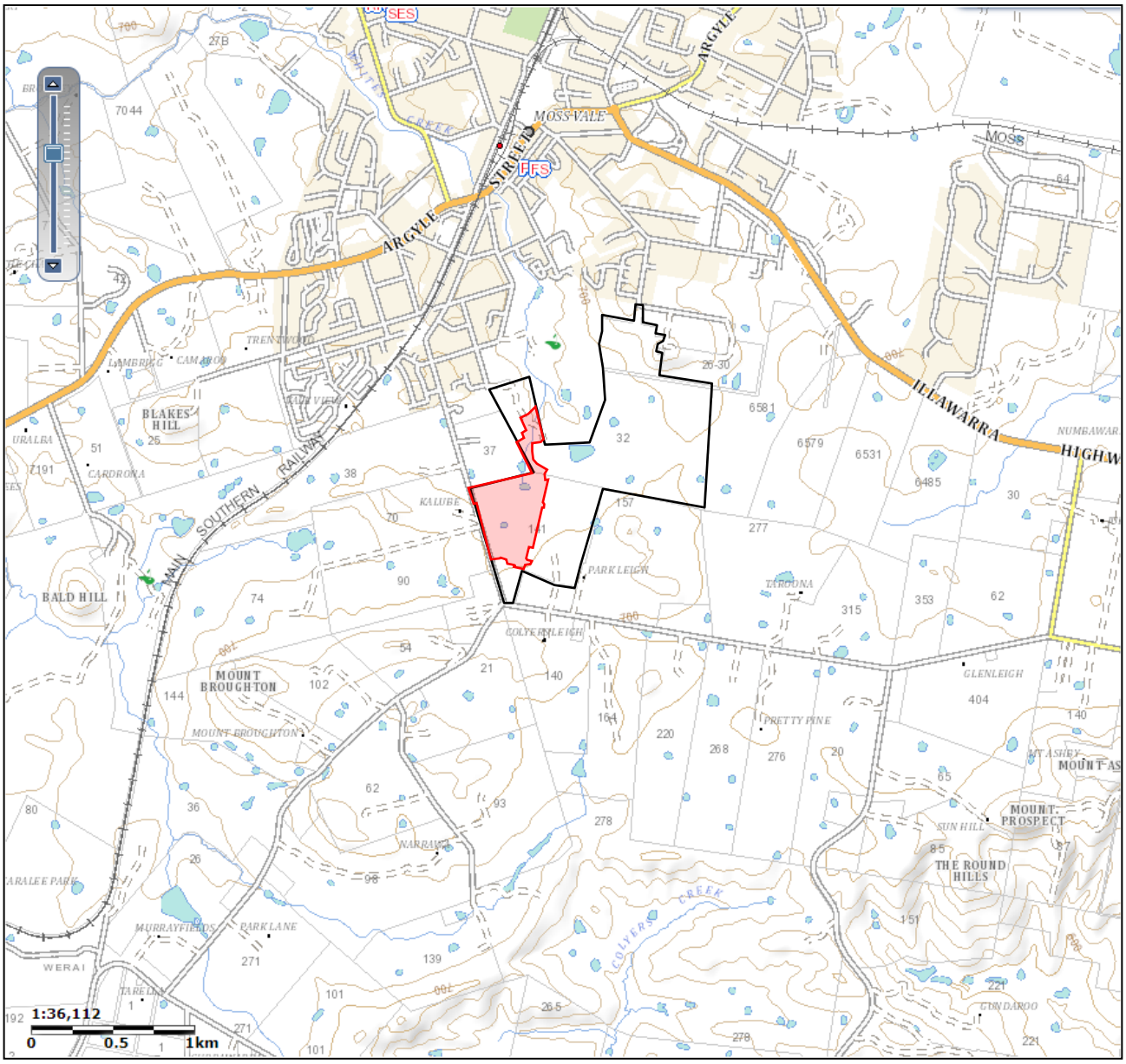

Figure 2: Site Location (NSW Spatial Information Exchange) – Stage 1 highlighted in red

2.0 REPORT OBJECTIVES

The objectives of the Detailed Environmental Site Investigation are to:

- To identify any past or present potentially contaminating activities
- To describe the site and discuss its condition
- To determine the nature and extent of any contamination on site
- To identify potential contamination migration routes
- To determine whether applicable health and ecological investigation levels are exceeded
- To assess the adequacy of information available, and
- To determine the need for any further investigation or management action.

3.0 SCOPE OF WORK

The scope of works included the following:

- A review of Preliminary Environmental Site Assessment findings
- A site inspection
- Excavation of test pits across areas of concern
- Collection of representative soil samples
- Laboratory analysis of representative samples for contaminants of concern, and
- Reporting in accordance with the associated legislations and guidelines.

The Scope of Work was guided by the recommendations provided in:

- Harvest Scientific Services, 2019. Phase I Environmental Site Assessment – Chelsea Gardens MOSS VALE. Job Reference: 201577.

- Review of proposed Phase 1 ESA and Sampling Analysis and Quality Plan (SAQP) prepared by Harvest Scientific Services dated 2 September, 2020 (Appendix 1) and reviewed by Zoic Environmental Pty Ltd (Appendix 2).

4.0 GUIDELINES

The legislative framework for the report is based on guidelines that have been set out by the NSW Environmental Protection Agency (EPA) in the form of the following Acts and Regulations:

- State Environmental Planning Policy 55 - Remediation of Land (SEPP 55)
- Protection of the Environment Operations Act (1997)
- Contaminated Land Management Act (1997)
- Protection of the Environment Operations Regulation (2008)

In addition, the following Guidelines have been reviewed and applied where applicable:

- Sampling Design Guidelines (NSW EPA, 1995)
- Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2000).
- Guidelines for the NSW Site Auditor Scheme (NSW DEC, 2017)
- Assessment & Management of Groundwater Contamination (NSW DEC, 2007)
- National Environmental Protection Measure: Guidelines on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
- Waste Classification Guidelines Part 1: Classifying Waste (NSW DECCW, 2014)
- The Excavated Natural Material Exemption (NSW EPA, 2014)
- Australian Standard AS 4482.1 Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-Volatile Compounds.

5.0 PROPOSED DEVELOPMENT

The proposed development entails a Development Application with Wingecarribee Shire Council to subdivide Stage 1 of the property into 176 residential allotments (Figure 1). There are seven (7) stages proposed in total.

6.0 SITE IDENTIFICATION AND LOCATION

The total development site is identified as Lot 3 DP 706194 and Lot 12 DP 866036, with Stage 1 occupying the western portions of both lots and is located approximately 1.0 kilometres south of Moss Vale township. The Property can be accessed from Yarrawa Road and/or Lovelle Street (Figure 2).

6.1. ADJACENT LAND USE

The site is bordered by a rural and rural-residential environment dominated by open paddocks used for cattle and sheep grazing.

6.2. SOILS

The soil landscape within Stage 1 of the proposed development is dominated by the Moss Vale Soil Landscape which consists of gently undulating to rolling rises on Wianamatta shales. Extensive clearing has occurred for cattle grazing. Mottling and iron accumulation in the subsoils indicates seasonal profile saturation – associated with summer deluges.

6.3. TOPOGRAPHY

Stage I topography exhibits a slight fall to the north in concert with the general direction of the drainage. Virtually the entire area within Stage 1 has a fall of less than 10%.

7.0 SUMMARY OF PRELIMINARY ASSESSMENT AND SITE INVESTIGATIONS

A review of the Preliminary Environmental Site Assessment prepared for the site (Harvest Scientific Services, 2019) was undertaken. That particular assessment included:

- A review of historical aerial photographs;
- An interview with property owners;
- A summary of soil and geological maps;
- A review of records held by Wingecarribee Shire Council relevant to the site;
- A review of the DECCW Register for Contaminated Sites, and
- A visual site inspection.

The assessment identified a number of Areas of Environmental Concern (AEC), the locations of which are illustrated in Figure 3. A summary of each AEC is given in Table 1 which has been taken from the above report. Those AECs assessed for this Stage 1 are highlighted in gray shading.

Table 1: Identified Areas of Environmental Concern (AEC)			
AEC Description	**Potentially Contaminating Activity**	**Contaminants of Concern**	**Likelihood of Contamination***
AEC 1. Much of the property split into paddocks for pasture growth – see Plates 1 and 2.	Application of agricultural chemicals.	OC/OPs and heavy metals	Moderate to Low
AEC 2. Residential area and old dairy and milking area and immediate surrounds – see Plates 3 and 4.	Possible host for farm machinery, fuels and chemicals. Possible use of asbestos in roofing and walls.	Heavy metals, OC/Ops, Asbestos, TRH, BTEXN	Moderate
AEC 3. Cattle yards – see Plate 7.	Long term leaching of contaminants associated with yard activities and infrastructure (e.g. dips).	Heavy metals, OC/OPs, Asbestos	Moderate
AEC 4. Farm driveway – see Plate 11.	Type of fill is shale based mixed with old concrete and other unknown materials. Long term leaching of contaminants from imported fill materials, spillage of oil and grease	Heavy metals, OC/Ops, TRH, BTEXN, Asbestos.	Moderate
AEC 5. Minor Farm infrastructure	Old deteriorating concrete infrastructure	Heavy metals, OC/OPs, Asbestos	Low
AEC 6. Minor rubbish dump – see Plate 5.	Deteriorating old tyres and treated timber	Heavy metals, OC/OPs, Asbestos	Low
AEC 7. Asbestos piping – see Plate 9.	Breakdown of piping over time	Asbestos	Strong
AEC 8. Old silage pit – see Plate 6.	Farm rubbish – leaching metals, possible disposal site for chemicals	Heavy metals, OC/OPs, TRH, BTEXN, Asbestos.	Moderate
AEC 9. Much of the property split into paddocks for pasture growth – see Plates 1/2.	Application of agricultural chemicals.	OC/OPs and heavy metals	Moderate to Low
AEC 10. Cattle yards.	Long term leaching of contaminants associated with yard activities (e.g., dips).	Heavy metals, OC/OPs, Asbestos	Moderate
AEC 11. Residential area and immediate surrounds.	Possible host for farm machinery, fuels and chemicals.	Heavy metals, OC/OPs, Asbestos	Low
AEC 12. All farm dams	Concentration of farm chemicals due to run-off from drainage lines	OC/OPs and heavy metals	Moderate to Low

The area within Stage 1 is impacted only by AECs 1, 4, 9 and 12 – see Figure 3.

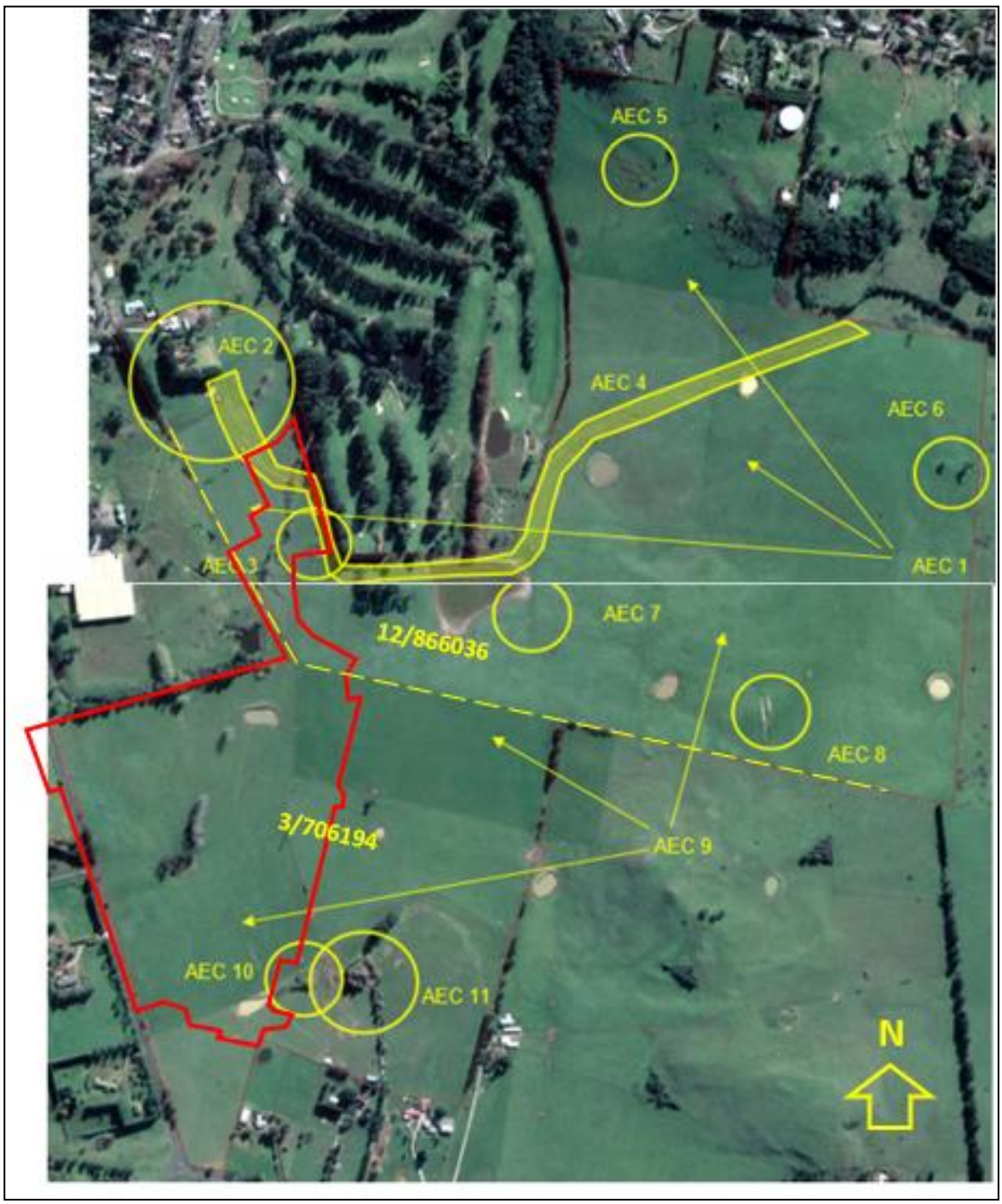

Figure 3: Location of Areas of Environmental Concern (AEC) showing Stage 1 (red boundary)

8.0 SOIL SAMPLING AND ANALYSIS

8.1. DATA QUALITY OBJECTIVES

Data Quality Objectives were established for the site characterisation works following the decision-making procedures outlined in NEPC (2013):

- Define the problem;
- Identify the decision;
- Identify inputs to the decision;
- Define the study boundaries;
- Develop a decision rule;
- Specify limits on decision errors, and
- Optimise the design for obtaining data.

8.2. DEFINE THE PROBLEM

The Preliminary Environmental Site Assessment identified potential areas of environmental concern warranting further investigation.

8.3. IDENTIFY THE DECISION

Based on the decision-making process for assessing urban redevelopment sites, the following decisions must be made:

- Are there any unacceptable health risks to future onsite receptors?
- Are there any unacceptable ecological risks posed by the site?
- Are there any aesthetic issues at the site?
- Is there any evidence of, or potential for, migration of contaminants from the site?
- Is a site management strategy required?

8.4. IDENTIFY INPUTS TO THE DECISION

The following inputs were used to allow the assessment of the decisions:

- Preliminary Environmental Site Assessment results;
- Observations made during site investigations;
- Soil analytical data from samples collected on site;
- Adopted site assessment criteria, and
- Data quality indicators.

8.5. DEFINE THE STUDY BOUNDARIES

The study area includes all of the Stage 1 subdivision area. However, with the exception of background data, soil sampling was limited to:

- Areas of Environmental Concern; and
- A maximum 1,000 mm below ground level (unless fill material identified)

8.6. DEVELOP A DECISION RULE

Soil analytical data was assessed against National Environmental Protection Measure (NEPM) Residential Criteria as identified in Section 10. Statistical analysis of the data would be undertaken if necessary. The following statistical criteria shall be adopted:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte shall exceed 250% of the adopted criterion;
- The standard deviation of the results must be below 50 % of the criterion;
- The relative percent difference between primary and intra duplicate samples must be below 50%; and
- The relative percent difference between primary and inter duplicate samples must be below 70%.

8.7. SPECIFY LIMITS OF DECISION ERRORS

Data generated during the project must be appropriate to allow decisions to be made with confidence. The acceptable limit on decision error is 95 % compliance with data quality indicators.

8.8. OPTIMISE DESIGN FOR OBTAINING DATA

Twenty-six (26) test pits within the approximate locations indicated on approved Sampling Analysis Quality Plan (SAQP) were opened. An additional three (3) test pits were excavated outside the rural land use area (within fenced yards and an adjacent golf course) for the purpose of acquiring background contaminant concentrations (BG1, BG2 and BG3) (Figure 4).

This was considered adequate given:

- The targeted nature of sampling plan;
- Largely rural nature of the site (low risk), and
- Low intensity land use to date.

The analytical schedule is outlined in Table 2.

8.9 SOIL SAMPLE METHODOLOGY

- Each test pit was opened to approximately 1,000 mm depth with the exception of Test Pits 1, 2 and 3 which consisted of surface scrapes of an access driveway only;

- All work was undertaken on 22 September 2020 with the assistance of a small excavator fitted with 500 mm bucket driven by Terra Insight personnel; and

- Representative soil samples were acquired from near surface top-soil stratum (L1 0 – 200 mm) and sub-soil stratum (L2 500 – 700 mm).

Figure 4: Bore Hole (BH) sampling locations across Stage 1 sub-division (investigation) area – see Appendix 4 for profile descriptions

Table 2: Analytical Schedule			
Ref	AEC	Description	Analytes
1_1	AEC 4	Coal wash driveway	Asbestos, Heavy Metals (8), OC/OP, TPH, TRH, BTEXN
2_1	AEC 4	Coal wash driveway	Asbestos, Heavy Metals (8), OC/OP, TPH, TRH, BTEXN
3_1	AEC 4	Earth driveway	Heavy Metals (8), OC/OP
4_1	AECs 1/9	Dark grey dam sediment	Heavy Metals (8), OC/OP
5_1	AECs 1/9	Dark grey dam sediment	Heavy Metals (8), OC/OP
6_1	AECs 1/9	Grey brown dam sediment	Heavy Metals (8), OC/OP
7_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
8_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
9_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
10_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
11_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
12_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
13_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
14_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
15_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
16_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
17_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
18_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
19_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
20_1	AECs 1/9	Dark grey brown silty loam	Heavy Metals (8), OC/OP
21_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
22_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
23_1	AECs 1/9	Grey silty loam	Heavy Metals (8), OC/OP
24_1	AECs 1/9	Grey brown silty loam	Heavy Metals (8), OC/OP
25_1	AECs 1/9	Dark brown silty loam	Heavy Metals (8), OC/OP
26_1	AECs 1/9	Dark grey silty loam	Heavy Metals (8), OC/OP
BG-1	AECs 1/9	Dark grey silty loam	Heavy Metals (8)
BG_2	AECs 1/9	Dark grey silty loam	Heavy Metals (8)
BG_3	AECs 1/9	Grey brown silty loam	Heavy Metals (8)
DUP_1	AECs 1/9	Dark grey silty loam	Heavy Metals (8)
DUP_2	AECs 1/9	Dark grey silty loam	Heavy Metals (8)

9.0 SITE ASSESSMENT CRITERIA

Concentrations of contaminants in soil samples were compared against the National Environmental Protection Council (2013) site assessment criteria presented below and summarised in Table 3:

- Health Investigation Levels (HIL) for Soil Contaminants – Residential A;
- Soil Health Screening Levels (HSL) for Vapour Intrusion – Residential A & B;
- Generic Ecological Investigation Levels (EIL) for Arsenic, DDT and Naphthalene in Soils - Urban Residential;
- Ecological Screening Levels (ESL) for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in Soil - Urban Residential and Public Open Space and Fine-Grained Soils, and
- Health Screening Levels for Asbestos Contamination in Soil – Residential A with garden/accessible soil also includes day care centres, preschools, primary schools.

Table 3: Adopted Investigation Levels and Health Screening Levels (mg/kg) where applicable			
	Health Based Investigation Levels	Health Screening Levels	Environmental Investigation Levels
METALS AND INORGANICS			
Arsenic	100	-	100
Cadmium	20	-	-
Chromium	100	-	400
Copper	6,000	-	-
Nickel	400	-	350
Lead	300	-	1100
Zinc	7,400	-	-
Mercury	40	-	-
PAH			
BaP (TEQ)	3	-	1.4
Total PAH*	300	-	-
BTEXN			
Benzene	-	0.6	65
Toluene	-	390	105
Ethylbenzene	-	-	125
Total Xylenes	-	95	45
Naphthalene	-	4	170
TRH			
F1 C6 – C10	-	40	180
F2 > C10 – C16	-	230	120
F3 > C16 – C34	-	-	1300
F4 > C34 – C40	-	-	5600
OC / OP			
DDT+DDE+DDD	240	-	-
Aldrin and dieldrin	6	-	-
Chlordane	50	-	-
Endosulfan	270	-	-
Endrin	10	-	-
Heptachlor	6	-	-
HCB	10	-	-
Methoxychlor	300	-	-
Mirex	10	-	-
Toxaphene	20	-	-
ASBESTOS			
Bonded	-	0.01%	-
Friable	-	0.001%	-
Visible	-	None visible	-

10.0 QUALITY ASSURANCE / QUALITY CONTROL

10.1. SITE PROCEDURES

The following field quality assurance and quality control measures were implemented:

- Soil samples were collected directly from the top and center of the excavator bucket and placed into laboratory supplied 250 mL sample jars sealed with Teflon lids;
- For asbestos, approximately 10 L of soil was collected from the excavated material using a spade and bucket and placed into a 7 mm sieve. The soil was sieved completely and approximately 500 grams of sieved soil collected and placed into laboratory supplied zip-lock bags. Material in the top of the sieve was closely inspected for asbestos containing material. In the instance that asbestos or foreign materials of any sort were identified, the material was bagged and stored for later analysis if necessary;
- The samples were stored in a chilled esky (separate un-chilled esky for asbestos) and transferred to ALS Environmental Division Smithfield Lab under chain of custody (COC) procedures. The laboratory is NATA accredited for the selected analyses;
- All L1 series surface samples were immediately analyzed as per the approved SAQP. All L2 sub-soil samples were placed on Hold at ALS until further notice;
- During the collection of soil samples, any features such as fill material, foreign materials, discoloration, staining, odours, or other indicators of contamination were noted;
- Other than surface aggregates at Test Pits 1 and 2, all test pits revealed natural undisturbed soil profiles indicative of the local soil landscape;
- Two (2) inter-laboratory & two (2) intra-laboratory samples were collected for analysis; and
- All site work was undertaken by Cheyne Hudson, Senior Environmental Scientist at Broadcrest Consulting Pty Ltd in accordance with best industry practices (Appendix 3).

10.2. LABORATORY QUALITY CONTROL

The following is an extract from the quote for service provided by ALS Environmental Division.

“ALS has a comprehensive QA/QC program. Our QA/QC procedures are designed to provide reliable and defensible analytical results. Our analytical services are based on internal QCS3 schedule, which includes Laboratory Control Samples (LCS), Method Blanks (MB), Matrix Spikes (MS), Laboratory Duplicates (Dups) and Surrogates (for target organics) where applicable, at frequencies at or above that detailed in the 1999 NEPM guidelines. The basis of the QCS3 Schedule is the ‘analytical lot’ (process analytical batch) of samples. Generally, the laboratory processes samples of similar matrices in groups called ‘Lots’. ‘Lots’ are made up of 20 samples that may consist of several discrete batches and may be independent of project and / or client. The selection of samples for QC purposes will be biased towards the larger batches within the process lot”.

The following summarises the frequency that QC samples are processed:

- 5% Method Blanks (MB) – 1 analysed within each process lot of 20 samples;
- 10% Laboratory Duplicates (Dups) – 2 analysed within each process lot of 20 samples;
- 5% Laboratory Control Samples (LCS) – 1 analysed within each process lot of 20 samples;
- 5% Matrix Spikes (MS) – 1 analysed within each process lot of 20 samples; and
- Surrogate Spikes on all ‘target’ organics analyses.

QA/QC RESULTS

Site

- All soil samples arrived at ALS Environmental within specified holding times;
- All soil samples arrived at ALS Environmental within specified temperature requirements;
- No potential OHS incidents were recorded on site;
- No quality assurance incidents (such as cross contamination or similar) were recorded;
- The mean relative percent difference (RPD) between primary and intra-laboratory duplicates was calculated using heavy metals data and determined to be 34.75% - within the required 50% limit (Appendix 8); and
- The relative percent difference (RPD) between primary and inter-laboratory duplicates was calculated using heavy metals data and determined to be 63.24% - within the required 70% limit. Note that differences in limits of reporting (LOR) were the primary point of difference.

Lab

ALS Environmental Division provided a Quality Control Report and Interpretive Quality Control Report (Appendix 7). Those Quality Control Reports contain the following information:

- Laboratory Duplicate (DUP) Report - referring to a randomly selected intra-laboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. For all matrices, no duplicate outliers occurred;
- Method Blank (MB) Report - referring 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. For all matrices, no method blank outliers occurred;
- Laboratory Control Spike (LCS) Report - referring 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. For all matrices, no laboratory control outliers occurred;
- Matrix Spike (MS) Report – referring to an intra-laboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. For all matrices, no matrix spike outliers occurred;
- Analysis Holding Time Compliance Report - No Analysis Holding Time outliers exist; and
- Frequency Quality Control Samples Report - No Quality Control Frequency Outliers exist.

QA/QC CONCLUSIONS

The sampling and handling procedures adopted produced QA/QC results within the adopted criterion indicating that data is of acceptable quality and suitable for use in site characterisation. Laboratory quality control reports indicate that the laboratory was achieving levels of performance within its recommended limits during the period when the samples from this program were analysed. On this basis, the data acquired is of an acceptable quality upon which to draw conclusions regarding the contamination status of the site.

11.0 RESULTS

11.1. SITE OBSERVATIONS

No significant change in site conditions was evident between the time the test pitting and sampling regime for this Assessment was undertaken and the initial Phase 1 assessment.

11.2. SOIL PROFILES

A total of twenty-six (26) test pits were excavated across the site to approximately 1000 mm depth using a small excavator fitted with 300 mm bucket. Soil profiles are described in more detail in Appendix 4. Observations made at the time of excavation includes:

- Soil profiles consisted of grey to dark brown silty loam over yellowish brown well-structured clay in almost every instance;
- Other than aggregates for access driveways, no imported fill was identified; and
- No asbestos containing materials were visually identified during the excavations.

11.3. SOIL LABORATORY RESULTS

Detailed laboratory reports are provided in Appendices 5 and 6. Laboratory results are summarised in Table 4 and were as follows:

- Asbestos: No asbestos containing material was detected;
- Total Metals: All samples were reported by the laboratory to have concentrations below the adopted residential site assessment criteria;
- TRH: All samples were reported by the laboratory to have concentrations below the adopted residential site assessment criteria (all below limits of reporting);
- Benzene, Toluene, Ethyl-Benzene, and Xylenes (BTEX): All samples were reported by the laboratory to have concentrations below the adopted residential site assessment criteria (all below limits of reporting);
- OC and OP Pesticides: All samples were reported by the laboratory to have concentrations below the adopted residential site assessment criteria (all below limits of reporting);
- Excluding samples 1_1, 2_1 and 3_1 which were sourced from the sites access driveway, the mean concentration of Copper across all samples was calculated to be 6.76 mg/kg (assuming half LOR). The mean background concentration was calculated to be 3.67 mg/kg (also assuming half LOR). These concentrations are *very low* and close to or below the LOR (5 mg/kg). No Cation Exchange Capacity or Carbon Content data was available. Therefore, for the purposes of this report, Generic EILs provided in Table 3 have bene adopted;
- Excluding samples 1_1, 2_1 and 3_1 which were sourced from the sites access driveway, the mean concentration of Nickel across all samples was calculated to be 7.16 mg/kg (assuming half LOR). The mean background concentration was calculated to be 5.67 mg/kg. These concentrations are *very low* and close to the LOR (5 mg/kg). No Cation Exchange Capacity or Carbon Content data was available. Therefore, for the purposes of this report, Generic EILs provided in Table 3 have been adopted; and
- Excluding samples 1_1, 2_1 and 3_1 which were sourced from the sites access driveway, the mean concentration of Zinc across all samples was calculated to be 11 mg/kg (assuming half LOR). The mean background concentration was calculated to be 9.16 mg/kg (also assuming half LOR). These concentrations are *very low* and close to the LOR. No Cation Exchange Capacity or Carbon Content data was available. Therefore, for the purposes of this report, Generic EILs provided in Table 3 have been adopted.

Table 4: Analytical Results mg/kg													
	IL	1_1	2_1	3_1	4_1	5_1	6_1	7_1	8_1	9_1	10_1	11_1	12_1
METALS AND INORGANICS													
Arsenic	100	<5	<5	<5	6	<5	<5	<5	<5	<5	7	<5	<5
Cadmium	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	100	25	9	23	38	44	62	62	36	38	23	34	22
Copper	6,000	97	18	18	9	7	5	15	8	<5	12	10	<5
Nickel	400	10	6	16	10	7	5	10	8	4	7	11	5
Lead	300	12	12	9	3	2	13	6	9	7	6	9	8
Zinc	7,400	23	31	32	23	8	<5	14	11	9	25	10	6
Mercury	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BTEX													
Benzene	0.6	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-	-
Toluene	390	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Ethylbenzene	125	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Total Xylenes	95	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
Naphthalene	4	<1	<1	<0.5	-	-	-	-	-	-	-	-	-
TRH													
F1 C6 – C10	40	<10	<10	<10	-	-	-	-	-	-	-	-	-
F2 > C10 – C16	230	<50	<50	<50	-	-	-	-	-	-	-	-	-
F3 > C16 – C34	1,300*	<100	<100	<100	-	-	-	-	-	-	-	-	-
F4 > C34 – C40	5,600*	<100	<100	<100	-	-	-	-	-	-	-	-	-
OC/OP													
DDT+DDE+DDD	240	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin and dieldrin	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan	270	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
HCB	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	300	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
ASBESTOS													
Detected	Yes/No	No	No	-	-	-	-	-	-	-	-	-	-
Fines + Fibrous	0.001%	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-

Table 4: Analytical Results (continued) mg/kg													
	IL	13_1	14_1	15_1	16_1	17_1	18_1	19_1	20_1	21_1	22_1	23_1	24_1
METALS AND INORGANICS													
Arsenic	100	<5	7	<5	<5	5	<5	<5	<5	<5	<5	<5	<5
Cadmium	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	100	30	32	33	29	26	81	11	23	55	16	24	51
Copper	6,000	<5	7	6	<5	7	12	<5	<5	8	<5	<5	<5
Nickel	400	3	4	6	5	3	21	4	3	11	3	5	4
Lead	300	13	13	11	9	9	12	9	10	10	11	8	9
Zinc	7,400	<5	14	8	8	12	16	6	<5	19	9	6	<5
Mercury	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BTEX													
Benzene	0.6	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	390	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	125	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylenes	95	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	4	-	-	-	-	-	-	-	-	-	-	-	-
TRH													
F1 C6 – C10	40	-	-	-	-	-	-	-	-	-	-	-	-
F2 > C10 – C16	230	-	-	-	-	-	-	-	-	-	-	-	-
F3 > C16 – C34	1,300*	-	-	-	-	-	-	-	-	-	-	-	-
F4 > C34 – C40	5,600*	-	-	-	-	-	-	-	-	-	-	-	-
OC/OP													
DDT+DDE+DDD	240	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin and dieldrin	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan	270	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
HCB	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	300	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
ASBESTOS													
Detected	Yes/No	-	-	-	-	-	-	-	-	-	-	-	-
Fines + Fibrous	0.001%	-	-	-	-	-	-	-	-	-	-	-	-

Table 4: Analytical Results (continued) mg/kg													
	IL	25_1	26_1	DUP_1	DUP_2	BG_1	BG_2	BG_3					
METALS AND INORGANICS													
Arsenic	100	<5	10	<5	<5	-	-	-					
Cadmium	20	<1	<1	<1	<1	-	-	-					
Chromium	100	41	82	26	40	-	-	-					
Copper	6,000	<5	17	6	15	6	<5	<5					
Nickel	400	5	22	5	8	11	3	3					
Lead	300	8	27	20	12	-	-	-					
Zinc	7,400	7	39	6	12	12	<5	13					
Mercury	40	<0.1	<0.1	<0.1	<0.1	-	-	-					
BTEX													
Benzene	0.6	-	-	-	-	-	-						
Toluene	390	-	-	-	-	-	-						
Ethylbenzene	125	-	-	-	-	-	-						
Total Xylenes	95	-	-	-	-	-	-						
Naphthalene	4	-	-	-	-	-	-						
TRH													
F1 C6 – C10	40	-	-	-	-	-	-						
F2 > C10 – C16	230	-	-	-	-	-	-						
F3 > C16 – C34	1,300*	-	-	-	-	-	-						
F4 > C34 – C40	5,600*	-	-	-	-	-	-						
OC/OP													
DDT+DDE+DDD	240	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Aldrin and dieldrin	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Chlordane	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Endosulfan	270	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Endrin	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Heptachlor	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
HCB	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Methoxychlor	300	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05						
ASBESTOS													
Detected	Yes/No	-	-	-	-	-	-						
Fines + Fibrous	0.001%	-	-	-	-	-	-						

12.0 DISCUSSION

12.1. SOIL LABORATORY RESULTS

As indicated in Section 11.3 the sampling indicated that:

- Contaminant concentration levels for metals were all below the adopted HBIL criteria;
- Contaminant concentration levels for BTEX and TPH were all below the adopted HBIL criteria;
- Contaminant concentration levels for OC/OPs were all below the adopted HBIL criteria; and
- No asbestos containing material (ACM) was identified.

12.2. POTENTIAL RISKS TO ONSITE RECEPTORS

No potential risks to on-site receptors were detected.

12.3. POTENTIAL FOR MIGRATION OF CONTAMINANTS

The potential for contaminant migration beyond the site boundaries or into areas of ecological significance is considered to be ***low*** given:

- The soil laboratory results (Section 11.3) demonstrating that there are no reportable contaminants

12.4. VISUAL AMENITY

No visual amenity issues were noted.

12.5. RECOMMENDATIONS

Based on the evidence from this assessment, it is considered that from a contamination perspective, the site is suited for the intended residential subdivision.

13.0 UNEXPECTED FINDINGS PROTOCOL

In the event that future earthworks associated with the development uncover any suspect material (fibro, metal, wood, plastic, odours, asbestos, discoloured soil, mechanical parts, etc.), the following procedure must be implemented:

- Stop all work in the immediate or affected area
- Immediately notify the Environment Manager
- Recommence works in an alternate area where practicable
- Prior to any contamination investigation / management action, appropriate personal protective equipment (PPE) is to be worn as per the relevant Material Safety Data Sheet(s). This may include, but not be limited to:
    - Eye goggles
    - Face mask
    - Rubber boots
    - Rubber gloves
    - Work clothes (i.e. long sleeve shirt / pants and steel capped boots)
- Investigate the area of concern
- The Environmental Manager is to assess the situation and if considered necessary, commission a suitably qualified contamination specialist to undertake a contamination investigation in the area of the find
- The Environmental Manager (in consultation with specialists) will determine the appropriate management measures to be implemented
- Recommence works only after the Environmental Manager grants approval.

14.0 LIMITATIONS OF THIS REPORT

This report has been prepared subject to a number of limitations, these include:

No contamination assessment can eliminate all risk. Even a rigorous professional assessment may not detect all contamination within a site. Contaminants may be present in areas that were not sampled or surveyed or may migrate to areas which did not show any signs of contamination when sampled. Contaminant analysis cannot cover every type of contaminant, only the most likely contaminants are screened;

Site assessment identifies actual sub-surface conditions only at those points where samples are taken and when they are taken. Data obtained from the sampling and subsequent laboratory analysis are interpreted by professional consultants and opinions are drawn about the overall sub-surface conditions, the nature and extent of the contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated;

In preparing this report, Harvest Scientific Services has relied upon certain information and documentation provided by the client and/or third parties. Harvest Scientific did not attempt to independently verify the accuracy or completeness of that information. To the extent that the conclusions and recommendations in this report are based in whole or in part on such information, they are contingent on its validity. Harvest Scientific Services assume no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to Harvest Scientific Services.

The findings contained in this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site in question. Under no circumstances, however, can it be considered that these findings represent the actual state of the site/sites at all points.

The application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document. The client agrees that such events are possible but nevertheless accepts the risk that they pose.

Prepared by:

Mart Rampe BSc (Applied Geology)

Principal

13th October 2020

15.0 APPENDIX 1: SAMPLING ANALYSIS AND QUALITY PLAN (SAQP)

Harvest Scientific Services
Environmental and Earth Science Consultants

2 September, 2020

Mr P Moore
ZOIC Environmental Pty Ltd
1/19 189 Kent Street,
SYDNEY NSW 2000

Dear Peter

Re: Sampling and Analysis Quality Plan – Chelsea Gardens, MOSS VALE

Our Reference: 201577

Further to your email advice dated 30/8/2020 please find details of a Sampling and Analysis Quality Plan (SAQP) regarding the above project for your review and comment.

Should you have any questions regarding this matter in the meantime, please feel free to call me on 02 4647 6177 or 0408 677709.

Regards

Mart Rampe

Mart Rampe BSc (Applied Geology)
Principal Consultant

All Correspondence to: PO Box 427 Narellan NSW 2567
Unit 4A, 20 Somerset Avenue Narellan NSW 2567
www.harvestservices.com.au
Email: office@harvestservices.com.au
Tel: 02 4647 6177 • Mobile: 0408 677 709

CHELSEA GARDENS – MOSS VALE

SAMPLING AND ANALYSIS QUALITY PLAN

FOR A DETAILED SITE INVESTIGATION (PHASE 2 ENVIRONMENTAL ASSESSMENT)

EXECUTIVE SUMMARY

A Sampling and Analysis Quality Plan (SAQP) has been prepared in support of a Detailed Site Investigation – DSI (or Phase 2 Environmental Assessment) which is to be undertaken on Stage 1 of the Chelsea Gardens development ('the Property'). The DSI will in turn, support a Development Application with Wingecarribee Shire Council to subdivide the property into 189 residential allotments. During 2019, a Phase 1 Environmental Assessment was undertaken which identified a number of Areas of Environmental Concern (AEC). The DSI will entail the following:

- A summary of outcomes from the previous Phase 1 Contamination Assessment
- Site inspection and excavation of a minimum of twenty six (26) test pits across the areas of concern (as denoted in the Phase 1 Environmental Site Assessment) to maximum depth 1.0 m but subject also to any additional sampling where site observation is suggestive of potential contamination;
- An assessment of existing or historic farm sewer systems and domestic waste disposal areas that may have impacts on the area of investigation;
- An assessment of sensitive receptors such as the drainage lines and dams making up the White Creek system;
- Proposed sampling locations are illustrated in Figure 3;
- Collection of at least one (1) representative soil sample per sampling location (near surface). Where deemed appropriate, additional samples may be taken from sub-surface stratum;
- Collection of two (2) intra and one (2) inter laboratory duplicate samples;
- Laboratory analysis for the nominated contaminants of concern, those being:
  - OC/Ops and Heavy metals only for all sample sites; and
  - Including asbestos identification*, TRH, BTEX for samples targeting the access track at the northern section of Stage 1
- A detailed description of the site and soil profiles;
- A copy of the nominated assessment criteria and the basis for its adoption;
- A copy and interpretation of the laboratory results, and
- A site characterization.

It is considered that the most appropriate soil sampling strategy will entail:

- Targeted sampling – where one dominant broad domain (of agricultural impacted paddocks) will be tested for a limited range of contaminating substances on a judgemental basis and a farm track for a slightly extended range of potential contaminants.

It is proposed that 26 soil samples will be collected for analysis from three identified AECs (namely AECs 1, 4, and 12).

During the collection of soil samples, any features such as seepage, discoloration, staining, odours, or other physical indicators of contamination will be recorded. The presence of an aboriginal site has been identified very close to the northern part of Stage 1 and sampling within close proximity to this site will be avoided.

In the event that the DSI identifies contamination warranting remediation, a Remediation Action Plan (RAP) will be incorporated into the Assessment report.

CHELSEA GARDENS – MOSS VALE

SAMPLING AND ANALYSIS QUALITY PLAN

FOR A DETAILED SITE INVESTIGATION (PHASE 2 ENVIRONMENTAL ASSESSMENT)

1.0 INTRODUCTION

This Sampling and Analysis Quality Plan (SAQP) has been prepared in support of a Detailed Site Investigation – DSI (or Phase 2 Environmental Assessment) which is to be undertaken on Stage 1 of the Chelsea Gardens development ('the Property'). The DSI will in turn, support a Development Application with Wingecarribee Shire Council to subdivide the property into 189 residential allotments (Figure 1).

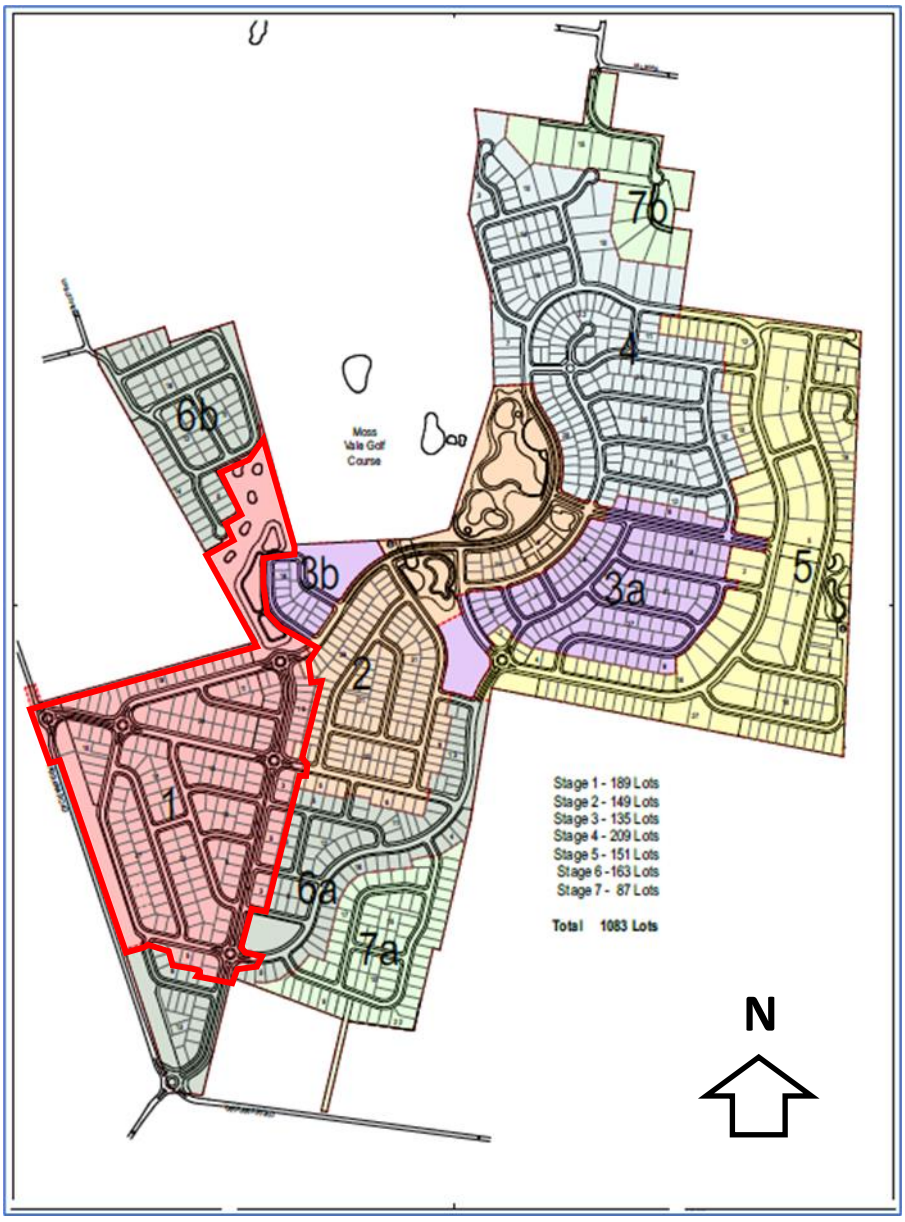

Figure 1: Chelsea Gardens Development showing Stage 1(red shading)

2.0 REVIEW OF PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

During 2019, a Phase 1 Environmental Assessment was undertaken by Harvest Scientific Services (Harvest Scientific Services, 2019) on the Property. This assessment identified a number of Areas of Environmental Concern (AEC), the locations of which are illustrated in Figure 2. A summary of each AEC is given in Table 1.

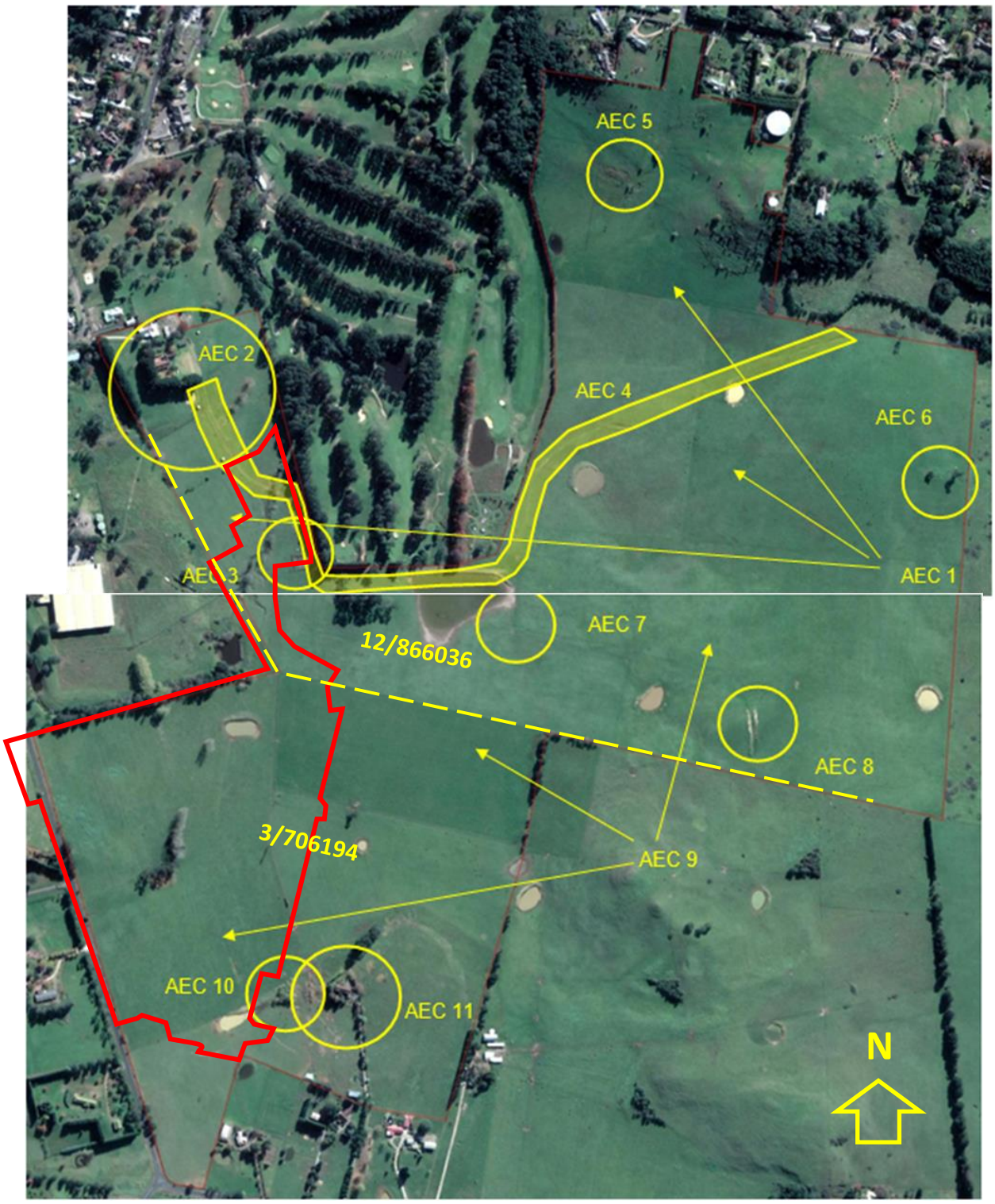

Figure 2: Location of Areas of Environmental Concern (AEC) showing Stage 1 (red boundary)

The location of the Stage 1 is found almost entirely within Lot 3 DP 706194, with the smaller (northern portion found within Lot 12 DP 866036 (see Figure 2).

Table 1: Areas of Environmental Concern (AEC) identified as a result of Field Inspections

AEC Description	Potentially Contaminating Activity	Contaminants of Concern	Likelihood of Contamination*
AEC 1. Much of the property split into paddocks for pasture growth – see Plates 1 and 2.	Application of agricultural chemicals.	OC/Ops and heavy metals	Moderate to Low
AEC 2. Residential area and old Dairy and milking area and immediate surrounds – see Plates 3 and 4.	Possible host for farm machinery, fuels and chemicals. Possible use of asbestos in roofing and walls.	Heavy metals, OC/Ops, Asbestos, TRH, BTEX,	Moderate
AEC 3. Cattle yards – see Plate 7.	Long term leaching of contaminants associated with yard activities and infrastructure (eg, dips).	Heavy metals, OC/Ops, Asbestos	Moderate
AEC 4. Farm driveway – see Plate 11.	Type of fill is shale based mixed with old concrete and other unknown materials. Long term leaching of contaminants from imported fill materials, spillage of oil and grease	Heavy metals, OC/Ops, TRH, BTEX, Asbestos.	Moderate
AEC 5. Minor Farm infrastructure	Old deteriorating concrete infrastructure	Heavy metals, OC/Ops, Asbestos	Low
AEC 6. Minor rubbish dump – see Plate 5.	Deteriorating old tyres and treated timber	Heavy metals, OC/Ops, Asbestos	Low
AEC 7. Asbestos piping – see Plate 9.	Breakdown of piping over time	Asbestos	Strong
AEC 8. Old silage pit – see Plate 6.	Farm rubbish – leaching metals, possible disposal site for chemicals	Heavy metals, OC/Ops, TRH, BTEX, Asbestos.	Moderate
AEC 9. Much of the property split into paddocks for pasture growth – see Plates 1 and 2.	Application of agricultural chemicals.	OC/Ops and heavy metals	Moderate to Low
AEC 10. Cattle yards.	Long term leaching of contaminants associated with yard activities (eg, dips).	Heavy metals, OC/Ops, Asbestos	Moderate
AEC 11. Residential area and immediate surrounds.	Possible host for farm machinery, fuels and chemicals.	Heavy metals, OC/Ops, Asbestos	Low
AEC 12. All farm dams	Concentration of farm chemicals due to run-off from drainage lines	OC/Ops and heavy metals	

The area within Stage 1 is impacted only by AEC 9 and AEC 4.

3.0 PHASE 2 ENVIRONMENTAL SITE ASSESSMENT

3.1 Objectives

- Determine the nature and extent of contamination on the property
- Identify potential contamination migration routes
- Supplement existing site assessment information
- Determine whether applicable health and ecological investigation levels are exceeded
- Assess the adequacy of information available, and
- Determine the need for any further investigation or remediation action.

The Assessment will be prepared following the requirements set out in:

- Phase 1 Contamination Assessment (Harvest Scientific Services, 2019)
- Contaminated Land Guidelines: Consultants Reporting on Contaminated Land (NSW EPA, 2020), and
- National Environmental Protection (Assessment of Site Contamination) Measure (NEPM, 2013)

3.2 Inclusions

- A summary of outcomes from the previous Phase 1 Contamination Assessment
- Site inspection and excavation of a minimum of twenty six (26) test pits across the areas of concern (as denoted in the Phase 1 Environmental Site Assessment) to maximum depth 1.0 m but subject also to any additional sampling where site observation is suggestive of potential contamination;
- An assessment of existing or historic farm sewer systems and domestic waste disposal areas that may have impacts on the area of investigation;
- An assessment of sensitive receptors such as the drainage lines and dams making up the White Creek system;
- Proposed sampling locations are illustrated in Figure 3;
- Collection of at least one (1) representative soil sample per sampling location (near surface). Where deemed appropriate, additional samples may be taken from sub-surface stratum;
- Collection of two (2) intra and one (2) inter laboratory duplicate samples;
- Laboratory analysis for the nominated contaminants of concern, those being:
    - OC/Ops and Heavy metals only for all sample sites; and
    - Including asbestos identification*, TRH, BTEX for samples targeting the access track at the northern section of Stage 1
- A detailed description of the site and soil profiles;
- A copy of the nominated assessment criteria and the basis for its adoption;
- A copy and interpretation of the laboratory results, and
- A site characterization.

**In the event that asbestos is identified in any sample, the laboratory will be requested to carry out a quantification of the asbestos.*

3.3 Exclusions

- Groundwater testing

4.0 SAMPLING AND ANALYSIS QUALITY PLAN

4.1 Sampling Methodology

Given the extent of the Property and the limited nature of the potential contaminant sources, it is considered that the most appropriate soil sampling strategy will entail:

- Targeted sampling – where one dominant broad domain (of agricultural impacted paddocks) will be tested for a limited range of contaminating substances on a judgemental basis and a farm track for a slightly extended range of potential contaminants.

The proposed sampling density for each AEC is outlined in Table 2.

Table 2: Proposed Sampling Density for each (AEC)

AEC #	**Land use**	**Area affected**	**Estimated No. of Sample Sites**
AEC 4	Farm track (~100 X 2 metres)	~ 200 m^2	3
AECs 1& 9	Farm paddocks	~ 19 Ha	20
AEC 12	Farm Dams	~800 m^2	3

During the collection of soil samples, any features such as seepage, discoloration, staining, odours, or other physical indicators of contamination will be recorded.

The presence of an aboriginal site has been identified very close to the northern part of Stage 1 (PAD 1 – see Figure 3). Sampling within close proximity to this site will be avoided.

It should be noted however, that given that the extent of any contamination is unknown at this point of time, it is necessary to consider the possibility that that the initial sampling program will not be successful in defining the entire extent of contamination. As a result, a second or third stage sampling program may be required.

4.2 Data Quality Objectives

Data quality objectives to be established for the site characterisation works, follow the decision-making procedures outlined in NEPC (2013):

- Define the problem
- Identify the decision
- Identify inputs to the decision
- Define the study boundaries
- Develop a decision rule
- Specify limits on decision errors, and
- Optimise the design for obtaining data.

4.2.1 Define the Problem

Phase 1 Preliminary Investigations indicate that potentially contaminated media exists on the site.

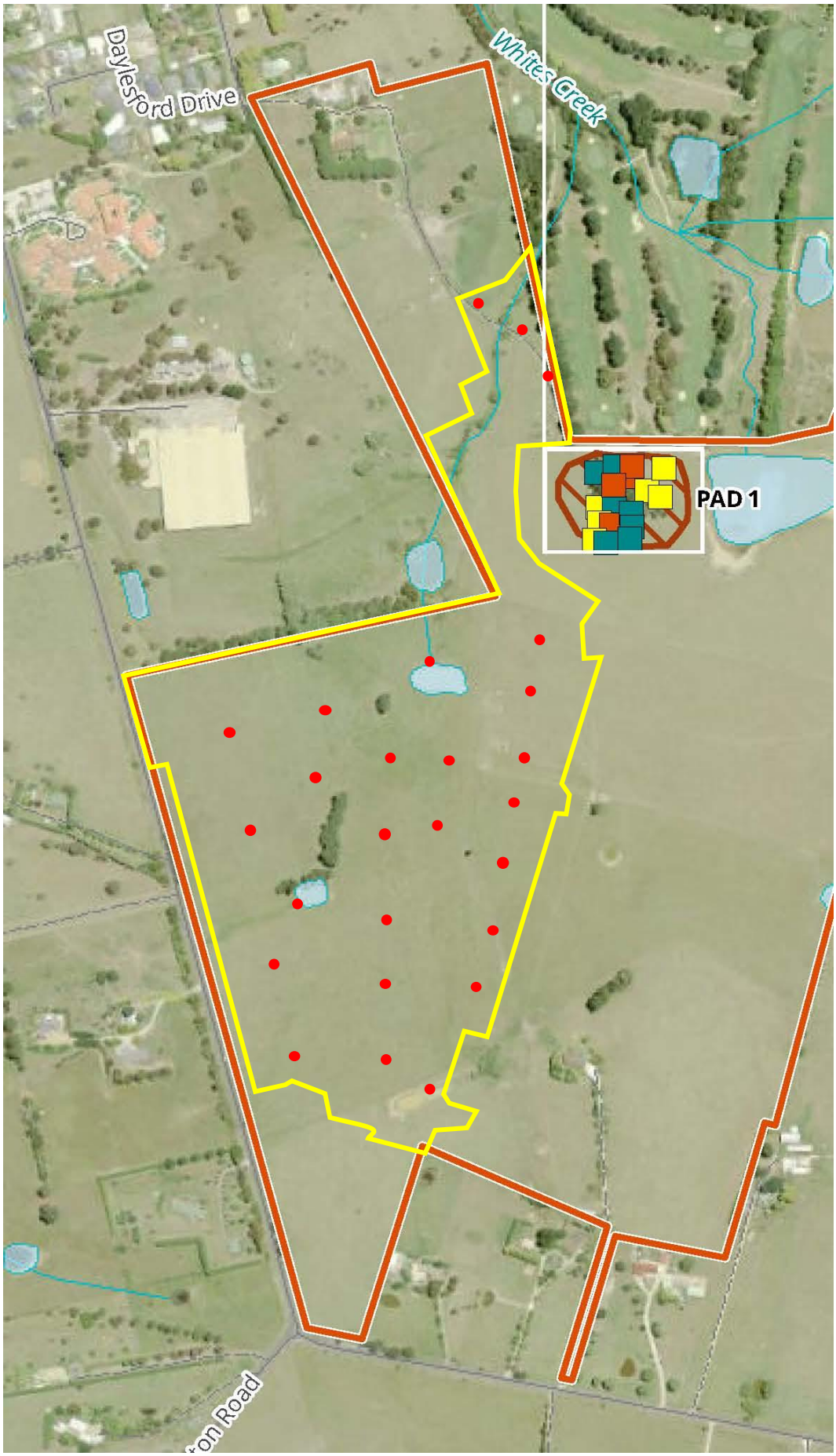

Figure 3: Proposed soil sample locations (red points)

4.2.2 Identify the Decision

Based on the decision-making process for assessing urban redevelopment sites, the following decisions must be made:

- Are there any unacceptable health risks to future onsite receptors?
- Are there any unacceptable ecological risks posed by the site?
- Are there any aesthetic issues at the site?
- Is there any evidence of, or potential for, migration of contaminants from the site?
- Is a site management strategy required?

4.2.3 Identify Inputs to the Decision

The following inputs were used to allow the assessment of the decisions:

- Historical information
- Observations made during site investigations
- Soil analytical data from samples collected on site
- Adopted site assessment criteria, and
- Data quality indicators.

4.2.4 Define the Property Boundaries

The Property is defined as Stage 1 of the Chelsea Gardens development at Moss Vale (Figure 1).

4.2.5 Develop a Decision Rule

Soil analytical data are to be assessed against National Environmental Protection Measure (NEPM) criteria as identified in Section 5. Statistical analysis of the data will be undertaken if necessary. The following statistical criteria shall be adopted:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion
- No single analyte shall exceed 250% of the adopted criterion
- The standard deviation of the results must be below 50% of the criterion
- The relative percent difference between duplicate samples must be below 50%.

4.2.6 Specify Limits of Decision Errors

Data generated during the project must be appropriate to allow decisions to be made with confidence. The acceptable limit on decision error is 95% compliance with data quality indicators.

4.2.7 Optimize Design for Obtaining Data

Based on the available information, a targeted type sampling plan was considered most appropriate to provide sufficient characterisation data. A minimum of twenty six (26) sampling sites have nominated across the areas of concern (Table 2).

4.3 Site Assessment Criteria

Concentrations of contaminants in soil samples are to be compared against the site assessment criteria outlined in the National Environmental Protection Measure (2013) (NEPM) and summarised in Table 3:

- *Health Investigation Levels (HIL) for Soil Contaminants – Residential A*
- *Soil Health Screening Levels (HSL) for Vapour Intrusion – Residential A & B*
- *Generic Ecological Investigation Levels (EIL) for Arsenic, DDT and Naphthalene in Soils - Urban Residential*
- *Ecological Screening Levels (ESL) for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in Soil - Urban Residential and Public Open Space and Coarse-Grained Soils, and*
- *Health Screening Levels for Asbestos Contamination in Soil – Residential A with garden/accessible soil also includes day care centres, preschools, primary schools.*

Table 3: Adopted Human Health Based Soil Criteria and Ecological Investigation Levels (mg/kg)

	Health Based Investigation Levels	Health Screening Levels	Environmental Investigation Levels
METALS AND INORGANICS			
Arsenic	100	-	100
Cadmium	20	-	-
Chromium	100	-	400
Copper	6,000	-	-
Nickel	400	-	350
Lead	300	-	1100
Zinc	7,400	-	-
Mercury	40	-	-
PAH			
BaP (TEQ)	3	-	0.7
Total PAH	300	-	
BTEX			
Benzene	-	0.5	50
Toluene	-	160	85
Ethylbenzene	-	55	70
Total Xylenes	-	40	105
Naphthalene	-	3	170
F1	-	45	-
F2	-	110	-
PHENOLS			
Phenol	3,000		-
Pentachlorophenol	100		-
Cresols	400		-
Organochlorine Pesticides			
DDT+DDE+DDD	240		
Aldrin and Dieldrin	6		
Chlordane	50		

Endosulfan	270		
Endrin	10		
Heptachlor	6		
HCB	10		
Methoxychlor	300		
Mirex	10		
Toxaphene	20		
Herbicides			
2,4,5-T	600		
2,4-D	900		
MCPA	600		
MCPB	600		
Mecoprop	600		
Picloram	4500		
Other Pesticides			
Atrazine	320		
Chlorpyrifos	160		
Bifenthrin	600		
PCB			
Total PCBs	1		-
Asbestos*			
Bonded		0.01%	
Friable		0.001%	
Visible		None visible	

*In the event that asbestos is identified in any sample, the laboratory will be requested to carry out a quantification of the asbestos.

Site specific criteria for Ni, Cu and Zn EILs are to be determined by reference to one or more analyses of soils unlikely to be impacted by past industrial or agricultural practices. The location of these soil sampling sites will be subject to further assessment ahead of the main sampling program.

4.4 QUALITY ASSURANCE / QUALITY CONTROL

4.4.1. Site Procedures

The following field quality assurance and quality control measures are to be implemented:

- All sample jars and sample bags are to be clearly labelled prior to site visit
- All soil samples are to be collected by hand from side walls or directly from the centre of the excavator bucket
- Disposable gloves are to be worn throughout the process and changed between the collection of each soil sample
- Inter and intra laboratory quality control samples will be collected
- All sample jars and bags are to be immediately placed in an ice-block chilled esky
- All samples are to be clearly labelled and sealed for couriering

- The ALS Environmental chain-of-custody form is to be completed and emailed to the lab as well as a hard copy placed with the samples
- Any quality assurance incidents (such as cross contamination or similar) are to be recorded
- All samples are to be kept in the office of Harvest Scientific Services until collected by courier; and
- Ice-blocks are to be interchanged prior to couriering.

4.4.2 Laboratory

The following is an extract from the quote for service provided by ALS Environmental Division.

"ALS has a comprehensive QA/QC program. Our QA/QC procedures are designed to provide reliable and defensible analytical results. Our analytical services are based on internal QCS3 schedule, which includes Laboratory Control Samples (LCS), Method Blanks (MB), Matrix Spikes (MS), Laboratory Duplicates (Dups) and Surrogates (for target organics) where applicable, at frequencies at or above that detailed in the 2013 NEPM guidelines.

The basis of the QCS3 Schedule is the 'analytical lot' (process analytical batch) of samples. Generally, the laboratory processes samples of similar matrices in groups called 'Lots'. 'Lots' are made up of 20 samples that may consist of several discrete batches, and may be independent of project and / or client. The selection of samples for QC purposes will be biased towards the larger batches within the lot" ...

The following summarizes the frequency that QC samples are processed:

- 5% Method Blanks (MB) –1 analysed within each process lot of 20 samples.
- 10% Laboratory Duplicates (Dups) –2 analysed within each process lot of 20 samples.
- 5% Laboratory Control Samples (LCS) –1 analysed within each process lot of 20 samples.
- 5% Matrix Spikes (MS) – 1 analysed within each process lot of 20 samples (except for dioxins).
- Surrogate Spikes on all 'target' organics analyses.

Eurofins Australia is the nominated laboratory for the processing of soil sample duplicates.

5.0 REMEDIATION ACTION PLAN

In the event that the Phase 2 Environmental Assessment identifies contamination warranting remediation, a Remediation Action Plan will be incorporated into the Assessment report.

The objectives of the RAP are to:

- Set remediation goals that ensure that the remediated site will be suitable for the proposed use and will pose no unacceptable risks to the human health or the environment
- Document the procedures and plans to be implemented to reduce the risk of significant harm to acceptable levels
- Establish the environmental safeguards required in completing the remediation in an environmentally acceptable manner, and
- Identify necessary approvals and licenses required by regulatory authorities if required.

6.0 REFERENCES

Harvest Scientific Services, 2019. Phase I Environmental Site Assessment – Chelsea Gardens MOSS VALE. Job Reference: 201577.

16.0 APPENDIX 2: REVIEW OF SAQP BY ZOIC ENVIRONMENTAL PTY LTD.

ZOIC Environmental Pty Ltd
ABN 23 154 745 525
Suite 1, Level 9
189 Kent Street Sydney 2000
Phone: +61 2 9251 8070
www.zoic.com.au

20183 CEnvP 2 Sept20.docx

2 September 2020

Mr Mart Rampe
Harvest Group Services
20/4 Somerset Ave
Narellan NSW 2567

Via email: office@harvestservices.com.au

Dear Mart,

Re: C EnvP Certification PSI Report and SAQP Chelsea Gardens Moss Vale NSW

As requested, and as a Certified Practitioner in Site Contamination, I have reviewed Preliminary Site Investigation Report No. 201577 Final entitled 'Phase 1 Environmental Site Assessment Chelsea Gardens Moss Vale' dated 22 February 2019 and Sampling and Analysis Quality Plan (SAQP) – Chelsea Gardens, Moss Vale dated 2 September 2020 Reference 201577 prepared by Harvest Scientific Services. The objective of the investigation was to provide a preliminary investigation of the potential below ground contamination status of the above site for a residential subdivision based on information obtained from a desktop study, historical photography review and site inspection. The SAQP was compiled to provide a basis for a detailed site investigation (DSI) for a portion of the total site area covered by the Phase 1 investigation. My objective was to review and provide final certification for these documents.

Upon my review of the above documents, I am satisfied with the report's conclusion and recommendations upon which the SAQP has been developed and that both were generally prepared in accordance with the requirements of the relevant standards, legislation and guidelines, namely:

- Office of Environment and Heritage (NSW EPA) Guidelines for Consultants Reporting on Contaminated Sites (2011) and subsequent revision dated 5 May 2020;
- State Environmental Planning Policy 55 – Remediation of Land (SEPP 55); and,
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) (NEPM 2013).

If you have any further queries, please contact me on 02 92518070.

Yours sincerely,

Peter Moore
Principal Engineer CEnvP - SC
Zoic Environmental Pty Ltd

17.0 APPENDIX 3: SAMPLING PROCEDURES BY BROADCREST PTY LTD

Broadcrest
Engineering and Environmental consultants

Broadcrest Consulting Pty Ltd
ABN: 69 622 508 187
The Ponds, NSW
broadcrest.com.au
1300 554 945

Environmental Site Assessment

Chelsea Gardens, Moss Vale

RE: 07/10/2020

Environmental Site Assessment, Chelsea Gardens, Moss Vale

TO: Mart Rampe, Harvest Group Services

I can confirm that the following was undertaken on the grounds of Chelsea Gardens, Moss Vale:

- Excavation of twenty-six (26) test pits within the approximate locations indicated on approved Sampling Analysis Quality Plan (SAQP). An additional three (3) test pits were excavated outside the rural land use area (within fenced yards and an adjacent golf course) for the purpose of acquiring background contaminant concentrations (BG1, BG2 and BG3 (Figure 1)
- Each test pit was opened to approximately 1,000 mm depth with the exception of Test Pits 1, 2 and 3 which consisted of surface scrapes of an access driveway only
- All work was undertaken on 22 September 2020 with the assistance of a small excavator fitted with 500 mm bucket driven by Terra Insight personnel.
- Representative soil samples were acquired from near surface top-soil stratum (L1 0 – 200 mm) and sub-soil stratum (L2 500 – 700 mm)
- Soil samples were collected directly from the top and center of the excavator bucket and placed into laboratory supplied 250 mL sample jars sealed with Teflon lids
- For asbestos, approximately 10 L of soil was collected from the excavated material using a spade and bucket and placed into a 7 mm sieve. The soil was sieved completely and approximately 500 grams of sieved soil collected and placed into laboratory supplied zip-lock bags. Material in the top of the sieve was closely inspected for asbestos containing material. In the instance that asbestos or foreign materials of any sort were identified, the material was bagged and stored for later analysis if necessary.
- The samples were stored in a chilled esky (separate un-chilled esky for asbestos) and transferred to ALS Environmental Division Smithfield Lab under chain of custody (COC) procedures. The laboratory is NATA accredited for the selected analyses
- All L1 near surface samples were immediately analyzed as per the approved SAQP. All L2 sub-soil samples were placed on Hold at ALS until further notice.
- During the collection of soil samples, any features such as fill material, foreign materials, discoloration, staining, odours, or other indicators of contamination were noted

- Other than surface aggregates at Test Pits 1 and 2, all test pits revealed natural undisturbed soil profiles indicative of the local soil landscape
- Two (2) inter-laboratory & two (2) intra-laboratory samples were collected for analysis
- All site work was undertaken by Cheyne Hudson, Senior Environmental Scientist at Broadcrest Consulting Pty Ltd in accordance with best industry practices.

Regards

Cheyne Hudson BEnvSc (Hons) (CenvP)

Senior Environmental Scientist

Figure 1: Test Pit Locations (Chelsea Gardens, Moss Vale)

18.0 APPENDIX 4: SOIL PROFILE LOGS

BG1
0-400 dark grey silty loam
400-1000+ yellowish to reddish brown clay

BG2
0-350 dark grey silty loam
350-1000+ yellowish brown light clay

BG3
0-150 greyish brown silty loam 5% CF
150-800+ yellowish brown light clay

BH1
0-100 Dark grey coal-wash aggregate driveway

BH2
0-100 Dark grey coal-wash aggregate driveway

BH3
0-100 Compacted brown loam topsoil driveway with included minor coal-wash aggregates

BH4 Dark grey dam sediment

BH5 Dark grey dam sediment

BH6 Dark grey-brown dam sediment

BH7
0-400 dark brown silty loam
400-1000+ yellow brown light

BH8
0-300 dark brown silty loam
300-1000+ dull grey brown light clay

BH9
0-300 dark brown silty loam
300-1000+ yellowish brown light clay

BH10
0-300 dark brown silty loam
300-700 yellow brown light clay
700+ rock

BH11
0-350 dark brown silty loam
350-1000+ dull grey brown light clay

BH12
0-300 dark brown silty loam
300-1000+ yellowish brown light clay

BH13
0-300 grey brown silty loam
300-1000+ dull yellowish-brown light clay

BH14

0-300	dark brown silty loam
300-1000+	yellowish to reddish brown mottled light clay

BH15

0-350	dark brown silty loam
350-1000+	yellowish brown light clay

BH16

0-400	grey brown silty loam
400-1000+	yellowish brown light clay

BH17

0-350	grey brown silty loam
350-1000+	reddish to yellowish brown mottled light clay

BH18

0-300	grey brown silty loam
300-1000+	dull yellowish-brown light clay

BH19

0-400	dark brown silty loam
400-1000+	yellow brown light clay

BH20

0-250	dark grey brown silty loam
250-1000+	yellowish brown light clay

BH21

0-300	grey brown silty loam
300-1000+	dull yellowish-brown light clay

BH22

0-300	dark brown silty loam
300-1000+	yellowish to reddish brown light clay

BH23

0-300	grey silty loam
300-1000+	reddish brown mottled light clay

BH24

0-450	grey brown silty loam
450-1000+	yellowish brown light clay

BH25

0-300	dark brown silty loam
300-1000+	yellowish brown light clay

BH26

0-300	dark grey brown silty loam
300-1000+	yellowish brown light clay

19.0 APPENDIX 5: ALSE CERTIFICATES OF ANALYSIS

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2033546**	Page	: 1 of 17
Client	: **HARVEST SCIENTIFIC SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: MR MART RAMPE	Contact	: Customer Services ES
Address	: PO BOX 427 NARELLAN NSW, AUSTRALIA 2567	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4647 6177	Telephone	: +61-2-8784 8555
Project	: CHELSEA	Date Samples Received	: 23-Sep-2020 14:05
Order number	: ----	Date Analysis Commenced	: 25-Sep-2020
C-O-C number	: ----	Issue Date	: 30-Sep-2020 13:36
Sampler	: CHEYNE HUDSON		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 31		
No. of samples analysed	: 31		

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
- Descriptive Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP071: Results of sample 2_1 have been confirmed by re-extraction and re-analysis.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1_1	2_1	3_1	4_1	5_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-001	ES2033546-002	ES2033546-003	ES2033546-004	ES2033546-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		11.7	15.4	10.2	28.6	26.7
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres		No	No	----	----	----
Asbestos Type	1332-21-4	-	--		-	-	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg		No	No	----	----	----
Organic Fibre	----	0.1	g/kg		No	No	----	----	----
Sample weight (dry)	----	0.01	g		536	584	----	----	----
APPROVED IDENTIFIER:	----	-	--		A. SMYLIE	A. SMYLIE	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	6	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		25	9	23	38	39
Copper	7440-50-8	5	mg/kg		97	18	18	9	7
Lead	7439-92-1	5	mg/kg		12	12	9	11	8
Nickel	7440-02-0	2	mg/kg		10	6	16	10	7
Zinc	7440-66-6	5	mg/kg		23	31	32	23	8
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1_1	2_1	3_1	4_1	5_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-001	ES2033546-002	ES2033546-003	ES2033546-004	ES2033546-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1_1	2_1	3_1	4_1	5_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-001	ES2033546-002	ES2033546-003	ES2033546-004	ES2033546-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	200	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	130	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	330	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	270	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	270	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		97.2	128	108	104	103
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		82.2	98.3	92.1	91.8	89.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		80.0	85.5	82.8	----	----
Toluene-D8	2037-26-5	0.2	%		90.2	106	104	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		82.7	101	107	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6_1	7_1	8_1	9_1	10_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-006	ES2033546-007	ES2033546-008	ES2033546-009	ES2033546-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		20.5	15.6	20.4	14.5	14.4
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		44	62	36	38	23
Copper	7440-50-8	5	mg/kg		5	15	8	<5	12
Lead	7439-92-1	5	mg/kg		13	6	9	7	6
Nickel	7440-02-0	2	mg/kg		5	10	8	4	7
Zinc	7440-66-6	5	mg/kg		<5	14	11	9	25
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6_1	7_1	8_1	9_1	10_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-006	ES2033546-007	ES2033546-008	ES2033546-009	ES2033546-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**123**	**87.1**	**94.8**	**81.4**	**89.5**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**120**	**92.1**	**96.1**	**78.8**	**80.4**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	11_1	12_1	13_1	14_1	15_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-011	ES2033546-012	ES2033546-013	ES2033546-014	ES2033546-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		20.0	15.3	15.9	13.8	17.4
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	7	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		34	22	30	32	33
Copper	7440-50-8	5	mg/kg		10	<5	<5	7	6
Lead	7439-92-1	5	mg/kg		9	8	13	13	11
Nickel	7440-02-0	2	mg/kg		11	5	3	4	6
Zinc	7440-66-6	5	mg/kg		10	6	<5	14	8
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	11_1	12_1	13_1	14_1	15_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-011	ES2033546-012	ES2033546-013	ES2033546-014	ES2033546-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**84.9**	**79.9**	**89.3**	**68.8**	**82.1**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**87.5**	**78.2**	**86.7**	**71.4**	**86.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	16_1	17_1	18_1	19_1	20_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-016	ES2033546-017	ES2033546-018	ES2033546-019	ES2033546-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		17.3	15.3	17.5	17.0	16.6
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		29	26	81	11	23
Copper	7440-50-8	5	mg/kg		<5	7	12	<5	<5
Lead	7439-92-1	5	mg/kg		9	9	12	9	10
Nickel	7440-02-0	2	mg/kg		5	3	21	4	3
Zinc	7440-66-6	5	mg/kg		8	12	16	6	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	16_1	17_1	18_1	19_1	20_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-016	ES2033546-017	ES2033546-018	ES2033546-019	ES2033546-020
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**81.0**	**85.2**	**84.8**	**74.4**	**71.4**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**69.2**	**80.9**	**89.4**	**66.3**	**85.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21_1	22_1	23_1	24_1	25_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-021	ES2033546-022	ES2033546-023	ES2033546-024	ES2033546-025
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		16.1	17.3	16.0	15.2	16.2
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		55	16	24	51	41
Copper	7440-50-8	5	mg/kg		8	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg		10	11	8	9	8
Nickel	7440-02-0	2	mg/kg		11	3	5	4	5
Zinc	7440-66-6	5	mg/kg		19	9	6	<5	7
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21_1	22_1	23_1	24_1	25_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-021	ES2033546-022	ES2033546-023	ES2033546-024	ES2033546-025
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.4**	**92.3**	**88.8**	**104**	**87.4**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**85.6**	**84.4**	**74.4**	**82.6**	**76.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	26_1	DUP1	DUP2	BG1_1	BG2_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-026	ES2033546-027	ES2033546-028	ES2033546-029	ES2033546-030
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		----	----	----	19.3	15.2
Moisture Content	----	1.0	%		17.2	13.7	23.6	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		10	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		82	26	40	----	----
Copper	7440-50-8	5	mg/kg		17	6	15	6	<5
Lead	7439-92-1	5	mg/kg		27	20	12	----	----
Nickel	7440-02-0	2	mg/kg		22	5	8	11	3
Zinc	7440-66-6	5	mg/kg		39	6	12	12	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<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	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	26_1	DUP1	DUP2	BG1_1	BG2_1
				Client sampling date / time	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00	22-Sep-2020 17:00
Compound	CAS Number	LOR	Unit		ES2033546-026	ES2033546-027	ES2033546-028	ES2033546-029	ES2033546-030
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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	72-54-8/72-55-9/50-2	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	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**90.1**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**88.1**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BG3_1	----	----	----	----
				Client sampling date / time	22-Sep-2020 17:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2033546-031	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.6**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Copper	7440-50-8	5	mg/kg		<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**3**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**13**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	1_1 - 22-Sep-2020 17:00	Mid brown soil.
EA200: Description	2_1 - 22-Sep-2020 17:00	Mid brown soil.

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

20.0 APPENDIX 6: EUROFINS CERTIFICATE OF ANALYSIS

Harvest Scientific Services Pty Ltd
PO Box 427
Narellan
NSW 2567

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Mart Rampe**

Report **746371-S**
Project name CHELSEA
Project ID CHELSEA
Received Date Sep 24, 2020

Client Sample ID			**DUP3**	**DUP4**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**S20-Se42726**	**S20-Se42727**
Date Sampled			**Sep 22, 2020**	**Sep 22, 2020**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	2	mg/kg	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	16	75
Copper	5	mg/kg	< 5	14
Lead	5	mg/kg	12	14
Mercury	0.1	mg/kg	1.2	< 0.1
Nickel	5	mg/kg	5.2	22
Zinc	5	mg/kg	11	28
% Moisture	1	%	17	25

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Sep 25, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Sep 24, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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Company Name: Harvest Scientific Services Pty Ltd
Address: PO Box 427
Narellan
NSW 2567

Project Name: CHELSEA
Project ID: CHELSEA

Order No.:
Report #: 746371
Phone: 02 4647 6177
Fax:

Received: Sep 24, 2020 6:05 PM
Due: Oct 1, 2020
Priority: 5 Day
Contact Name: Mart Rampe

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Metals M8	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	DUP3	Sep 22, 2020		Soil	S20-Se42726	X	X
2	DUP4	Sep 22, 2020		Soil	S20-Se42727	X	X
Test Counts						2	2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

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

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

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
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	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	99			80-120	Pass	
Copper	%	99			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	101			80-120	Pass	
Nickel	%	98			80-120	Pass	
Zinc	%	99			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Se42184	NCP	%	97			75-125	Pass	
Cadmium	S20-Se42184	NCP	%	92			75-125	Pass	
Chromium	S20-Se42184	NCP	%	99			75-125	Pass	
Copper	S20-Se42184	NCP	%	92			75-125	Pass	
Lead	S20-Se42184	NCP	%	102			75-125	Pass	
Mercury	S20-Se42184	NCP	%	109			75-125	Pass	
Nickel	S20-Se42184	NCP	%	92			75-125	Pass	
Zinc	S20-Se42184	NCP	%	75			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Se42183	NCP	mg/kg	7.8	8.5	8.0	30%	Pass	
Cadmium	S20-Se42183	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Se42183	NCP	mg/kg	23	23	<1	30%	Pass	
Copper	S20-Se42183	NCP	mg/kg	21	21	2.0	30%	Pass	
Lead	S20-Se42183	NCP	mg/kg	16	17	5.0	30%	Pass	
Mercury	S20-Se42183	NCP	mg/kg	0.8	0.6	15	30%	Pass	
Nickel	S20-Se42183	NCP	mg/kg	10	10	1.0	30%	Pass	
Zinc	S20-Se42183	NCP	mg/kg	42	43	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Se42945	NCP	%	10	12	18	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

Authorised By

Asim Khan	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

21.0 APPENDIX 7: ALSE QUALITY CONTROL DOCUMENTATION

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2033546**	Page	: 1 of 13
Client	: **HARVEST SCIENTIFIC SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: MR MART RAMPE	Contact	: Customer Services ES
Address	: PO BOX 427 NARELLAN NSW, AUSTRALIA 2567	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4647 6177	Telephone	: +61-2-8784 8555
Project	: CHELSEA	Date Samples Received	: 23-Sep-2020
Order number	: ----	Date Analysis Commenced	: 25-Sep-2020
C-O-C number	: ----	Issue Date	: 30-Sep-2020
Sampler	: CHEYNE HUDSON		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 31		
No. of samples analysed	: 31		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3279459)									
ES2033314-139	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	24	24	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	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	14	12	11.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	7	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	48	45	6.07	No Limit
ES2033546-004	4_1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	38	32	15.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	8	14.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	8	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	9	20.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	23	19	22.9	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3279461)									
ES2033546-015	15_1	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
ES2033546-015	15_1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	33	33	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	6	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	10	11.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	8	0.00	No Limit
ES2033546-025	25_1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	41	45	7.61	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	6	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 (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3279461) - continued									
ES2033546-025	25_1	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	6	19.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	22	97.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	6	0.00	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3279463)									
ES2033416-003	Anonymous	EA055: Moisture Content	----	0.1	%	24.2	25.2	4.11	0% - 20%
ES2033546-007	7_1	EA055: Moisture Content	----	0.1	%	15.6	15.6	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3279464)									
ES2033546-016	16_1	EA055: Moisture Content	----	0.1	%	17.3	16.4	5.23	0% - 50%
ES2033546-027	DUP1	EA055: Moisture Content	----	0.1	%	13.7	13.7	0.00	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3279460)									
ES2033314-139	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2033546-004	4_1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3279462)									
ES2033546-015	15_1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2033546-025	25_1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3274535)									
ES2033546-007	7_1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		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
ES2033546-017	17_1	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: 3274535) - continued									
ES2033546-017	17_1	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
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3274537)									
ES2033546-001	1_1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		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

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: 3274537) - continued									
ES2033546-001	1_1	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: 3274535)									
ES2033546-007	7_1	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
ES2033546-017	17_1	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

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 (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3274535) - continued									
ES2033546-017	17_1	EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3274537)									
ES2033546-001	1_1	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3274536)									
ES2033546-001	1_1	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3276246)									
ES2033546-001	1_1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2033598-028	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3274536)									
ES2033546-001	1_1	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3276246)									
ES2033546-001	1_1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES2033598-028	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 3276246)									
ES2033546-001	1_1	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

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: BTEXN (QC Lot: 3276246) - continued									
ES2033546-001	1_1	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
ES2033598-028	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

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control 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.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3279459)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	102	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	85.4	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	80.7	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	106	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	98.4	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	95.4	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	67.0	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3279461)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	102	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	85.4	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	102	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	106	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	98.4	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	95.4	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	77.5	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3279460)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.0847 mg/kg	76.3	70.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3279462)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.0847 mg/kg	103	70.0	105
EP068A: Organochlorine Pesticides (OC) (QCLot: 3274535)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.4	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.3	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.7	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	67.0	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3274535) - continued								
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	96.4	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.9	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	98.2	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	97.8	54.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3274537)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.7	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	84.5	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.6	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	85.8	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	84.3	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3274535)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	100	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	88.1	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	99.9	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	89.4	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	69.0	117

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3274535) - continued								
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	90.9	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.8	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	101	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	101	41.0	123
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3274537)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	79.9	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	93.0	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	90.1	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	90.3	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.0	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	41.0	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3274536)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	114	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	96.6	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3276246)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.4	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3274536)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	108	77.0	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3274536) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	102	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	77.3	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3276246)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	91.1	68.4	128
EP080: BTEXN (QCLot: 3276246)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	84.9	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.6	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.8	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	109	63.0	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3279459)							
ES2033314-139	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	80.0	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	79.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	85.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	82.4	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	79.7	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	80.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	77.8	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3279461)							
ES2033546-015	15_1	EG005T: Arsenic	7440-38-2	50 mg/kg	98.1	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	80.2	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	72.2	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	80.4	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	79.4	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	76.7	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	79.2	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3279460)							
ES2033314-139	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	70.1	70.0	130

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
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3279462)							
ES2033546-015	15_1	EG035T: Mercury	7439-97-6	5 mg/kg	94.0	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3274535)							
ES2033546-007	7_1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	97.2	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	89.8	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	97.3	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	102	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	82.8	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	85.5	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3274537)							
ES2033546-001	1_1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	90.6	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	90.7	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	92.4	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	94.2	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	77.9	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	79.1	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3274535)							
ES2033546-007	7_1	EP068: Diazinon	333-41-5	0.5 mg/kg	113	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	82.2	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	81.1	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	82.0	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	74.2	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3274537)							
ES2033546-001	1_1	EP068: Diazinon	333-41-5	0.5 mg/kg	95.0	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	98.0	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	88.6	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	75.5	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	92.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3274536)							
ES2033546-001	1_1	EP071: C10 - C14 Fraction	----	523 mg/kg	104	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	118	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	128	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3276246)							
ES2033546-001	1_1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	90.8	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3274536)							
ES2033546-001	1_1	EP071: >C10 - C16 Fraction	----	860 mg/kg	106	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	122	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	108	52.0	132

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*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3276246)							
ES2033546-001	1_1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	106	70.0	130
EP080: BTEXN (QCLot: 3276246)							
ES2033546-001	1_1	EP080: Benzene	71-43-2	2.5 mg/kg	84.8	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.8	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.6	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	89.8	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	87.9	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2033546**	Page	: 1 of 7
Client	: **HARVEST SCIENTIFIC SERVICES**	Laboratory	: Environmental Division Sydney
Contact	: MR MART RAMPE	Telephone	: +61-2-8784 8555
Project	: CHELSEA	Date Samples Received	: 23-Sep-2020
Site	: ----	Issue Date	: 30-Sep-2020
Sampler	: CHEYNE HUDSON	No. of samples received	: 31
Order number	: ----	No. of samples analysed	: 31

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
1_1, 2_1, 3_1, 4_1, 5_1, 6_1, 7_1, 8_1, 9_1, 10_1, 11_1, 12_1, 13_1, 14_1, 15_1, 16_1, 17_1, 18_1, 19_1, 20_1, 21_1, 22_1, 23_1, 24_1, 25_1, 26_1, DUP1, DUP2, BG1_1, BG2_1, BG3_1	**22-Sep-2020**	**----**	----	----	**28-Sep-2020**	06-Oct-2020	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag (EA200)							
1_1, 2_1	**22-Sep-2020**	**----**	----	----	**25-Sep-2020**	21-Mar-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
1_1, 2_1, 3_1, 4_1, 5_1, 6_1, 7_1, 8_1, 9_1, 10_1, 11_1, 12_1, 13_1, 14_1, 15_1, 16_1, 17_1, 18_1, 19_1, 20_1, 21_1, 22_1, 23_1, 24_1, 25_1, 26_1, DUP1, DUP2, BG1_1, BG2_1, BG3_1	**22-Sep-2020**	**28-Sep-2020**	21-Mar-2021	✓	**28-Sep-2020**	21-Mar-2021	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
1_1, 2_1, 3_1, 4_1, 5_1, 6_1, 7_1, 8_1, 9_1, 10_1, 11_1, 12_1, 13_1, 14_1, 15_1, 16_1, 17_1, 18_1, 19_1, 20_1, 21_1, 22_1, 23_1, 24_1, 25_1, 26_1, DUP1, DUP2	**22-Sep-2020**	**28-Sep-2020**	20-Oct-2020	✓	**29-Sep-2020**	20-Oct-2020	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
7_1, 8_1, 9_1, 10_1, 11_1, 12_1, 13_1, 14_1, 15_1, 16_1, 17_1, 18_1, 19_1, 20_1, 21_1, 22_1, 23_1, 24_1, 25_1, 26_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**28-Sep-2020**	04-Nov-2020	✓
Soil Glass Jar - Unpreserved (EP068)							
1_1, 2_1, 3_1, 4_1, 5_1, 6_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**29-Sep-2020**	04-Nov-2020	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
7_1, 8_1, 9_1, 10_1, 11_1, 12_1, 13_1, 14_1, 15_1, 16_1, 17_1, 18_1, 19_1, 20_1, 21_1, 22_1, 23_1, 24_1, 25_1, 26_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**28-Sep-2020**	04-Nov-2020	✓
Soil Glass Jar - Unpreserved (EP068)							
1_1, 2_1, 3_1, 4_1, 5_1, 6_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**29-Sep-2020**	04-Nov-2020	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
1_1, 2_1, 3_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**28-Sep-2020**	04-Nov-2020	✓
Soil Glass Jar - Unpreserved (EP080)							
1_1, 2_1, 3_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**29-Sep-2020**	06-Oct-2020	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
1_1, 2_1, 3_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**28-Sep-2020**	04-Nov-2020	✓
Soil Glass Jar - Unpreserved (EP080)							
1_1, 2_1, 3_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**29-Sep-2020**	06-Oct-2020	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
1_1, 2_1, 3_1	**22-Sep-2020**	**25-Sep-2020**	06-Oct-2020	✓	**29-Sep-2020**	06-Oct-2020	✓

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	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	26	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	5	40	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (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 SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 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 Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

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 Schedule B(3).
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, Na2SO4 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.

22.0 APPENDIX 8: CALCULATIONS OF RPD

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Relative Percent Difference

Duplicate Sample Conformity

Project:	00677-ESA-1	Date:	12.10.2020
Assessor	Cheyne Hudson	Laboritory	ALS

Borehole ID	BH 22
Sample ID	22_1
Dupilicate Sample ID	DUP 1 (INTRA)

Analyte	Sample Result	Duplicate Result	Mean	Difference	RPD%
Arsenic	2.5	2.5	*2.5*	*0*	0.00%
Cadmium	0.5	0.5	*0.5*	*0*	0.00%
Chromium	16	26	*21*	*10*	47.62%
Copper	2.5	6	*4.25*	*3.5*	82.35%
Lead	11	20	*15.5*	*9*	58.06%
Nickel	3	5	*4*	*2*	50.00%
Zinc	9	6	*7.5*	*-3*	40.00%
Mercury	0.05	0.05	*0.05*	*0*	0.00%
			Relative Percentage Difference:		**34.75%**

Broadcrest
Engineering and Environmental consultants

Relative Percent Difference

Duplicate Sample Conformity

Project:	00677-ESA-1	Date:	12.10.2020
Assessor	Cheyne Hudson	Laboritory	ALS

Borehole ID	BH 19
Sample ID	19_1
Dupilicate Sample ID	DUP 3 (INTER)

Analyte	Sample Result	Duplicate Result	Mean	Difference	RPD%
Arsenic	2.5	1	*1.75*	*-1.5*	85.71%
Cadmium	0.5	0.2	*0.35*	*-0.3*	85.71%
Chromium	11	16	*13.5*	*5*	37.04%
Copper	2.5	2.5	*2.5*	*0*	0.00%
Lead	9	12	*10.5*	*3*	28.57%
Nickel	4	5.2	*4.6*	*1.2*	26.09%
Zinc	6	11	*8.5*	*5*	58.82%
Mercury	0.05	1.2	*0.625*	*1.15*	184.00%
			Relative Percentage Difference:		**63.24%**