REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS31546.1-AO

19 August 2022

Kahuna No1 Pty Ltd
C/o: Garrard Building Pty Limited
PO Box 538
YAMBA NSW 2464

**Attention: Neil Garrard**

Dear Neil

**RE: Yamba Gardens Residential Estate – 52-54 Miles Street, Yamba**
**Stage 2 Site Contamination Assessment - Addendum**

## 1 INTRODUCTION

Regional Geotechnical Solutions Pty Ltd (RGS) has previously undertaken a Stage 1 Site Contamination Assessment (SCA) and a Stage 2 SCA for a residential subdivision that is proposed at 52-54 Miles Street, Yamba (Lots 46 & 47 DP751395).

The Stage 1 SCA, presented within RGS Report No. RGS31546.1-AJ, dated 18 July 2019, identified five areas of environmental concern (AEC) where sampling and testing were recommended. The location and extent of the identified AEC are shown on Figure 1.

The Stage 2 SCA, presented within RGS Report No. RGS31546.1-AL, dated 10 March 2020, included sampling and testing from within three of the five AEC identified within the Stage 1 SCA (AEC-1, AEC-2 and AEC-5). RGS was advised at the time that AEC-4 (fill stockpiles that are present within a fenced area in the northeast of the site) was not within the proposed development footprint and sampling and testing was therefore not required within that area.

We understand that Clarence Valley Council has since requested that a Stage 2 SCA be undertaken to address AEC-4. This addendum presents the results of the sampling and testing that has since been undertaken within AEC-4. This addendum must be read in conjunction with the Stage 2 SCA report.

## 2 SITE CONDITIONS

A description of the site location and general site conditions is presented within the Stage 2 SCA report. AEC-4 is located along the northern site boundary adjacent to Miles Street in the east of the site, as illustrated within the attached Figures 1 and 2.

AEC-4 has a footprint of about 2,000m$^2$ and the perimeter of the area is fenced. Fill has been placed across the majority of the site and a review of satellite photographs indicates that the fill was placed between 2004 and 2011. The surface level within the site is about 0.6 to 0.9m above surrounding site levels.

Outlines of individual small loads/stockpiles are visible in the east of the site, including a load of concrete blocks, a load of tiles and concrete, and a load of topsoil. A row of topsoil is present in the west of the site.

The site is currently vegetated with regrowth trees and weeds.

Photographs from the site investigation are presented below.

*Small loads of tiles and concrete are in the east of the site*

*Concrete block fragments are in the northeast of the site*

## 3 GUIDELINES & ASSESSMENT CRITERIA

The assessment was carried out in accordance with the '*National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013*)'. The investigation levels for "Residential A" land use have been adopted as the primary investigation criteria. The adopted criteria are presented in the Stage 2 SCA.

## 4 INTRUSIVE INVESTIGATIONS

### 4.1 Investigations, Sampling & Laboratory Testing

Field work was carried out 12 July 2022 and included:

- A site walkover assessment, observation and mapping of surface features and existing structures with aim of identifying areas of potential contamination concern; and
- Judgemental sampling at 11 locations within AEC-4 as recommended within the Stage 1 SCA. The approximate sample locations are shown on Figure 2.

Samples were collected in acid-rinsed 125mL glass jars and placed in an ice-chilled cooler while on site and during transit to the laboratory where the samples were refrigerated.

Twelve soil samples were transported under chain-of-custody to ALS Laboratory Group (ALS), a NATA accredited specialist chemical testing laboratory. The samples included eleven primary samples and one duplicate soil samples.

A summary of the soil sampling and laboratory testing is presented in Table 1. Laboratory test results are attached.

**Table 1: Soil Sampling Summary – AEC-4**

| Sample Location | Depth | Chemicals of Concern Analysed | Sample Description |
|---|---|---|---|
| S4A | 0 – 0.1m | Heavy metals, pesticides, TRH, PAH, BTEX, PCB, Asbestos | Fill – Silty SAND |
| S4B | 0 – 0.1m | | Fill – Silty SAND |
| S4C | 0 – 0.1m | | Fill – Silty SAND |
| S4D | 0 – 0.1m | | Fill – Silty SAND |
| S4E | 0 – 0.1m | | Fill – Silty SAND |
| S4F | 0 – 0.1m | | Fill – Silty SAND |
| S4G | 0 – 0.1m | | Fill – Sandy GRAVEL |
| S4H | 0 – 0.1m | | Fill – Silty SAND |
| S4I | 0 – 0.1m | | Fill – Silty SAND |
| S4J | 0 – 0.1m | | Fill – Silty SAND |
| S4K | 0 – 0.1m | | Fill – Sand with tiles and concrete |

### 4.2 Quality Control

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination.

One duplicate sample was submitted to ALS along with the primary samples. The primary sample was labelled as S4C and the duplicate D41.

A comparison between the primary and duplicate sample results indicates that the Relative Percentage Difference (RPD) were within or equal to the control limit of 50% and indicated generally good correlation between the primary and duplicate samples.

In addition to the filed quality control procedures, the laboratory conducted internal quality control testing including surrogates, blanks and laboratory duplicate samples. The results are presented within the attached laboratory test results.

All laboratory quality control data is within acceptable limits for the tests carried out. Therefore, on the basis of the results of the field and laboratory quality control procedures and testing, the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

### 4.3 Soil Sampling

In consideration of the site conditions and the AEC identified within the Stage 1 SCA, a judgemental sampling plan was prepared with the aim of targeting the area of concern. Approximate sampling locations are shown on Figure 2. A summary of the soils present at the sampled locations is presented in Table 1.

### 4.4 Results of Analysis

An evaluation of the laboratory test results against the adopted soil assessment criteria as presented in Table 2 and Table 3 of the Stage 2 SCA is provided below:

- Asbestos was not detected in any of the samples tested;
- Results of heavy metal analysis revealed some elevated levels of chromium, lead, mercury, nickel and zinc, however, the concentrations encountered were below the adopted health assessment criteria in all samples;
- Results of TRH (F1, F2, F3 and F4) analysis revealed some elevated petroleum hydrocarbon levels, however, the concentrations encountered were below the adopted ecological screening level for all samples tested; and
- Results of BTEX, PAH and OC/OP Pesticides analysis revealed concentrations below the level of reporting in all samples tested.

### 4.5 ASSESSMENT & CONCLUSIONS REGARDING SITE CONTAMINATION

For all samples, sample analysis found that heavy metals, TRH, BTEX, OC/OP pesticides and the presence of asbestos were either at concentrations below the laboratory detection limits or at concentrations below the adopted health assessment criteria and ecological screening level for Residential A land use.

Based on the assessment undertaken, the site soils are considered to meet with the requirements for a Residential A site as detailed in the NEPM 2013 guidelines.

Based on the assessment as presented herein, the site is considered to be suitable for the proposed residential development from a contamination perspective.

## 5 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Contaminated site investigations are based on data collection, judgment, experience, and opinion. By nature, these investigations are less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein

were obtained using normal, industry accepted practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Recommendations regarding ground conditions referred to in this report are estimates based on the information available at the time of its writing. Estimates are influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

**Simon Keen**

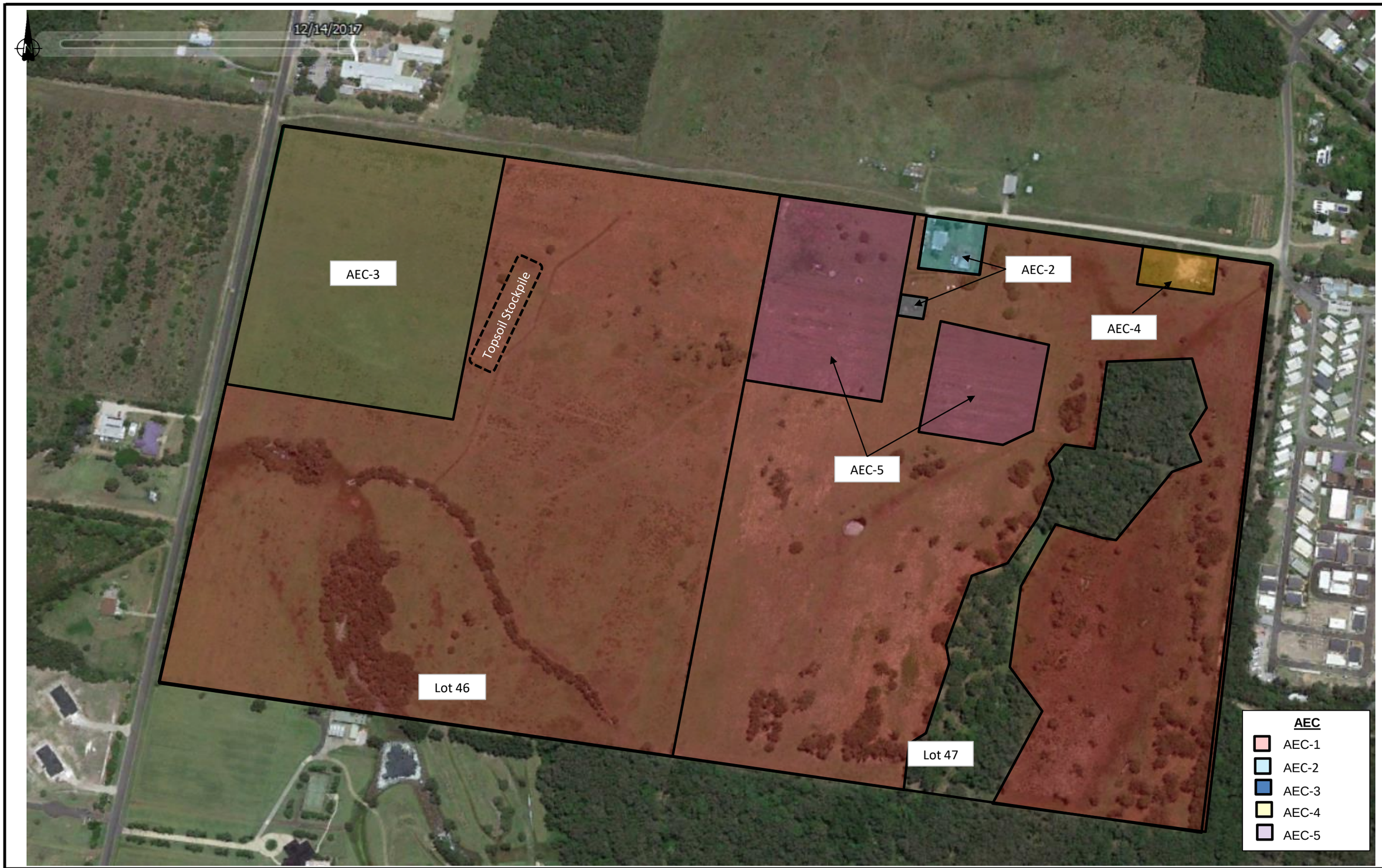
Associate Geotechnical Engineer

Reviewed by

**Adam Holzhauser**

Principal Geotechnical Engineer

Attachments: Figure 1
Laboratory Test Result Sheets




| | | | | |
|---|---|---|---|---|
| REGIONAL GEOTECHNICAL SOLUTIONS | **Client:** | Kahuna No. 1 | Job No. | RGS31546.1 |
| | **Project:** | Stage 2 Site Contamination Assessment<br>52-54 Miles Street, Yamba | Drawn By: | SK |
| | | | Scale: | NTS |
| | | | Date: | 16-Aug-22 |
| | **Title:** | Areas of Environmental Concern | Drawing No. | Figure 1 |


Image dated 2022

| | | | | |
|---|---|---|---|---|
| REGIONAL GEOTECHNICAL SOLUTIONS | **Client:** | Kahuna No. 1 | Job No. | RGS31546.1 |
| | **Project:** | Stage 2 Site Contamination Assessment | Drawn By: | SK |
| | | | Scale: | NTS |
| | | 52-54 Miles Street, Yamba | Date: | 16-Aug-22 |
| | **Title:** | Sample Locations - AEC-4 | Drawing No. | **Figure 2** |

**TABLE A1 - RESULTS OF CHEMICAL ANALYSES** (concentrations in mg/kg) '**Residential A' Site**.

*National Environmental Protection Measure (NEPM) 2013 – Volume 2: Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater*

**Report No.** RGS31546.1-AO

**Site Location:** 52-54 Miles Street, Yamba

| Location | Depth (m) | Asebestos | TOTAL RECOVERABLE HYDROCARBONS | | | | | PAH | | OC-OP PESTICIDE | BTEX | PCB | HEAVY METALS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C6-C10 | C10-C16 | C16-C34 | C34-C40 | TOTAL 10-40 | Total | b-a-p | | | | As | Cd | Cr* | Cu | Pb | Hg | Ni | Zn |
| *Health Based Soil investigation Level* | | | | | | | | *300* | *3* | *6* | *NL* | *1* | *100* | *20* | *100* | *6000* | *300* | *40* | *400* | *7400* |
| *Ecological Investigation Level (EIL):* | | | | | | | | | | | | | | | | | | | | |
| *Ecological Screening Level (ESL):* | | | *180* | *120* | *300* | *2800* | | | *0.7* | | *50* | | ***Coarse grained soil in mg/kg*** | | | | | | | |
| | | | *180* | *120* | *1300* | *5600* | | | *0.7* | | *65* | | ***Fine grained soil in mg/kg*** | | | | | | | |
| S4A | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 4 | <5 | <5 | 0.1 | <2 | <5 |
| S4B | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | <5 |
| S4C | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 12 | <5 | <5 | 0.1 | <2 | <5 |
| S4D | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 14 | <5 | <5 | 0.2 | <2 | 6 |
| S4E | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | <2 | <5 | 16 | <0.1 | <2 | 18 |
| S4F | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 20 | <5 | 6 | 0.1 | 3 | 5 |
| S4G | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 7 |
| S4H | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | <2 | <5 | 7 | <0.1 | <2 | 10 |
| S4I | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 20 | <5 | 6 | 0.1 | 3 | 6 |
| S4J | 0-0.1 | No | <10 | <50 | 150 | 100 | 250 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 11 | <5 | 10 | <0.1 | 4 | 149 |
| S4K | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | <0.5 | <0.5 | <0.2 | <0.2 | <0.1 | <5 | <1 | 8 | <5 | 7 | <0.1 | 4 | 21 |
| D41 | 0-0.1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | <5 | <1 | 20 | <5 | 6 | 0.1 | 3 | <5 |

BLUE - Denotes concentration exceeds health based guideline for Residential A
GREEN - Denotes concentration exceeds ecological guideline for Residential A
ORANGE - Denotes concentration exceeds health and ecological based guideline

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2225016** | Page | : 1 of 16 |
| Client | : **REGIONAL GEOTECHNICAL SOLUTION** | Laboratory | : Environmental Division Sydney |
| Contact | : MR SIMON KEEN | Contact | : Customer Services ES |
| Address | : Unit 14 25-27 Hurley Drive<br>COFFS HARBOUR NSW, AUSTRALIA 2450 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : +61 02 6553 5641 | Telephone | : +61-2-8784 8555 |
| Project | : RGS31546.1 Proposed Residential Subdivision | Date Samples Received | : 15-Jul-2022 09:30 |
| Order number | : ---- | Date Analysis Commenced | : 19-Jul-2022 |
| C-O-C number | : ---- | Issue Date | : 25-Jul-2022 17:52 |
| Sampler | : ---- | | |
| Site | : Miles Street, Yamba | | |
| Quote number | : EN/222 | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- 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 | Team Leader - Asbestos | Newcastle - Asbestos, Mayfield West, NSW |
| Ankit Joshi | Senior Chemist - Inorganics | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, 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 Contract 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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- 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.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- 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**)

| Compound | CAS Number | LOR | Unit | Sample ID | S4A 0.05-0.15 | S4B 0.05-0.15 | S4C 0.05-0.15 | S4D 0.05-0.15 | S4E 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| | | | | | ES2225016-001 | ES2225016-002 | ES2225016-003 | ES2225016-004 | ES2225016-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | | |
| **Moisture Content** | ---- | 1.0 | % | | **10.1** | **11.5** | **14.3** | **11.3** | **15.4** |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | | |
| **Asbestos Detected** | 1332-21-4 | 0.1 | g/kg | | **No** | **No** | **No** | **No** | **No** |
| **Asbestos (Trace)** | 1332-21-4 | 5 | Fibres | | **No** | **No** | **No** | **No** | **No** |
| **Asbestos Type** | 1332-21-4 | - | -- | | **-** | **-** | **-** | **-** | **-** |
| **Synthetic Mineral Fibre** | ---- | 0.1 | g/kg | | **No** | **No** | **No** | **No** | **No** |
| **Organic Fibre** | ---- | 0.1 | g/kg | | **No** | **No** | **No** | **No** | **No** |
| **Sample weight (dry)** | ---- | 0.01 | g | | **156** | **176** | **227** | **186** | **261** |
| **APPROVED IDENTIFIER:** | ---- | - | -- | | **A. SMYLIE** | **A. SMYLIE** | **A. SMYLIE** | **A. SMYLIE** | **A. SMYLIE** |
| **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 | | **4** | **4** | **12** | **14** | <2 |
| **Copper** | 7440-50-8 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **Lead** | 7439-92-1 | 5 | mg/kg | | <5 | <5 | <5 | <5 | **16** |
| **Nickel** | 7440-02-0 | 2 | mg/kg | | <2 | <2 | <2 | <2 | <2 |
| **Zinc** | 7440-66-6 | 5 | mg/kg | | <5 | <5 | <5 | **6** | **18** |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | | |
| **Mercury** | 7439-97-6 | 0.1 | mg/kg | | **0.1** | <0.1 | **0.1** | **0.2** | <0.1 |
| **EP066: Polychlorinated Biphenyls (PCB)** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 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 |

## Analytical Results

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

| Compound | CAS Number | LOR | Unit | Sample ID | S4A 0.05-0.15 | S4B 0.05-0.15 | S4C 0.05-0.15 | S4D 0.05-0.15 | S4E 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| | | | | | ES2225016-001 | ES2225016-002 | ES2225016-003 | ES2225016-004 | ES2225016-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| **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 |
| **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** | 72-54-8/72-55-9/50-29-3 | 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 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | S4A 0.05-0.15 | S4B 0.05-0.15 | S4C 0.05-0.15 | S4D 0.05-0.15 | S4E 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| Compound | CAS Number | LOR | Unit | | ES2225016-001 | ES2225016-002 | ES2225016-003 | ES2225016-004 | ES2225016-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(k)fluoranthene | 207-08-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Benzo(a)pyrene TEQ (half LOR) | ---- | 0.5 | mg/kg | | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| ^ Benzo(a)pyrene TEQ (LOR) | ---- | 0.5 | mg/kg | | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| C10 - C14 Fraction | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| C15 - C28 Fraction | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | <100 |
| C29 - C36 Fraction | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | <100 |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | <100 |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | <100 |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | S4A 0.05-0.15 | S4B 0.05-0.15 | S4C 0.05-0.15 | S4D 0.05-0.15 | S4E 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| Compound | CAS Number | LOR | Unit | ES2225016-001 | ES2225016-002 | ES2225016-003 | ES2225016-004 | ES2225016-005 |
| | | | | Result | Result | Result | Result | Result |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| **EP080: BTEXN** | | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <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 | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Sum of BTEX | ---- | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ Total Xylenes | ---- | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Naphthalene | 91-20-3 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP066S: PCB Surrogate** | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | **80.6** | **78.7** | **76.9** | **90.4** | **88.2** |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | **88.4** | **89.2** | **87.0** | **98.6** | **92.3** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | **88.2** | **91.7** | **87.7** | **100** | **93.4** |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 0.5 | % | **82.1** | **87.6** | **88.9** | **90.2** | **88.1** |
| 2-Chlorophenol-D4 | 93951-73-6 | 0.5 | % | **95.7** | **102** | **105** | **106** | **104** |
| 2.4.6-Tribromophenol | 118-79-6 | 0.5 | % | **82.3** | **94.4** | **92.6** | **91.0** | **91.9** |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.5 | % | **102** | **109** | **112** | **113** | **111** |
| Anthracene-d10 | 1719-06-8 | 0.5 | % | **98.5** | **104** | **107** | **107** | **107** |
| 4-Terphenyl-d14 | 1718-51-0 | 0.5 | % | **95.4** | **101** | **104** | **105** | **103** |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.2 | % | **118** | **117** | **98.4** | **118** | **121** |
| Toluene-D8 | 2037-26-5 | 0.2 | % | **82.6** | **82.0** | **83.4** | **99.8** | **86.4** |
| 4-Bromofluorobenzene | 460-00-4 | 0.2 | % | **86.5** | **85.3** | **78.0** | **93.2** | **86.6** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | S4F 0.05-0.15 | S4G 0.05-0.15 | S4H 0.05-0.15 | S4I 0.05-0.15 | S4J 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| Compound | CAS Number | LOR | Unit | ES2225016-006 | ES2225016-007 | ES2225016-008 | ES2225016-009 | ES2225016-010 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 10.6 | 7.0 | 14.0 | 10.5 | 14.1 |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | No | No | No | No | No |
| Asbestos (Trace) | 1332-21-4 | 5 | Fibres | No | No | No | No | No |
| Asbestos Type | 1332-21-4 | - | -- | - | - | - | - | - |
| Synthetic Mineral Fibre | ---- | 0.1 | g/kg | No | No | No | No | No |
| Organic Fibre | ---- | 0.1 | g/kg | No | No | No | No | No |
| Sample weight (dry) | ---- | 0.01 | g | 133 | 104 | 458 | 257 | 207 |
| APPROVED IDENTIFIER: | ---- | - | -- | A. SMYLIE | A. SMYLIE | A. SMYLIE | A. SMYLIE | A. SMYLIE |
| **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 | 20 | <2 | <2 | 20 | 11 |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | 6 | <5 | 7 | 6 | 10 |
| Nickel | 7440-02-0 | 2 | mg/kg | 3 | <2 | <2 | 3 | 4 |
| Zinc | 7440-66-6 | 5 | mg/kg | 5 | 7 | 10 | 6 | 149 |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | 0.1 | <0.1 | <0.1 | 0.1 | <0.1 |
| **EP066: Polychlorinated Biphenyls (PCB)** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 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 |

## Analytical Results

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

| Compound | CAS Number | LOR | Unit | Sample ID | S4F 0.05-0.15 | S4G 0.05-0.15 | S4H 0.05-0.15 | S4I 0.05-0.15 | S4J 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| | | | | | ES2225016-006 | ES2225016-007 | ES2225016-008 | ES2225016-009 | ES2225016-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| **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 |
| **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 |

## Analytical Results

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

| Compound | CAS Number | LOR | Unit | Sample ID | S4F 0.05-0.15 | S4G 0.05-0.15 | S4H 0.05-0.15 | S4I 0.05-0.15 | S4J 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| | | | | | ES2225016-006 | ES2225016-007 | ES2225016-008 | ES2225016-009 | ES2225016-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(b+j)fluoranthene** | 205-99-2 205-82-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(k)fluoranthene** | 207-08-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Sum of polycyclic aromatic hydrocarbons** | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Benzo(a)pyrene TEQ (zero)** | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Benzo(a)pyrene TEQ (half LOR)** | ---- | 0.5 | mg/kg | | **0.6** | **0.6** | **0.6** | **0.6** | **0.6** |
| ^ **Benzo(a)pyrene TEQ (LOR)** | ---- | 0.5 | mg/kg | | **1.2** | **1.2** | **1.2** | **1.2** | **1.2** |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| **C6 - C9 Fraction** | ---- | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| **C10 - C14 Fraction** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **C15 - C28 Fraction** | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | <100 |
| **C29 - C36 Fraction** | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | **140** |
| ^ **C10 - C36 Fraction (sum)** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | **140** |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| **C6 - C10 Fraction** | C6_C10 | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| ^ **C6 - C10 Fraction minus BTEX (F1)** | C6_C10-BTEX | 10 | mg/kg | | <10 | <10 | <10 | <10 | <10 |
| **>C10 - C16 Fraction** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **>C16 - C34 Fraction** | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | **150** |
| **>C34 - C40 Fraction** | ---- | 100 | mg/kg | | <100 | <100 | <100 | <100 | **100** |
| ^ **>C10 - C40 Fraction (sum)** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | **250** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | S4F 0.05-0.15 | S4G 0.05-0.15 | S4H 0.05-0.15 | S4I 0.05-0.15 | S4J 0.05-0.15 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 |
| Compound | CAS Number | LOR | Unit | | ES2225016-006 | ES2225016-007 | ES2225016-008 | ES2225016-009 | ES2225016-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | | |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **EP080: BTEXN** | | | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Toluene | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <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 | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Sum of BTEX | ---- | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ Total Xylenes | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Naphthalene | 91-20-3 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP066S: PCB Surrogate** | | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | **89.3** | **79.5** | **83.6** | **84.8** | **74.1** |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | | **97.4** | **85.7** | **90.8** | **99.3** | **85.2** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | | **96.3** | **86.1** | **93.4** | **97.4** | **87.6** |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 0.5 | % | | **85.7** | **84.5** | **82.2** | **86.9** | **90.9** |
| 2-Chlorophenol-D4 | 93951-73-6 | 0.5 | % | | **102** | **98.9** | **96.5** | **102** | **106** |
| 2.4.6-Tribromophenol | 118-79-6 | 0.5 | % | | **85.4** | **78.2** | **79.9** | **82.6** | **86.3** |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.5 | % | | **109** | **108** | **105** | **112** | **116** |
| Anthracene-d10 | 1719-06-8 | 0.5 | % | | **102** | **103** | **100** | **105** | **110** |
| 4-Terphenyl-d14 | 1718-51-0 | 0.5 | % | | **101** | **100** | **97.1** | **103** | **108** |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.2 | % | | **114** | **133** | **130** | **75.4** | **126** |
| Toluene-D8 | 2037-26-5 | 0.2 | % | | **75.1** | **94.2** | **87.2** | **90.7** | **78.8** |
| 4-Bromofluorobenzene | 460-00-4 | 0.2 | % | | **77.4** | **92.8** | **87.2** | **94.9** | **79.3** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | S4K 0.05-0.15 | D41 0.05-0.15 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES2225016-011 | ES2225016-012 | -------- | -------- | -------- |
| | | | | Result | Result | ---- | ---- | ---- |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 8.0 | 14.2 | ---- | ---- | ---- |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | No | ---- | ---- | ---- | ---- |
| Asbestos (Trace) | 1332-21-4 | 5 | Fibres | No | ---- | ---- | ---- | ---- |
| Asbestos Type | 1332-21-4 | - | -- | - | ---- | ---- | ---- | ---- |
| Synthetic Mineral Fibre | ---- | 0.1 | g/kg | No | ---- | ---- | ---- | ---- |
| Organic Fibre | ---- | 0.1 | g/kg | No | ---- | ---- | ---- | ---- |
| Sample weight (dry) | ---- | 0.01 | g | 189 | ---- | ---- | ---- | ---- |
| APPROVED IDENTIFIER: | ---- | - | -- | A. SMYLIE | ---- | ---- | ---- | ---- |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | <5 | ---- | ---- | ---- |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | ---- | ---- | ---- |
| Chromium | 7440-47-3 | 2 | mg/kg | 8 | 20 | ---- | ---- | ---- |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | ---- | ---- | ---- |
| Lead | 7439-92-1 | 5 | mg/kg | 7 | 6 | ---- | ---- | ---- |
| Nickel | 7440-02-0 | 2 | mg/kg | 4 | 3 | ---- | ---- | ---- |
| Zinc | 7440-66-6 | 5 | mg/kg | 21 | <5 | ---- | ---- | ---- |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | 0.1 | ---- | ---- | ---- |
| **EP066: Polychlorinated Biphenyls (PCB)** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | S4K 0.05-0.15 | D41 0.05-0.15 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES2225016-011 | ES2225016-012 | -------- | -------- | -------- |
| | | | | Result | Result | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| 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 | ---- | ---- | ---- | ---- |
| 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 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | S4K 0.05-0.15 | D41 0.05-0.15 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2225016-011 | ES2225016-012 | -------- | -------- | -------- |
| | | | | | Result | Result | ---- | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(k)fluoranthene | 207-08-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (half LOR) | ---- | 0.5 | mg/kg | | **0.6** | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (LOR) | ---- | 0.5 | mg/kg | | **1.2** | ---- | ---- | ---- | ---- |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| C10 - C14 Fraction | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| C15 - C28 Fraction | ---- | 100 | mg/kg | | <100 | ---- | ---- | ---- | ---- |
| C29 - C36 Fraction | ---- | 100 | mg/kg | | <100 | ---- | ---- | ---- | ---- |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | | <100 | ---- | ---- | ---- | ---- |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | | <100 | ---- | ---- | ---- | ---- |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | S4K 0.05-0.15 | D41 0.05-0.15 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 12-Jul-2022 00:00 | 12-Jul-2022 00:00 | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES2225016-011 | ES2225016-012 | -------- | -------- | -------- |
| | | | | Result | Result | ---- | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| **EP080: BTEXN** | | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | <0.2 | ---- | ---- | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| ^ Sum of BTEX | ---- | 0.2 | mg/kg | <0.2 | ---- | ---- | ---- | ---- |
| ^ Total Xylenes | ---- | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Naphthalene | 91-20-3 | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- |
| **EP066S: PCB Surrogate** | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | **73.8** | ---- | ---- | ---- | ---- |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | **84.7** | ---- | ---- | ---- | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | **86.2** | ---- | ---- | ---- | ---- |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 0.5 | % | **86.6** | ---- | ---- | ---- | ---- |
| 2-Chlorophenol-D4 | 93951-73-6 | 0.5 | % | **102** | ---- | ---- | ---- | ---- |
| 2.4.6-Tribromophenol | 118-79-6 | 0.5 | % | **83.1** | ---- | ---- | ---- | ---- |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.5 | % | **110** | ---- | ---- | ---- | ---- |
| Anthracene-d10 | 1719-06-8 | 0.5 | % | **104** | ---- | ---- | ---- | ---- |
| 4-Terphenyl-d14 | 1718-51-0 | 0.5 | % | **100** | ---- | ---- | ---- | ---- |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.2 | % | **132** | ---- | ---- | ---- | ---- |
| Toluene-D8 | 2037-26-5 | 0.2 | % | **84.4** | ---- | ---- | ---- | ---- |
| 4-Bromofluorobenzene | 460-00-4 | 0.2 | % | **85.3** | ---- | ---- | ---- | ---- |

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

| Method: Compound | Sample ID - Sampling date / time | Analytical Results |
|---|---|---|
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | |
| EA200: Description | S4A0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4B0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4C0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4D0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4E0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4F0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4G0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4H0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4I0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4J0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |
| EA200: Description | S4K0.05-0.15 - 12-Jul-2022 00:00 | Soil sample. |

## Surrogate Control Limits

| Sub-Matrix: SOIL | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP066S: PCB Surrogate** | | | |
| Decachlorobiphenyl | 2051-24-3 | 39 | 149 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | |
| Dibromo-DDE | 21655-73-2 | 49 | 147 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | |
| DEF | 78-48-8 | 35 | 143 |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | |
| Phenol-d6 | 13127-88-3 | 63 | 123 |
| 2-Chlorophenol-D4 | 93951-73-6 | 66 | 122 |
| 2.4.6-Tribromophenol | 118-79-6 | 40 | 138 |
| **EP075(SIM)T: PAH Surrogates** | | | |
| 2-Fluorobiphenyl | 321-60-8 | 70 | 122 |
| Anthracene-d10 | 1719-06-8 | 66 | 128 |
| 4-Terphenyl-d14 | 1718-51-0 | 65 | 129 |
| **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 |

## Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

**Kahuna No. 1 Pty Ltd**

# Stage 2 Site Contamination Assessment

## Proposed Residential Development

## 52-54 Miles Street, Yamba

Report No. RGS31546.1-AL

10 March 2020

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS31546.1-AL

10 March 2020

Kahuna No. 1 Pty Ltd
C/o: Garrard Building Pty Limited
PO Box 538
YAMBA NSW 2464

**Attention: Neil Garrard**

Dear Neil

**RE: Proposed Residential Development – 52-54 Miles Street, Yamba**
**Stage 2 Site Contamination Assessment**

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Stage 2 Site Contamination Assessment at 52-54 Miles Street, Yamba NSW (Lots 46 and 47 DP751395) where a residential development is proposed on the approximately 42ha lot.

The results of the assessment are presented herein.

The work presented herein was reviewed by Dr David Tully CEnvP SC. A copy of Dr Tully's letter pertaining to the review is appended to the report.

If you have any questions regarding this project, please contact the undersigned.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

**Simon Keen**

Senior Geotechnical Engineer

Reviewed by

**Andrew Hills**

Senior Environmental Engineer

**Table of Contents**



**Figures**



**Appendices**

## 1 INTRODUCTION

This report presents the results of a Stage 2 Site Contamination Assessment (SCA) undertaken by Regional Geotechnical Solutions Pty Ltd (RGS) for a residential subdivision that is proposed at 52-54 Miles Street, Yamba (Lots 46 & 47 DP751395).

The development will occupy the full approximately 21.2ha of Lot 46 and approximately 10.9ha of Lot 47. The remaining approximately 10.5ha in the east and southeast of the site (as illustrated on Figure 2) will remain undeveloped. A fill pad is to be constructed within the developed areas of the lots which will raise site levels by between about 1.0 to 2.8m.

RGS has previously prepared a Stage 1 SCA (RGS Report No. RGS31546.1-AJ, dated 18 July 2019) that identified five areas of environmental concern (AEC) where sampling and testing were recommended. The location and extent of the identified AEC are shown on Figure 1. Clarence Valley Council have requested that a Stage 2 SCA be undertaken that implements the recommendations presented within Section 4 of the Stage 1 SCA report. The recommendations were:

- Sampling and testing across AEC-1 (including topsoil stockpiles from AEC-3 filled area), AEC-2, AEC4 and AEC-5. The site history assessment presented herein indicates that there is a low potential for residual contamination at the site and therefore it is recommended that limited judgemental sampling be undertaken rather than systematic grid sampling as defined by the EPA 'Sampling Design Guidelines' (1995); and
- Confirm that all of the imported fill that has been placed in AEC-3 and is currently being, or is to be placed on the site has been classified as Excavated Natural Material in accordance with the Resource *Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014).*

## 2 METHODOLOGY

The Stage 2 SCA was undertaken in accordance with the relevant sections of the NSW EPA, *Guidelines for Consultants Reporting on Contaminated Sites,* and involved the following process:

- A review of the Stage 1 SCA (RGS Report No. RGS31546.1-AJ, dated 18 July 2019);
- Site walkover to assess visible surface conditions and identify potential evidence of contamination, or past activities that may cause contamination;
- Collection of samples within three of the five Areas of Concern identified within the Stage 1 SCA report (AEC-1, AEC-2 and AEC-5). A summary of the AEC is presented in Table 1 and the extents are presented on Figure 1. The following was noted:
    - Sampling and testing were not undertaken within AEC-3 where imported fill has been and is currently being placed in the west of the site. As outlined within RGS proposal RGS31546.1-AK, it is understood that confirmation is to be sought by others to ensure that the imported fill has been classified as either Virgin Excavated Natural Material (VENM) as defined within the Protection of the Environment Operations Act 1997 (POEO Act), or as Excavated Natural Material in accordance with the *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the*

*Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014);*

- AEC-4 is not within the development footprint and sampling and analysis was therefore not required; and

- Laboratory testing of recovered samples for the Chemicals of Concern (CoC) identified within the Stage 1 SCA. A summary of the Areas of Environmental Concern (AEC) and the CoC is presented in Table 1. The extents of the AEC are reproduced in Figure 1.

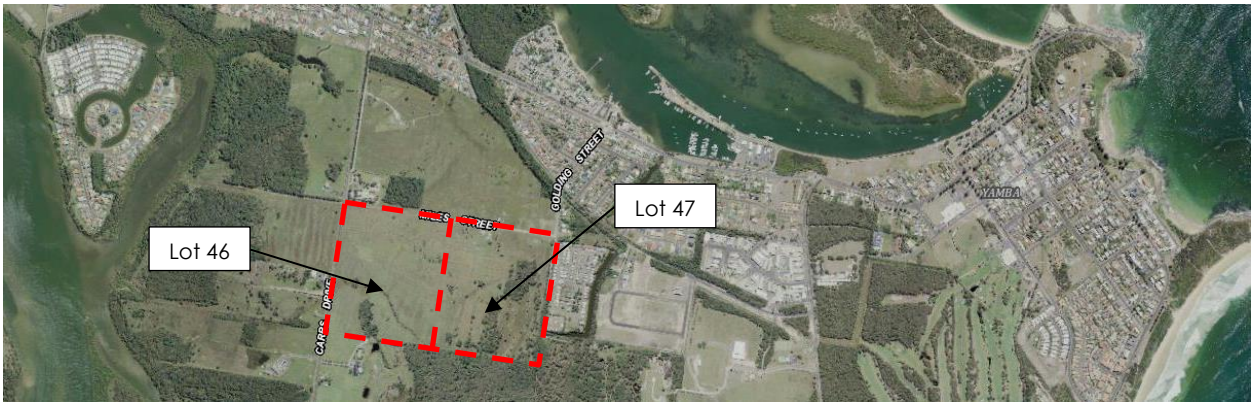
**Table 1: Areas of Environmental Concern & Chemicals of Concern**

| Areas of Environmental Concern | | Mode of Potential Contamination | Chemicals of Concern |
|---|---|---|---|
| AEC-1 | Soils used of agricultural or grazing purposes | Spraying, spillage or storage of pesticides. | Heavy metals, pesticides |
| AEC-2 | Building materials, including potential asbestos containing linings (Fibro sheeting), lead based paints etc.,<br>Parked cars and plant | Building materials from construction of house and any renovations.<br>Oil spills or fuel spills. | Asbestos, heavy metals, hydrocarbons |
| AEC-3 | Imported fill | Contamination prior to arrival onsite | Unknown |
| AEC-4 | Portion of site where fill was placed between 2004 and 2017 | Unknown | Unknown |
| AEC-5 | Potential former market garden | Spraying, spillage or storage of pesticides. | Heavy metals, pesticides |

## 3 SITE CONDITIONS

### 3.1 Surface Conditions

The approximately 42ha rectangular site is bound by Miles Street to the north, Carrs Drive to the west, Golding Street to the east, and by rural-residential lots and bushland to the south. A satellite image that illustrates the site location and site setting is shown below.




*Site location and setting is illustrated on the NSW Government 'Six Maps'. The approximate boundary of the site is shown by a red box*

The site is located within a region characterised by low lying sand flats with localised swamp deposits in lower lying areas and depressions across the site. The provided survey indicates that site levels are generally between about RL1.0 to 1.4m (AHD) with lower lying depressions and drainage lines having elevations of between about 0.5 to 1.0m. The intermittent drainage lines drain to both the northeast towards the Clarence River and to the southwest towards Oyster Channel.

Two single storey residential dwellings and associated sheds/garages of cladded and fibrous sheeting construction are located in the northeast of the site. Timber stockyards, an ageing tractor and cattle troughs are located to the southwest of the dwellings. The remainder of the site (with the exception of that which is outlined below) was being used for grazing purposes.

Fill was being placed and worked on the western portion of Lot 46 during our site visit.

Typical site photographs are presented below.

*Looking west from the southeast corner of the site. Groups of trees are scattered across this area.*

*Looking south across the northwest portion of the site that was being used for grazing purposes in 2018*

*A row of trees can be seen which are located on the edge of a drainage line in the southwest of the site that drains into Oyster Channel*

*Looking north from the central portion of the site at open farmland in June 2018*

*Looking northeast at the two existing dwellings that are located along the northern boundary of Lot 47.*

*Looking west across the site from the cattle yards towards the earthworks being undertaken on Lot 46*

*Looking northeast at the dilapidated cattle yards that have been constructed with timber and corrugated steel sheeting*

*Disused tractor adjacent to stock yards*

### 3.2 Subsurface Conditions & Geology

The 1:25,000 Yamba Quaternary Geology Map indicates that the site is predominantly underlain by a Holocene tidal-delta flat that comprises marine sand, silt, clay, shell and gravel. The lower lying drainage lines that are located at the site are underlain by a Holocene saline swamp that comprises organic mud, peat, clay, silt and sand, that overlies the tidal-delta flat outlined above.

RGS has previously undertaken geotechnical investigations which involved the excavation of eleven test pits. The test pit logs are presented in Report No. RGS31546.1-AB, dated 26 July 2018. The test pits generally encountered up to 0.25m of topsoil that overlies firm alluvial Silty CLAY and medium dense to dense alluvial SAND to at least the maximum depth of the investigation of 1.3m.

The investigation was undertaken shortly after a period of high rainfall and groundwater was encountered at a depth of between 0.65 and 1.0m. Subsequent investigations (summarised in

report nos. RGS31546.1-AD and RGS31546.1-AG) encountered the groundwater table between 1 and 1.3m depth.

## 4 GUIDELINES & ASSESSMENT CRITERIA

The assessment was carried out in accordance with the '*National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013*)'. The NEPM document provides a range of guidelines for assessment of contaminants for various land uses. The development is a residential subdivision, therefore, the investigation levels for "Residential A" land use have been adopted as the primary investigation criteria. In accordance with the NEPM guidelines the following criteria were adopted for this assessment:

- Health investigation levels (HIL) for Residential A land use were used to assess the potential human health impact of heavy metals and polycyclic aromatic hydrocarbons (PAHs);
- Health Screening Levels (HSL) for coarse textured (sand) or fine textured (silt or clay) soils on a Residential A site were adopted as appropriate for the soils encountered to assess the potential human health impact of petroleum hydrocarbons reported as total recoverable hydrocarbons (TRH) in four fraction ranges and benzene, toluene, ethylbenzene and xylene (BTEX) compounds;
- Ecological Investigation Levels (EIL) for Residential A land use were used for evaluation of the potential ecological / environmental impact of heavy metals and PAH; and
- Ecological Screening Levels (ESL) for coarse textured (sand) or fine textured (silt or clay) soils on a Residential A site were adopted as appropriate for the soils encountered, to assess the potential ecological / environmental impact of petroleum hydrocarbons and BTEX compounds.

In accordance with NEPM 2013, exceedance of the criteria does not necessarily deem that remediation or clean-up is required but is a trigger for further assessment of the extent of contamination and associated risks. The adopted criteria are presented in Table 2 and Table 3.

**Table 2: Adopted Site Investigation Criteria (ppm)**

| Analyte | Adopted Soil Investigation Criteria | Analyte | Adopted Soil Investigation Criteria |
|---|---|---|---|
| Benzene | 0.5 | Chlordane | 50 |
| Toluene | 160 | Heptachlor | 6 |
| Ethyl-benzene | 55 | Copper | 6,000 |
| Xylene | 40 | Lead | 300 |
| TRH C6 – C10 (F1) | 180[1] | Zinc | 7,400 |
| TRH >C10 – C16 (F2) | 120[1] | Cadmium | 20 |
| TRH >C16 – C34 (F3) | 300[1] | Chromium (VI) | 100 |
| TRH >C34 – C40 (F4) | 2800[1] | Arsenic | 100 |
| DDT+DDE+DDD | 240 | Nickel | 400 |
| Aldrin / Dieldrin | 6 | Mercury | 40 |

Note: 1 Based on ecological screening levels (ESL)

Selected samples were composited a rate of 4 to 1 for analysis. In accordance with NEPM 2013, the criteria for analytes for these samples have been divided by the number of discrete samples

(four) that have been combined to create each composite sample. Therefore, the adopted criteria for composited samples are presented in Table 3.

**Table 3: Adopted Soil Investigation Criteria for Samples Composited at 4:1**

| Analyte | Adopted Soil Investigation Criteria (mg/kg) |
|---|---|
| Copper | 1,500 |
| Lead | 75 |
| Zinc | 1,850 |
| Cadmium | 5 |
| Chromium (VI) | 25 |
| Arsenic | 25 |
| Nickel | 100 |
| Mercury | 10 |

# 5 INTRUSIVE INVESTIGATION

## 5.1 Investigations, Sampling & Laboratory Testing

Field work was carried out 16 January 2020 and included:

- A site walkover assessment, observation and mapping of surface features and existing structures with aim of identifying areas of potential contamination concern; and
- Judgemental sampling within AEC-1, AEC-2 and AEC-5 as recommended within the Stage 1 SCA. The approximate sample locations are shown on Figure 1.

Samples were collected in acid-rinsed 125mL glass jars and placed in an ice-chilled cooler while on site and during transit to the laboratory where the samples were refrigerated.

Thirty nine soil samples were transported under chain-of-custody to ALS Laboratory Group (ALS), a NATA accredited specialist chemical testing laboratory. The samples included eight composited samples and six duplicate soil samples. Three triplicate samples were submitted to Environmental Analysis Laboratory (EAL), a NATA accredited laboratory.

A summary of the soil sampling and laboratory testing is presented in Table 4. Laboratory test results are presented in Appendix A.

**Table 4: Soil Sampling Summary**

| Sample Location | Depth | Area of Environmental Concern | Chemicals of Concern Analysed | Sample Description |
|---|---|---|---|---|
| Composite C1 (S101, S102, S104, S105) | 0 – 0.1m | AEC-1 | Heavy metals, pesticides | Sandy TOPSOIL |
| Composite C2 (S106, S107, S108, S109) | 0 – 0.1m | | | Sandy TOPSOIL |
| Composite C3 (S110, S111, S116, S117) | 0 – 0.1m | | | Sandy TOPSOIL |
| Composite C4 (S112, S113, S118, S119) | 0 – 0.1m | | | Sandy TOPSOIL |
| Composite C5 | 0 – 0.1m | | | Sandy TOPSOIL |

| Sample Location | Depth | Area of Environmental Concern | Chemicals of Concern Analysed | Sample Description |
|---|---|---|---|---|
| (S114, S115, S120, S121) | | | | |
| S103 | 0 – 0.1m | | | Sandy TOPSOIL |
| D1 (S103 Duplicate) | | | | |
| T1 (S103 Triplicate) | | | | |
| Composite C8 (S147, S148, S149, S150) | 0 – 0.1m | AEC-1 (Topsoil Stockpile stripped from filled area) | Heavy metals, pesticides | Sandy TOPSOIL |
| S133 | 0 – 0.1m | AEC-2 | Asbestos, heavy metals, hydrocarbons | Sandy TOPSOIL |
| D5 (S133 Duplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| S134 | 0 – 0.1m | | | Sandy TOPSOIL |
| S135 | 0 – 0.1m | | | Sandy TOPSOIL |
| S136 | 0 – 0.1m | | | Sandy TOPSOIL |
| S137 | 0 – 0.1m | | | Sandy TOPSOIL |
| S138 | 0 – 0.1m | | | Sandy TOPSOIL |
| D6 (S138 Duplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| S139 | 0 – 0.1m | | | Sandy TOPSOIL |
| S140 | 0 – 0.1m | | | Sandy TOPSOIL |
| S141 | 0 – 0.1m | | | Sandy TOPSOIL |
| S142 | 0 – 0.1m | | | Sandy TOPSOIL |
| S143 | 0 – 0.1m | | | Sandy TOPSOIL |
| S144 | 0 – 0.1m | | | Sandy TOPSOIL |
| S145 | 0 – 0.1m | | | Sandy TOPSOIL |
| S146 | 0 – 0.1m | | | Sandy TOPSOIL |
| Composite C6 (S122, S123, S124, S125) | 0 – 0.1m | AEC-5 | Heavy metals, pesticides | Sandy TOPSOIL |
| Composite C7 (S128, S129, S131, S132) | 0 – 0.1m | | | Sandy TOPSOIL |
| S126 | 0 – 0.1m | | | Sandy TOPSOIL |
| D2 (S126 Duplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| T2 (S126 Triplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| S127 | 0 – 0.1m | | | Sandy TOPSOIL |
| D3 (S127 Duplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| S130 | 0 – 0.1m | | | Sandy TOPSOIL |
| D4 (S130 Duplicate) | 0 – 0.1m | | | Sandy TOPSOIL |
| T3 (S130 Triplicate) | 0 – 0.1m | | | Sandy TOPSOIL |

## 5.2 Quality Control

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination.

Six duplicate samples were submitted to ALS along with the primary samples, and three triplicated samples were submitted to EAL for analysis as shown below.

**Table 5: Summary of Duplicate & Triplicate Samples**

| Primary Sample (ALS) | Duplicate Sample (ALS) | Triplicate Sample (EAL) |
|---|---|---|
| S103 | D1 | T1 |
| S126 | D2 | T2 |
| S127 | D3 | -- |
| S130 | D4 | T3 |
| S133 | D5 | -- |
| S138 | D6 | -- |

A comparison between the primary, duplicate and triplicate sample results is presented within Table A2 in Appendix A. The table indicates that the Relative Percentage Difference (RPD) is below 30% where the concentrations are above 10 times the limit of analysis and below 50% where the concentrations are below 10 times the limit of analysis, except for one sample (Duplicate D5). Duplicate D5 recorded an RPD for TRH (>C10-C40) of 82%, however, it is considered that the variation is likely to be due to heterogeneity of the soil as outlined below.

The following is noted regarding field sampling QA/QC:

- Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination;
- The samples were recovered from test pits and the retained material did not directly come into contact with the sampling equipment and it is therefore considered that rinsate sampling and testing was not necessary;
- Although all due care and attention was taken to obtain samples containing the same material, it is feasible that exceedances between the samples (which were all collected from or close to the surface within topsoil) may have been caused by heterogeneity of the soil; and
- A trip spike was not taken during the investigation, however, given the generally low concentrations of volatile hydrocarbons encountered during the assessment, the absence of which is not expected to affect the usability of the data.

All laboratory quality control data where concentrations were detected above the detectable limits are within acceptable limits for the tests carried out.

Therefore, on the basis of the results of the field and laboratory quality control procedures and testing, the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

### 5.3 Soil Sampling

In consideration of the site conditions and assessed AEC's identified within the Stage 1 SCA, a judgemental sampling plan was prepared with the aim of targeting these areas of concern. Approximate sampling locations are shown on Figure 2. A summary of the soils present at the sampled locations is presented in Table 4.

### 5.4 Results of Analysis

An evaluation of the laboratory test results against the adopted soil assessment criteria as presented in Table 2 and Table 3 is provided below:

- Asbestos was not detected in any of the samples tested;
- Results of heavy metal analysis revealed some elevated levels of chromium, copper, lead and zinc, however, the concentrations encountered were below the adopted health assessment criteria in all samples;
- Results of TRH (F1, F2, F3 and F4) analysis revealed some elevated petroleum hydrocarbon levels, however, with the exception of Sample S138 (and corresponding duplicate D6), the concentrations encountered were below the adopted ecological screening level for all samples tested. Sample S138 (and corresponding Duplicate D6) both exceeded the adopted ecological screening assessment criteria for the F3 hydrocarbon fraction (>C16-C34);
- Results of BTEX analysis revealed concentrations below the level of reporting in all samples tested; and
- Results of organochlorine and organophosphorus pesticide analysis revealed concentrations below the level of reporting in all samples tested.

## 6 ASSESSMENT & CONCLUSIONS REGARDING SITE CONTAMINATION

For all but two samples (a primary sample and the corresponding duplicate), sample analysis found that heavy metals, TRH, BTEX, OC/OP pesticides and the presence of asbestos were either at concentrations below the laboratory detection limits or at concentrations below the adopted health assessment criteria and ecological screening level for Residential A land use.

The ecological screening level for the F3 hydrocarbon fraction (>C16-C34) was exceeded at one location (S138) adjacent to an old parked up unregistered car near the northern site boundary between two existing dwellings. The hydrocarbon source is likely to be from the parked car and it is likely that the extents would be limited to the immediate area surrounding the vehicle. This portion of the site is to be overlain by up to 1.8m of imported fill or is to be located beneath the fill batter, and is beyond the northern boundary of the proposed residential lots. The elevated hydrocarbon concentration may present a potential risk to some ecological receptors which may result in slow or reduced plant growth in this area. However, the risk of human exposure to the hydrocarbon impacted soil in this location is considered to be very low given its inaccessibility due to the overlying layer of emplaced fill.

Based on the assessment undertaken, the site soils are considered to meet with the requirements for a Residential A site as detailed in the NEPM 2013 guidelines.

It is recommended that a hazardous materials survey be undertaken prior to demolition of the existing dwellings at the site. An asbestos clearance certificate should also be obtained by the demolition contractor to certify that all asbestos (if present) has been appropriately removed from the site. Should asbestos be encountered during demolition works, it is recommended that validation soil sampling be undertaken for the presence of asbestos from within the former dwelling footprints.

Based on the assessment as presented herein, the site is considered to be suitable for the proposed residential development from a contamination perspective provided the recommendations of this report are adhered to.

## 7 LIMITATIONS

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical and pavement design practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points. If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

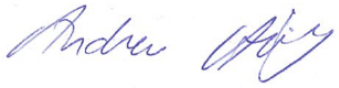
For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

**Simon Keen**

Senior Geotechnical Engineer

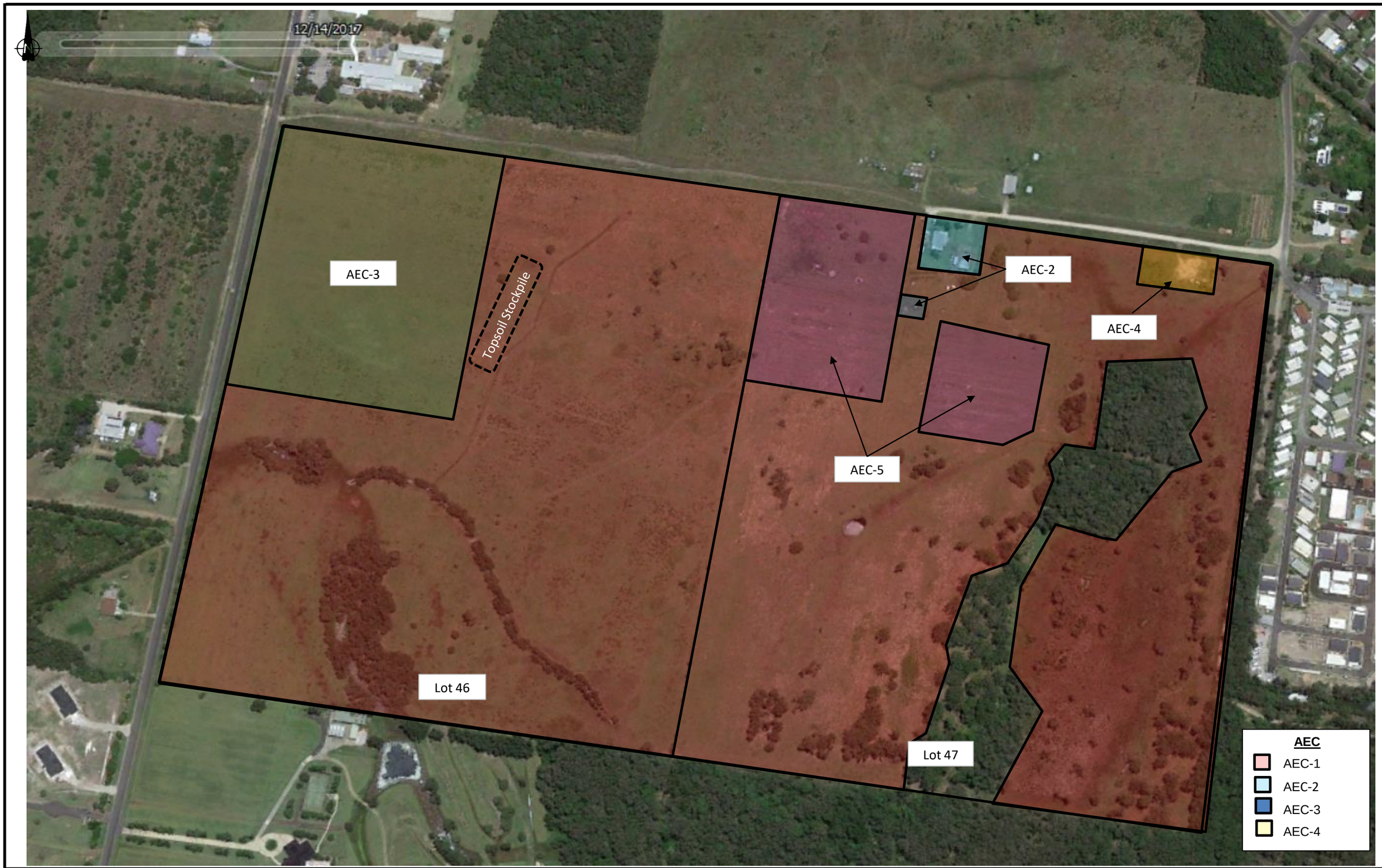
Reviewed by



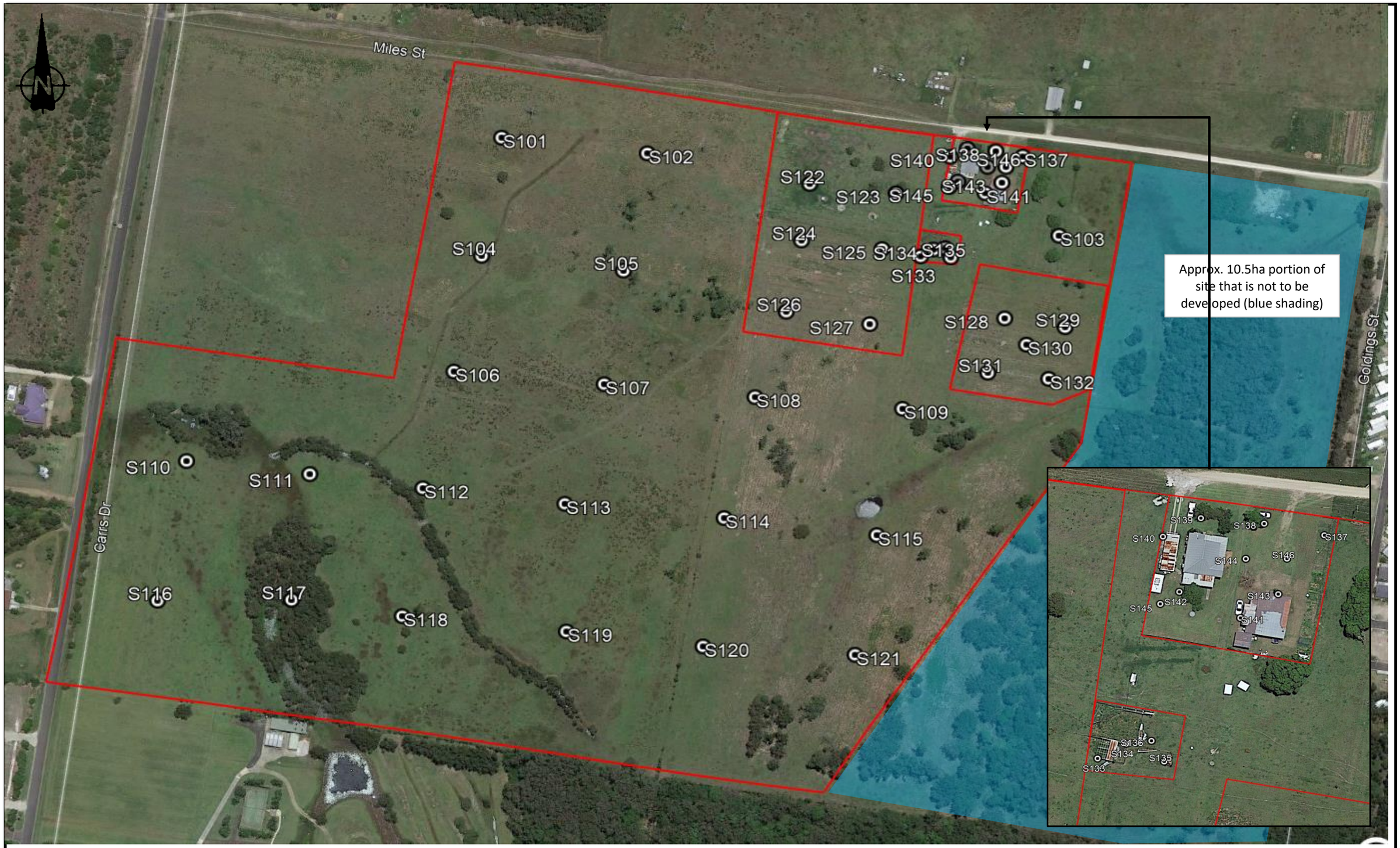
**Andrew Hills**

Senior Environmental Engineer

# Figures




| | | | | |
|---|---|---|---|---|
| REGIONAL GEOTECHNICAL SOLUTIONS | **Client:** | Kahuna No. 1 | Job No. | RGS31546.1 |
| | **Project:** | Stage 2 Site Contamination Assessment<br>52-54 Miles Street, Yamba | Drawn By: | SK |
| | | | Scale: | NTS |
| | | | Date: | 10-Mar-20 |
| | **Title:** | Areas of Environmental Concern | Drawing No. | 10-Mar-20 |




| | | | | |
|---|---|---|---|---|
| REGIONAL GEOTECHNICAL SOLUTIONS | **Client:** | Kahuna No. 1 Pty Ltd | Job No. | RGS31546.1-AL |
| | **Project:** | Proposed Residential Development<br>52-54 Miles Street, Yamba | Drawn By: | SK |
| | | | Scale: | NTS |
| | | | Date: | 26-Feb-20 |
| | **Title:** | Sample Location Plan | Drawing No. | **Figure 2** |

# Appendix A

## Laboratory Test Results

**TABLE A1 - RESULTS OF CHEMICAL ANALYSES** (concentrations in mg/kg) '**Residential A' Site**.

*National Environmental Protection Measure (NEPM) 2013 – Volume 2: Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater*

**Report No.** RGS31546.1-AL

**Site Location:** 52-54 Miles Street, Yamba

| Location | Depth (m) | Asebestos | TOTAL RECOVERABLE HYDROCARBONS | | | | | PAH | | OC-OP PESTICIDE | BTEX | PCB | HEAVY METALS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C6-C10 | C10-C16 | C16-C34 | C34-C40 | TOTAL 10-40 | Total | b-a-p | | | | As | Cd | Cr* | Cu | Pb | Hg | Ni | Zn |
| *Health Based Soil investigation Level* | | | | | | | | *300* | *3* | *6* | *NL* | *1* | *100* | *20* | *100* | *6000* | *300* | *40* | *400* | *7400* |
| *Ecological Investigation Level (EIL):* | | | | | | | | | | | | | | | | | | | | |
| *Ecological Screening Level (ESL):* | | | *180* | *120* | *300* | *2800* | | | *0.7* | | *50* | | ***Coarse grained soil in mg/kg*** | | | | | | | |
| | | | *180* | *120* | *1300* | *5600* | | | *0.7* | | *65* | | ***Fine grained soil in mg/kg*** | | | | | | | |
| C1 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 9 |
| C2 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 9 |
| C3 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 10 | 6 | 6 | <0.1 | 5 | 34 |
| C4 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 10 | <5 | 6 | <0.1 | 4 | 16 |
| C5 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 5 | <5 | <5 | <0.1 | 2 | 10 |
| S103 | 0-0.1 | | | | | | | | | <0.2 | | | 6 | <1 | 18 | <5 | 8 | <0.1 | 5 | 29 |
| D1 (S103 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | 6 | <1 | 19 | <5 | 9 | <0.1 | 6 | 27 |
| T1 (S103 Trip.) | 0-0.1 | | | | | | | | | | | | 7 | <0.5 | 20 | 6 | 10 | <0.1 | 7 | 32 |
| C8 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | 8 |
| S133 | 0-0.1 | No | <10 | <50 | 120 | <100 | 120 | | | | <0.2 | | <5 | <1 | 3 | 14 | 35 | <0.1 | 2 | 450 |
| D5 (S133 Dupl.) | 0-0.1 | ---- | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 3 | 13 | 33 | <0.1 | 3 | 429 |
| S134 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 3 | 6 | 102 | <0.1 | <2 | 235 |
| S135 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 42 | 11 | 62 | <0.1 | 4 | 111 |
| S136 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 5 | 10 | 58 | <0.1 | <2 | 212 |
| S137 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | 5 | <1 | 14 | 8 | 15 | <0.1 | 5 | 65 |
| S138 | 0-0.1 | No | <10 | <50 | 470 | 170 | 640 | | | | <0.2 | | <5 | <1 | 9 | 6 | 15 | <0.1 | 3 | 49 |
| D6 (S138 Dupl.) | 0-0.1 | ---- | <10 | <50 | 720 | 140 | 860 | | | | <0.2 | | <5 | <1 | 9 | 5 | 13 | <0.1 | 4 | 42 |
| S139 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 5 | 6 | 10 | <0.1 | 2 | 45 |
| S141 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 5 | 13 | 23 | <0.1 | <2 | 74 |
| S142 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 7 | 61 | 107 | 0.6 | 3 | 272 |
| S140 | 0-0.1 | ---- | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 4 | 26 | 16 | <0.1 | <2 | 99 |
| S143 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 8 | 20 | 54 | <0.1 | 3 | 132 |
| S144 | 0-0.1 | ---- | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 4 | 7 | 124 | 0.1 | <2 | 349 |
| S145 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 4 | 8 | 25 | <0.1 | <2 | 89 |
| S146 | 0-0.1 | No | <10 | <50 | <100 | <100 | <50 | | | | <0.2 | | <5 | <1 | 5 | <5 | <5 | <0.1 | <2 | 26 |
| C6 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 2 | <5 | <5 | <0.1 | <2 | 11 |
| C7 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 3 | <5 | <5 | <0.1 | <2 | 8 |
| S126 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 6 |
| D2 (S126 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 7 |
| T2 (S126 Trip.) | 0-0.1 | | | | | | | | | | | | <2 | <0.2 | <2 | 2 | 2 | <0.1 | <1 | 6 |

BLUE - Denotes concentration exceeds health based guideline for Residential A
GREEN - Denotes concentration exceeds ecological guideline for Residential A
ORANGE - Denotes concentration exceeds health and ecological based guideline

**TABLE A1 - RESULTS OF CHEMICAL ANALYSES** (concentrations in mg/kg) '**Residential A' Site**.

*National Environmental Protection Measure (NEPM) 2013 – Volume 2: Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater*

**Report No.** RGS31546.1-AL

**Site Location:** 52-54 Miles Street, Yamba

| Location | Depth (m) | Asebestos | TOTAL RECOVERABLE HYDROCARBONS | | | | | PAH | | OC-OP PESTICIDE | BTEX | PCB | HEAVY METALS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C6-C10 | C10-C16 | C16-C34 | C34-C40 | TOTAL 10-40 | Total | b-a-p | | | | As | Cd | Cr* | Cu | Pb | Hg | Ni | Zn |
| S127 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 2 | <5 | <5 | <0.1 | <2 | 7 |
| D3 (S127 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 2 | <5 | <5 | <0.1 | <2 | 8 |
| S130 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | 6 |
| D4 (S130 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | 6 |
| T3 (S130 Trip.) | 0-0.1 | | | | | | | | | | | | <2 | <0.5 | 4 | 2 | 3 | <0.1 | 2 | 6 |

BLUE - Denotes concentration exceeds health based guideline for Residential A
GREEN - Denotes concentration exceeds ecological guideline for Residential A
ORANGE - Denotes concentration exceeds health and ecological based guideline

**TABLE A2 - Relative Percentage Difference (RPD)**

**Report No.** RGS31546.1-AL

**Site Location:** 52-54 Miles Street, Yamba

| Location | Depth (m) | Asebestos | TOTAL RECOVERABLE HYDROCARBONS | | | | | PAH | | OC-OP PESTICIDE | BTEX | PCB | HEAVY METALS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C6-C10 | C10-C16 | C16-C34 | C34-C40 | TOTAL 10-40 | Total | b-a-p | | | | As | Cd | Cr* | Cu | Pb | Hg | Ni | Zn |
| *Limit of Reporting* | | | *10* | *50* | *100* | *100* | *100* | | | | | | *5* | *1* | *2* | *5* | *5* | *0* | *2* | *5* |
| S103 | 0-0.1 | | | | | | | | | <0.2 | | | 6 | <1 | 18 | <5 | 8 | <0.1 | 5 | 29 |
| D1 (S103 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | 6 | <1 | 19 | <5 | 9 | <0.1 | 6 | 27 |
| T1 (S103 Trip.) | 0-0.1 | | | | | | | | | | | | 7 | <0.5 | 20 | 6 | 10 | <0.1 | 7 | 32 |
| RPD (D1) | | | | | | | | | | 0% | | | 0% | 0% | 5% | 0% | 12% | 0% | 18% | 7% |
| RPD (T1) | | | | | | | | | | | | | 15% | 0% | 11% | 18% | 22% | 0% | 33% | 10% |
| S133 | 0-0.1 | No | <10 | <50 | 120 | <100 | 120 | | | | <0.2 | | <5 | <1 | 3 | 14 | 35 | <0.1 | 2 | 450 |
| D5 (S133 Dupl.) | 0-0.1 | ---- | <10 | <50 | 18 | <100 | <50 | | | | <0.2 | | <5 | <1 | 3 | 13 | 33 | <0.1 | 3 | 429 |
| RPD (D5) | | | 0% | 0% | 148% | 0% | 82% | | | | 0% | | 0% | 0% | 0% | 7% | 6% | 0% | 40% | 5% |
| S138 | 0-0.1 | No | <10 | <50 | 470 | 170 | 640 | | | | <0.2 | | <5 | <1 | 9 | 6 | 15 | <0.1 | 3 | 49 |
| D6 (S138 Dupl.) | 0-0.1 | ---- | <10 | <50 | 720 | 140 | 860 | | | | <0.2 | | <5 | <1 | 9 | 5 | 13 | <0.1 | 4 | 42 |
| RPD (D6) | | | 0% | 0% | 42% | 19% | 29% | | | | 0% | | 0% | 0% | 0% | 18% | 14% | 0% | 29% | 15% |
| S126 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 6 |
| D2 (S126 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | <2 | <5 | <5 | <0.1 | <2 | 7 |
| T2 (S126 Trip.) | 0-0.1 | | | | | | | | | | | | <2 | <0.2 | <2 | 2 | 2 | <0.1 | <1 | 6 |
| RPD (D2) | | | | | | | | | | 0% | | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 15% |
| RPD (T2) | | | | | | | | | | | | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| S127 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 2 | <5 | <5 | <0.1 | <2 | 7 |
| D3 (S127 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 2 | <5 | <5 | <0.1 | <2 | 8 |
| RPD (D3) | | | | | | | | | | 0% | | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 13% |
| S130 | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | 6 |
| D4 (S130 Dupl.) | 0-0.1 | | | | | | | | | <0.2 | | | <5 | <1 | 4 | <5 | <5 | <0.1 | <2 | 6 |
| T3 (S130 Trip.) | 0-0.1 | | | | | | | | | | | | <2 | <0.5 | 4 | 2 | 3 | <0.1 | 2 | 6 |
| RPD (D4) | | | | | | | | | | 0% | | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| RPD (T3) | | | | | | | | | | | | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

BLUE - Denotes concentration exceeds health based guideline for Residential A
GREEN - Denotes concentration exceeds ecological guideline for Residential A
ORANGE - Denotes concentration exceeds health and ecological based guideline

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2001976** | Page | : 1 of 11 |
| Client | : **REGIONAL GEOTECHNICAL SOLUTION** | Laboratory | : Environmental Division Sydney |
| Contact | : JOEL BABBAGE | Contact | : Customer Services ES |
| Address | : Unit 14 25-27 Hurley Drive<br>COFFS HARBOUR NSW, AUSTRALIA 2450 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : ---- | Telephone | : +61-2-8784 8555 |
| Project | : RGS31546.1 Carrs Drive | Date Samples Received | : 22-Jan-2020 13:45 |
| Order number | : ---- | Date Analysis Commenced | : 29-Jan-2020 |
| C-O-C number | : ---- | Issue Date | : 31-Jan-2020 17:05 |
| Sampler | : ---- | | |
| Site | : Yamba | | |
| Quote number | : EN/222 | | |
| No. of samples received | : 16 | | |
| No. of samples analysed | : 16 | | |

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 |

## General Comments

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

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

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

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

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

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

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

- 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 | S133 0-0.1 | S134 0-0.1 | S135 0-0.1 | S136 0-0.1 | S137 0-0.1 |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | ES2001976-001 | ES2001976-002 | ES2001976-003 | ES2001976-004 | ES2001976-005 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 6.0 | 8.9 | 4.2 | 9.1 | 7.1 |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | No | No | No | No | No |
| Asbestos (Trace) | 1332-21-4 | 5 | Fibres | No | No | No | No | No |
| Asbestos Type | 1332-21-4 | - | -- | - | - | - | - | - |
| Synthetic Mineral Fibre | ---- | 0.1 | g/kg | No | No | No | No | No |
| Organic Fibre | ---- | 0.1 | g/kg | No | No | No | No | No |
| Sample weight (dry) | ---- | 0.01 | g | 115 | 64.9 | 60.9 | 79.7 | 35.0 |
| APPROVED IDENTIFIER: | ---- | - | -- | A. SMYLIE | A. SMYLIE | A. SMYLIE | A. SMYLIE | A. SMYLIE |
| **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 | 3 | 3 | 42 | 5 | 14 |
| Copper | 7440-50-8 | 5 | mg/kg | 14 | 6 | 11 | 10 | 8 |
| Lead | 7439-92-1 | 5 | mg/kg | 35 | 102 | 62 | 58 | 15 |
| Nickel | 7440-02-0 | 2 | mg/kg | 2 | <2 | 4 | <2 | 5 |
| Zinc | 7440-66-6 | 5 | mg/kg | 450 | 235 | 111 | 212 | 65 |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| C10 - C14 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| C15 - C28 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| C29 - C36 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | 120 | <100 | <100 | <100 | <100 |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | 120 | <50 | <50 | <50 | <50 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S133 0-0.1 | S134 0-0.1 | S135 0-0.1 | S136 0-0.1 | S137 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | | ES2001976-001 | ES2001976-002 | ES2001976-003 | ES2001976-004 | ES2001976-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | | |
| ^ **>C10 - C16 Fraction minus Naphthalene (F2)** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **EP080: BTEXN** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <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 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Sum of BTEX** | ---- | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Total Xylenes** | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Naphthalene** | 91-20-3 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 0.2 | % | | **92.0** | **95.6** | **99.6** | **99.1** | **93.1** |
| **Toluene-D8** | 2037-26-5 | 0.2 | % | | **105** | **105** | **110** | **110** | **103** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.2 | % | | **92.4** | **89.5** | **97.6** | **95.9** | **91.6** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Client sample ID | S138 0-0.1 | S139 0-0.1 | S140 0-0.1 | S141 0-0.1 | S142 0-0.1 |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | ES2001976-006 | ES2001976-007 | ES2001976-008 | ES2001976-009 | ES2001976-010 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 10.6 | 11.4 | 3.7 | 5.8 | 3.5 |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | No | No | ---- | No | No |
| Asbestos (Trace) | 1332-21-4 | 5 | Fibres | No | No | ---- | No | No |
| Asbestos Type | 1332-21-4 | - | -- | - | - | ---- | - | - |
| Synthetic Mineral Fibre | ---- | 0.1 | g/kg | No | No | ---- | No | No |
| Organic Fibre | ---- | 0.1 | g/kg | No | No | ---- | No | No |
| Sample weight (dry) | ---- | 0.01 | g | 68.8 | 73.8 | ---- | 106 | 63.3 |
| APPROVED IDENTIFIER: | ---- | - | -- | A. SMYLIE | A. SMYLIE | ---- | A. SMYLIE | A. SMYLIE |
| **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 | 9 | 5 | 4 | 5 | 7 |
| Copper | 7440-50-8 | 5 | mg/kg | 6 | 6 | 26 | 13 | 61 |
| Lead | 7439-92-1 | 5 | mg/kg | 15 | 10 | 16 | 23 | 107 |
| Nickel | 7440-02-0 | 2 | mg/kg | 3 | 2 | <2 | <2 | 3 |
| Zinc | 7440-66-6 | 5 | mg/kg | 49 | 45 | 99 | 74 | 272 |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | 0.6 |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| C10 - C14 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| C15 - C28 Fraction | ---- | 100 | mg/kg | 350 | <100 | <100 | <100 | <100 |
| C29 - C36 Fraction | ---- | 100 | mg/kg | 220 | <100 | <100 | <100 | <100 |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | 570 | <50 | <50 | <50 | <50 |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | 470 | <100 | <100 | <100 | <100 |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | 170 | <100 | <100 | <100 | <100 |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | 640 | <50 | <50 | <50 | <50 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S138 0-0.1 | S139 0-0.1 | S140 0-0.1 | S141 0-0.1 | S142 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | | ES2001976-006 | ES2001976-007 | ES2001976-008 | ES2001976-009 | ES2001976-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | | |
| ^ **>C10 - C16 Fraction minus Naphthalene (F2)** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **EP080: BTEXN** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <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 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Sum of BTEX** | ---- | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Total Xylenes** | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Naphthalene** | 91-20-3 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 0.2 | % | | **91.0** | **88.5** | **89.8** | **95.6** | **94.8** |
| **Toluene-D8** | 2037-26-5 | 0.2 | % | | **102** | **97.9** | **97.7** | **103** | **104** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.2 | % | | **87.3** | **85.0** | **85.1** | **89.0** | **89.8** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Client sample ID | S143 0-0.1 | S144 0-0.1 | S145 0-0.1 | S146 0-0.1 | D5 0-0.1 |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | ES2001976-011 | ES2001976-012 | ES2001976-013 | ES2001976-014 | ES2001976-015 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 5.5 | 6.3 | <1.0 | 4.5 | 11.8 |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | No | ---- | No | No | ---- |
| Asbestos (Trace) | 1332-21-4 | 5 | Fibres | No | ---- | No | No | ---- |
| Asbestos Type | 1332-21-4 | - | -- | - | ---- | - | - | ---- |
| Synthetic Mineral Fibre | ---- | 0.1 | g/kg | No | ---- | No | No | ---- |
| Organic Fibre | ---- | 0.1 | g/kg | No | ---- | No | No | ---- |
| Sample weight (dry) | ---- | 0.01 | g | 88.1 | ---- | 91.0 | 122 | ---- |
| APPROVED IDENTIFIER: | ---- | - | -- | A. SMYLIE | ---- | A. SMYLIE | A. SMYLIE | ---- |
| **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 | 8 | 4 | 4 | 5 | 3 |
| Copper | 7440-50-8 | 5 | mg/kg | 20 | 7 | 8 | <5 | 13 |
| Lead | 7439-92-1 | 5 | mg/kg | 54 | 124 | 25 | <5 | 33 |
| Nickel | 7440-02-0 | 2 | mg/kg | 3 | <2 | <2 | <2 | 3 |
| Zinc | 7440-66-6 | 5 | mg/kg | 132 | 349 | 89 | 26 | 429 |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | 0.1 | <0.1 | <0.1 | <0.1 |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| C10 - C14 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| C15 - C28 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| C29 - C36 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | <10 | <10 | <10 | <10 | <10 |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | <100 | <100 | <100 | <100 | <100 |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S143 0-0.1 | S144 0-0.1 | S145 0-0.1 | S146 0-0.1 | D5 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 | 21-Jan-2020 00:00 |
| Compound | CAS Number | LOR | Unit | | ES2001976-011 | ES2001976-012 | ES2001976-013 | ES2001976-014 | ES2001976-015 |
| | | | | | Result | Result | Result | Result | Result |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | | |
| ^ **>C10 - C16 Fraction minus Naphthalene (F2)** | ---- | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| **EP080: BTEXN** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <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 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ **Sum of BTEX** | ---- | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Total Xylenes** | ---- | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Naphthalene** | 91-20-3 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 0.2 | % | | **97.9** | **80.8** | **99.6** | **97.4** | **98.7** |
| **Toluene-D8** | 2037-26-5 | 0.2 | % | | **104** | **86.6** | **108** | **104** | **105** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.2 | % | | **91.6** | **72.9** | **95.4** | **88.2** | **91.5** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | D6 0-0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Jan-2020 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2001976-016 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EA055: Moisture Content** | | | | | | | | | |
| **Moisture Content** | ---- | 1.0 | % | | **12.1** | ---- | ---- | ---- | ---- |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | | |
| **Arsenic** | 7440-38-2 | 5 | mg/kg | | <5 | ---- | ---- | ---- | ---- |
| **Cadmium** | 7440-43-9 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| **Chromium** | 7440-47-3 | 2 | mg/kg | | **9** | ---- | ---- | ---- | ---- |
| **Copper** | 7440-50-8 | 5 | mg/kg | | **5** | ---- | ---- | ---- | ---- |
| **Lead** | 7439-92-1 | 5 | mg/kg | | **13** | ---- | ---- | ---- | ---- |
| **Nickel** | 7440-02-0 | 2 | mg/kg | | **4** | ---- | ---- | ---- | ---- |
| **Zinc** | 7440-66-6 | 5 | mg/kg | | **42** | ---- | ---- | ---- | ---- |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | | |
| **Mercury** | 7439-97-6 | 0.1 | mg/kg | | <0.1 | ---- | ---- | ---- | ---- |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| **C6 - C9 Fraction** | ---- | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| **C10 - C14 Fraction** | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| **C15 - C28 Fraction** | ---- | 100 | mg/kg | | **560** | ---- | ---- | ---- | ---- |
| **C29 - C36 Fraction** | ---- | 100 | mg/kg | | **240** | ---- | ---- | ---- | ---- |
| ^ **C10 - C36 Fraction (sum)** | ---- | 50 | mg/kg | | **800** | ---- | ---- | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| **C6 - C10 Fraction** | C6_C10 | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| ^ **C6 - C10 Fraction minus BTEX (F1)** | C6_C10-BTEX | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| **>C10 - C16 Fraction** | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| **>C16 - C34 Fraction** | ---- | 100 | mg/kg | | **720** | ---- | ---- | ---- | ---- |
| **>C34 - C40 Fraction** | ---- | 100 | mg/kg | | **140** | ---- | ---- | ---- | ---- |
| ^ **>C10 - C40 Fraction (sum)** | ---- | 50 | mg/kg | | **860** | ---- | ---- | ---- | ---- |
| ^ **>C10 - C16 Fraction minus Naphthalene (F2)** | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| **EP080: BTEXN** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ **Sum of BTEX** | ---- | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | D6 0-0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Jan-2020 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2001976-016 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP080: BTEXN - Continued** | | | | | | | | | |
| ^ **Total Xylenes** | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **Naphthalene** | 91-20-3 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 0.2 | % | | **90.8** | ---- | ---- | ---- | ---- |
| **Toluene-D8** | 2037-26-5 | 0.2 | % | | **97.3** | ---- | ---- | ---- | ---- |
| **4-Bromofluorobenzene** | 460-00-4 | 0.2 | % | | **83.6** | ---- | ---- | ---- | ---- |

## 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 | S1330-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1340-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1350-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1360-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1370-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1380-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1390-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1410-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1420-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1430-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1450-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |
| EA200: Description | S1460-0.1 - 21-Jan-2020 00:00 | Mid brown soil. |

## Surrogate Control Limits

| Sub-Matrix: **SOIL** | | Recovery Limits (%) | |
|---|---|---|---|
| *Compound* | *CAS Number* | *Low* | *High* |
| **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 |

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2001977** | Page | : 1 of 15 |
| Client | : **REGIONAL GEOTECHNICAL SOLUTION** | Laboratory | : Environmental Division Sydney |
| Contact | : JOEL BABBAGE | Contact | : Customer Services ES |
| Address | : Unit 14 25-27 Hurley Drive<br>COFFS HARBOUR NSW, AUSTRALIA 2450 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : ---- | Telephone | : +61-2-8784 8555 |
| Project | : RGS31546.1 Carrs Drive | Date Samples Received | : 22-Jan-2020 13:45 |
| Order number | : ---- | Date Analysis Commenced | : 23-Jan-2020 |
| C-O-C number | : ---- | Issue Date | : 29-Jan-2020 14:38 |
| Sampler | : ---- | | |
| Site | : Yamba | | |
| Quote number | : EN/222 | | |
| No. of samples received | : 16 | | |
| No. of samples analysed | : 16 | | |

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

## *Signatories*

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

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Celine Conceicao | Senior Spectroscopist | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, Smithfield, NSW |
| Wisam Marassa | Inorganics Coordinator | Sydney Inorganics, Smithfield, NSW |

## General Comments

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

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

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

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

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

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

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

- EG005: Poor precision was obtained for Manganese on sample ES2001944-119. Results have been confirmed by re-extraction and reanalysis.

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Client sample ID | C1 0-0.1 | C2 0-0.1 | C3 0-0.1 | C4 0-0.1 | C5 0-0.1 |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | ES2001977-001 | ES2001977-002 | ES2001977-003 | ES2001977-004 | ES2001977-005 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 7.3 | 7.9 | 17.9 | 13.2 | 7.0 |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Barium | 7440-39-3 | 10 | mg/kg | <10 | <10 | 20 | 20 | 20 |
| Beryllium | 7440-41-7 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Boron | 7440-42-8 | 50 | mg/kg | <50 | <50 | <50 | <50 | <50 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | <2 | <2 | 10 | 10 | 5 |
| Cobalt | 7440-48-4 | 2 | mg/kg | <2 | <2 | 2 | <2 | <2 |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | 6 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | <5 | <5 | 6 | 6 | <5 |
| Manganese | 7439-96-5 | 5 | mg/kg | 16 | 17 | 69 | 27 | 20 |
| Nickel | 7440-02-0 | 2 | mg/kg | <2 | <2 | 5 | 4 | 2 |
| Selenium | 7782-49-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Vanadium | 7440-62-2 | 5 | mg/kg | <5 | <5 | 18 | 18 | 9 |
| Zinc | 7440-66-6 | 5 | mg/kg | 9 | 9 | 34 | 16 | 10 |
| **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 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | C1 0-0.1 | C2 0-0.1 | C3 0-0.1 | C4 0-0.1 | C5 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-001 | ES2001977-002 | ES2001977-003 | ES2001977-004 | ES2001977-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| 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 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | | 108 | 101 | 95.8 | 91.9 | 91.7 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | C1 0-0.1 | C2 0-0.1 | C3 0-0.1 | C4 0-0.1 | C5 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-001 | ES2001977-002 | ES2001977-003 | ES2001977-004 | ES2001977-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068T: Organophosphorus Pesticide Surrogate - Continued** | | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | | **85.7** | **86.9** | **74.9** | **95.9** | **81.4** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | C6 0-0.1 | C7 0-0.1 | C8 0-0.1 | S103 0-0.1 | S126 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-006 | ES2001977-007 | ES2001977-008 | ES2001977-009 | ES2001977-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | | 6.8 | 9.4 | 2.8 | 19.0 | 12.1 |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | | <5 | <5 | <5 | 6 | <5 |
| Barium | 7440-39-3 | 10 | mg/kg | | <10 | 10 | 10 | 30 | <10 |
| Beryllium | 7440-41-7 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| Boron | 7440-42-8 | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| Cadmium | 7440-43-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | | 2 | 3 | 4 | 18 | <2 |
| Cobalt | 7440-48-4 | 2 | mg/kg | | <2 | <2 | <2 | 4 | <2 |
| Copper | 7440-50-8 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | | <5 | <5 | <5 | 8 | <5 |
| Manganese | 7439-96-5 | 5 | mg/kg | | 26 | 21 | 14 | 147 | 15 |
| Nickel | 7440-02-0 | 2 | mg/kg | | <2 | <2 | <2 | 5 | <2 |
| Selenium | 7782-49-2 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| Vanadium | 7440-62-2 | 5 | mg/kg | | <5 | 8 | 6 | 36 | <5 |
| Zinc | 7440-66-6 | 5 | mg/kg | | 11 | 8 | 8 | 29 | 6 |
| **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 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | C6 0-0.1 | C7 0-0.1 | C8 0-0.1 | S103 0-0.1 | S126 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-006 | ES2001977-007 | ES2001977-008 | ES2001977-009 | ES2001977-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| 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 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | | 110 | 98.9 | 101 | 102 | 114 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | C6 0-0.1 | C7 0-0.1 | C8 0-0.1 | S103 0-0.1 | S126 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-006 | ES2001977-007 | ES2001977-008 | ES2001977-009 | ES2001977-010 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068T: Organophosphorus Pesticide Surrogate - Continued** | | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | | 110 | 84.3 | 70.2 | 108 | 95.1 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S127 0-0.1 | S130 0-0.1 | D1 0-0.1 | D2 0-0.1 | D3 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-011 | ES2001977-012 | ES2001977-013 | ES2001977-014 | ES2001977-015 |
| | | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | | 5.5 | 11.4 | 20.8 | 12.7 | 4.1 |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | | <5 | <5 | 6 | <5 | <5 |
| Barium | 7440-39-3 | 10 | mg/kg | | <10 | 10 | 30 | <10 | <10 |
| Beryllium | 7440-41-7 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| Boron | 7440-42-8 | 50 | mg/kg | | <50 | <50 | <50 | <50 | <50 |
| Cadmium | 7440-43-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | | 2 | 4 | 19 | <2 | 2 |
| Cobalt | 7440-48-4 | 2 | mg/kg | | <2 | <2 | 4 | <2 | <2 |
| Copper | 7440-50-8 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | | <5 | <5 | 9 | <5 | <5 |
| Manganese | 7439-96-5 | 5 | mg/kg | | 13 | 10 | 117 | 18 | 20 |
| Nickel | 7440-02-0 | 2 | mg/kg | | <2 | <2 | 6 | <2 | <2 |
| Selenium | 7782-49-2 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| Vanadium | 7440-62-2 | 5 | mg/kg | | <5 | 8 | 38 | <5 | <5 |
| Zinc | 7440-66-6 | 5 | mg/kg | | 7 | 6 | 27 | 7 | 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 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S127 0-0.1 | S130 0-0.1 | D1 0-0.1 | D2 0-0.1 | D3 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-011 | ES2001977-012 | ES2001977-013 | ES2001977-014 | ES2001977-015 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| 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 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | | 100 | 98.5 | 96.8 | 99.1 | 100 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | S127 0-0.1 | S130 0-0.1 | D1 0-0.1 | D2 0-0.1 | D3 0-0.1 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] | [22-Jan-2020] |
| Compound | CAS Number | LOR | Unit | | ES2001977-011 | ES2001977-012 | ES2001977-013 | ES2001977-014 | ES2001977-015 |
| | | | | | Result | Result | Result | Result | Result |
| **EP068T: Organophosphorus Pesticide Surrogate - Continued** | | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | | 122 | 98.0 | 88.4 | 89.7 | 129 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | D4 0-0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2001977-016 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | | 10.5 | ---- | ---- | ---- | ---- |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | | <5 | ---- | ---- | ---- | ---- |
| Barium | 7440-39-3 | 10 | mg/kg | | 10 | ---- | ---- | ---- | ---- |
| Beryllium | 7440-41-7 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| Boron | 7440-42-8 | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| Cadmium | 7440-43-9 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| Chromium | 7440-47-3 | 2 | mg/kg | | 4 | ---- | ---- | ---- | ---- |
| Cobalt | 7440-48-4 | 2 | mg/kg | | <2 | ---- | ---- | ---- | ---- |
| Copper | 7440-50-8 | 5 | mg/kg | | <5 | ---- | ---- | ---- | ---- |
| Lead | 7439-92-1 | 5 | mg/kg | | <5 | ---- | ---- | ---- | ---- |
| Manganese | 7439-96-5 | 5 | mg/kg | | 10 | ---- | ---- | ---- | ---- |
| Nickel | 7440-02-0 | 2 | mg/kg | | <2 | ---- | ---- | ---- | ---- |
| Selenium | 7782-49-2 | 5 | mg/kg | | <5 | ---- | ---- | ---- | ---- |
| Vanadium | 7440-62-2 | 5 | mg/kg | | 7 | ---- | ---- | ---- | ---- |
| Zinc | 7440-66-6 | 5 | mg/kg | | 6 | ---- | ---- | ---- | ---- |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | | <0.1 | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Aldrin | 309-00-2 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Endrin | 72-20-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | D4 0-0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2001977-016 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| 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 | ---- | ---- | ---- | ---- |
| 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 | % | | 98.5 | ---- | ---- | ---- | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | D4 0-0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [22-Jan-2020] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2001977-016 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate - Continued** | | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | | **97.0** | **----** | **----** | **----** | **----** |

## 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 |

# RESULTS OF SOIL ANALYSIS

3 samples supplied by Regional Geotechnical Solutions Pty Ltd on 2/03/2020 . Lab Job No. J1296.

Samples submitted by Joel Babbage. Your Job: RGS31546.1.

44 Bent Street WINGHAM NSW 2429

| | Method | Sample 1<br>T1 0-0.1 | Sample 2<br>T2 0-0.1 | Sample 3<br>T3 0-0.1 |
|---|---|---|---|---|
| | *Job No.* | *J1296/1* | *J1296/2* | *J1296/3* |
| **Silver (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | <1 | <1 | <1 |
| **Arsenic (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 7 | <2 | <2 |
| **Lead (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 10 | 2 | 3 |
| **Cadmium (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | <0.5 | <0.5 | <0.5 |
| **Chromium (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 20 | <2 | 4 |
| **Copper (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 6 | 2 | 2 |
| **Manganese (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 146 | 21 | 12 |
| **Nickel (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 7 | <1 | 2 |
| **Selenium (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 0.8 | <0.5 | <0.5 |
| **Zinc (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 32 | 7 | 6 |
| **Mercury (mg/kg)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | <0.1 | <0.1 | <0.1 |
| **Iron (%)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 2.46 | 0.08 | 0.38 |
| **Aluminium (%)** | 1:3 Nitric/HCl digest - APHA 3125 ICPMS | 1.57 | 0.20 | 0.59 |

**Notes:**

1. ppm = mg/Kg dried sample
2. All results as dry weight DW - samples were dried at 40oC for 24-48hrs prior to crushing and analysis.
3. Methods from Rayment and Lyons, Soil Chemical Methods - Australasia
4. Metals analysed by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry)
5. Analysis conducted between sample arrival date and reporting date.
6. ** NATA accreditation does not cover the performance of this service.
7. .. Denotes not requested.
8. This report is not to be reproduced except in full.
9. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
10. Results relate only to the samples tested.
11. This report was issued on 09/03/2020.

NATA
WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster
Laboratory Manager

# Appendix B

## Report Review by Certified Environmental Practitioner Site Contamination Specialist

# Contaminated Land Solutions

12 March 2020

Ref: 0067.L02

Regional Geotechnical Solutions Pty Ltd
Unit 4
25-27 Hurley Drive
Coffs Harbour
NSW 2450

For the attention of Simon Keen

Dear Simon,

**RE: Report Review Stage2 Site Contamination Assessment Report – Proposed Residential Development, 52-54 Miles Street, Yamba**

I, Dr David Tully of Contaminated Land Solutions Pty Ltd, am a Certified Environmental Practitioner Site Contamination Specialist (General Certified Environmental Practitioner certification no. 1138 and Site Contamination Specialist certification no. SC40084).

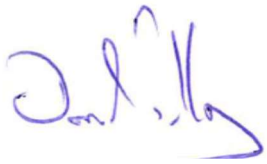
I confirm I have reviewed the Regional Geotechnical Solutions report entitled "Stage 2 Site Contamination Assessment Report – *Proposed Residential Development, 52-54 Miles Street, Yamba*" (Ref: RGS31546.1-AL), dated 10 March 2020 and a copy of which I have retained.

I can confirm that on the basis of the information contained within the report, I support the conclusions and recommendations provided therein.

Should the client, regulator or local authority have any queries regarding the report review, I can be contacted by e-mail via david.tully@contaminatedlandsolutions.com.au. Specific queries regarding the content of the report should be addressed to Simon Keen at Regional Geotechnical Solutions.

For and on behalf of

**Contaminated Land Solutions Pty Ltd**



Dr David Tully CEnvP SC
Director
Contaminated Land Solutions Pty Ltd

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