

PRELIMINARY SITE INVESTIGATION (PSI)

FELICITY DR, MONALTRIE, NEW SOUTH WALES



PREPARED FOR:

Sewak Pty Ltd
20 King George Dr, Lismore, NSW 2480

PREPARED BY:

Mr. Dane Egelton
Contaminated Site Investigation Australia Pty Ltd
PO Box 389, Alstonville NSW 2477



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Figure 4: 1971 Aerial Photo

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APPENDIX 2 – LABORATORY REPORTS

APPENDIX 3 – HISTORICAL TITLE SEARCHES

ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGS	Below Ground Surface
BH	Bore Hole
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene
BOC	Below Top of Casing
C ₆ -C ₃₆	Hydrocarbon chain length fraction
COPC	Contaminants of Potential Concern
CSI Aus	Contaminated Site Investigations Australia
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
GPR	Ground Penetrating Radar
HDPE	High Density Polyethylene
HIL	Health Investigation Level
HSL	Health Screening Level
IP	Interface Probe
LNAPL	Light Non-Aqueous Phase Liquid
MAH	Monocyclic Aromatic Hydrocarbon
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionisation Detector
RPD	Relative Percentage Difference
QA	Quality Assurance
QC	Quality Control
RAP	Remediation Action Plan
SAQP	Sampling Analysis and Quality Plan
SVB	Soil Vapour Bore
TDS	Total Dissolved Solid
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbon
TRH	Total Recoverable Hydrocarbon
USCS	Unified Soil Classification System
UST	Underground Storage Tank
VOC	Volatile Organic Compound
XRF	X-Ray Fluorescence Analyser

1 Introduction

Contaminated Site Investigations Australia Pty Ltd (CSI Aus) was commissioned by Ardill Payne and Partners Pty Ltd (on behalf of the site owner Mr. Bill Roberts of Sewak P/L), to conduct a preliminary site investigation (PSI) at the rural property, located at the end of Felicity Drive, Monaltrie, New South Wales (the site).

The site is currently vacant rural land and the site owners intend to subdivide the land into 30 residential lots. The current zoning across the site is RU1, with the proposed rezoning to R1. The PSI investigation is limited to the elevated portion of the site which is to be developed.

The proposed sub-division of the site has triggered the need for the PSI under State Environmental Planning Policy No. 55 Remediation of Land (SEPP 55). This report pertains to the portion of the Lot that is proposed for a residential subdivision only.

1.1 Objectives

The objective of the PSI is to identify potential contamination of surface soils or potentially contaminating historical activities at the site and make an assessment of the sites' suitability for residential use, or if further investigation is required. This objective will be met via desktop research of government sources, a site visit and walk-over, surface soil sampling and subsequent laboratory analysis.

1.2 Scope of Works

The following scope of works was undertaken by CSI Aus, in accordance with NSW EPA guidelines and Lismore Councils specifications:

- Desktop assessment of site location, setting and historical building and development applications;
- Review of available historical aerial photography and historical title searches;
- Site visit and walk-over (see photos in report);
- Collection of eleven primary samples to assess for contaminants of potential concern (COPC);
- Chain of Custody documentation;
- Analysis of samples via a NATA accredited laboratory; and
- Preparation of this PSI report.

2 Site Information

2.1 Site Identification

The site is located at an elevated section of range south of East Lismore. General site information is presented in Table 1 below, and a Site Layout Plan is included as Figure 1, Appendix A.

Table 1: General Site Information

Table 1 General Site Information	
Site Address:	End of Felicity Drive East Lismore which is the suburb boundary to Monaltrie (south of East Lismore)
Land Description:	Vacant Rural land
Site Area:	Approximately 4.8ha is the focus area of this PSI. The whole lot is approximately 62 ha
Site Owner:	Mr Bill Roberts
Municipality	Lismore
Formal ID:	Lot 3 in DP 805680
Current Zoning:	RU1 Primary Production
Current Site Use:	Vacant with seasonal cattle agistment
Proposed Site Use:	Residential subdivision
Adjoining Land Uses:	North: East Lismore residential housing development East: Wilson Nature Reserve and Council depot South: Lismore rainforest botanic gardens and Lismore Community recycling centre West: Cattle farming and the Wilson River

2.2 Regional Setting

The local landscape is high rolling hills and steep waning hills. The subdivision portion of the site is located at approximately 120 m to 135m AHD and slopes to the west, south and east in accordance with the local topography. The nearest surface water body is the Wilson River located approximately 1km west of the site.

2.3 Geology / Soils

A review of the NSW Government online mapping service indicates that the site is underlain by the Lismore basalts which are of the Tertiary Period. Only minor Basalt outcrops were observed during the site visit.

The dominant soil type for the region is a dark reddish-brown friable clay loam topsoil (Georgica). The total soil depth generally ranges from 0.5 to 1m. The ridgetop is considered to be low probability for potential acid sulphate soils.

The site soils were relatively uniform in lithology and consisted of a firm dark reddish-brown clay loam. Surface vegetation (grass) was removed to expose the soils for sampling. Shallow soils were high in organic material - grass rootlets.

A total of eleven soil samples and two duplicates were collected from surface soils and submitted for analysis by a NATA accredited laboratory. See Appendix B for laboratory reports, and Figure 1 and 2 for site layout and sample locations.

PHOTOGRAPH 1 AND 2



Left: Basalt outcrop

Right: Soil sample location EL4



2.4 Site Visit and Observations

A site visit and walk-over was conducted by Dane Egelton of CSI Aus on 19 August and again on 7 September 2020. At the entrance to the site, two farm sheds were observed to still be present and housed a tractor, a car and some macadamia farming equipment. An above ground diesel tank (800L capacity) was noted to be in this same location which is just inside of the proposed residential development boundary. The soils around the base of the tank were inspected for staining and odours and two samples were collected for laboratory analysis. The tank was in reasonable condition and there was no observable evidence of significant spills or poorly maintained infrastructure. See results section for lab data.

The entire site had tall grass and had not been cattle farmed for a number of months prior to the visit. The majority of the site was cleared of original native vegetation and the previous macadamia plantation, with only sparse mature vegetation remaining along fence lines, and the steep western ridge slope.

There were no visual or olfactory indicators of industrial activities that would potentially cause contamination of the site soils or underlying groundwater. Note; groundwater was not assessed during this PSI because there was no evidence to suggest it was warranted.

Asbestos containing materials were not observed, and the site surface was free of any unnatural materials or imported fill (with the exception of sandstone blocks at the site entry).

PHOTOGRAPH 3

CURRENT SITE LAYOUT AND SETTING – VIEW FROM RIDGETOP LOOKING SOUTH-EAST



PHOTOGRAPH 4 SHED AND ABOVE GROUND FUEL TANK



3 Historical Information

3.1 Title Search

Limited information on previous site use and ownership was obtained from the NSW land registry services. See summary table below and Appendix 3 for land title documents.

Historical title searches indicate that the current Lot 3/805680 was formally three or more separate lots. These former titles were: Crown land, 1/728271, 21/793350, Vol 2073 Fol 107, Vol2933 Fol 12, Vol 3376 Fol 185, Vol 1147 Fol 227, Vol 5251 Fol 9 and 121/787624.

There is small gap in the available information between 1953 and 1974 and anecdotal evidence suggests that the owner was George Davis who sold it to the current owners - the Roberts family. The property has only been used for farming (cattle) in the past (prior to macadamia farming).

Table 2 Historical Title Search	
Date	Information
15/11/1894	Land Granted to John Sheehan (40 acre portion of the current Lot)
30/8/1904	Land registered to Johns Widow – Bridget Sheehan
21/11/1912	Land Registered to Mary Catherine Collins
15/9/1916	Land registered to Timothy Joseph Collins
4/12/1922	Land Registered to David Kirk Martin
16/4/1923	Land Transferred to the Bank of New South Wales
19/6/1933	Land leased to Elsie May Anderson
22/9/1936	Discharge of mortgage (David Kirk Martin)
30/6/1941	Land title transferred to Thomas John Gahan (Vol 1147 Fol 227 and Vol 3376 Fol 185 merged to become a 120 acre Lot)
18/3/1953	Land title transferred to Joseph Bede Gahan
?	Anecdotal information suggests that George Davis became the owner of the property
~ 1974	Land registered to Alexander Cyffen Roberts
26/6/1974	Grant of land as compensation for land resumed for a public road (160m ²)
2010?	Title transferred to Sewak P/L (Bill Roberts and family)

3.2 Aerial Photography

The NSW Government spatial services were contacted to review historical aerial photographs of the site. From the available photographs, five were obtained for the years 1958, 1971, 1987, 1991 and 1997 to assess the land use activities that may be visually obvious. These photos are presented in Appendix 1, Figure's 3 to 7.

In summary, the land use and layout has not changed significantly between the 1958 aerial photograph and the site walk over conducted in 2020. Apart from the construction of sheds associated with macadamia farming in the 1980's the property has remained relatively undeveloped since it was crown land.

3.3 Cattle Dip Search Results

No cattle dips or similar structures were observed during site visit. The Department of Primary industries online services were viewed to identify the presence of former cattle dip's on the site or nearby. No cattle dips were identified onsite or upgradient nearby. Lismore Councils online mapping services did identify a cattle dip site approximately 800m south and down gradient on Lot 2 DP 701097.

Therefore this site is not considered to be a risk of residual cattle dip contaminants.

4 Contaminants

4.1 Possible Sources of Contamination

With the sites' previous use as cattle farming and macadamia farming the following potential sources of contamination have been identified.

- Agriculture
- Chemical storage – pesticides, fuels etc
- Historically imported fill material

4.2 Contaminants of Potential Concern

Based on the review of the sites' history, contaminants of potential concern are considered to include:

- Pesticides (macadamia farming)
- Total Recoverable hydrocarbons (TRH) (Fuel Storage onsite in an AST).
- Heavy Metals/Metalloids (Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead and Zinc) – common contaminants on human modified environments.

Following a desktop review of site history and a site visit, there are no impacts expected on groundwater at the site resulting from previous use, and therefore, soil vapour and groundwater were not investigated (or considered necessary) as part of this PSI.

5 Guidelines & Criteria

The soil analytical results have been assessed with regard to the suitability of the site for the proposed residential development. The following receptors have been identified as requiring protection:

- Human Health - Future occupants of the residential development
- Maintenance of Modified Ecosystems

The adopted guidelines associated with the protection of each identified receptor are detailed in the following sections. The guidelines have been sourced from the National Environment Protection Measure - Assessment of Site Contamination, as amended in 2013 (NEPM). The NEPM presents a range of guidelines applicable for the protection of receptors associated with land uses.

It is emphasised within the NEPM that the purpose of the guidelines is to provide a basis whereby the chemical profile for a site may be screened to identify conditions that may warrant further consideration of risks to human health or the environment. Therefore, the guidelines do not represent values above which remedial action or other site management measure would be required. Rather, the adopted guidelines provide an appropriate basis for identifying conditions which do not warrant any further consideration.

5.1 Ecological Criteria

The NEPM defines Ecological Investigation Levels (EILs) based on land use and soil properties (pH, cation exchange capacity, and clay content). As no assessment of soil properties has been undertaken at the site, the most conservative criteria have been adopted for the land use setting 'Residential / Public Open Space'. In addition to the EILs, the NEPM defines Ecological Screening Levels (ESLs) for hydrocarbons, based on the land use and soil type. The selected ESLs have been adopted for the land use 'Urban Residential / Public Open Space'. The selected soil texture 'fine' has been adopted as the site uppermost geology consists predominantly of sandy clay.

5.2 Human Health Criteria

The NEPM provides Health Investigation Levels (HILs) and Health Screening Levels (HSLs) for a range of different land uses and soil types. The human health criteria for the site have been adopted for the land use setting 'Residential A', which includes garden accessible soil for home grown produce of <10% fruit and vegetable intake (no poultry). The selected soil texture 'clay' has been adopted as the site uppermost geology consists predominantly of sandy clay.

TABLE 3 Assessment Criteria				
Element / Compound 1,2,3	Health-based Investigation levels (mg/kg)			
	Residential A	Residential B	Recreational C	Commercial / Industrial D
Metals				
Arsenic	100	500	300	3,000
Cadmium	20	150	90	900
Chromium (VI)	100	500	300	3,600
Copper	6,000	30,000	17,000	240,000
Lead	300	1,200	600	1,500
Nickel	400	1,200	1,200	6,000
Zinc	7,400	60,000	30,000	40,000
Mercury	40	120	80	730
Organochlorine Pesticides				
DDT+DDE+DDD	240	600	400	3600
Aldrin & Dieldrin	6	10	10	45
Chlordane	50	90	70	530
Endosulfan	270	400	340	2,000
Endrin	10	20	20	100
Heptachlor	6	10	10	50
HCB	10	15	10	80
Methoxychlor	300	500	400	2,500
Toxaphene	20	30	30	160
Total Recoverable Hydrocarbons & PAHs				
F1 TRH (C6 – C10) less BTEX	45			
F2 TRH (>C10 – C16) Less Naphthalene	110			

Notes: 1: NEPC (2013) – Health Screening Levels for Vapour Intrusion (HSL-A&B Low-high density residential) for Sand.
2: CRC Care (2011) - Health Screening Levels for Vapour Intrusion. Low-high density residential) for Sand. 0.15mbgs.
3: NEPC (2013) – Interim Health Investigation Levels. Residential Setting A. (Low density residential).

5.3 Data Quality Objectives

Data quality objectives (DQOs) were developed to define the type and quality of data required to achieve the potential soil contamination assessment and, if required, remediation investigation objectives. Development of the DQOs was based on guidelines in the US EPA *Guidance for the Data Quality Objectives Process* (2000), and

with reference to relevant guidelines published by the NSW EPA (1997 and 1998), ANZECC 2000, and NEPC 2013, which define minimum data requirements and quality control procedures.

The DQO process comprises a seven-step planning approach. Using this approach, CSI Aus has developed the sampling design for data collection activities that support the objectives of the soil investigation and facilitate decision-making. Table 4 below lists the seven steps and identifies the sections within this report that addresses those steps.

TABLE 4 Data Quality Objectives Process	
DQO Step	Discussion and Detailed description
1. Define the problem	Assessment of site history and limited soil sample data from the site proposed to be rezoned. Soil data has not previously been obtained at the site and site history indicates predominantly rural use. The potential for site contamination needs to be assessed.
2. Identify the decision	If identified COPC are detected in surface soils exceed Tier 1 or Tier 2 Risk Assessment Criteria. If the 95% UCL does <u>not</u> exceed Tier 1 and/or Tier 2 Risk Assessment Criteria a human health pathway is considered to not exist.
3. Identify the inputs of the decision	Correct collection of soil samples, sample preservation and use of a NATA accredited laboratory. Surface soil samples collected from five locations selected judgmentally across the site. Analysis of soil samples for 8 common heavy metals and persistent pesticides Tier 1, and if required Tier 2 Risk Assessment.
4. Define the investigation boundaries	The portion of the site that has been proposed to be developed for residential use (~4Ha).
5. Develop a decision rule – analytical approach	Acceptable limits for analytical approach are presented in Data Quality Indicators Table 5 below. The analytical method can achieve detection limits below Tier 1 Risk Assessment Criteria.
6. Specify tolerable limits on decision errors	The limits on decision errors expressed as per cent error for the investigative activities should be no greater than 10 per cent. The aggregate sampling and analysis error may be greater, but error resulting from sampling procedures or the nature of the sample matrix is not quantifiable. By implementing statistically valid sampling plan and adopting the 95% UCL to compare against the Tier 1 / 2 Risk Assessment Criteria we have adopted a 5% level of significance, i.e. adopting a 5% probability we will make the wrong decision (Type 1 / Type 2 error). The data must fall within the range of DQIs to be considered reliable.
7. Optimise the design for obtaining data	Presented in Sections 6 & 7 of this PSI. All available resources were used to collate historical data. Physical data was obtained by soil sampling.

5.4 Data Quality indicators

Quality Assurance and Quality Control QA/QC is tested by review of data against Data Quality Indicators (DQIs) to ensure data precision, accuracy, representativeness, comparability and completeness. A summary of DQIs for samples to be collected as part of the investigation are presented in the table below:

TABLE 5 Data Quality Indicators		
Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Duplicate samples	1 per 10 samples	RPD <50%
Accuracy		
Laboratory control samples	1 per day	General analytes recovery of 70–130%
Analysis blank	1 per day	Non-detect
Representativeness		
Samples analysed within specified holding times	Soil Samples	<30 days Within specific analyte holding times
Samples transported under COC conditions	N/A	All samples will be transported under chain of custody documentation
Reliability of field measured data	N/A	
Comparability		
Industry best practise for all sample media	All samples, all analytes	Experienced staff
Consistent sampling techniques	All samples all analytes	Same staff and method for the project
Appropriate laboratory reporting limits	All samples, all analytes	-
Completeness		
Appropriate sample design to meet objectives	N/A	-

5.5 Field Data QA/QC Acceptance Criteria

For all samples, field sample QA/QC was conducted in accordance with AS 4482.1–2005 (Australian Standard, 2005) and consist of the following:

AS 4482.1–2005 (Australian Standard, 2005) indicate an acceptable RPD range of 30-50%, and that the variation can be expected to be higher for organic analysis than inorganics, and for low concentrations of analytes.

Field and Laboratory Quality Control/Quality Assurance (QA/QC) procedures were conducted in accordance with NEPC (2013) and AS 4482.1–2005.

All soil samples were collected in new sample media jars provided by the laboratory and the soil sampling trowel was thoroughly washed between sample locations to prevent cross contamination. Samples were not composited but rather individual samples taken from each location identified in Figure 2.

The acceptance criteria for QA/QC samples are detailed in Table 5 above:

5.6 Laboratory QA/QC

- At least one analysis blank per batch
- Duplicate analysis at a rate of one per batch or one per ten samples, whichever is smaller
- Laboratory Control Samples at a rate of one per batch

The nominated laboratory must comply with the minimum QA procedures documented in Schedule B(3) in NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure and include, but not be limited to:

- Matrix spikes, and
- Surrogate Spikes

A review of SGS's quality report in Appendix 2 indicates that all QA procedures were satisfactory and no significant outliers were reported.

In the event the acceptance criteria are not met, the variation is taken into consideration and its implications assessed in regard to the context of the investigation.

5.7 Transporting Samples

Before sample transportation, appropriate methods for test specific handling requirements were reviewed. Samples were transported and delivered within documented holding times using ice bricks to preserve samples. To avoid breakages, all glass containers were well cushioned. Samples were transported under chain of custody documentation directly to the laboratory. The original chain-of-custody record accompanied the samples to the analytical laboratory, see Appendix 2.

5.8 Sampling Rationale

The desktop assessment did not identify any activities or previous site uses that would indicate the potential for significant contamination of soils or groundwater. In order to make an assessment of the sites' contamination status and suitability for residential use, eleven primary soil samples were collected and analysed. If these samples detect concentrations of the COPC above the residential criteria, further investigation would be required.

Surface soil sample locations have been randomly (EL1 to EL9) and judgementally (DAST1 & 2 and S1) selected to target the portion of the site to be developed for residential dwellings. Good site coverage has been achieved by the lateral spread of sample locations as seen in Figure 2.

As outlined in NSW government document "Consultants Reporting on Contaminated Land", where a complete site history clearly shows that activities have been non-contaminating, there are no impacts from off-site contamination sources, and observations do not indicate any potential for contamination, there may be no need for further investigation or site sampling. As part of this PSI, samples were collected as a secondary line of evidence that contamination is *not* present at the site and to confirm the hypothesis that contamination is not an issue for the proposed development.

As Outlined in the NSW EPA's "Sampling Design Guidelines" the number of samples collected should be determined by the investigator on a site-specific basis. For this PSI eleven samples have been selected to get good site coverage for making the assessment of general soil conditions, and at the same time to identify any unexpected detections of contaminants of potential concern. The soil sampling frequency data table A in these design guidelines is only to be used as a guide and is generally used on sites where contamination is likely to be present as a result of industrial activity.

6 Conceptual Site Model (CSM)

National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC 2013) identifies a conceptual site model (CSM) as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

1. Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
 - For this site the potential sources of contamination would be the above ground storage of diesel and the potential for historical use of persistent pesticides.
2. Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air);
 - This would be expected to be limited to the surface soils at this site given its historical use for agriculture and *not* for industrial use.
3. Human and ecological receptors;

- Human receptors would be likely given that the proposed future use is residential with access to soil for home grown produce. Ecological receptors also apply as the property is bordered to the east by the Wilson Nature Reserve and also has environmental zoning in portions of the larger lot.
4. Potential and complete exposure pathways;
 - A complete pathway does exist for persistent pesticides in surface soils (if present).
 5. Any potential preferential pathways for vapour migrations (if potential for vapours identified)
 - Given that volatile compounds are not a significant risk at this site (only a small above ground fuel tank), this pathway is not considered to be complete for this contaminant. This area of fuel storage was targeted to make an assessment of contamination from the fuel storage.
 6. Data Gaps
 - Groundwater has not been assessed in this PSI due to the lack of evidence that would indicate groundwater contamination as an issue.

7 Results

The results for soil analysis have been summarised in Table 6 below. Laboratory certificate of analysis and QA/QC assessment is provided at the end of this report in Appendix 3.

Table 6 Results															
Analyte	Criteria 1,2,3		Concentrations in mg/kg												
		PQL	EL1	EL2	EL2D*	EL3	EL4	EL5	EL6	EL7	EL8	EL9	DAST1	DAST2*	S1
Arsenic	100	2	2	1	1	2	2	1	3	1	2	2	2	2	2
Cadmium	20	0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	100	2	29	35	38	80	88	49	82	42	35	18	27	26	10
Copper	6,000	2	25	26	27	18	19	19	21	20	14	19	13	13	19
Lead	300	2	6	6	6	6	8	5	7	5	7	6	11	11	3
Nickel	40	0.05	6.5	7.0	7.7	8.2	11	6.6	9.9	9.2	12	7.6	9.1	8.4	29
Zinc	400	2	140	85	91	64	65	83	100	75	80	110	170	180	70
Mercury	7,400	2	0.05	0.05	0.06	0.05	0.05	0.05	0.06	0.07	0.07	0.06	<0.05	<0.05	<0.05
OCP/OPP - 37 compounds	7-260	1-1.7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TRH F1	45	25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<25	<25	<25
TRH F2	110	210	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<25	<25	<25
TRH C10 – C36	-	110	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<110	<110	340
Benzene	300	0.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	<0.1	<0.1

Notes: 1: NEPC (2013) – Health Screening Levels for Vapour Intrusion (HSL-A&B Low-high density residential) for Sand.
 2: CRC Care (2011) – Health Screening Levels for Vapour Intrusion. Low-high density residential) for Sand. 0.15mbgs.
 3: NEPC (2013) – Interim Health Investigation Levels. Residential Setting A. (Low density residential).
 ND = Non-Detect
 NT = Not tested
 OCP/OPP = Organochlorine and Organophosphate Pesticides
 * Duplicate samples

7.1 Discussion

As can be seen from the data summary table above, there were no exceedances of the residential criteria or the more sensitive ecological criteria and all results for the compounds tested were either non-detect (pesticides, and hydrocarbons) or significantly below the human health investigation limits (metals). The collection of further data is not warranted and the surface of the site is free of contamination in the areas sampled. Site history information also indicates that contamination is unlikely at the site.

7.2 QA/QC

CSI Aus has completed a review of the Quality Assurance (QA) steps and Quality Control (QC) results, according to the data quality objectives defined in Section 5.6 and the following documents:

- NEPC, National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council (1999).
- US EPA Guidance on Environmental Data Verification and Data Validation (2002).

This included examining holding times, laboratory accreditation, sample preservation methods, a review of field quality control sample results and a review of laboratory quality control sample results.

SGS Alexandria (Sydney), was the chosen NATA accredited laboratory for soil analysis. The primary samples identified as EL2 and DAST 1 and the duplicates were identified as ELD2 and DAST 2. As can be seen from Table 7 below, all relative percentage difference (RPD) values met the +/-50% acceptance criteria. The highest RPD value was 12.5 % for mercury with the absolute difference being only 0.1mg/kg.

TABLE 7 RPD Values						
Compound	EL2	ELD2 Dup	RPD (%)	DAST1	DAST2 Dup	RPD (%)
Arsenic	1	1	0	2	2	0
Cadmium	<0.3	<0.3	NA	<0.3	<0.3	NA
Chromium	35	38	-5.6	27	26	2.5
Copper	26	27	-2.5	13	13	0.0
Lead	6	6	0.0	11	11	0.0
Nickel	7	7.7	-6.5	9.1	8.4	5.3
Zinc	85	91	-4.6	170	180	-3.8
Mercury	0.05	0.06	-12.5	<0.05	<0.05	NA
OCP/OPP compounds - 37	<1	<1	NA	<1	<1	NA
TRH F1	NT	NT	NA	<25	<25	NA
TRH F2	NT	NT	NA	<25	<25	NA
TRH C10 – C36	NT	NT	NA	<110	<110	NA
Benzene	NT	NT	NA	<0.1	<0.1	NA

Based on the DQI criteria being met, all data collected in this investigation is considered to be representative of site conditions at the time of sampling and satisfactory for use in this assessment.

8 Concluding Comments

CSI Aus has undertaken a Preliminary Site Investigation to assess the contamination status of the site located in Monaltrie under SEPP 55. A desktop review of available information and a site visit did *not* identify evidence of previous development or activities on the site that would suggest any potentially contaminating activities had

taken place within the area of focus. Analytical results from surface soils indicate all of the compounds tested returned concentrations that were below the adopted criteria for residential use.

Based on the sample data collected (eleven primary surface soil samples) and the absence of contamination at the site, no further investigation is deemed warranted. A review of laboratory data against the data quality indicators outlined in this report demonstrate that the data obtained in this investigation is representative and satisfactory for use in the assessment.

Therefore, the site is considered to be suitable for its intended use as a residential subdivision.

8.1 Unexpected Finds

During the construction phase of development roads, sub-terranean services infrastructure and general earthworks, *if* unexpected finds are uncovered (old pipe work, storage tanks etc) work should cease until an experienced environmental scientist can inspect the material and make an assessment of the significance for site contamination. This would include any human-made structures uncovered during development. This PSI has been limited to desk top study and minor surface soil sampling.

9 Limitations

The findings of this report are based on the objectives and scope of work outlined above. CSI Aus performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment industry. No warranties or guarantees, express or implied, are made. Subject to the scope of work, CSI Aus' assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of any other issues.

This report does not comment on any regulatory obligations based on the findings, for which a legal opinion should be sought. This report relates only to the objectives and scope of work stated, and does not relate to any other works undertaken for the Client.

The report and conclusions are based on the information obtained at the time of the assessment. Changes to the subsurface conditions may occur subsequent to the investigation described herein, through natural process or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

The site history, and associated uses, areas of use, and potential contaminants, were determined based on the activities described in the scope of work. Additional site history information held by the Client, regulatory authorities, or in the public domain, which was not provided to CSI Aus or was not sourced by CSI Aus under the scope of work, may identify additional uses, areas of use and/or potential contaminants. The information sources referenced have been used to determine site history and desktop information regarding local subsurface conditions. While CSI Aus has used reasonable care to avoid reliance on data and information that is inaccurate or unsuitable, CSI Aus is not able to verify the accuracy or completeness of all information and data made available.

Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history, and which may not be expected at the site. The absence of any identified hazardous or toxic materials on the

subject property should not be interpreted as a warranty or guarantee that such materials do not exist on the site. If additional certainty is required, additional site history or desktop studies, or environmental sampling and analysis, should be commissioned.

The results of this assessment are based upon site inspection and fieldwork conducted by CSI Aus personnel and information provided by the Client. Samples were collected at specific locations and should be considered to be an approximation of the condition of the sample. All conclusions regarding the property area are the professional opinions of CSI Aus personnel involved with the project, subject to the qualifications made above.

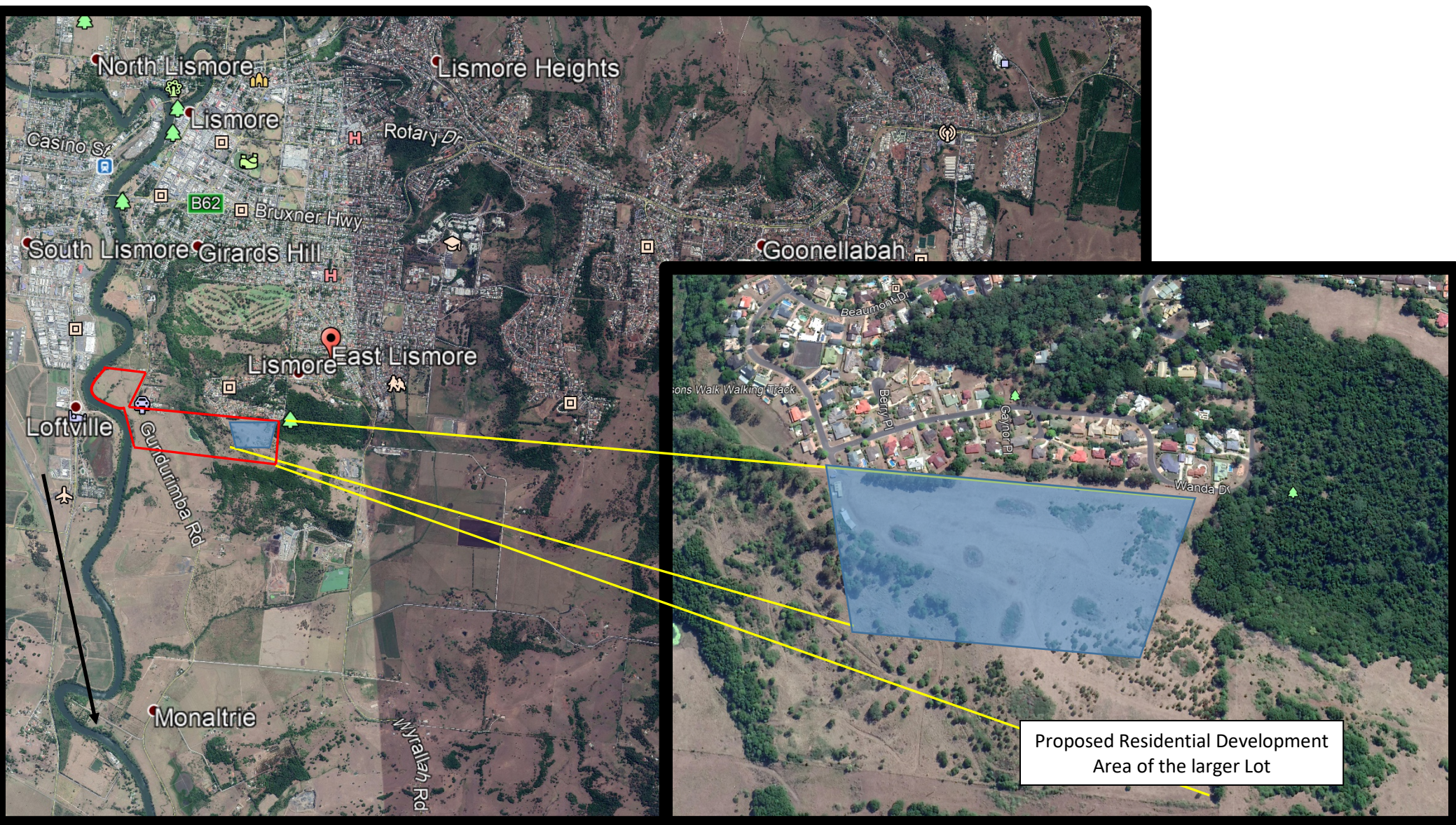
While normal assessments of data reliability have been made, CSI Aus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of CSI Aus. CSI Aus accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

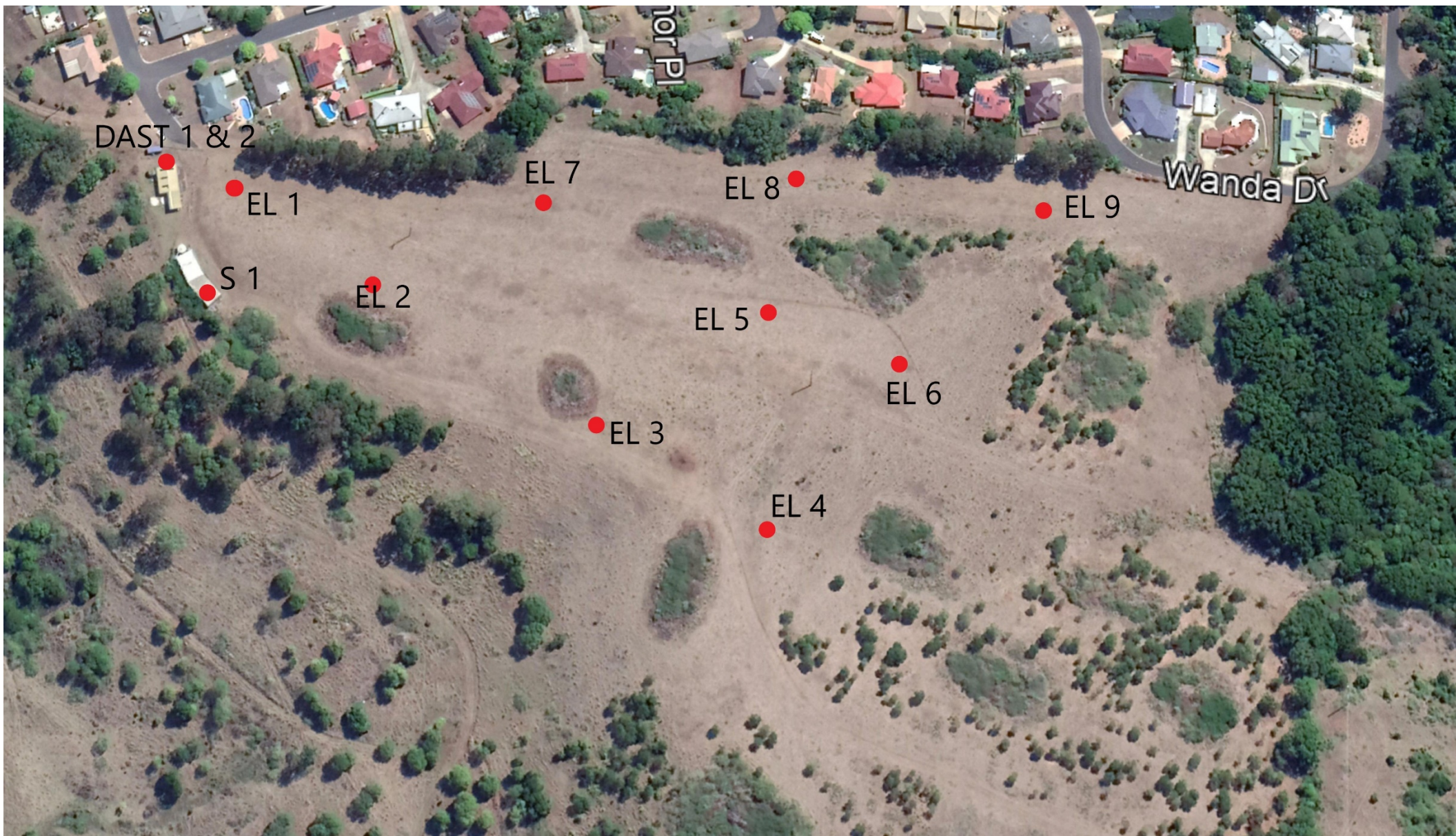
No part of this report may be reproduced, stored or transmitted in any form without the prior consent of CSI Aus.

APPENDIX 1 – FIGURES

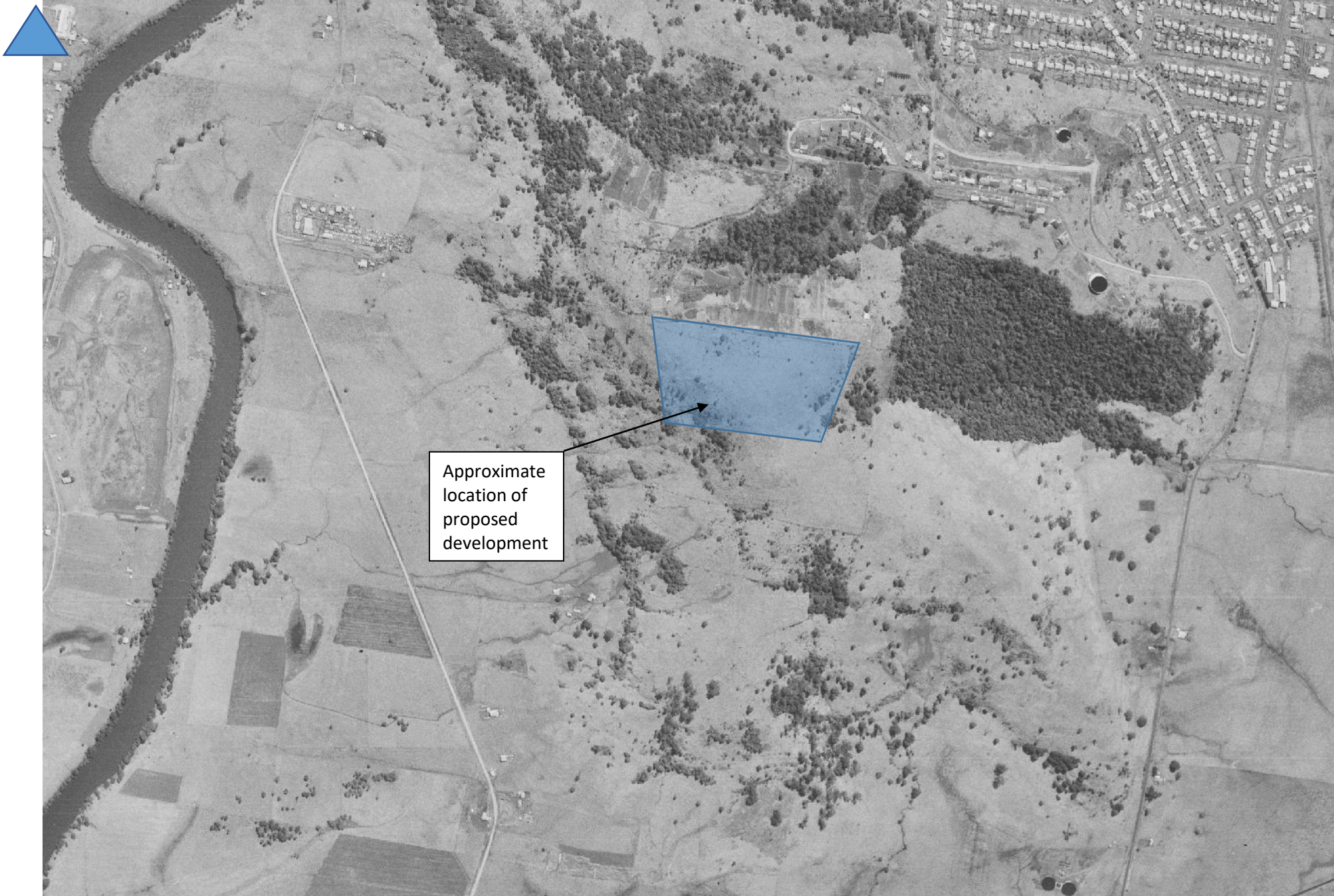


NORTH















APPENDIX 2 – LABORATORY REPORTS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 1

Email Results: dane@csiaus.com.au[illegible]

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 1

Project Name/No: 2216 East Lismore

Purchase Order No:

Results Required By: Normal TAT

Telephone: 0499 859 528

Facsimile:

Email Results:

dane@cs.cmu.edu

[illegible]

SGS EHS Sydney COC

SE210304

Date/Time	9am	21/8/20
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Date/Time 24/08/20 @ 9.25

Laboratory Quotation No:

Comments

[Signature]

CLIENT DETAILS

Contact **DANE EGELTON**
 Client **CSI AUSTRALIA**
 Address **PO BOX 389
 ALSTONVILLE NSW 2477**

Telephone (Not specified)
 Facsimile (Not specified)
 Email **dane@csiaus.com.au**

Project **2216 East Lismore**
 Order Number (Not specified)
 Samples **3**

LABORATORY DETAILS

Manager **Huong Crawford**
 Laboratory **SGS Alexandria Environmental**
 Address **Unit 16, 33 Maddox St
 Alexandria NSW 2015**

Telephone **+61 2 8594 0400**
 Facsimile **+61 2 8594 0499**
 Email **au.environmental.sydney@sgs.com**

SGS Reference **SE210861 R0**
 Date Received **08 Sep 2020**
 Date Reported **15 Sep 2020**

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Bennet LO
 Senior Organic Chemist/Metals Chemis



Dong LIANG
 Metals/Inorganics Team Leader



Ly Kim HA
 Organic Section Head

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE210861.001 Soil 07 Sep 2020 DAST-1	SE210861.002 Soil 07 Sep 2020 DAST-2	SE210861.003 Soil 07 Sep 2020 S1
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Volatiles Petroleum Hydrocarbons in Soil Method: AN433 Tested: 9/9/2020

TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	114	112	133
d8-toluene (Surrogate)	%	-	93	93	96
Bromofluorobenzene (Surrogate)	%	-	94	90	88

VPH F Bands

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 9/9/2020

TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	59	76
TRH C29-C36	mg/kg	45	<45	<45	270
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	<110	340
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	240

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	240
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120

OC Pesticides in Soil Method: AN420 Tested: 9/9/2020

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	0.3
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE210861.001 Soil 07 Sep 2020 DAST-1	SE210861.002 Soil 07 Sep 2020 DAST-2	SE210861.003 Soil 07 Sep 2020 S1
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OC Pesticides in Soil Method: AN420 Tested: 9/9/2020 (continued)
Surrogates

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	109	103	102
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OP Pesticides in Soil Method: AN420 Tested: 9/9/2020

Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

Surrogates

2-fluorobiphenyl (Surrogate)	%	-	76	90	98
d14-p-terphenyl (Surrogate)	%	-	82	98	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 9/9/2020

Arsenic, As	mg/kg	1	2	2	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	27	26	10
Copper, Cu	mg/kg	0.5	13	13	19
Nickel, Ni	mg/kg	0.5	9.1	8.4	29
Lead, Pb	mg/kg	1	11	11	3
Zinc, Zn	mg/kg	2	170	180	70

Mercury in Soil Method: AN312 Tested: 9/9/2020

Mercury	mg/kg	0.05	<0.05	<0.05	<0.05
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Moisture Content Method: AN002 Tested: 9/9/2020

% Moisture	%w/w	1	18.1	17.8	4.6
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MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB208738	mg/kg	0.05	<0.05	1%	115%	87%

Moisture Content Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB208725	%w/w	1	2 - 15%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Hexachlorobenzene (HCB)	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Alpha BHC	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Lindane	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Heptachlor	LB208724	mg/kg	0.1	<0.1	0%	75%	92%
Aldrin	LB208724	mg/kg	0.1	<0.1	0%	78%	86%
Beta BHC	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Delta BHC	LB208724	mg/kg	0.1	<0.1	0%	76%	87%
Heptachlor epoxide	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDE	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Endosulfan	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Gamma Chlordane	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Chlordane	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
trans-Nonachlor	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDE	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Dieldrin	LB208724	mg/kg	0.2	<0.2	0%	75%	84%
Endrin	LB208724	mg/kg	0.2	<0.2	0%	78%	84%
o,p'-DDD	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDT	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Beta Endosulfan	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
p,p'-DDD	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDT	LB208724	mg/kg	0.1	<0.1	0%	61%	67%
Endosulfan sulphate	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Aldehyde	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Methoxychlor	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Ketone	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Isodrin	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Mirex	LB208724	mg/kg	0.1	<0.1	0%	NA	NA
Total CLP OC Pesticides	LB208724	mg/kg	1	<1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB208724	%	-	102%	1%	89%	116%

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dichlorvos	LB208724	mg/kg	0.5	<0.5	0%	91%	81%
Dimethoate	LB208724	mg/kg	0.5	<0.5	0%	NA	NA
Diazinon (Dimpylate)	LB208724	mg/kg	0.5	<0.5	0%	92%	99%
Fenitrothion	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Malathion	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB208724	mg/kg	0.2	<0.2	0%	95%	101%
Parathion-ethyl (Parathion)	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Bromophos Ethyl	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Methidathion	LB208724	mg/kg	0.5	<0.5	0%	NA	NA
Ethion	LB208724	mg/kg	0.2	<0.2	0%	64%	71%
Azinphos-methyl (Guthion)	LB208724	mg/kg	0.2	<0.2	0%	NA	NA
Total OP Pesticides*	LB208724	mg/kg	1.7	<1.7	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
2-fluorobiphenyl (Surrogate)	LB208724	%	-	83%	8 - 9%	86%	85%
d14-p-terphenyl (Surrogate)	LB208724	%	-	97%	4 - 21%	84%	83%

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB208745	mg/kg	1	<1	11%	107%	79%
Cadmium, Cd	LB208745	mg/kg	0.3	<0.3	0%	92%	84%
Chromium, Cr	LB208745	mg/kg	0.5	<0.5	10%	120%	87%
Copper, Cu	LB208745	mg/kg	0.5	<0.5	7%	107%	94%
Nickel, Ni	LB208745	mg/kg	0.5	<0.5	5%	104%	91%
Lead, Pb	LB208745	mg/kg	1	<1	4%	106%	90%
Zinc, Zn	LB208745	mg/kg	2	<2	3%	106%	54%

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB208724	mg/kg	20	<20	0%	93%	88%
TRH C15-C28	LB208724	mg/kg	45	<45	0%	83%	80%
TRH C29-C36	LB208724	mg/kg	45	<45	0%	88%	80%
TRH C37-C40	LB208724	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB208724	mg/kg	110	<110	0%	NA	NA
TRH >C10-C40 Total (F bands)	LB208724	mg/kg	210	<210	0%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16	LB208724	mg/kg	25	<25	0%	93%	88%
TRH >C16-C34 (F3)	LB208724	mg/kg	90	<90	0%	83%	78%
TRH >C34-C40 (F4)	LB208724	mg/kg	120	<120	0%	85%	NA

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB208723	mg/kg	25	<25	0%	84%	69%
TRH C6-C9	LB208723	mg/kg	20	<20	0%	86%	72%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB208723	%	-	122%	9 - 13%	106%	93%
d8-toluene (Surrogate)	LB208723	%	-	97%	10 - 14%	89%	78%
Bromofluorobenzene (Surrogate)	LB208723	%	-	101%	5 - 16%	96%	84%

VPF F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB208723	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB208723	mg/kg	25	<25	0%	79%	64%

METHOD

METHODOLOGY SUMMARY

AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicates that both * and ** apply.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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CLIENT DETAILS

Contact **DANE EGELTON**
 Client **CSI AUSTRALIA**
 Address **PO BOX 389
 ALSTONVILLE NSW 2477**

Telephone (Not specified)
 Facsimile (Not specified)
 Email **dane@csiaus.com.au**

Project **2216 East Lismore**
 Order Number (Not specified)
 Samples **10**

LABORATORY DETAILS

Manager **Huong Crawford**
 Laboratory **SGS Alexandria Environmental**
 Address **Unit 16, 33 Maddox St
 Alexandria NSW 2015**

Telephone **+61 2 8594 0400**
 Facsimile **+61 2 8594 0499**
 Email **au.environmental.sydney@sgs.com**

SGS Reference **SE210304 R0**
 Date Received **24 Aug 2020**
 Date Reported **31 Aug 2020**

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Bennet LO
 Senior Organic Chemist/Metals Chemis



Dong LIANG
 Metals/Inorganics Team Leader



Ly Kim HA
 Organic Section Head

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE210304.001 Soil 19 Aug 2020 EL1	SE210304.002 Soil 19 Aug 2020 EL2	SE210304.003 Soil 19 Aug 2020 EL2D	SE210304.004 Soil 19 Aug 2020 EL3
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OC Pesticides in Soil Method: AN420 Tested: 26/8/2020

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1

Surrogates

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	108	107	111	110
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OP Pesticides in Soil Method: AN420 Tested: 26/8/2020

Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methodathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7

Surrogates

2-fluorobiphenyl (Surrogate)	%	-	101	96	103	100
d14-p-terphenyl (Surrogate)	%	-	96	109	97	111

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 26/8/2020

Arsenic, As	mg/kg	1	2	1	1	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	29	35	38	80
Copper, Cu	mg/kg	0.5	25	26	27	18
Nickel, Ni	mg/kg	0.5	6.5	7.0	7.7	8.2
Lead, Pb	mg/kg	1	6	6	6	6
Zinc, Zn	mg/kg	2	140	85	91	64

Parameter	Units	LOR	Sample Number	SE210304.001	SE210304.002	SE210304.003	SE210304.004
			Sample Matrix	Soil	Soil	Soil	Soil
			Sample Date	19 Aug 2020	19 Aug 2020	19 Aug 2020	19 Aug 2020
			Sample Name	EL1	EL2	EL2D	EL3

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 26/8/2020 (continued)

Mercury in Soil Method: AN312 Tested: 26/8/2020

Mercury	mg/kg	0.05	0.05	0.05	0.06	0.05
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Moisture Content Method: AN002 Tested: 26/8/2020

% Moisture	%w/w	1	32.7	30.5	31.9	35.8
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Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE210304.005 Soil 19 Aug 2020 EL4	SE210304.006 Soil 19 Aug 2020 EL5	SE210304.007 Soil 19 Aug 2020 EL6	SE210304.008 Soil 19 Aug 2020 EL7
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OC Pesticides in Soil Method: AN420 Tested: 26/8/2020

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1

Surrogates

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	106	110	111	108
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OP Pesticides in Soil Method: AN420 Tested: 26/8/2020

Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methodathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7

Surrogates

2-fluorobiphenyl (Surrogate)	%	-	99	109	93	101
d14-p-terphenyl (Surrogate)	%	-	96	128	127	100

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 26/8/2020

Arsenic, As	mg/kg	1	2	1	3	1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	88	49	82	42
Copper, Cu	mg/kg	0.5	19	19	21	20
Nickel, Ni	mg/kg	0.5	11	6.6	9.9	9.2
Lead, Pb	mg/kg	1	8	5	7	5
Zinc, Zn	mg/kg	2	65	83	100	75

Parameter	Units	LOR	Sample Number	SE210304.005	SE210304.006	SE210304.007	SE210304.008
			Sample Matrix	Soil	Soil	Soil	Soil
			Sample Date	19 Aug 2020	19 Aug 2020	19 Aug 2020	19 Aug 2020
			Sample Name	EL4	EL5	EL6	EL7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 26/8/2020 (continued)

Mercury in Soil Method: AN312 Tested: 26/8/2020

Mercury	mg/kg	0.05	0.05	0.05	0.06	0.07
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Moisture Content Method: AN002 Tested: 26/8/2020

% Moisture	%w/w	1	31.0	42.9	38.1	28.4
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		Sample Number	SE210304.009	SE210304.010
		Sample Matrix	Soil	Soil
		Sample Date	19 Aug 2020	19 Aug 2020
		Sample Name	EL8	EL9
Parameter	Units	LOR		

OC Pesticides in Soil Method: AN420 Tested: 26/8/2020

Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

Surrogates

Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	106	106
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OP Pesticides in Soil Method: AN420 Tested: 26/8/2020

Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methodathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

Surrogates

2-fluorobiphenyl (Surrogate)	%	-	104	99
d14-p-terphenyl (Surrogate)	%	-	100	95

		Sample Number	SE210304.009	SE210304.010
		Sample Matrix	Soil	Soil
		Sample Date	19 Aug 2020	19 Aug 2020
		Sample Name	EL8	EL9
Parameter	Units	LOR		

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 26/8/2020

Arsenic, As	mg/kg	1	2	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	35	18
Copper, Cu	mg/kg	0.5	14	19
Nickel, Ni	mg/kg	0.5	12	7.6
Lead, Pb	mg/kg	1	7	6
Zinc, Zn	mg/kg	2	80	110

Mercury in Soil Method: AN312 Tested: 26/8/2020

Mercury	mg/kg	0.05	0.07	0.06
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Moisture Content Method: AN002 Tested: 26/8/2020

% Moisture	%w/w	1	29.8	26.5
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MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB207639	mg/kg	0.05	<0.05	0 - 2%	98%	73%

Moisture Content Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB207608	%w/w	1	0 - 1%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Hexachlorobenzene (HCB)	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Alpha BHC	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Lindane	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Heptachlor	LB207610	mg/kg	0.1	<0.1	0%	91%	116%
Aldrin	LB207610	mg/kg	0.1	<0.1	0%	101%	127%
Beta BHC	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Delta BHC	LB207610	mg/kg	0.1	<0.1	0%	104%	132%
Heptachlor epoxide	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDE	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Endosulfan	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Gamma Chlordane	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Chlordane	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
trans-Nonachlor	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDE	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Dieldrin	LB207610	mg/kg	0.2	<0.2	0%	103%	125%
Endrin	LB207610	mg/kg	0.2	<0.2	0%	107%	129%
o,p'-DDD	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDT	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Beta Endosulfan	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
p,p'-DDD	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDT	LB207610	mg/kg	0.1	<0.1	0%	87%	81%
Endosulfan sulphate	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Aldehyde	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Methoxychlor	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Ketone	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Isodrin	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Mirex	LB207610	mg/kg	0.1	<0.1	0%	NA	NA
Total CLP OC Pesticides	LB207610	mg/kg	1	<1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB207610	%	-	107%	1%	97%	117%

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dichlorvos	LB207610	mg/kg	0.5	<0.5	0%	123%	98%
Dimethoate	LB207610	mg/kg	0.5	<0.5	0%	NA	NA
Diazinon (Dimpylate)	LB207610	mg/kg	0.5	<0.5	0%	126%	117%
Fenitrothion	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Malathion	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB207610	mg/kg	0.2	<0.2	0%	110%	113%
Parathion-ethyl (Parathion)	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Bromophos Ethyl	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Methidathion	LB207610	mg/kg	0.5	<0.5	0%	NA	NA
Ethion	LB207610	mg/kg	0.2	<0.2	0%	132%	132%
Azinphos-methyl (Guthion)	LB207610	mg/kg	0.2	<0.2	0%	NA	NA
Total OP Pesticides*	LB207610	mg/kg	1.7	<1.7	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
2-fluorobiphenyl (Surrogate)	LB207610	%	-	100%	3%	95%	103%
d14-p-terphenyl (Surrogate)	LB207610	%	-	116%	11%	83%	95%

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB207632	mg/kg	1	<1	11 - 35%	98%	69%
Cadmium, Cd	LB207632	mg/kg	0.3	<0.3	0 - 15%	110%	76%
Chromium, Cr	LB207632	mg/kg	0.5	<0.5	2 - 6%	96%	77%
Copper, Cu	LB207632	mg/kg	0.5	<0.5	3 - 5%	98%	75%
Nickel, Ni	LB207632	mg/kg	0.5	<0.5	4 - 5%	95%	85%
Lead, Pb	LB207632	mg/kg	1	<1	6 - 7%	101%	84%
Zinc, Zn	LB207632	mg/kg	2	<2	2 - 7%	98%	-18%

METHOD

METHODOLOGY SUMMARY

AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicative data, theoretical holding time exceeded and NATA accreditation does not cover the performance of this service.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE210861 R0

CLIENT DETAILS

Contact DANE EGELTON
Client CSI AUSTRALIA
Address PO BOX 389
ALSTONVILLE NSW 2477

Telephone (Not specified)
Facsimile (Not specified)
Email dane@csiaus.com.au

Project 2216 East Lismore
Order Number (Not specified)
Samples 3

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference SE210861 R0
Date Received 08 Sep 2020
Date Reported 15 Sep 2020

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Surrogate	Volatile Petroleum Hydrocarbons in Soil	1 item
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	None
Samples received in correct containers	Yes	Sample counts by matrix	3 Soil
Date documentation received	8/9/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	17.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208738	07 Sep 2020	08 Sep 2020	05 Oct 2020	09 Sep 2020	05 Oct 2020	14 Sep 2020
DAST-2	SE210861.002	LB208738	07 Sep 2020	08 Sep 2020	05 Oct 2020	09 Sep 2020	05 Oct 2020	14 Sep 2020
S1	SE210861.003	LB208738	07 Sep 2020	08 Sep 2020	05 Oct 2020	09 Sep 2020	05 Oct 2020	14 Sep 2020

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208725	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	14 Sep 2020	14 Sep 2020
DAST-2	SE210861.002	LB208725	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	14 Sep 2020	14 Sep 2020
S1	SE210861.003	LB208725	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	14 Sep 2020	14 Sep 2020

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
DAST-2	SE210861.002	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
S1	SE210861.003	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	15 Sep 2020
DAST-2	SE210861.002	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	15 Sep 2020
S1	SE210861.003	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	15 Sep 2020

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208745	07 Sep 2020	08 Sep 2020	06 Mar 2021	09 Sep 2020	06 Mar 2021	14 Sep 2020
DAST-2	SE210861.002	LB208745	07 Sep 2020	08 Sep 2020	06 Mar 2021	09 Sep 2020	06 Mar 2021	14 Sep 2020
S1	SE210861.003	LB208745	07 Sep 2020	08 Sep 2020	06 Mar 2021	09 Sep 2020	06 Mar 2021	14 Sep 2020

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
DAST-2	SE210861.002	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
S1	SE210861.003	LB208724	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DAST-1	SE210861.001	LB208723	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
DAST-2	SE210861.002	LB208723	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020
S1	SE210861.003	LB208723	07 Sep 2020	08 Sep 2020	21 Sep 2020	09 Sep 2020	19 Oct 2020	14 Sep 2020

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	109
	DAST-2	SE210861.002	%	60 - 130%	103
	S1	SE210861.003	%	60 - 130%	102

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	76
	DAST-2	SE210861.002	%	60 - 130%	90
	S1	SE210861.003	%	60 - 130%	98
d14-p-terphenyl (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	82
	DAST-2	SE210861.002	%	60 - 130%	98
	S1	SE210861.003	%	60 - 130%	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	94
	DAST-2	SE210861.002	%	60 - 130%	90
	S1	SE210861.003	%	60 - 130%	88
d4-1,2-dichloroethane (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	114
	DAST-2	SE210861.002	%	60 - 130%	112
	S1	SE210861.003	%	60 - 130%	133 Ⓢ
d8-toluene (Surrogate)	DAST-1	SE210861.001	%	60 - 130%	93
	DAST-2	SE210861.002	%	60 - 130%	93
	S1	SE210861.003	%	60 - 130%	96

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB208738.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB208724.001	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Alpha BHC	mg/kg	0.1	<0.1
	Lindane	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Alpha Endosulfan	mg/kg	0.2	<0.2
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	p,p'-DDE	mg/kg	0.1	<0.1
	Dieldrin	mg/kg	0.2	<0.2
	Endrin	mg/kg	0.2	<0.2
	Beta Endosulfan	mg/kg	0.2	<0.2
	p,p'-DDD	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	Endrin Aldehyde	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Endrin Ketone	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	102

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB208724.001	Dichlorvos	mg/kg	0.5	<0.5
	Dimethoate	mg/kg	0.5	<0.5
	Diazinon (Dimpylate)	mg/kg	0.5	<0.5
	Fenitrothion	mg/kg	0.2	<0.2
	Malathion	mg/kg	0.2	<0.2
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
	Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
	Bromophos Ethyl	mg/kg	0.2	<0.2
	Methidathion	mg/kg	0.5	<0.5
	Ethion	mg/kg	0.2	<0.2
	Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	2-fluorobiphenyl (Surrogate)	%	-	83
Surrogates	d14-p-terphenyl (Surrogate)	%	-	97

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN40/AN320

Sample Number	Parameter	Units	LOR	Result
LB208745.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB208724.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB208724.001	TRH C10-C36 Total	mg/kg	110	<110

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result
LB208723.001	TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	122

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210863.026	LB208738.014	Mercury	mg/kg	0.05	0.0384537294	0.0504467242	142	1

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210879.001	LB208725.011	% Moisture	%w/w	1	15.18324607325	5.094679891	37	2
SE210885.008	LB208725.021	% Moisture	%w/w	1	10.2	8.8	41	15

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210885.007	LB208724.025	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0	200	0
		Alpha BHC	mg/kg	0.1	<0.1	0	200	0
		Lindane	mg/kg	0.1	<0.1	0	200	0
		Heptachlor	mg/kg	0.1	<0.1	0	200	0
		Aldrin	mg/kg	0.1	<0.1	0.0003949381	200	0
		Beta BHC	mg/kg	0.1	<0.1	0	200	0
		Delta BHC	mg/kg	0.1	<0.1	0	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	0	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	0	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	0.0008426175	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	0	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	0	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	0	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	0	200	0
		Dieldrin	mg/kg	0.2	<0.2	0.0030946705	200	0
		Endrin	mg/kg	0.2	<0.2	0.0050587909	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	0	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	0	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	0.0016434957	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	0	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	0	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	0.0045199747	200	0
		Methoxychlor	mg/kg	0.1	<0.1	0	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	0.0021037906	200	0
		Isodrin	mg/kg	0.1	<0.1	0.0009699338	200	0
		Mirex	mg/kg	0.1	<0.1	0.0015750849	200	0
		Total CLP OC Pesticides	mg/kg	1	<1	0.0164207226	200	0
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.155691343	30	1	

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210879.002	LB208724.014	Dichlorvos	mg/kg	0.5	0	0	200	0
		Dimethoate	mg/kg	0.5	0	0	200	0
		Diazinon (Dimpylate)	mg/kg	0.5	0.0553759501	0.0329968649	200	0
		Fenitrothion	mg/kg	0.2	0	0	200	0
		Malathion	mg/kg	0.2	0	0	200	0
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	0	0	200	0
		Parathion-ethyl (Parathion)	mg/kg	0.2	0.0114483976	0	200	0
		Bromophos Ethyl	mg/kg	0.2	0	0	200	0
		Methodathion	mg/kg	0.5	0	0	200	0
		Ethion	mg/kg	0.2	0.0042405576	0	200	0
		Azinphos-methyl (Guthion)	mg/kg	0.2	0	0.0065382660	200	0
		Total OP Pesticides*	mg/kg	1.7	0	0	200	0
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.41820140520	0.3877371709	30	8
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4910207281	0.4708374570	30	4
SE210885.008	LB208724.023	Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
		Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210885.008	LB208724.023	Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
		Malathion	mg/kg	0.2	<0.2	<0.2	200	0
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
		Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
		Methodathion	mg/kg	0.5	<0.5	<0.5	200	0
		Ethion	mg/kg	0.2	<0.2	<0.2	200	0
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates						
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	9
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	30	21

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210863.026	LB208745.014	Arsenic, As	mg/kg	1	6.81376685156	1326052439	45	11
		Cadmium, Cd	mg/kg	0.3	0.0406111994	0.0594292682	200	0
		Chromium, Cr	mg/kg	0.5	19.28466206524	7.194987804	31	10
		Copper, Cu	mg/kg	0.5	19.18978224920	6.259180487	33	7
		Nickel, Ni	mg/kg	0.5	13.82167504684	5.596754876	34	5
		Lead, Pb	mg/kg	1	22.81210313621	8.902757317	34	4
		Zinc, Zn	mg/kg	2	17.98234195498	5.805607317	41	3

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210879.002	LB208724.014	TRH C10-C14	mg/kg	20	0	0	200	0
		TRH C15-C28	mg/kg	45	0	0	200	0
		TRH C29-C36	mg/kg	45	0	0	200	0
		TRH C37-C40	mg/kg	100	0	0	200	0
		TRH C10-C36 Total	mg/kg	110	0	0	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	0	0	200	0
		TRH F Bands						
		TRH >C10-C16	mg/kg	25	0	0	200	0
		TRH >C16-C34 (F3)	mg/kg	90	0	0	200	0
		TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0
SE210885.007	LB208724.025	TRH C10-C14	mg/kg	20	<20	0	200	0
		TRH C15-C28	mg/kg	45	<45	0	200	0
		TRH C29-C36	mg/kg	45	<45	0	200	0
		TRH C37-C40	mg/kg	100	<100	0	200	0
		TRH C10-C36 Total	mg/kg	110	<110	0	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands						
		TRH >C10-C16	mg/kg	25	<25	0	200	0
		TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
		TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210879.001	LB208723.026	TRH C6-C10	mg/kg	25	0	0	200	0
		TRH C6-C9	mg/kg	20	0	0	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	12.51389425581	3.798151743	30	9
		d8-toluene (Surrogate)	mg/kg	-	10.47847942929	9.4567464594	30	10
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.44765563609	0.164278341	30	5
		VPH F Bands						
		Benzene (F0)	mg/kg	0.1	0.01644532110	0.0055132506	200	0
		TRH C6-C10 minus BTEX (F1)	mg/kg	25	0	0	200	0
		TRH C6-C10	mg/kg	25	<25	0	200	0
SE210885.007	LB208723.027	TRH C6-C9	mg/kg	20	<20	0	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	12.6	11.0378951773	30	13
		d8-toluene (Surrogate)	mg/kg	-	10.6	9.2171664546	30	14
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.3	8.8010664382	30	16
		VPH F Bands						
		Benzene (F0)	mg/kg	0.1	<0.1	0.0032467840	200	0
		TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	0	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208738.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	115

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208724.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	75
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	78
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	76
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	75
	Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	78
	p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	61
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130	89

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208724.002	Dichlorvos	mg/kg	0.5	1.8	2	60 - 140	91
	Diazinon (Dimpylate)	mg/kg	0.5	1.8	2	60 - 140	92
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.9	2	60 - 140	95
	Ethion	mg/kg	0.2	1.3	2	60 - 140	64
	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
Surrogates	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208745.002	Arsenic, As	mg/kg	1	340	318.22	80 - 120	107
	Cadmium, Cd	mg/kg	0.3	5.0	5.41	80 - 120	92
	Chromium, Cr	mg/kg	0.5	46	38.31	80 - 120	120
	Copper, Cu	mg/kg	0.5	310	290	80 - 120	107
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	104
	Lead, Pb	mg/kg	1	95	89.9	80 - 120	106
	Zinc, Zn	mg/kg	2	290	273	80 - 120	106

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208724.002	TRH C10-C14	mg/kg	20	37	40	60 - 140	93
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	83
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	88
	TRH >C10-C16	mg/kg	25	37	40	60 - 140	93
	TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	83
	TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	85

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB208723.002	TRH C6-C10	mg/kg	25	78	92.5	60 - 140	84
	TRH C6-C9	mg/kg	20	69	80	60 - 140	86
	Surrogates	d4-1,2-dichloroethane (Surrogate)	-	10.6	10	70 - 130	106
	Surrogates	Bromofluorobenzene (Surrogate)	-	9.6	10	70 - 130	96
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	25	49	62.5	60 - 140	79

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210861.001	LB208738.004	Mercury	mg/kg	0.05	0.22	<0.05	0.2	87

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210885.001	LB208724.024	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Lindane	mg/kg	0.1	<0.1	<0.1	-	-
		Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	92
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	86
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	87
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	84
		Endrin	mg/kg	0.2	<0.2	<0.2	0.2	84
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDT	mg/kg	0.1	0.1	<0.1	0.2	67
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
		Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
		Mirex	mg/kg	0.1	<0.1	<0.1	-	-
		Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.15	-	116

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210885.001	LB208724.026	Dichlorvos	mg/kg	0.5	1.6	<0.5	2	81
		Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
		Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	99
		Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
		Malathion	mg/kg	0.2	<0.2	<0.2	-	-
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.0	<0.2	2	101
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
		Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
		Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
		Ethion	mg/kg	0.2	1.4	<0.2	2	71
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
		Total OP Pesticides*	mg/kg	1.7	7.0	<1.7	-	-
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	85
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	83

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210861.001	LB208745.004	Arsenic, As	mg/kg	1	41	2	50	79
		Cadmium, Cd	mg/kg	0.3	42	<0.3	50	84
		Chromium, Cr	mg/kg	0.5	70	27	50	87
		Copper, Cu	mg/kg	0.5	60	13	50	94
		Nickel, Ni	mg/kg	0.5	55	9.1	50	91
		Lead, Pb	mg/kg	1	56	11	50	90
		Zinc, Zn	mg/kg	2	190	170	50	54 ☹

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210885.001	LB208724.024	TRH C10-C14	mg/kg	20	35	<20	40	88
		TRH C15-C28	mg/kg	45	<45	<45	40	80
		TRH C29-C36	mg/kg	45	<45	<45	40	80
		TRH C37-C40	mg/kg	100	<100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	mg/kg	25	35	<25	40	88
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	78
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210861.001	LB208723.004	TRH C6-C10	mg/kg	25	64	<25	92.5	69
		TRH C6-C9	mg/kg	20	58	<20	80	72
		Surrogates	mg/kg	-	9.3	11.4	10	93
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.8	9.3	10	78
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	9.4	-	84
		VPH F	mg/kg	0.1	3.6	<0.1	-	-
		Bands	mg/kg	25	41	<25	62.5	64
		TRH C6-C10 minus BTEX (F1)	mg/kg	25	41	<25	62.5	64

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service .
 - ** Indicative data, theoretical holding time exceeded.
 - *** Indicates that both * and ** apply.
 - Sample not analysed for this analyte.
 - IS Insufficient sample for analysis.
 - LNR Sample listed, but not received.
 - LOR Limit of reporting.
 - QFH QC result is above the upper tolerance.
 - QFL QC result is below the lower tolerance.
-
- ① At least 2 of 3 surrogates are within acceptance criteria.
 - ② RPD failed acceptance criteria due to sample heterogeneity.
 - ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
 - ④ Recovery failed acceptance criteria due to matrix interference.
 - ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
 - ⑥ LOR was raised due to sample matrix interference.
 - ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
 - ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
 - ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
 - ⑩ LOR was raised due to high conductivity of the sample (required dilution).
 - † Refer to relevant report comments for further information.

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STATEMENT OF QA/QC PERFORMANCE

SE210304 R0

CLIENT DETAILS

Contact DANE EGELTON
Client CSI AUSTRALIA
Address PO BOX 389
ALSTONVILLE NSW 2477

Telephone (Not specified)
Facsimile (Not specified)
Email dane@csiaus.com.au

Project 2216 East Lismore
Order Number (Not specified)
Samples 10

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference SE210304 R0
Date Received 24 Aug 2020
Date Reported 31 Aug 2020

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Matrix Spike

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

2 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	10 Soil
Date documentation received	24/8/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	13.7°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EL1	SE210304.001	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL2	SE210304.002	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL2D	SE210304.003	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL3	SE210304.004	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL4	SE210304.005	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL5	SE210304.006	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL6	SE210304.007	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL7	SE210304.008	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL8	SE210304.009	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020
EL9	SE210304.010	LB207639	19 Aug 2020	24 Aug 2020	16 Sep 2020	26 Aug 2020	16 Sep 2020	31 Aug 2020

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EL1	SE210304.001	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL2	SE210304.002	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL2D	SE210304.003	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL3	SE210304.004	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL4	SE210304.005	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL5	SE210304.006	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL6	SE210304.007	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL7	SE210304.008	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL8	SE210304.009	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020
EL9	SE210304.010	LB207608	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	31 Aug 2020	28 Aug 2020

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EL1	SE210304.001	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL2	SE210304.002	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL2D	SE210304.003	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL3	SE210304.004	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL4	SE210304.005	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL5	SE210304.006	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL6	SE210304.007	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL7	SE210304.008	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL8	SE210304.009	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020
EL9	SE210304.010	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	28 Aug 2020

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EL1	SE210304.001	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL2	SE210304.002	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL2D	SE210304.003	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL3	SE210304.004	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL4	SE210304.005	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL5	SE210304.006	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL6	SE210304.007	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL7	SE210304.008	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL8	SE210304.009	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020
EL9	SE210304.010	LB207610	19 Aug 2020	24 Aug 2020	02 Sep 2020	26 Aug 2020	05 Oct 2020	31 Aug 2020

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EL1	SE210304.001	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL2	SE210304.002	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL2D	SE210304.003	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL3	SE210304.004	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL4	SE210304.005	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL5	SE210304.006	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL6	SE210304.007	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL7	SE210304.008	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL8	SE210304.009	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020
EL9	SE210304.010	LB207632	19 Aug 2020	24 Aug 2020	15 Feb 2021	26 Aug 2020	15 Feb 2021	31 Aug 2020

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	EL1	SE210304.001	%	60 - 130%	108
	EL2	SE210304.002	%	60 - 130%	107
	EL2D	SE210304.003	%	60 - 130%	111
	EL3	SE210304.004	%	60 - 130%	110
	EL4	SE210304.005	%	60 - 130%	106
	EL5	SE210304.006	%	60 - 130%	110
	EL6	SE210304.007	%	60 - 130%	111
	EL7	SE210304.008	%	60 - 130%	108
	EL8	SE210304.009	%	60 - 130%	106
	EL9	SE210304.010	%	60 - 130%	106

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	EL1	SE210304.001	%	60 - 130%	101
	EL2	SE210304.002	%	60 - 130%	96
	EL2D	SE210304.003	%	60 - 130%	103
	EL3	SE210304.004	%	60 - 130%	100
	EL4	SE210304.005	%	60 - 130%	99
	EL5	SE210304.006	%	60 - 130%	109
	EL6	SE210304.007	%	60 - 130%	93
	EL7	SE210304.008	%	60 - 130%	101
	EL8	SE210304.009	%	60 - 130%	104
	EL9	SE210304.010	%	60 - 130%	99
d14-p-terphenyl (Surrogate)	EL1	SE210304.001	%	60 - 130%	96
	EL2	SE210304.002	%	60 - 130%	109
	EL2D	SE210304.003	%	60 - 130%	97
	EL3	SE210304.004	%	60 - 130%	111
	EL4	SE210304.005	%	60 - 130%	96
	EL5	SE210304.006	%	60 - 130%	128
	EL6	SE210304.007	%	60 - 130%	127
	EL7	SE210304.008	%	60 - 130%	100
	EL8	SE210304.009	%	60 - 130%	100
	EL9	SE210304.010	%	60 - 130%	95

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB207639.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB207610.001	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Alpha BHC	mg/kg	0.1	<0.1
	Lindane	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Alpha Endosulfan	mg/kg	0.2	<0.2
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	p,p'-DDE	mg/kg	0.1	<0.1
	Dieldrin	mg/kg	0.2	<0.2
	Endrin	mg/kg	0.2	<0.2
	Beta Endosulfan	mg/kg	0.2	<0.2
	p,p'-DDD	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	Endrin Aldehyde	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Endrin Ketone	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB207610.001	Dichlorvos	mg/kg	0.5	<0.5
	Dimethoate	mg/kg	0.5	<0.5
	Diazinon (Dimpylate)	mg/kg	0.5	<0.5
	Fenitrothion	mg/kg	0.2	<0.2
	Malathion	mg/kg	0.2	<0.2
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
	Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
	Bromophos Ethyl	mg/kg	0.2	<0.2
	Methidathion	mg/kg	0.5	<0.5
	Ethion	mg/kg	0.2	<0.2
	Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	2-fluorobiphenyl (Surrogate)	%	-	100
Surrogates	d14-p-terphenyl (Surrogate)	%	-	116

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB207632.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210304.010	LB207639.014	Mercury	mg/kg	0.05	0.06	0.06	117	2
SE210350.002	LB207639.024	Mercury	mg/kg	0.05	<0.01	<0.01	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210304.006	LB207608.011	% Moisture	%w/w	1	42.9	42.3	32	1
SE210304.010	LB207608.016	% Moisture	%w/w	1	26.5	26.4	34	0

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210242.004	LB207610.020	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Lindane	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
		Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
		Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
		Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
Surrogates		Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.17	30	1

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210242.004	LB207610.020	Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
		Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
		Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
		Malathion	mg/kg	0.2	<0.2	<0.2	200	0
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
		Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
		Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
		Ethion	mg/kg	0.2	<0.2	<0.2	200	0
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	3
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	11

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR
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Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE210304.010	LB207632.014	Arsenic, As	mg/kg	1	2	1	95	11
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	18	19	33	6
		Copper, Cu	mg/kg	0.5	19	20	33	5
		Nickel, Ni	mg/kg	0.5	7.6	7.9	36	4
		Lead, Pb	mg/kg	1	6	7	46	6
		Zinc, Zn	mg/kg	2	110	110	32	2
SE210350.002	LB207632.024	Arsenic, As	mg/kg	1	2	2	80	35
		Cadmium, Cd	mg/kg	0.3	0.4	0.5	97	15
		Chromium, Cr	mg/kg	0.5	23	24	32	2
		Copper, Cu	mg/kg	0.5	200	200	30	3
		Nickel, Ni	mg/kg	0.5	13	13	34	5
		Lead, Pb	mg/kg	1	12	11	39	7
		Zinc, Zn	mg/kg	2	61	57	33	7

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB207639.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	98

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB207610.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	91
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	101
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	104
	Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	103
	Endrin	mg/kg	0.2	0.2	0.2	60 - 140	107
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	87
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	97

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB207610.002	Dichlorvos	mg/kg	0.5	2.5	2	60 - 140	123
	Diazinon (Dimpylate)	mg/kg	0.5	2.5	2	60 - 140	126
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.2	2	60 - 140	110
	Ethion	mg/kg	0.2	2.6	2	60 - 140	132
Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	95
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	83

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB207632.002	Arsenic, As	mg/kg	1	310	318.22	80 - 120	98
	Cadmium, Cd	mg/kg	0.3	5.9	5.41	80 - 120	110
	Chromium, Cr	mg/kg	0.5	37	38.31	80 - 120	96
	Copper, Cu	mg/kg	0.5	280	290	80 - 120	98
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	95
	Lead, Pb	mg/kg	1	91	89.9	80 - 120	101
	Zinc, Zn	mg/kg	2	270	273	80 - 120	98

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210304.001	LB207639.004	Mercury	mg/kg	0.05	0.20	0.05	0.2	73

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210242.001	LB207610.004	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Lindane	mg/kg	0.1	<0.1	<0.1	-	-
		Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	116
		Aldrin	mg/kg	0.1	0.3	<0.1	0.2	127
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.3	<0.1	0.2	132
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Dieldrin	mg/kg	0.2	0.2	<0.2	0.2	125
		Endrin	mg/kg	0.2	0.3	<0.2	0.2	129
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	81
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
		Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
		Mirex	mg/kg	0.1	<0.1	<0.1	-	-
		Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.18	0.17	-	117

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210242.001	LB207610.004	Dichlorvos	mg/kg	0.5	2.0	<0.5	2	98
		Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
		Diazinon (Dimpylate)	mg/kg	0.5	2.4	<0.5	2	117
		Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
		Malathion	mg/kg	0.2	<0.2	<0.2	-	-
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.3	<0.2	2	113
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
		Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
		Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
		Ethion	mg/kg	0.2	2.7	<0.2	2	132
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
		Total OP Pesticides*	mg/kg	1.7	9.3	<1.7	-	-
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	103
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.8	-	95

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE210304.001	LB207632.004	Arsenic, As	mg/kg	1	36	2	50	69 Ⓢ
		Cadmium, Cd	mg/kg	0.3	38	<0.3	50	76
		Chromium, Cr	mg/kg	0.5	67	29	50	77
		Copper, Cu	mg/kg	0.5	62	25	50	75
		Nickel, Ni	mg/kg	0.5	49	6.5	50	85
		Lead, Pb	mg/kg	1	48	6	50	84
		Zinc, Zn	mg/kg	2	130	140	50	-18 Ⓢ

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service .
- ** Indicative data, theoretical holding time exceeded.
- *** Indicative data, theoretical holding time exceeded and NATA accreditation does not cover the performance of this service.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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APPENDIX 3 – HISTORICAL TITLE SEARCH INFORMATION



LAND REGISTRY SERVICES

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

26/8/2020 5:33PM

FOLIO: 21/793350

First Title(s): VOL 2073 FOL 107 VOL 2933 FOL 12
VOL 3376 FOL 185 VOL 1147 FOL 227
Prior Title(s): 121/787624 VOL 5251 FOL 9

Recorded	Number	Type of Instrument	C.T. Issue
20/12/1989	DP793350	DEPOSITED PLAN	FOLIO CREATED EDITION 1
7/2/1990	Y851278	DEPARTMENTAL DEALING	EDITION 2
PRIOR TITLES(S) AS AMENDED: 121/787624, VOL 5251 FOLS 9-10.			
19/2/1990	Y864294	DEPARTMENTAL DEALING	
17/4/1990	Y916322	DISCHARGE OF MORTGAGE	
17/4/1990	Y916323	DISCHARGE OF MORTGAGE	
17/4/1990	Y916324	TRANSFER	EDITION 3
7/1/1991	DP805680	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

HAZ-MARK-

PRINTED ON 26/8/2020

Hazlett Information Services hereby certifies that the information contained in this document has been provided electronically by the Registrar-General in accordance with Section 96B(2) of the Real Property Act 1900.

Date and Time of Search: Wed Aug 26 17:33:57 2020
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LAND REGISTRY SERVICES

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

26/8/2020 5:33PM

FOLIO: 1/728271

First Title(s): 1/728271
Prior Title(s): CROWN LAND

Recorded	Number	Type of Instrument	C.T. Issue
17/5/1989	DP728271	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
31/5/1989	DP728271	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
6/7/1989	Y457740	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	EDITION 1
7/1/1991	DP805680	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

HAZ-MARK-

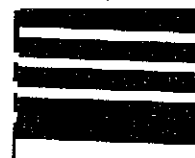
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New South Wales



12651184

No. 19 74/3649

FREE

CANCELLED

12651 Fol. 184

Registered 13-1-1975

J. J. J. J.
Registrar General.

SEE AUTO FOLIO
GRANT OF LAND AS COMPENSATION FOR LAND RESUMED FOR A PUBLIC ROAD
UNDER THE PUBLIC ROADS ACT, 1902

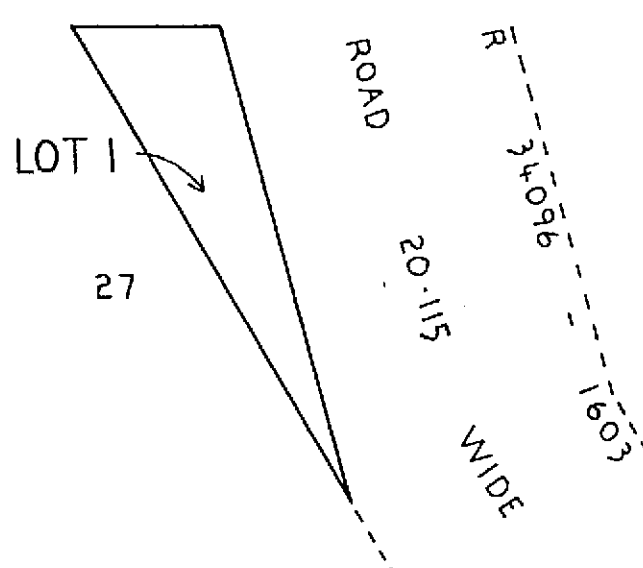
ELIZABETH the SECOND, by the Grace of God Queen of Australia and Her other Realms
and Territories, Head of the Commonwealth:-
To All to whom these Presents shall come, Greeting:-

Whereas ALEXANDER CYFFEN ROBERTS of 275 Keen Street Lismore in Our State of New South Wales

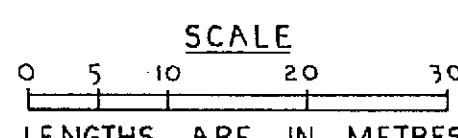
(hereinafter called the GRANTEE) agreed to accept a Grant in fee simple of the land hereinafter described and intended to be hereby granted as compensation for certain land which was resumed under the Public Roads Act, 1902 — by Notification of Resumption published in the Gazette on the twenty sixth day of July 1974 and which was at the time of such resumption held by the GRANTEE in fee simple NOW THESE PRESENTS WITNESS That in consideration of the premises WE DO HEREBY GRANT unto the GRANTEE Subject to the Reservations and Exceptions hereinafter contained ALL THAT parcel of land containing by admeasurement one hundred and sixty square metres be the same more or less situated in the County of Rous

Parish of Lismore Being Lot 1 in Deposited Plan No. 247801

NORTH



AREA : 160 m²



As per Plan hereon TO HOLD unto the GRANTEE in fee simple PROVIDED NEVERTHELESS AND WE DO HEREBY RESERVE AND EXCEPT unto Us Our Heirs and Successors all minerals which the Land hereby granted contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or Them to enter upon the Land hereby granted and to search for mine dig and remove the said minerals AND ALSO all such parts and so much of the Land hereby granted as may hereafter be required for public ways in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways And the right of full and free ingress egress and regress into out of and upon the Land hereby granted for the several purposes aforesaid or any of them IN TESTIMONY WHEREOF We have caused this Our Grant to be Sealed with the Seal of Our said State

Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this eighteenth day of December in the twenty third year of Our Reign and in the year of Our Lord one Thousand nine hundred and seventy four

A. P. Butler
Governor

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

(Page 1) Vol. 12651 Fol. 184

REGISTERED PROPRIETOR

[illegible]

PARTICULARS

[illegible]

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

8a 509-94

No. 94/
669



Collect
m. m. h.



[LAND GRANT.]

REGISTER BOOK,

VOL. 1147 FOL. 227

CANCELLED

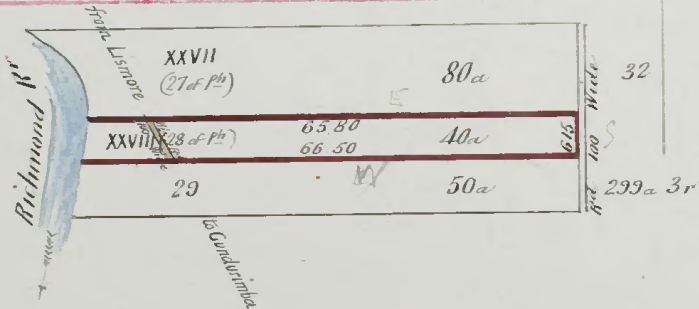
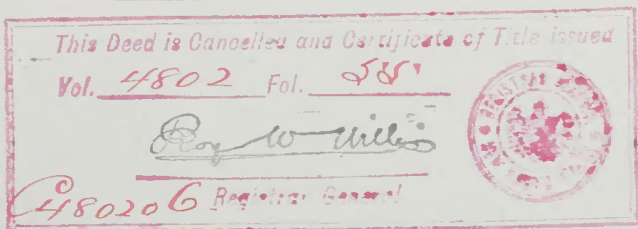
GRANT OF LAND PURCHASED BY CONDITIONAL SALE WITHOUT COMPETITION.

(UNDER THE CROWN LANDS ALIENATION ACT OF 1861.)

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—
TO ALL to whom these Presents shall come, Greeting:—

WHEREAS *John Sheehan* of *Lismore* in Our Colony of New South Wales, claims to be entitled, in respect of a purchase by Conditional Sale, without competition, under the 13th Section of the Crown Lands Alienation Act of 1861, to the parcel of land hereinafter described; and the declaration as by law required has been made, and the Minister for the time being charged with the administration of the public lands is satisfied that all things required by law to be done to entitle the said *John Sheehan* to a grant of the fee simple of the said land, subject to the reservations hereinafter contained, have been done and performed: And Whereas the sum of *Forty pounds* sterling, being

the purchase money payable for the said land, has been duly paid into the Office of the Colonial Treasurer of Our said Colony: Now Know Ye, That for and in consideration of the said sum, for and on Our behalf well and truly paid into the Colonial Treasury of Our said Colony, before these presents are issued, and of all and singular the premises, We, for Us, Our Heirs and Successors, DO HEREBY GRANT unto the said *John Sheehan* his Heirs and Assigns, subject to the several and respective reservations hereinafter mentioned, ALL THAT piece or parcel of land in Our said Colony, containing by admeasurement *Forty acres* be the same more or less, situated in the County of *Nowe* and Parish of *Lismore*



Scale 20 chains to an inch

Portion XXVIII (28 of Parish)

Commencing on the left bank of the Richmond River at the South Western corner of portion XXVII (27 of Parish) of eighty acres and bounded thence on the North by the Southern boundary of that portion bearing East fifty five chains eighty links on the East by a road one chain wide dividing it from part of portion thirty two of two hundred and ninety nine acres three rods bearing South by six chains fifty links on the South by the Northern boundary of portion twenty nine of fifty acres bearing West sixty six chains fifty links to the aforesaid river and on the West by that river upwards to the point of commencement Exclusively of the road one chain wide from Lismore to Gundurimba passing through this land in a South Easterly direction the area of which has been deducted from the total area

As per Plan in the margin hereof: with all the Rights and Appurtenances whatsoever thereto belonging: To Hold unto the said *John Sheehan* his Heirs and Assigns for ever: Subject nevertheless to the several and respective

reservations, hereinafter contained, that is to say: Provided Nevertheless, AND WE DO HEREBY RESERVE unto Us, Our Heirs and Successors, all Minerals which the said Land contains, with full power and authority for Us, Our Heirs and Successors, and such person or persons as shall from time to time be authorized by Us, Our Heirs and Successors, or by the Governor for the time being, of Our said Colony, to enter upon the said Land, and to search for, mine, dig, and remove the said Minerals, with full right of ingress, egress, and regress, for the purposes aforesaid: Provided Also, AND WE DO HEREBY FURTHER EXCEPT AND RESERVE unto Us, Our Heirs and Successors, all such parts and so much of the said Land as may hereafter be required for a Public Way, or Public Ways, Canals, or Railroads, in, over, and through the same, to be set out by Our Governor for the time being of Our said Colony or some person by him authorized in that respect; AND ALSO all Sand, Clay, Stone, Gravel, and Indigenous Timber, and all other Materials, the natural produce of the said Land, which may be required at any time or times hereafter by the Government of Our said Colony, for the construction and repair of any Public Ways, Bridges, or Canals, or for Naval purposes, or Railroads, or any Fences, Embankments, Dams, or Drains necessary for the same, together with the right of taking and removing all such Materials: AND ALSO the right of full and free ingress, egress, and regress, into, out of, and upon the said Land, for the several purposes aforesaid, or any of them: In Testimony Whereof, Our Grant to be Sealed with the Seal of Our said Colony.

WITNESS Our Right Trusty and Well-beloved Councillor SIR ROBERT WILLIAM DUFF, a Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, Our Governor and Commander-in-Chief of Our Colony of NEW SOUTH WALES and its Dependencies, at Government House, Sydney, in NEW SOUTH WALES aforesaid, this *fifteenth* day of *November* in the *fifty-eight* year of Our Beign, and in the year of Our Lord one thousand eight hundred and ninety-four

R. W. Duff

RECORDED and ENROLLED in the Registrar General's Office, at Sydney, in New South
Wales, this 20 day of December 1893

Charles Pinkey
Registrar General.

No. 16113 APPLICATION BY TRANSMISSION
Bridget Sheehan of Lismore,
Widow
is now the REGISTERED
PROPRIETOR OF THE LAND WITHIN DESCRIBED IN PURSUANCE
OF ABOVE APPLICATION, PRODUCED 30th August 1904
AND ENTERED 17th September 1904
AT 10 O'CLOCK IN THE NOON
Chenail
DEPUTY REGISTRAR GENERAL.

No. 392579 CAVEAT DATED 13th September 1904
BY THE REGISTRAR GENERAL, PRODUCED & ENTERED
17th September 1904 AT 10
O'CLOCK IN THE NOON
Chenail
Deputy Registrar General.

Withdrawal of above Caveat no 392579
dated 21st November 1912
Produced & entered the 21st day of November 1912
at 4 o'clock in the afternoon
W. H. Williams
Reg. General

No. 28158 APPLICATION BY TRANSMISSION
Mary Catherine Collins wife of Timothy
Joseph Collins of Lismore Farmer
is now the registered
Proprietors of the Land within described in pursuance of the above
Application. Produced 1st September 1912 and
entered 21st November 1912
at 11 o'clock in the after noon.
W. H. Williams
REGISTRAR GENERAL.

No. A265201 APPLICATION BY TRANSMISSION
Timothy Joseph Collins of Lismore
Farmer
is now the registered
Proprietors of the Land within described in pursuance of the above
Application. Produced 8th September 1916 and
entered 11th October 1916
at 10 o'clock in the after noon.
W. H. Williams
REGISTRAR GENERAL.

No. A945555 TRANSFER dated 4th December 1922
from the said Timothy Joseph Collins to David
Kirk Martin of Lismore Farmer
of the land within described
Produced and entered 2nd May 1923
at 25 mts past 10 o'clock in the fore noon.
W. H. Williams
REGISTRAR GENERAL.

No. A945559 MORTGAGE dated 16th April 1923
from the said David Kirk Martin to Bank of
New South Wales
Produced and entered 2nd May 1923
at 25 mts past 10 o'clock in the fore noon.
W. H. Williams
REGISTRAR GENERAL.

No. C120776 writ of Execution dated 6th May 1932
Produced and entered 13th May 1932 at 31 mts past 9
o'clock in the forenoon.
W. H. Williams
Acting Registrar General.

No. C. 123644. Caveat dated 30th May
1932. Produced and entered 13th June
1932 at 55 mts past 2 o'clock in
the afternoon
W. H. Williams
Acting Registrar General.

No. C125226 writ of Execution dated 10th June 1932
Produced 13th June 1932 and entered 20th June 1932 at
10 o'clock in the forenoon.
W. H. Williams
Acting Registrar General.

WITHDRAWAL of the within Caveat
No. C188686 dated 28th June 1933
No. C123644 dated 30th June 1933 and entered
Produced 6th July 1933
at 1 o'clock in the after noon.
Roy W. Willis
REGISTRAR GENERAL.

No. C186296 Lease dated 9th June 1933
from the said David Kirk Martin (with consent
of mortgagee) to Eric May Anderson of
Lismore Married Woman
Produced 19th June 1933
entered 6th July 1933
at 1 o'clock in the after noon.
Roy W. Willis
REGISTRAR GENERAL.

Sufficient evidence of the satisfaction of the within mentioned
Writ of Execution Nos. C120776 & C125226 has been furnished to me
Dated 4th August, 1936
W. H. Williams
Reg. General

The within mentioned LEASE No. C186296
has expired by effluxion of time
Dated 14th September 1936 Vide CH71254
Roy W. Willis
REGISTRAR GENERAL.

No. C 473911 DISCHARGE of within mortgage
No. A 945559 dated 28th July 1936
Produced and entered 23rd September 1936
at 43 mts past 2 o'clock in the after noon
Roy W. Willis
REGISTRAR GENERAL.

97189R

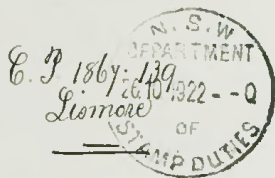
For Cancellation, see Previous page

C.P. 1861 Act.

No. 1922/4518

State of New South Wales.

[LAND GRANT.]



REGISTER BOOK
VOL. 3376 Fol. 185

CANCELLED ☐

GRANT OF LAND PURCHASED BY CONDITIONAL SALE WITHOUT COMPETITION.

GEORGE R. by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India:—
TO ALL to whom these Presents shall come, Greeting:—

Whereas Timothy Joseph Collins of Lismore

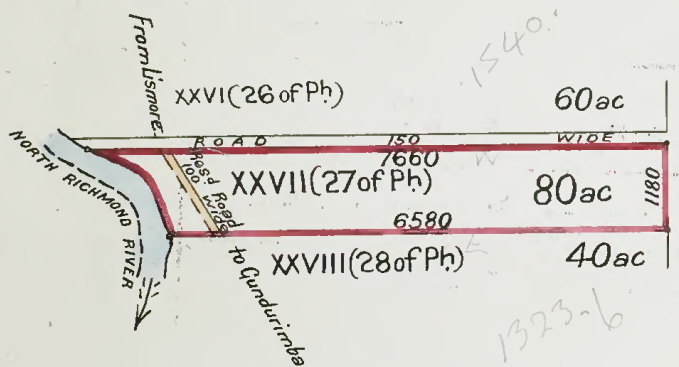
in Our State of New South Wales claims—to be entitled in respect of a purchase by Conditional Sale without competition under the 13th Section of the Crown Lands Alienation Act of 1861 to the Parcel of Land hereinafter described and the declaration—as by law required has been made and the Minister for the time being charged with the administration of the public lands is satisfied that all things required by law to be done to entitle the said Timothy Joseph Collins

to a grant of the fee simple of the said Lands subject to the Reservations hereinafter contained have been done and performed And Whereas the sum of Eighty pounds

sterling being the purchase money payable for the said Land has been duly paid into the Office of the Treasurer of Our said State Now Know Ye That for and in consideration of the said sum for and on Our behalf well and truly paid into the Treasury of Our said State before these Presents are issued and of all and singular the premises We for Us Our Heirs and Successors Do HEREBY GRANT unto the said Timothy Joseph Collins

subject to the several and respective Reservations hereinafter mentioned ALL THAT piece or parcel of Land in Our said State containing by Admeasurement Eighty acres he the same more or less situated in the County of Rous and Parish of Lismore

Portion XXVII (27 of Parish)



Scale 20 Chains to an Inch.

Commencing on the left bank of the North Richmond River at the North Western corner of portion XXVIII (28 of Parish) of forty acres and bounded thence on the South by the Northern boundary of portion XXVIII (28 of Parish) bearing East sixty five chains eighty links on the East by a line bearing North eleven chains eighty links on the South by a road one chain fifty links wide dividing this land from portion XXVI (26 of Parish) of sixty acres bearing West seventy six chains sixty links to the left bank of the North Richmond River aforesaid and on the South West by that bank downwards to the point of commencement Exclusively of the road one chain wide from Lismore to Gundurimba passing through this land in a South Easterly direction the area of which has been deducted from the total area

As per plan in the margin hereof with all the Rights and Appurtenances whatsoever thereto belonging To hold unto the said Timothy Joseph Collins his Heirs and Assigns for ever Subject nevertheless to the several and respective Reservations hereinafter contained that is to say Provided Nevertheless And We do HEREBY RESERVE unto Us Our Heirs and Successors all Minerals which the said Land contains with full power and authority for Us Our Heirs and Successors and such person or persons as may from time to time be authorised by Us Our Heirs and Successors or by the Governor for the time being of Our said State to enter upon the said Land and to search for mine dig and remove the said Minerals with full right of ingress egress and regress for the purposes aforesaid Provided also AND WE DO HEREBY FURTHER EXCEPT AND RESERVE unto Us Our Heirs and Successors all such parts and so much of the said Land as may hereafter be required for a Public Way or Public Ways Canals or Railroads in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect And also all Sand Clay Stone Gravel and Indigenous Timber and all other Materials the natural produce of the said Land which may be required at any time or times hereafter by the Government of Our said State for the construction and repair of any Public Ways Bridges or Canals or for Naval Purposes or Railroads or any Fences Embankments Dams Sewers or Drains necessary for the same together with the right of taking and removing all such materials AND ALSO the right of full and free ingress egress and regress into out of and upon the said Land for the several purposes aforesaid or any of them In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said State

WITNESS Our Trusty and Well-beloved SIR WALTER EDWARD DAVIDSON, KNIGHT Commander of Our Most Distinguished Order of Saint Michael and Saint George, Our Governor of Our State of New South Wales and its Dependencies, in the Commonwealth of Australia, at Sydney, in Our said State, this twentieth day of October in the thirteenth year of Our Reign, and in the year of Our Lord One thousand nine hundred and twenty-two.

W. E. Davidson
Governor.

RECORDED and ENROLLED in the Registrar General's Office, at Sydney, in New South

Wales, this 27th day of October 1932

Roy W. Willis Registrar General.

No. A945558 TRANSFER dated 4th December 1922
from the said Amos Joseph Collins to David Kirk Martin of Diamond Farm
of the land within described
Produced and entered 21st May 1923
at 28 mpt 10 o'clock in the fore noon.
Roy W. Willis
REGISTRAR GENERAL

Sufficient evidence of the satisfaction of the within mentioned Writs of Execution Nos. C120776 and C125226 has been furnished to me.
Dated 4th August, 1936.
Tide C459289.

No. A945559 MORTGAGE dated 16th April 1923
from the said David Kirk Martin to Bank of New South Wales
Produced and entered 21st May 1923
at 28 mpt 10 o'clock in the fore noon.
Roy W. Willis
REGISTRAR GENERAL

The within mentioned LEASE No. C186296
has expired by effluxion of time
Dated 14th September 1934 vide C471254
Roy W. Willis
REGISTRAR GENERAL

No. C473911 DISCHARGE of within mortgage
No. A945559 dated 28th July 1936
Produced and entered 23rd September 1936
at 43 mpt 20 o'clock in the after noon
Roy W. Willis
REGISTRAR GENERAL

No C120776 writ of Execution dated 6th March 1932.
Produced and entered 13th May 1932 at 31 mpt 9 o'clock in the afternoon
Amos Joseph Collins
Acting Registrar General

No C123644 caveat dated 30th May 1932. Produced and entered
1st June 1932 at 55 mpt 2 o'clock in the afternoon
Amos Joseph Collins
Acting Registrar General

This Deed is Cancelled and Certificate of Title issued
Vol. 4802 Fol. 551
Roy W. Willis
C480206 Registrar General

No C125226 writ of Execution dated 10th June 1932.
Produced 13th June 1932 and entered 20th June 1932
at 10 o'clock in the forenoon.
Amos Joseph Collins
Acting Registrar General

No. C188686 WITHDRAWAL of the within Caveat
No. C123644 dated 28th June 1933
Produced 30th June 1933 and entered 6th July 1933
at 1 o'clock in the after noon.
Roy W. Willis
REGISTRAR GENERAL

No. C186296 Lease dated 9th June 1933
from the said David Kirk Martin (with consent of mortgagee) to Elsie May Anderson of Diamond Farm
Produced 19th June 1933 and entered 6th July 1933
at 1 o'clock in the after noon.
Roy W. Willis
REGISTRAR GENERAL

C120776
C123644
C125226
C186296
C188686
C459289
C471254
C480206

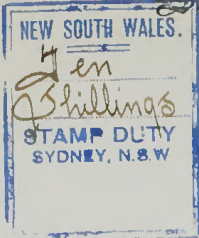
C.P. 1861 Act.

47301 M 801

No. 1919/305

State of New South Wales.

[LAND GRANT.]



REGISTER BOOK,
Vol. 2933 Fol. 12

CANCELLED W

GRANT OF LAND PURCHASED BY CONDITIONAL SALE WITHOUT COMPETITION.

C.P. 67. 217.
Lismore

GEORGE V, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.
TO ALL to whom these Presents shall come, Greeting:--

Whereas Giuseppe Marozin of Lismore

in Our State of New South Wales claims to be entitled in respect of a purchase by Conditional Sale without competition under the 13th Section of the Crown Lands Alienation Act of 1861 to the Parcel of Land hereinafter described and the declaration as by law required has been made and the Minister for the time being charged with the administration of the public lands is satisfied that all things required by law to be done to entitle the said Giuseppe Marozin

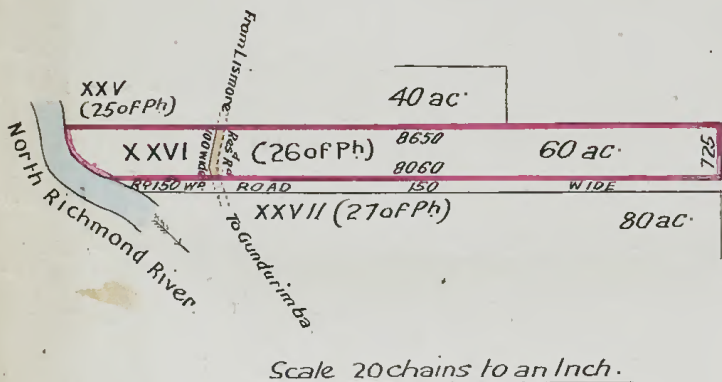
to a grant of the fee simple of the said Lands subject to the Reservations hereinafter contained have been done and performed And Whereas the sum of Sixty pounds

sterling being the purchase money payable for the said land has been duly paid into the Office of the Treasurer of Our said State Now Know Ye That for and in consideration of the said Sum for and on Our behalf well and truly paid into the Treasury of Our said State before these presents are issued and of all and singular the premises WE for Us Our Heirs and Successors DO HEREBY GRANT unto the said Giuseppe Marozin his

Heirs and Assigns subject to the several and respective Reservations hereinafter mentioned ALL THAT Piece or Parcel of Land in Our said State containing by Admeasurement Sixty acres be the same more or less situated in the County of Rous and Parish of Lismore

Portion XXVI (26 of Parish).

Commencing on the left bank of the North Richmond River at the South Western corner of Portion XXV (25 of Parish) of forty acres and bounded thence on the North by the Southern boundary of that portion and a line in all bearing East eighty six chains fifty links on the East by a line bearing South seven chains twenty five links on the South by a road one chain fifty links wide dividing it from Portion XXVII (27 of Parish) of eighty acres a line crossing the road from Lismore to Gundurimba and thence by a road one chain fifty links wide dividing it from Portion XXVIII (27 of Parish) in all bearing West eighty chains sixty links to the left bank of the aforesaid River and on all other sides by that bank upwards to the point of commencement Exclusively of the road one chain wide from Lismore to Gundurimba passing through this land in a South Westely and thence in a South Easterly direction the area of which has been deducted from the total area



As per plan in the margin hereof With all the Rights and Appurtenances whatsoever thereto belonging To Hold unto the said Giuseppe Marozin his Heirs and Assigns for ever Subject nevertheless to the several and respective Reservations hereinafter contained that is to say Provided Notwithstanding And WE DO HEREBY RESERVE unto Us Our Heirs and Successors all Minerals which the said Land contains with full power and authority for Us Our Heirs and Successors and such person or persons as may from time to time be authorised by Us Our Heirs and Successors or by the Governor for the time being of Our said State to enter upon the said Land and to search for mine dig and remove the said Minerals with full right of ingress egress and regress for the purposes aforesaid Provided also AND WE DO HEREBY FURTHER EXCEPT AND RESERVE unto Us Our Heirs and Successors all such parts and so much of the said Land as may hereafter be required for a Public Way or Public Ways Canals or Railroads in over and through the same to be set out by Our Governor for the time-being of Our said State or some person by him authorised in that respect And also all sand clay stone gravel and indigenous timber and all other Materials the natural produce of the said Land which may be required at any time or times hereafter by the Government of Our said State for the construction and repair of any Public Ways Bridges or Canals or for Naval Purposes or Railroads or any Fences Embankments Dams Sewers or Drains necessary for the same together with the right of taking and removing all such materials AND ALSO the right of full and free ingress egress and regress into out of and upon the said Land for the several purposes aforesaid or any of them In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said State

WITNESS Our Trusty and Well-beloved SIR WALTER EDWARD DAVIDSON, Knight Commander of Our Most Distinguished Order of Saint Michael and Saint George, Our Governor of Our State of New South Wales and its Dependencies, in the Commonwealth of Australia, at Sydney, in Our said State, this twenty second day of April in the ninth year of Our Reign, and in the year of Our Lord One thousand nine hundred and nineteen

W. E. Davidson

Governor.

RECORDED and ENROLLED in the Registrar General's Office, at Sydney, in New South

Wales, this

5th day of May

1919.

No. A 437219 MORTGAGE dated 22nd January 1919
from the said Giuseppe Marozin to The Bank of Australasia

Produced 30th January 1919 and
entered 5th June 1919
at 12 o'clock in the noon

REGISTRAR GENERAL

No. B 358139 DISCHARGE of within Mortgage

A 437219 dated 14th May 1919

Produced 24th May 1919 and entered
24th May 1919
at 8.15 p.m. o'clock in the afternoon

REGISTRAR GENERAL

No. B 388960 APPLICATION BY TRANSMISSION

Angelina Marozin of Lismore Widow

is now the registered
Proprietors of the Land within described in pursuance of the above
Application. Produced 14th August 1926 and
entered 11th August 1926
at 12 o'clock in the noon

REGISTRAR GENERAL

No. B 388961 CAVEAT dated 15th August 1926
by the Registrar General Produced and entered

15th August 1926
at 12 o'clock in the noon

REGISTRAR GENERAL

The within Caveat No. B 388961 is hereby withdrawn.

Dated 11th November 1926

REGISTRAR GENERAL

No. C 481328 TRANSFER dated 30th September 1936
from the said Angelina Marozin to Joseph
Laurence Mazzer of Goolamanger near
Lismore, Farmers, of the land within described.

Produced 20th October 1936 and entered 11th November 1936
at 3 o'clock in the afternoon

REGISTRAR GENERAL

No. C 481329 MORTGAGE dated 17th October 1936
from the said Joseph Laurence Mazzer to
Commonwealth Bank of Australia.

Produced 20th October 1936 and entered 11th November 1936
at 3 o'clock in the afternoon

REGISTRAR GENERAL

REGISTRAR GENERAL

No. F 629195 TRANSFER dated 7th December 1937
from the said Joseph Laurence Mazzer (with consent of
mortgagee) to Richard Henry Thomas Junior of Lismore,
Bremen, Jack Harrison of Lismore, Solomon Robert Wagner
of Lismore, and the said Joseph Laurence Mazzer of Lismore,
Farmers of the land within described.

Produced 6th March 1952 and entered 7th May 1952
at 12 o'clock in the noon

As to land in this transfer
this ~~grant~~ is cancelled
and new Certificate issued
Vol. 6489 Fol. 113-114-115

REGISTRAR GENERAL

No. F 596896 TRANSFER dated 12th June 1957
from the said Joseph Laurence Mazzer (with consent
of Mortgagee) to Dudley David Arthur of Gundahimba,
Farmer of part (subject to covenant)

of the land within described
Produced 7th January 1958 and entered 17th May 1958
at 12 o'clock in the noon

As to land in this transfer
this ~~grant~~ is cancelled
and new Certificate issued
Vol. 6493 Fol. 61

REGISTRAR GENERAL

This Deed is Cancelled and Certificate of Title issued

Vol. 6544 Fol. 26

for residue

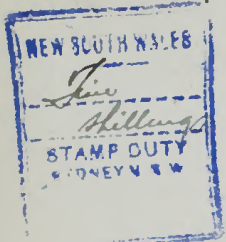
REGISTRAR GENERAL

No. 190

State of New South Wales.

[LAND GRANT.] B

53791-1



REGISTER BOOK,
VOL. 2073 FOL. 107

CANCELLED

St 7451

GRANT OF LAND PURCHASED BY CONDITIONAL SALE WITHOUT COMPETITION.

(UNDER THE CROWN LANDS ALIENATION ACT OF 1861.)



GEORGE V, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India:—
TO ALL to whom these Presents shall come, Greeting:—

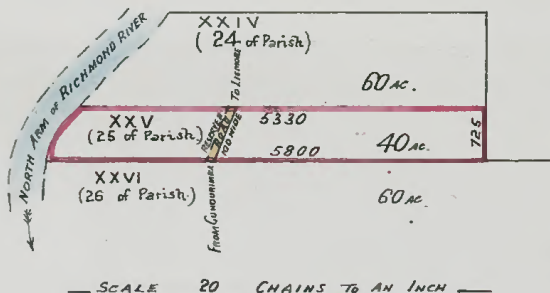
WHEREAS The Bank of New South Wales hereinafter called the said Bank in Our State of New South Wales claims to be entitled in respect of a purchase by Conditional Sale without competition under the 13th Section of the Crown Lands Alienation Act of 1861 to the Parcel of Land hereinafter described and the declaration as by law required has been made and the Minister for the time being charged with the administration of the public lands is satisfied that all things required by law to be done to entitle the said Bank

to a grant of the fee simple of the said Lands subject to the Reservations hereinafter contained have been done and performed And Whereas the sum of Forty pounds

sterling being the purchase money payable for the said Land has been duly paid into the Office of the Treasurer of Our said State Now Know Ye That for and in consideration of the said sum for and on Our behalf well and truly paid into the Treasury of Our said State before these Presents are issued and of all and singular the premises We for Us Our Heirs and Successors DO HEREBY GRANT unto the said Bank and its

subject to the several and respective Reservations hereinafter mentioned ALL THAT piece or parcel of land in Our said State containing by Admeasurement Forty acres situated in the County of Ross and Parish of Dismore

Portion XXV (25 of Parish)



commencing on the left bank of the North Arm of the Richmond River at the South Western corner of portion XXIV (24 of Parish) and bounded thence on the North by the Southern boundary of that portion bearing East fifty three chains thirty links on the East by a line bearing South seven chains twenty five links on the South by part of the Northern boundary of portion XXVI (26 of Parish) of sixty acres bearing West fifty eight chains to the North Western corner of portion XXVI (26 of Parish) on the left bank of the North Arm of the aforesaid River and on the West and North West by that bank upwards to the point of commencement. Exclusively of the road one chain wide from Gundurimba to Dismore passing through this land in a Northerly direction the area of which has been deducted from the total area.

As per plan in the margin hereof with all the Rights and Appurtenances whatsoever thereto belonging To Hold unto the said Bank and its Heirs and Assigns for ever.

Subject nevertheless to the several and respective Reservations hereinafter contained that is to say Provided Nevertheless And WE DO HEREBY RESERVE unto Us Our Heirs and Successors all Minerals which the said Land contains with full power and authority for Us Our Heirs and Successors and such person or persons as may from time to time be authorised by Us Our Heirs and Successors or by the Governor for the time being of Our said State to enter upon the said Land and to search for mine dig and remove the said Minerals with full right of ingress egress and regress for the purposes aforesaid Provided Also AND WE DO HEREBY FURTHER EXCEPT AND RESERVE unto Us Our Heirs and Successors all such parts and so much of the said Land as may hereafter be required for a Public Way or Public Ways Canals or Railroads in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect AND ALSO all Sand Clay Stone Gravel and Indigenous Timber and all other Materials the natural produce of the said Land which may be required at any time or times hereafter by the Government of Our said State for the construction and repair of any Public Ways Bridges or Canals or for Naval Purposes or Railroads or any Fences Embankments Dams Sewers or Drains necessary for the same together with the right of taking and removing all such materials AND ALSO the right of full and free ingress egress and regress into out of and upon the said Land for the several purposes aforesaid or any of them In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said State

WITNESS Our Right Trusty and Well-beloved FREDERIC JOHN NAPIER, BARON CHELMSFORD, Knight Commander of Our Most Distinguished Order of Saint Michael and Saint George, Our Governor of Our State of New South Wales and its Dependencies, in the Commonwealth of Australia, at Sydney, in Our said State, this fifth day of July in the first year of Our Reign, and in the year of Our Lord One thousand nine hundred and ten.

Govt

G. H. Napier

Governor.

+ m 8-12-54
 (2082x) tot 0 (Klone) R
 6251532 0 Res.

201.

Appn. No. _____
Reference to last certificate
Vol. 4802 Fol. 55

New South Wales

[CERTIFICATE OF TITLE.]



TENANCY IN COMMON

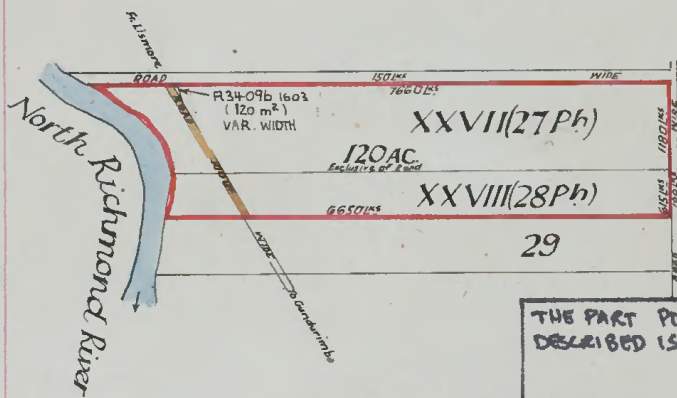
REGISTER BOOK.
Vol. 5251 Fol. 9

CANCELLED ☒ R 7-2-1990

34
THOMAS JOHN GAHAN, of Meerscham Vale, Farmer, Transferee under Instrument of Transfer No.D31386 is now the proprietor of an Estate in Fee Simple in an undivided moiety or half share, subject nevertheless to the reservations and conditions, if any, contained in the Grants hereinafter referred to, and also subject to such encumbrances, liens, and interests as are notified hereon, in ^{Firstly} that piece of land situated in the Shire of Gundurimba Parish of Lismore, and County of Rous containing Forty acres or thereabouts being Portion XXVIII (28 of Parish) originally granted to John Sheehan by Crown Grant dated the 15th day of November 1894 Volume 1147 Folio 227. Secondly that piece of land situated as aforesaid containing Eighty acres or thereabouts being Portion XXVII (27 of Parish) originally granted to Timothy Joseph Collins by Crown Grant dated the 20th day of October 1922 Volume 3376 Folio 185. Which said pieces of land are shown in the plan hereon and therein edged red. Excepting out of the said pieces of land the road coloured brown in the plan hereon the area of which is not included in the above stated areas of 40 acres and 80 acres. In witness whereof I have hereunto signed my name and affixed my Seal, this Twenty second day of July, 1941.

Signed in the presence of *W. H. Gahan*

W. H. Gahan
Registrar General.



Scale 20CH to one inch

NOTIFICATION REFERRED TO

Amongst the reservations and conditions contained in the Grants above referred to are reservations of minerals.

W. H. Gahan
Registrar General.

No. D31386 MORTGAGE dated 11 June 1941 from the said Thomas John Gahan and also Veronica Gahan to Commonwealth Bank of Australia. Produced 30th June 1941 and entered 1st July 1941 at 4 o'clock in the afternoon.

W. H. Gahan
REGISTRAR GENERAL.

No. F819910 APPLICATION BY TRANSMISSION Joseph Bede Gahan of Gundurimba near Lismore the registered Proprietor of the land within described in pursuance of the above Application Produced 10th March 1953 and entered 18th March 1953 at 12 o'clock in the noon.

J. H. Wells
REGISTRAR GENERAL.

No. F819911 CAVEAT dated 10th March 1953 by the Registrar General. Produced 10th March 1953 and entered 18th March 1953 at 12 o'clock in the noon.

J. H. Wells
REGISTRAR GENERAL.

No. F849508 DISCHARGE of within mortgage D31386 dated 10th May 1953 Produced 4th May 1953 and entered 11th May 1953 at 12 o'clock in the noon.

J. H. Wells
REGISTRAR GENERAL.

The within Caveat No. F819911 is hereby withdrawn. Dated 11th May 1953.

J. H. Wells
REGISTRAR GENERAL.

D31386
F819910
F849508
509
510

No. F849509 TRANSFER dated 20th April 1953
from the said Joseph Bede Cahane to George
Hession Davis of Queensland
as set out in the instrument described
Produced 4th May 1953 and entered 11th May 1953
at 12 noon.
J. Wells
REGISTRAR GENERAL

T941098 Mortgage to Commonwealth
of Trading Bank of Australia Registered
13-12-1984 excluding land in Resumption
No. N997559. Registered 13-2-1989.
Blum
REGISTRAR GENERAL

No. F849510 MORTGAGE dated 20th April 1953
from the said George Hession Davis and also
Victoria Davis to Commonwealth
Bank of Australia
Produced 4th May 1953 and entered 11th May 1953
at 12 noon.
J. Wells
REGISTRAR GENERAL

DP/SP 793350 Registered 8-12-89
This folio is cancelled as to who part upon creation
of computer folios for lots 20-21 in the
abovementioned plan.



MORTGAGE No. F849510 has been discharged.
See L583184 Entered 1st October 1969
Jaworski
REGISTRAR GENERAL

Alexander Luffen Roberts of Leamore, Building Contractor is
now the registered proprietor of the land within described
See TRANSFER No. L583185 dated 10th September 1969
Entered 1st October 1969
Jaworski
REGISTRAR GENERAL

No. L583186 MORTGAGE dated 10th September 1969
to George Hession Davis of Leamore, Farmer and Victoria
Davis his wife
Entered 1st October 1969
Jaworski
REGISTRAR GENERAL

No. N997559 Resumption of land for Public Road. Notice in
Government Gazette dated 26th July 1974 Folio 2911
whereby and by operation of the Public Roads Act of 1902 the
road shown in the plan catalogued R34096 1603 in the
Department of Lands and shown as firm lines and notation
(120m²) wide var width on the plan hereon
was declared to be a Public Road.

Registered 11th October 1974.

Jaworski
REGISTRAR GENERAL

N 997559 N/R Rol
R559918 O/M/R
T941098
D.P. 793350