



26 July 2021

Jaclyn Burns
Oberon Council
137 Oberon Street
Oberon NSW 2787

Our ref: L10390c

Jaclyn,

Additional contamination investigation 31 Albion Street, Oberon, NSW

1. Background

A change in land-use is proposed for 31 Albion Street Oberon from rural to recreational. A preliminary investigation was undertaken in 2018 (R10900c) which did not identify soil contamination. Additional information provided by council indicates a sheep dip was located in an area identified as a drainage pit. A detailed investigation including sampling was required to confirm the contamination status of the drainage pit area.

2. Scope

Undertake an assessment of the drainage pit area for contamination including sampling, provide an indication of the contamination status and suitability for recreational land-use.

3. Site description

The site is the area around the drainage pit at 31 Albion Street Oberon, NSW on Lot 2 DP1073627.

4. Investigations

The history was reviewed by inspection of aerial photographs and review of the Preliminary Site Investigation (R10390c). Evidence of historical activity on the site was determined by a site walkover on 14 July 2021.

Likely areas of contamination on the site were inspected and samples collected at a range of locations. The soil samples were collected from nine locations at the 0-100mm and 200-300mm depths. The soil samples were analysed for the contaminants concern associated with sheep dips including heavy metals and organochlorine and organophosphate pesticides. The soil samples were analysed at the NATA accredited laboratory of SGS.

5. Assessment criteria

The soil laboratory results were compared with proposed health investigation level (HIL) recreational land-use threshold (*HIL C*) as listed in NEPM (1999).

Ecological investigation levels (EIL) have been developed for the protection of terrestrial ecosystems for selected metals and organic substances in the soil in the guideline (NEPC 1999). The EILs consider the properties of the soil and contaminants and the capacity of the local ecosystem to accommodate increases in contaminant levels.

EILs are dependent on land-use, soil types and are applicable to contaminants up to 2m below the surface (Table 1).

The site comprises kandosol and chromosol soils. Typical CEC values for kandosols and chromosols is 10cmol(+)/kg, pH values of between 6 and 7, organic carbon content of 0.4% and clay content of 45 to 50%. The EIL for arsenic, lead, DD's and naphthalene is not dependant on soil types.

Table 1. Soil assessment criteria (mg/kg)

Analyte	HIL C – recreational	EIL C – recreational
Arsenic	300	103
Cadmium	90	-
Chromium (total)	300 (VI)	600 (III)
Copper	17,000	305
Lead	600	1,100
Nickel	1200	300
Zinc	30,000	430
Mercury	80	-
OCP – DD's	400	180
OCP – Aldrin and dieldrin	10	-

HIL – health investigation level, EIL – ecological investigation level

Table 2. EIL Calculation sheet, residential /public open space land-use

Analyte	Rationale	ACL (mg/kg)	ABC (mg/kg)	EIL (mg/kg)
Arsenic	Aged	100	3	103
Chromium III	Clay content 20%	400	200	600
Copper	CEC 15cmol/kg, 2% organic carbon, pH 6.5	280	25	305
Lead	Generic	1,100	10	1,110
Nickel	CEC 20cmol/kg	270	30	300
Zinc	CEC 10cmol/kg, pH 6.5	400	30	430
DDT	Aged	370	-	370

ACL- added

6. Quality control quality assurance

The sampling was undertaken in accordance with Envirowest Consulting quality assurance and quality control procedures to achieve the data quality objectives (Appendix 2). Samples were collected in laboratory prepared containers, refrigerated after collection and transported to the laboratory.

The analyses were undertaken in NATA accredited laboratories.

All media appropriate to the objectives of this investigation have been adequately analysed and no area of significant uncertainty exist. It is concluded the data is usable for the purposes of the investigation.

7. Results

Dams and pits appeared on the site between 1964 and 1984. The dams and pits contained water on the day of inspection (14/7/21). No obvious indicators of a sheep dip or yards was observed in the inspection. The sampled area were along the flow of surface water expected to be impacted by dip drain water. The pit contained general farm waste including fencing materials. The sampled area east of the pit intercepted a hard layer and was unable to be penetrated. The hard layer is potentially a stock drain pen, or rock and gravel layer. A single timber fence post was located near the sampled area. A bore was located south of the sampled area containing water at a depth of 0.8m below the surface.

All soil samples contained levels of heavy metals at environmental background levels. OCP and OPP pesticides were not detected in the samples collected.

Table 3. Analytical results and threshold concentrations – heavy metals (mg/kg)

Sample ID	Location	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury	OCP	OPP
101-100	Pit north	4	<0.3	200	27	18	13	28	<0.05	<1	<1
101-300	Pit south	2	<0.3	67	17	9	8.7	18	<0.05	<1	<1
102-100	West of pit	5	<0.3	130	26	12	15	32	<0.05	<1	<1
102-300	West of pit	8	<0.3	200	14	16	9.6	19	<0.05	<1	<1
103-100	East of pit 12m	3	<0.3	77	25	10	15	35	<0.05	<1	<1
103-300	East of pit 12m	4	<0.3	98	11	10	8.5	13	<0.05	<1	<1
104-100	East of pit 28m	5	<0.3	77	12	12	9.1	22	<0.05	<1	<1
104-300	East of pit 28m	6	<0.3	120	13	17	13	17	<0.05	<1	<1
105-100	Shallow dam east	11	<0.3	240	24	27	16	30	<0.05	<1	<1
106-100	Silt pond east	9	<0.3	140	19	16	11	67	<0.05	<1	<1
107-100	East of pit	4	<0.3	84	18	15	12	42	<0.05	<1	<1
107-300	East of pit	4	<0.3	100	12	11	7.8	19	<0.05	<1	<1
108-100	Dam sediments	9	<0.3	230	17	22	15	29	<0.05	<1	<1
109-100	North of dam	8	<0.3	190	19	18	8.5	20	<0.05	<1	<1
Average		5.8	<0.3	139.5	18.1	15.2	11.5	27.9	<0.05	<1	<1
Upper 95% CI		8.5	-	200.3	23.6	20.3	14.5	41.7	-	-	-
<i>HIL recreational</i>		300	20	300 ¹	17,000	600	1200	30000	80	-	-
<i>EIL open space</i>		103	-	600 ²	305	1,110	300	430	-	-	-

¹ Cr6+, ²Cr3+

8. Conclusions and recommendations

The aerial photographs and visual inspection did not indicate evidence of significant infrastructure in the assessment area. Sampling undertaken along the draining line and level areas used for stock mustering did not confirm any remaining sheep dip infrastructure. The bore nearby may have been a water source for stock.

Soil samples collected from the nine locations around the suspected sheep dip area at the 0-100mm and 200-300mm depths did not contain elevated level of heavy metals, OCP or OPP. All soil sampling data indicated analytes were near environmental background levels and less than health and ecological thresholds.

Based on the inspection, sampling and analysis results the site is suitable for recreational land-use.

Regards

Greg Madafiglio CEnvP
Senior environmental scientist

Figure 1. Location of the site
Figure 2. Sampling locations
Figure 3. Photographs of the area

Appendix 1. Limitations
Appendix 2. QAQC report
Appendix 3. Laboratory analysis results

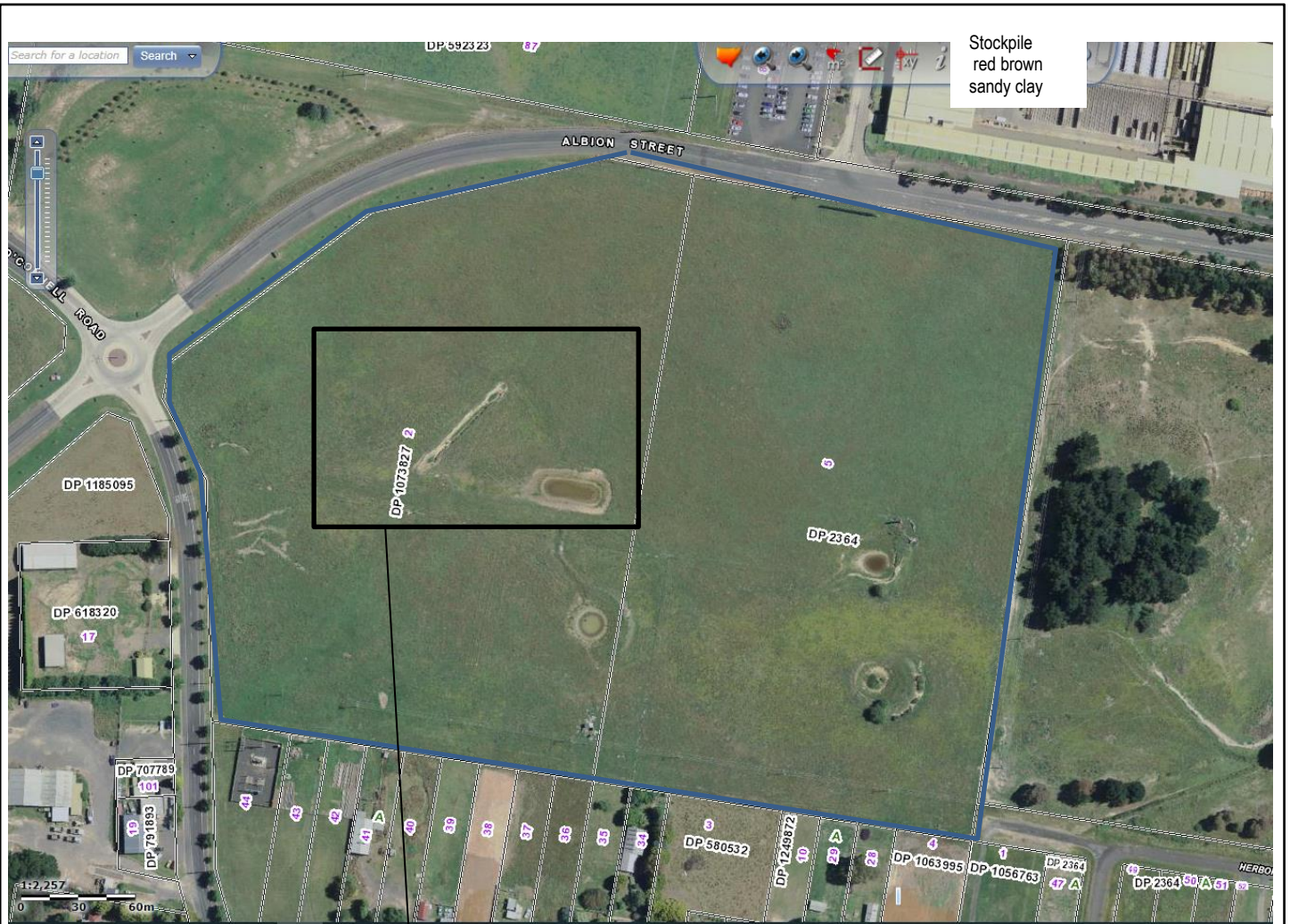


Figure 2 enlargement

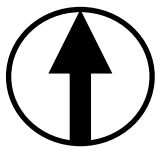

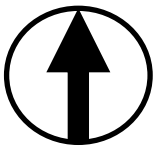


Figure 1. Description of the site		
31 Albion Street, Oberon, NSW		
	Envirowest Consulting Pty Ltd	
Job: L10390c	Drawn by: GM	Date: 27/7/2021



⊗104 Sampling location



Water flow


Figure 2. Sampling locations		
31 Albion Street, Oberon, NSW		
		
Job: L10390c	Drawn by: GM	Date: 27/7/2021

Figure 3. Photographs of the sampling areas (14/7/21)



Borehole 101



Borehole 102



Borehole 103, 104



Borehole 105, BH106, BH107



Borehole 10



Borehole 109

Appendix 1 Report limitations and intellectual property

This report has been prepared for the use of the client to achieve the objectives given the clients requirements. The level of confidence of the conclusion reached is governed by the scope of the investigation and the availability and quality of existing data. Where limitations or uncertainties are known, they are identified in the report. No liability can be accepted for failure to identify conditions or issues which arise in the future and which could not reasonably have been predicted using the scope of the investigation and the information obtained.

The investigation identifies the actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing is interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of the contamination, its likely impact on the proposed development and appropriate remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock or time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. It is thus important to understand the limitations of the investigation and recognise that we are not responsible for these limitations.

This report, including data contained and its findings and conclusions, remains the intellectual property of Envirowest Consulting Pty Ltd. A licence to use the report for the specific purpose identified is granted for the persons identified in that section after full payment for the services involved in preparation of the report. This report should not be used by persons or for purposes other than those stated, and should not be reproduced without the permission of Envirowest Consulting Pty Ltd.

Appendix 2. Sample analysis, quality assurance and quality control (QAQC) report

1. Data quality indicators (DQI) requirements

1.1 Completeness

A measure of the amount of usable data for a data collection activity. Greater than 95% of the data must be reliable based on the quality objectives. Where greater than two quality objectives have less reliability than the acceptance criterion the data may be considered with uncertainty.

1.1.1 Field

Consideration	Requirement
Locations and depths to be sampled	Described in the sampling plan. The acceptance criterion is 95% data retrieved compared with proposed. Acceptance criterion is 100% in crucial areas.
SOP appropriate and compiled	Described in the sampling plan.
Experienced sampler	Sampler or supervisor
Documentation correct	Sampling log and chain of custody completed

1.1.2 Laboratory

Consideration	Requirement
Samples analysed	Number according to sampling and quality plan
Analytes	Number according to sampling and quality plan
Methods	EPA or other recognised methods with suitable PQL
Sample documentation	Complete including chain of custody and sample description
Sample holding times	Metals 6 months, OCP, PAH, TPH, PCB 14 days, microbiology 24 hours

1.2 Comparability

The confidence that data may be considered to be equivalent for each sampling and analytical event. The data must show little or no inconsistencies with results and field observations.

1.2.1 Field

Consideration	Requirement
SOP	Same sampling procedures to be used
Experienced sampler	Sampler or supervisor
Climatic conditions	Described as may influence results
Samples collected	Sample medium, size, preparation, storage, transport

1.2.2 Laboratory

Consideration	Requirement
Analytical methods	Same methods, approved methods
PQL	Same
Same laboratory	Justify if different
Same units	Justify if different

1.3 Representativeness

The confidence (expressed qualitatively) that data are representative of each media present on the site.

1.3.1 Field

Consideration	Requirement
Appropriate media sampled	Sampled according to sampling and quality plan or in accordance with the EPA (1995) sampling guidelines.
All media identified	Sampling media identified in the sampling and quality plan. Where surface water bodies on the site sampled.

1.3.2 Laboratory

Consideration	Requirement
Samples analysed	Blanks

1.4 Precision

A quantitative measure of the variability (or reproduced of the data). Is measured by standard deviation or relative percent difference (RPD). A RPD analysis is calculated and compared to the practical quantitation limit (PQL) or absolute difference AD.

- Levels greater than 10 times the PQL the RPD is 50%
- Levels between 5 and 10 times the PQL the RPD is 75%
- Levels between 2 and 5 times the PQL the RPD is 100%
- Levels less than 2 times the PQL, the AD is less than 2.5 times the PQL

Data not conforming to the acceptance criterion will be examined for determination of suitability for the purpose of site characterisation.

1.4.1 Field

Consideration	Requirement
Field duplicates	Frequency of 5%, results to be within RPD or discussion required indicate the appropriateness of SOP

1.4.2 Laboratory

Consideration	Requirement
Laboratory and inter lab duplicates	Frequency of 5%, results to be within RPD or discussion required. Inter laboratory duplicates will be one sample per batch.
Field duplicates	Frequency of 5%, results to be within RPD or discussion required
Laboratory prepared volatile trip spikes	One per sampling batch, results to be within RPD or discussion required

1.5 Accuracy

A quantitative measure of the closeness of the reported data to the true value.

1.5.1 Field

Consideration	Requirement
SOP	Complied
Inter laboratory duplicates	Frequency of 5%. Analysis criterion 60% RPD for levels greater than 10 times the PQL 85% RPD for levels between 5 to 10 times the PQL 100% RPD at levels between 2 to 5 times the PQL Absolute difference, 3.5 times the PQL where levels are, 2 times PQL

1.5.2 Laboratory

Recovery data (surrogates, laboratory control samples and matrix spikes) data subject to the following control limits:

- 60 to 140% acceptable data
- 20-60% discussion required, may be considered acceptable
- 10-20% data should considered as estimates
- 10% data should be rejected

Consideration	Requirement
Field blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Rinsate blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Method blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Matrix spikes	Frequency of 5%, results to be within +/-40% or discussion required
Matrix duplicates	Sample injected with a known concentration of contaminants with tested. Frequency of 5%, results to be within +/-40% or discussion required
Surrogate spikes	QC monitoring spikes to be added to samples at the extraction process in the laboratory where applicable. Surrogates are closely related to the organic target analyte and not normally found in the natural environment. Frequency of 5%, results to be within +/-40% or discussion required
Laboratory control samples	Externally prepared reference material containing representative analytes under investigation. These will be undertaken at one per batch. It is to be within +/-40% or discussion required
Laboratory prepared spikes	Frequency of 5%, results to be within +/-40% or discussion required

Appendix 3. Laboratory analysis results

CLIENT DETAILS

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Project **10390**
 Order Number **10390**
 Samples 15

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SGS Reference **SE221854 R0**
 Date Received 16/7/2021
 Date Reported 23/7/2021

COMMENTS

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

SIGNATORIES



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OC Pesticides in Soil [AN420] Tested: 16/7/2021

PARAMETER	UOM	LOR	101-100	101-300	102-100	102-300	103-100
			SOIL - 14/7/2021 SE221854.001	SOIL - 14/7/2021 SE221854.002	SOIL - 14/7/2021 SE221854.003	SOIL - 14/7/2021 SE221854.004	SOIL - 14/7/2021 SE221854.005
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<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	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<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	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<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	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<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	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 16/7/2021 (continued)

PARAMETER	UOM	LOR	103-300	104-100	104-300	105-100	106-100
			SOIL - 14/7/2021 SE221854.006	SOIL - 14/7/2021 SE221854.007	SOIL - 14/7/2021 SE221854.008	SOIL - 14/7/2021 SE221854.009	SOIL - 14/7/2021 SE221854.010
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<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	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<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	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<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	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<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	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 16/7/2021 (continued)

PARAMETER	UOM	LOR	107-100	107-300	108-100	109-100	DA
			SOIL	SOIL	SOIL	SOIL	SOIL
			14/7/2021 SE221854.011	14/7/2021 SE221854.012	14/7/2021 SE221854.013	14/7/2021 SE221854.014	14/7/2021 SE221854.015
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<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	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<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	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<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	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<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	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 16/7/2021

PARAMETER	UOM	LOR	101-100	101-300	102-100	102-300	103-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			14/7/2021 SE221854.001	14/7/2021 SE221854.002	14/7/2021 SE221854.003	14/7/2021 SE221854.004	14/7/2021 SE221854.005
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<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	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<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	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	103-300	104-100	104-300	105-100	106-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			14/7/2021 SE221854.006	14/7/2021 SE221854.007	14/7/2021 SE221854.008	14/7/2021 SE221854.009	14/7/2021 SE221854.010
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<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	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<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	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	107-100	107-300	108-100	109-100	DA
			SOIL	SOIL	SOIL	SOIL	SOIL
			14/7/2021 SE221854.011	14/7/2021 SE221854.012	14/7/2021 SE221854.013	14/7/2021 SE221854.014	14/7/2021 SE221854.015
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<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	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<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	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 19/7/2021

PARAMETER	UOM	LOR	101-100	101-300	102-100	102-300	103-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
			SE221854.001	SE221854.002	SE221854.003	SE221854.004	SE221854.005
Arsenic, As	mg/kg	1	4	2	5	8	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	200	67	130	200	77
Copper, Cu	mg/kg	0.5	27	17	26	14	25
Lead, Pb	mg/kg	1	18	9	12	16	10
Nickel, Ni	mg/kg	0.5	13	8.7	15	9.6	15
Zinc, Zn	mg/kg	2	28	18	32	19	35

PARAMETER	UOM	LOR	103-300	104-100	104-300	105-100	106-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
			SE221854.006	SE221854.007	SE221854.008	SE221854.009	SE221854.010
Arsenic, As	mg/kg	1	4	5	6	11	9
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	98	77	120	240	140
Copper, Cu	mg/kg	0.5	11	12	13	24	19
Lead, Pb	mg/kg	1	10	12	17	27	16
Nickel, Ni	mg/kg	0.5	8.5	9.1	13	16	11
Zinc, Zn	mg/kg	2	13	22	17	30	67

PARAMETER	UOM	LOR	107-100	107-300	108-100	109-100	DA
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
			SE221854.011	SE221854.012	SE221854.013	SE221854.014	SE221854.015
Arsenic, As	mg/kg	1	4	4	9	8	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	84	100	230	190	110
Copper, Cu	mg/kg	0.5	18	12	17	19	31
Lead, Pb	mg/kg	1	15	11	22	18	9
Nickel, Ni	mg/kg	0.5	12	7.8	15	8.5	13
Zinc, Zn	mg/kg	2	42	19	29	20	25

Mercury in Soil [AN312] Tested: 19/7/2021

			101-100	101-300	102-100	102-300	103-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.001	SE221854.002	SE221854.003	SE221854.004	SE221854.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

			103-300	104-100	104-300	105-100	106-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.006	SE221854.007	SE221854.008	SE221854.009	SE221854.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

			107-100	107-300	108-100	109-100	DA
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.011	SE221854.012	SE221854.013	SE221854.014	SE221854.015
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 19/7/2021

			101-100	101-300	102-100	102-300	103-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.001	SE221854.002	SE221854.003	SE221854.004	SE221854.005
% Moisture	%w/w	1	19.0	20.4	21.0	16.7	38.8

			103-300	104-100	104-300	105-100	106-100
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.006	SE221854.007	SE221854.008	SE221854.009	SE221854.010
% Moisture	%w/w	1	20.7	29.0	17.2	22.8	39.9

			107-100	107-300	108-100	109-100	DA
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			14/7/2021	14/7/2021	14/7/2021	14/7/2021	14/7/2021
PARAMETER	UOM	LOR	SE221854.011	SE221854.012	SE221854.013	SE221854.014	SE221854.015
% Moisture	%w/w	1	38.3	24.6	21.1	17.7	18.9

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/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.

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.

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

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

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:

- a. 1 Bq is equivalent to 27 pCi
- b. 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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Chain of Custody Form – Ref 10390

Ref: 10390 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 Telephone: (02) 6361 4954 Facsimile: (02) 6360 3960 Email: greg@envirowest.net.au Contact Person: Greg Madafiglio Invoice: accounts@envirowest.net.au			Sample matrix Water Soil Paint			Sample preservation Cool HNO3/HCl Unpreserved			Analysis SGS Method Code				
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll													
Sample ID	Container*	Sampling Date/Time							8 Metals total	OC/OP Pesticides			
1 101-100	A	14/07/2021		X		X		X	X	X			
2 101-300	A	14/07/2021		X		X		X	X	X			
3 102-100	A	14/07/2021		X		X		X	X	X			
4 102-300	A	14/07/2021		X		X		X	X	X			
5 103-100	A	14/07/2021		X		X		X	X	X			
6 103-300	A	14/07/2021		X		X		X	X	X			
7 104-100	A	14/07/2021		X		X		X	X	X			
8 104-300	A	14/07/2021		X		X		X	X	X			
9 105-100	A	14/07/2021		X		X		X	X	X			
10 106-100	A	14/07/2021		X		X		X	X	X			
11 107-100	A	14/07/2021		X		X		X	X	X			
12 107-300	A	14/07/2021		X		X		X	X	X			
13 108-100	A	14/07/2021		X		X		X	X	X			
14 109-100	A	14/07/2021		X		X		X	X	X			
15 DA	A	14/07/2021		X		X		X	X	X			
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.						Sampler name: Greg Madafiglio Date: 14/07/2021 Time:			SGS EHS Sydney COC SE221854 				
Relinquished by: <i>[Signature]</i> (print and signature)			Date 15/07/2021 Time 1000			Received by: <i>George Zhi</i> (print and signature)							

Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and green label, B= Plastic with green label, C= Amber with green label, D= Vial with white label, E= Plastic with red label



STATEMENT OF QA/QC PERFORMANCE

SE221854 R0

CLIENT DETAILS

Contact Greg Madafiglio
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Facsimile (Not specified)
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Project **10390**
Order Number **10390**
Samples 15

LABORATORY DETAILS

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SGS Reference **SE221854 R0**
Date Received 16 Jul 2021
Date Reported 23 Jul 2021

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:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

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

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
101-100	SE221854.001	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
101-300	SE221854.002	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
102-100	SE221854.003	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
102-300	SE221854.004	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
103-100	SE221854.005	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
103-300	SE221854.006	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
104-100	SE221854.007	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
104-300	SE221854.008	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
105-100	SE221854.009	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
106-100	SE221854.010	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
107-100	SE221854.011	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
107-300	SE221854.012	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
108-100	SE221854.013	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
109-100	SE221854.014	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021
DA	SE221854.015	LB229225	14 Jul 2021	16 Jul 2021	11 Aug 2021	19 Jul 2021	11 Aug 2021	20 Jul 2021

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
101-100	SE221854.001	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
101-300	SE221854.002	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
102-100	SE221854.003	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
102-300	SE221854.004	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
103-100	SE221854.005	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
103-300	SE221854.006	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
104-100	SE221854.007	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
104-300	SE221854.008	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
105-100	SE221854.009	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
106-100	SE221854.010	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
107-100	SE221854.011	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
107-300	SE221854.012	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
108-100	SE221854.013	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
109-100	SE221854.014	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021
DA	SE221854.015	LB229218	14 Jul 2021	16 Jul 2021	28 Jul 2021	19 Jul 2021	24 Jul 2021	22 Jul 2021

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
101-100	SE221854.001	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
101-300	SE221854.002	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
102-100	SE221854.003	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
102-300	SE221854.004	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
103-100	SE221854.005	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
103-300	SE221854.006	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
104-100	SE221854.007	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
104-300	SE221854.008	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
105-100	SE221854.009	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
106-100	SE221854.010	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
107-100	SE221854.011	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
107-300	SE221854.012	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
108-100	SE221854.013	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
109-100	SE221854.014	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
DA	SE221854.015	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
101-100	SE221854.001	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
101-300	SE221854.002	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
102-100	SE221854.003	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
102-300	SE221854.004	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
103-100	SE221854.005	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
103-300	SE221854.006	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
104-100	SE221854.007	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021

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

OP Pesticides in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
104-300	SE221854.008	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
105-100	SE221854.009	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
106-100	SE221854.010	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
107-100	SE221854.011	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
107-300	SE221854.012	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
108-100	SE221854.013	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
109-100	SE221854.014	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021
DA	SE221854.015	LB229187	14 Jul 2021	16 Jul 2021	28 Jul 2021	16 Jul 2021	25 Aug 2021	22 Jul 2021

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
101-100	SE221854.001	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
101-300	SE221854.002	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
102-100	SE221854.003	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
102-300	SE221854.004	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
103-100	SE221854.005	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
103-300	SE221854.006	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
104-100	SE221854.007	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
104-300	SE221854.008	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
105-100	SE221854.009	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
106-100	SE221854.010	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
107-100	SE221854.011	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
107-300	SE221854.012	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
108-100	SE221854.013	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
109-100	SE221854.014	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021
DA	SE221854.015	LB229222	14 Jul 2021	16 Jul 2021	10 Jan 2022	19 Jul 2021	10 Jan 2022	22 Jul 2021

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)	101-100	SE221854.001	%	60 - 130%	91
	101-300	SE221854.002	%	60 - 130%	84
	102-100	SE221854.003	%	60 - 130%	89
	102-300	SE221854.004	%	60 - 130%	90
	103-100	SE221854.005	%	60 - 130%	94
	103-300	SE221854.006	%	60 - 130%	95
	104-100	SE221854.007	%	60 - 130%	97
	104-300	SE221854.008	%	60 - 130%	88
	105-100	SE221854.009	%	60 - 130%	95
	106-100	SE221854.010	%	60 - 130%	97
	107-100	SE221854.011	%	60 - 130%	101
	107-300	SE221854.012	%	60 - 130%	93
	108-100	SE221854.013	%	60 - 130%	92
	109-100	SE221854.014	%	60 - 130%	87
	DA	SE221854.015	%	60 - 130%	104

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	101-100	SE221854.001	%	60 - 130%	86
	101-300	SE221854.002	%	60 - 130%	106
	102-100	SE221854.003	%	60 - 130%	102
	102-300	SE221854.004	%	60 - 130%	90
	103-100	SE221854.005	%	60 - 130%	92
	103-300	SE221854.006	%	60 - 130%	100
	104-100	SE221854.007	%	60 - 130%	96
	104-300	SE221854.008	%	60 - 130%	102
	105-100	SE221854.009	%	60 - 130%	98
	106-100	SE221854.010	%	60 - 130%	100
	107-100	SE221854.011	%	60 - 130%	102
	107-300	SE221854.012	%	60 - 130%	88
	108-100	SE221854.013	%	60 - 130%	102
	109-100	SE221854.014	%	60 - 130%	94
	DA	SE221854.015	%	60 - 130%	96
d14-p-terphenyl (Surrogate)	101-100	SE221854.001	%	60 - 130%	96
	101-300	SE221854.002	%	60 - 130%	100
	102-100	SE221854.003	%	60 - 130%	98
	102-300	SE221854.004	%	60 - 130%	92
	103-100	SE221854.005	%	60 - 130%	100
	103-300	SE221854.006	%	60 - 130%	94
	104-100	SE221854.007	%	60 - 130%	96
	104-300	SE221854.008	%	60 - 130%	96
	105-100	SE221854.009	%	60 - 130%	102
	106-100	SE221854.010	%	60 - 130%	104
	107-100	SE221854.011	%	60 - 130%	102
	107-300	SE221854.012	%	60 - 130%	98
	108-100	SE221854.013	%	60 - 130%	98
	109-100	SE221854.014	%	60 - 130%	98
	DA	SE221854.015	%	60 - 130%	94

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
LB229225.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB229187.001	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)	%	-	85

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	
LB229187.001	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	
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	80
		d14-p-terphenyl (Surrogate)	%	-	84

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

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

Sample Number	Parameter	Units	LOR	Result
LB229222.001	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: $RPD = |OriginalResult - ReplicateResult| \times 100 / Mean$

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: $MAD = 100 \times SDL / Mean + LR$

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE221854.006	LB229225.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE221854.015	LB229225.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE221854.009	LB229218.011	% Moisture	%w/w	1	22.8	24.1	34	5
SE221854.015	LB229218.018	% Moisture	%w/w	1	18.9	19.3	35	2

OC Pesticides in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE221854.009	LB229187.014	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			
SE221854.015	LB229187.021	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	1
		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	

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

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: $MAD = 100 \times SDL / Mean + LR$

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE221854.015	LB229187.021	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	0.14	30	14

OP Pesticides in Soil

Method: ME-(AU)-[ENV]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE221854.009	LB229187.014	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	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
SE221854.015	LB229187.021	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	12
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	16

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

Method: ME-(AU)-[ENV]JAN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE221854.006	LB229222.014	Arsenic, As	mg/kg	1	4	11	44	89 @
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	98	170	30	52 @
		Copper, Cu	mg/kg	0.5	11	12	34	4
		Nickel, Ni	mg/kg	0.5	8.5	9.0	36	5
		Lead, Pb	mg/kg	1	10	14	38	38 †
		Zinc, Zn	mg/kg	2	13	18	43	33
SE221854.015	LB229222.024	Arsenic, As	mg/kg	1	3	2	68	19
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	110	94	30	19
		Copper, Cu	mg/kg	0.5	31	38	31	19
		Nickel, Ni	mg/kg	0.5	13	14	34	7
		Lead, Pb	mg/kg	1	9	8	41	16
		Zinc, Zn	mg/kg	2	25	25	38	1

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 %
LB229225.002	Mercury	mg/kg	0.05	0.18	0.2	70 - 130	89

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB229187.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	84
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	78
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	78
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	82
	Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	95
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	77
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130	84

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB229187.002	Dichlorvos	mg/kg	0.5	1.7	2	60 - 140	85	
	Diazinon (Dimpylate)	mg/kg	0.5	2.2	2	60 - 140	109	
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	2	60 - 140	105	
	Ethion	mg/kg	0.2	1.5	2	60 - 140	76	
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	98
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100	

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 %
LB229222.002	Arsenic, As	mg/kg	1	350	318.22	80 - 120	111
	Cadmium, Cd	mg/kg	0.3	3.6	4.81	70 - 130	74
	Chromium, Cr	mg/kg	0.5	43	38.31	80 - 120	112
	Copper, Cu	mg/kg	0.5	320	290	80 - 120	110
	Nickel, Ni	mg/kg	0.5	200	187	80 - 120	106
	Lead, Pb	mg/kg	1	94	89.9	80 - 120	104
	Zinc, Zn	mg/kg	2	290	273	80 - 120	105

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%
SE221837.001	LB229225.004	Mercury	mg/kg	0.05	0.17	<0.05	0.2	74

OC Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE221854.001	LB229187.024	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	95
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	83
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	89
		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	91
		Endrin	mg/kg	0.2	0.2	<0.2	0.2	106
		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	89
		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	-	0.14	0.14	-	93	

OP Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE221854.001	LB229187.023	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	100	
		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	2.1	<0.2	2	107	
		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	1.7	<0.2	2	83	
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-	
		Total OP Pesticides*	mg/kg	1.7	7.4	<1.7	-	-	
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	100	

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE221837.001	LB229222.004	Arsenic, As	mg/kg	1	52	4	50	97
		Cadmium, Cd	mg/kg	0.3	45	<0.3	50	89
		Chromium, Cr	mg/kg	0.5	56	9.0	50	94
		Copper, Cu	mg/kg	0.5	84	32	50	106
		Nickel, Ni	mg/kg	0.5	51	4.4	50	94
		Lead, Pb	mg/kg	1	63	16	50	94
		Zinc, Zn	mg/kg	2	160	76	50	171 Ⓣ

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

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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