Detailed Contamination Investigations

197 Limekilns Road, Kelso NSW

Ref: R8593c
Date: 4 September 2017

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Interested authorities:	Bathurst Regional Council
Report number:	R8593c
Date:	4 September 2017

Summary report

Address: 197 Limekilns Road, Kelso NSW

Lot: Lot 5 Section: - DP: 847225

Dates of works 20/07/2017

Main areas of concern

Three areas were identified in a previous assessment undertaken by SESL Australia that required additional investigation. The investigation areas were an area west of a previously removed shed where asbestos cement fragments were identified, a fill bank north of the packing shed where asbestos cement fragments were identified and north west of the packing shed where elevated levels of lead and OCP were identified.

Notable contaminant concentrations

One sample (S7) previously collected by SESL Australia contained elevated levels of lead (310mg/kg) and dieldrin (9.9mg/kg) above the adopted residential health investigation levels. No samples collected in the detailed contamination investigation contained levels of analytes above the adopted threshold. The 95% upper confidence level of samples collected within this area is 113mg/kg lead and 2.8mg/kg dieldrin.

No asbestos remains on the surface of investigation area 1 and 2. However, it is possible that asbestos is present and an unexpected finds protocol should be implements during development of the site (Appendix 5).

Nature of works carried out

A soil investigation including test pit construction and soil sampling was undertaken of the areas previously identified as requiring additional investigations.

Eight test pits were constructed within investigation area 1 and ten test pits within investigation area 2 with surface visual inspections for asbestos undertaken.

Six surface locations were assessed and sampled within investigation area 3. Two test pits were constructed and subsurface soil samples collected at a depth of 200mm and 300mm at S202 and S203.

Nature and extent of residual contamination

No soil samples contained elevated levels of the contaminants of concern.

Risk factors

The potential contamination sources were asbestos, lead and OCP (dieldrin). The potential exposure pathways included direct (ingestion and absorption) and indirect contact (inhalation). The potential receptors included residential, on-site workers, visitors and the terrestrial environment. Previously identified elevated contaminants and hotspots were not identified.

Waste removed

No soil was removed as part of the contamination investigation.

Remediation summary

Remediation of the material identified by SESL Australia with elevated levels of lead and dieldrin is required. Excavation and disposal off-site to a licensed landfill is expected to be the most appropriate method of remediation. The material requires waste classification prior to disposing off-site.

Statement of suitability

Investigation areas 1 and 2 are suitable for proposed residential land-use. Investigation area 3 requires lead and dieldrin impacted material to be remediated. An unexpected finds protocol should be implemented during the development of the site (Appendix 5).

This is an accurate summary of the report titled: Additional Contamination investigation – Lot 5 DP847225, 197 Limekilns Road, Kelso NSW (Report number R8593c)

Produced by: Envirowest Consulting Pty Ltd Dated: 4/09/2017

Name: Gregory Madafiglio Certification details: Pending

Contents

1. Introduction

The site at 197 Limekilns Road, Kelso NSW is to be redeveloped by Bathurst Regional Council to residential land. Investigations previously undertaken by SESL Australia Pty Ltd identified two areas containing asbestos fragments and one area containing elevated levels of lead and organochlorine pesticides (OCP). A detailed investigation was requested by Bathurst Regional Council to determine the extent of impacted material.

2. Scope of work

Envirowest Consulting Pty Ltd was commissioned by Bathurst Regional Council to undertake a detailed contamination investigation of the previously identified areas of asbestos impacted material and the lead and OCP impacted material in accordance with the contaminated land management planning guidelines, from the *Contaminated Land Management Act 1997* and the *State Environmental Policy No. 55 (SEPP 55)*, at 197 Limekilns Road, Kelso NSW. The objective was to determine the lateral and vertical extent of asbestos impacted material in two locations and lead and OCP impacted material in one location and assess the need for remediation or suitability for proposed residential land-use.

3. Site identification

Address	197 Limekilns Road Kelso NSW
Client	Bathurst Regional Council
Deposited plans	Lot 5 DP847225
Locality map	Figure 1
Site plan	Figure 2
Photographs	Figure 3
Lot area Investigation area	Approximately 35 hectares total Area 1 – Approximately 1000m^2 (Figure 3) – asbestos impacted Area 2 – Approximately 1000m^2 (Figure 4) – asbestos impacted Area 3 – Approximately 500m^2 (Figure 5) – lead and OCP impacted

4. Site history

4.1 Zoning

The site is zoned R1 – General Residential and RE1 – Public Recreation under the Bathurst Local Environmental Plan (2014).

4.2 Land-use

The site is currently vacant with residential development beginning in the western section of the site. The investigation areas are part of later stage residential development. The site was previously used as an apple orchard with a packing shed and dwelling.

4.3 Summary of council records

A section 149 Certificate undertaken in 2015 identified Bathurst Regional Council has not received notice under the *Contaminated Land Management Act 1997*

- that the land is significantly contaminated
- subject to a voluntary management order
- subject to an ongoing maintenance order
- subject to a site audit statement.

- The land is not subject to mine subsidence under section 15 of the *Mine Subsidence Compensation Act 1961*
- The land is not bushfire prone land
- The site is subject to flood related development controls

Bathurst Regional Council did not have any other records on the site regarding contamination.

4.4 Sources of information

- Site inspection 20 July 2017 by Envirowest Consulting Pty Ltd
- NSW EPA records of public notices under the CLM Act 1997
- Soil and geological maps
- Historical photographs 1964, 1974, 1984 and 1996
- NSW Planning and Environment planning viewer

4.5 Chronological list of site uses

4.5.1 Aerial photographs

Year	Visual observations on Site
1964	The site has a similar layout to present. The site contains orchard trees and forms part of a larger site to the west. The site contains the packing shed and a dwelling north of the packing shed in the location of the current dwelling.
1974	Four additional sheds have been added to the property which were still present on the site in 2015. The dwelling is visible in this aerial photograph. The entire site still contains orchard trees.
1984	An additional farm dam has been constructed in this aerial photograph. The entire site is still covered in orchard trees.
1996	The water storage easement in the north of the site has been constructed. Many orchard trees have been removed from the site, predominately along the western side of the site.
2003	Orchard trees continue to be removed. The buildings all appear to remain. Residential development is evident west of the site.

4.5.2 Historical land uses

Title search Lot 5 DP847225

Year	Owners	Expected Landuse
1912 to 1922	Claude Harold Crago	Unknown
1922 to 1942	Harold Keith Chapman, Orchardist and Perpetual Trustee Company Ltd	Primary Production /Apple orchard
1942 to 1961	James Adrian Reed, Fruit and Vegetable Agent	Primary Production /Apple orchard
1961 to 1997	Sunbright Pty Ltd	Primary Production /Apple orchard
1997 to 2015	P J Paull Pty Ltd	Primary Production /Apple orchard
2015 to date	Bathurst Regional Council	Residential development

4.6 Buildings and infrastructure

No buildings or infrastructure was identified within the investigation area. A large packing shed was identified south of investigation area 2 and a shed has been removed from investigation area 1. Two sheds/structures are located south east of investigation area 3.

4.7 Potential Contaminants

Based on previously identified contaminants;

- Lead
- Organochlorine pesticides (dieldrin)
- Asbestos

4.9 Relevant complaint history

None known

4.10 Contaminated site register

The site is not listed on the NSW EPA register of contaminated sites.

4.11 Previous Investigations

4.11.1 *Due Diligence Assessment, Lot 5 DP847225 Limekilns Road, Kelso (SESL Australia Pty Ltd C4503.Q4409.B34749), June 2015*

A due diligence assessment was undertaken for Bathurst Regional Council prior to acquisition for residential development. A site history review, site walk over and inspection, sampling, soil analysis and preparation of report were undertaken.

The site was determined to be open agricultural land which contains a residential dwelling, farm dams and agricultural sheds. The analysis of soil samples indicated the results were below the adopted Health Investigation Levels and Health Screening Levels for residential land-use with the exception of the asbestos containing materials in the vicinity of some structures and the fill mound adjacent to the former processing shed and elevated OCP (dieldrin) (9.9mg/kg) and lead (310mg/kg) in sample location S7.

SESL Australia concluded that these elevations were not uncommon for sites with similar history, and minor remediation of the affected areas will be required prior to development of the proposed residential and recreational area.

4.11.2 Clearance Certificate, 197 Limekilns Road, Kelso (Envirowest Consulting Pty Ltd R8538cc), July 2017

A clearance certificate was issued to EODO Pty Ltd following removal of non-friable asbestos continuing irrigation pipes and tape stand. The removal work was under the supervision of Central Demolition and Asbestos Pty Ltd on 19, 20, 26, 27, 29, and 30 June 2017.

4.11.3 Clearance Certificate and Air Monitoring, 197 Limekilns Road, Kelso (Envirowest Consulting Pty Ltd R8538cc1 and R8538m), August 2017

A clearance certificate was issued to EODO Pty Ltd following removal of a fire pit with asbestos cement fragments from east of the former fruit store shed. The removal work was under the supervision of Central Demolition and Asbestos Pty Ltd in August 2017. Air monitoring was undertaken during the removal work. Ash potentially containing asbestos remains to the north and south of the former fruit store shed.

4.12 Neighbouring land-use

North – Rural-residential
South – Rural-residential
East – Rural-residential
West – Residential

Historical and present neighbouring land-uses are not expected to impact on the site.

4.13 Integrity assessment

The site history was obtained from a site inspection and history review. The information is consistent with the current site condition and to the best of the assessor's knowledge is accurate.

5. Site condition and environment

5.1 Surface cover

Surface cover on-site included pasture grasses and bare areas from recently removed shed.

5.2 Topography

The site is on a mid-slope with a very gently inclined slope of 1 to 3%. The site slopes generally from north to south.

5.3 Soils and geology

The site is within the Bathurst Soil Landscape (Kovac *et al*. 1990). The soil landscape includes non-calcic brown soils with yellow solodic soils on the lower slopes and in drainage lines. Sands and mottled yellow solodic soils also occur.

The site is underlain by Bathurst Granite. Parent rock includes medium to coarse-grained and massive granodiorites and adamellites. Parent materials comprise *in situ* and alluvial-colluvial materials from previously mentioned parent rock (Kovac *et al*. 1990).

5.4 Hydrology

5.4.1 Surface water

The soil is expected to have a low permeability. Surface water flows into on-site dams which flow south through a network of dams and drainage lines into Raglan Creek approximately 1.2km south of the site.

5.4.2 Groundwater

One groundwater bore is located on the property approximately 140m west of investigation area 3. The bore is licensed for irrigation and was constructed to a depth of 18.2 metres. The bore has a water bearing zone from 10.6m and standing water levels from 5.7m. No other bores are located within 500m of the investigation areas.

6. Data Quality Objectives

6.1 State the problem

The site at 197 Limekilns Road, Kelso NSW is to be redeveloped for residential land-use. Two areas have been previously identified containing asbestos fragments and one area containing lead and OCP (dieldrin) above the adopted residential thresholds. The extent of impacted material is required to be determined.

6.2 Identify the decision

The proposed land-use is residential and the levels of contaminants should be less than the thresholds listed in Section 10. The decision problem is, do the levels of potential contaminants exceed the assessment criteria listed in Section 10.

6.3 Identify the inputs decision

Investigation of the previously identified areas is required to identify the lateral and vertical extent of asbestos in two locations and lead and OCP impacted material at one location.

6.4 Define the boundaries of the study

The investigation areas are three previously identified areas of concern within Lot 5 DP847225, 197 Limekilns Road, Kelso NSW.

6.5 Develop a decision rule

The guidelines for soil were the health investigation levels for residential land-use (NEPC 1999).

Asbestos was visually assessed in the investigation areas.

6.6 Specify acceptable limits on the decision errors.

The HIL will be evaluated against the 95% upper confidence limit of soil analyte levels of samples collected. Samples with levels of contaminants exceeding the criterion of 2.5 times will be excluded from the sampling analysis. These results will indicate areas requiring specific management.

6.7 Optimize the design for obtaining data

Soil sampling was undertaken as described in Section 8.2.

Quality assurance and quality control objective and indicators are described in Section 8.

7. Sampling analysis plan and sampling methodology

7.1 Sampling strategy

7.1.1 Sampling design

A systematic sampling pattern was adopted to assess the extent of contamination across the investigation areas.

7.1.2 Sampling locations

Ten discrete soil samples were collected from the lead and OCP impacted area on 20 July 217 on an approximate 5m grid pattern. Two test pits were constructed at sample locations S201 and S203 to a depth of 300mm.

A visual assessment was undertaken across the surface of investigation areas 1 and 2 on 20 July 2017. Eight test pits were constructed across investigation areas 1 and ten test pits within investigation area 2. Asbestos was visually inspected within each test pit.

7.1.3 Sampling density

The sampling density can detect a potential hot spot with a radius of 3 metres at a 95% level of confidence.

7.1.4 Sampling depth

Test pits within the asbestos investigation areas were constructed to a depth of approximately 1,000mm or natural soil. A visual inspection was undertaken for each test pit.

Test pits constructed within the lead and OCP impacted area were constructed up to 300mm and soil samples collected from 0-100mm, 200mm and 300mm depths.

7.2 Analytes

The soil samples collected from investigation area 3 were analysed for lead and OCP (Table 1). No soil samples were collected from investigation area 1 and 2. The profile of each test pits and presence of foreign materials was described (Appendix 2).

7.3 Sampling methods

Test pits were constructed using a 5.5 tonne excavator. Soil was taken at each individual sampling location below the vegetated and detrital layer. Soil samples were directly transferred to solvent rinsed glass using a stainless steel spade.

Tools were decontaminated between sampling locations to prevent cross contamination by: brushing to remove caked or encrusted material, washing in detergent and tap water, rinsing in an organic solvent, rinsing with clean tap water and allowing to air dry or using a clean towel.

Table 1. Schedule of samples and analysis

Sample ID	Depth (mm)	Analysis undertaken
S201-0.1	100	Lead (Pb), organochlorine pesticides (OCP)
S202-0.1	100	Pb, OCP
S202-0.2	200	Pb, OCP
S202-0.3	300	Pb, OCP
S203-0.1	100	Pb, OCP
S203-0.2	200	Pb, OCP
S203-0.3	300	Pb, OCP
S204-0.1	100	Pb, OCP
S205-0.1	100	Pb, OCP
S206-0.1	100	Pb, OCP

8. Quality assurance and quality control

8.1 Sampling design

The sampling program is intended to provide data as to the presence and levels of contaminants. Test pits were constructed across investigation areas 1 and 2 on a systematic grid pattern of approximately 5metres. Discrete soil samples were collected across investigation area 3 on a systematic grid pattern of 5 metres. This sampling density will enable the detection of an area with an elevated concentration on a radius of 3 metres with a 95% confidence level.

The number of sampling locations is expected to provide adequate data to determine characterisation of the impacted areas.

8.2 Field

The collection of samples was undertaken in accordance with accepted standard protocols (NEPC 1999). All soil samples collected were analysed for lead and organochlorine pesticides (OCP).

Sampling equipment was decontaminated between each sampling event. The appropriate storage conditions and duration were observed between sampling and analysis. A chain of custody form accompanied the samples to the laboratory (Appendix 4).

A single sampler was used to collect the samples using standard methods. Soil collected was a fresh sample from a hand shovel. After collection the samples were immediately placed in new glass sampling jars and placed in a cooler.

One intra-laboratory duplicate sample was collected. The frequency of field duplicates is greater than the NEPC (1999) recommendation of 5%. No field blank, rinsate, trip blank or matrix spikes were submitted for analysis. Some samples from all batches did not contain contaminants which confirm the absence of cross contamination during transport and storage.
A field sampling log is presented in Appendix 3.

8.3 Laboratory

Chemical analysis was conducted by SGS Laboratories, Alexandria, which is NATA accredited for the tests undertaken. The laboratory has quality assurance and quality control programs in place, which include internal replication and analysis of spike samples and recoveries.

Method blanks, matrix duplicates and laboratory control samples were within acceptance criteria. The quality assurance and quality control report is presented together with the laboratory report as Appendix 2.

8.4 Data evaluation

The laboratory quality control report indicates the data variability is within acceptable industry limits. The data is considered representative and usable for the purposes of the investigation. Data quality indicators are presented in Appendix 1.

9. Conceptual site model

Potential contamination sources, exposure pathways and receptors are presented below.

Contamination source	Potential exposure pathways	Receptors
Lead and OCP Asbestos	Direct contact (ingestion and absorption) Indirect contact (inhalation)	*On-site* Site workers Residential Terrestrial environment *Off-site* Residential Rural Terrestrial and aquatic environment

10. Assessment criteria

A residential subdivision is proposed for the site. The laboratory results were assessed against the proposed land-use of residential. The health-based investigation levels (HIL) of contaminants in the soil for residential sites, for the lead and organochlorine pesticides, are listed in Table 2, as recommended in the NEPC (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 vary with land-use and apply to contaminants up to 2m depth below the surface. The EILs for commercial/industrial land-use are listed in Table 2.

Asbestos was visually inspected and assessed against the criteria of present/absent within the upper 500mm of soil.

Table 2. Investigation levels – residential land-use (mg/kg) (NEPC 1999)

Analyte	HIL A – Residential	EIL – Urban residential and public open space
Lead	300	1,100
OCP – Aldrin and dieldrin	6	-
Asbestos	Nil	-

11. Results and discussion

11.1 Asbestos hotspots

A small amount of fill (up to 300mm) was identified forming a shed building pad in investigation area 1. The fill material comprised crushed granite and silty sand. A shed had previously been removed from this area. The building pad was bare with no vegetation. Radiata pines were located as a wind break along the eastern boundary of the investigation area. Two pieces of asbestos cement sheeting were identified on the surface of investigation area 1 (Figure 2) and were removed as part of the investigation. Asbestos cement fragments were not identified within the subsoil material of the test pits constructed within this area. No additional fragments of asbestos were identified on the surface of investigation area 1.

A bank adjacent the packing shed formed investigation area 2. The bank was constructed with fill material to a depth of approximately 1000mm. The material comprised brownish red silty sand and sandy clay with trace brick and concrete. No asbestos was identified on the surface or within the test pits constructed in investigation area 2.

11.2 Lead and OCP hotspot

No bare areas were identified within investigation area 3.

The extent of lead and dieldrin impacted material was determined to be minor with no other samples containing levels of the analytes above the relevant thresholds (Table 3). Sample S7 previously collected by SESL Australia exceeded the adopted criteria for residential land-use.

The 95% upper confidence levels of lead (113mg/kg) and OCP's including dieldrin (2.8mg/kg) in the soil samples collected were below adopted thresholds (Table 3) for residential land-use (NEPC, 1999).

The approximate extent of the lead and dieldrin impacted material is expected to be approximately 5m by 5m to a depth of 0.3m.

Table 3. Soil analysis results general site area– metals (mg/kg)

Sample I.D.	Depth (m)	Lead	OCP- Aldrin and Dieldrin
S201-0.1	0-100mm	13	ND
S202-0.1	0-100mm	34	ND
S202-0.2	200mm	40	ND
S202-0.3	300mm	9	ND
S203-0.1	0-100mm	44	ND
S203-0.2	200mm	40	ND
S203-0.3	300mm	9	ND
S204-0.1	0-100mm	99	0.4
S205-0.1	0-100mm	59	ND
S206-0.1	0-100mm	21	ND
S7*	0-100mm	310	9.9
95% UCL		113	6.0
HIL A – Residential		*300*	*2.8*
EIL – Residential / Public open space		*1,100*	-

ND – not detected, HIL – health investigation level, EIL – ecological investigation level, ESL – ecological screening level

12. Site characterisation

12.1 Environmental contamination

One sample (S7) previously collected by SESL Australia identified elevated levels of lead and dieldrin (OCP). The levels were above the human health investigation levels for residential land with access to soil. No other samples collected from within this area contained levels of the analytes above the relevant thresholds.

12.2 Chemical degradation production

Lead is an element and consequently does not degrade. The half-life of dieldrin in temperate soils is approximately 5 years.

12.3 Exposed population

12.3.1 Human Health

Lead and dieldrin was detected at elevated levels in one sample (S7) above the relevant threshold for residential land-use with access to soil. The site is currently undergoing development and exposure to the elevated levels is expected to be low. The contaminant is not highly mobile and not expected to move from the site without soil disturbance.

12.3.2 Environment

Effects on the soil biota are expected to be restricted to a small area surrounding the sample identified by SESL Australia (S7). The area is currently vegetated and no off-site effects are expected.

13. Conclusions and recommendations

13.1 Summary

An inspection of the site was made on 20 July 2017. The three investigation areas are approximately 2,500m^2 in area in total.

The site is currently vacant and was previously used as an orchard with packing shed. The surface cover on the site was pasture grasses with broadleaved weeds. Some bare areas were identified in investigation area 1 in the location of a previously removed shed.

A small amount of fill (up to 300mm) was identified forming a shed building pad in investigation area 1. The fill material comprised crushed granite and brownish red silty sand. Two asbestos cement fragments were identified on the surface of this area. No asbestos cement fragments were identified within the fill material. No additional fragments of asbestos were identified within this area.

A bank adjacent the packing shed formed investigation area 2. The bank was constructed with fill material including brownish red silty sand and sandy clay with trace brick and concrete. No asbestos was identified within the fill material or on the surface of the bank.

No bare areas were identified within investigation area 3. The levels of lead and OCP's including dieldrin in the additional soil samples collected were below the adopted thresholds for residential land-use.

One sample previously collected by SESL Australia (S7) contained levels of lead and OCP (dieldrin) above the adopted threshold for residential land-use.

13.2 Assumptions in reaching the conclusions

It is assumed the sampling sites are representative of the site. An accurate history has been obtained and typical management practices were adopted.

13.3 Extent of uncertainties

The analytical data relate only to the locations sampled. Soil conditions can vary both laterally and vertically and it cannot be excluded that unidentified contaminants may be present. The sampling density was designed to detect a hot spot in the field area within a radius of approximately 3 metres and with a 95% level of confidence.

13.4 Suitability for proposed use of the site

The site is suitable for proposed residential activities following remediation of lead and dieldrin impacted material.

13.5 Limitations and constraints on the use of the site

No constraints are recommended following remediation of lead and dieldrin impacted material.

13.6 Recommendation for further work

Remediation and validation of lead and dieldrin impacted material is required to enable the site to be suitable for proposed residential land-use. A remediation action plan is required to identify the most appropriate method of remediation.

Any asbestos cement fragments discovered on the site should be managed with an unexpected finds protocol (Appendix 5).

14. 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 sub-surface 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.

15. References

DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditors Scheme* (NSW Department of Environment and Conservation, Chatswood)

Environment.nsw.gov.au, 'Espade | NSW Environment & Heritage' Version 2. N.p., 2015. Web. 3 August 2017.

Environment Protection Authority (1995) *Contaminated sites: Sampling Design Guidelines* (NSW Environment Protection Authority, Chatswood)

Kovac, M and Lawrie, JW (1990) *Soil Landscapes of the Bathurst 1:250,000 Sheet* (Soil Conservation Service of NSW, Sydney)

NEPC (1999 revised 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (National Environment Protection Council Service Corporation, Adelaide)

Figures

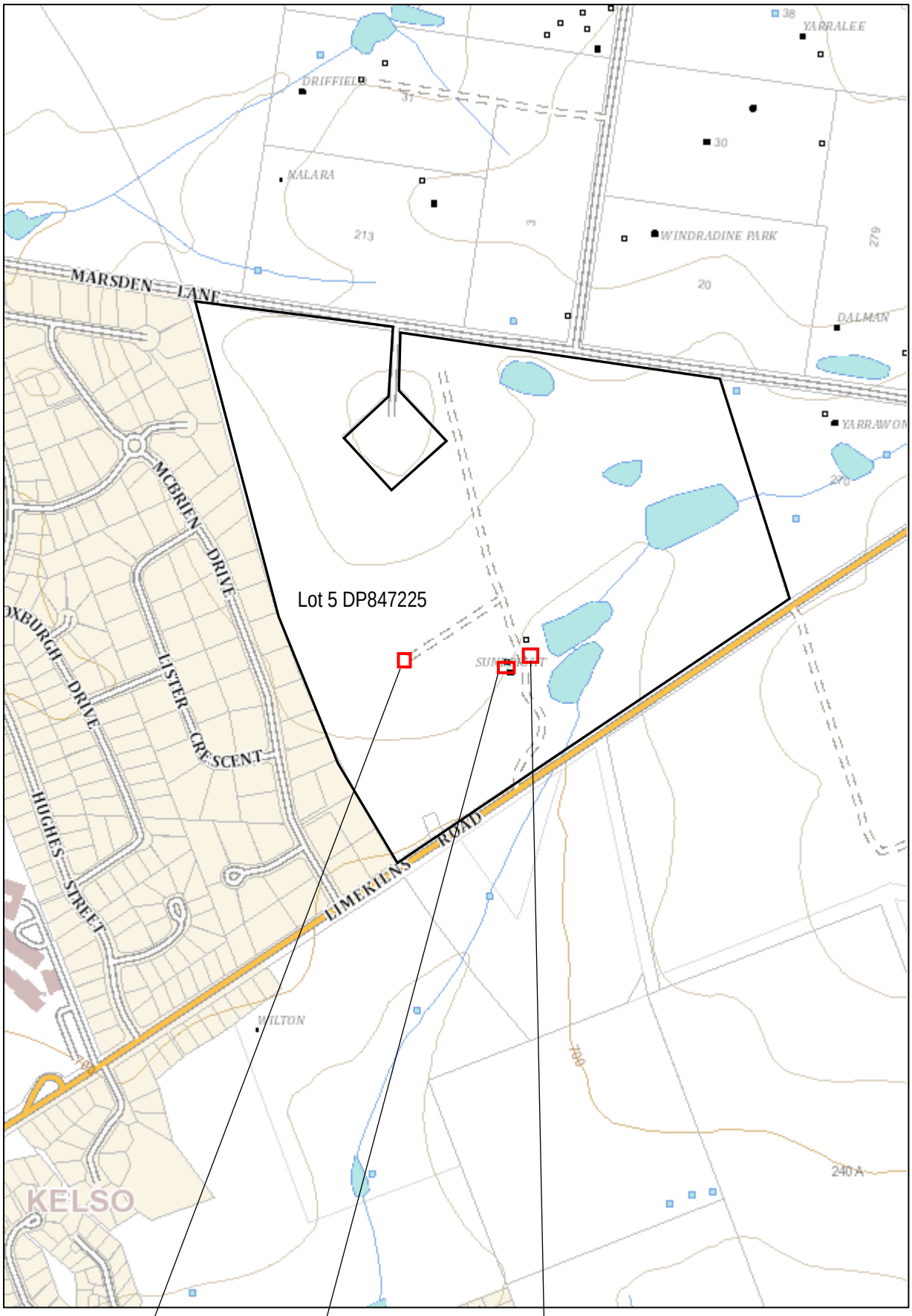

Figure 1: Locality map		
Lot 5 DP847225, 197 Limekilns Road, Bathurst NSW		
	Envirowest Consulting Pty Ltd	
Job: R8593c	Drawn by: AP	Date: 4/06/2017

Legend

X Test pit location

Investigation area

Figure 2: Investigation area 1 and test pit locations		
Lot 5 DP847225, 197 Limekilns Road, Bathurst NSW		
	Envirowest Consulting Pty Ltd	
Job: R8593c	Drawn by: AP	Date: 4/07/2017

Legend

⊗ Sample location

X Test pit location

Investigation area

Slope

contaminant	mg/kg

Approximate Scale 1: 600

0 6 12 24m

Figure 3: Site layout and sampling locations		
Lot 5 DP847225, 197 Limekilns Road, Bathurst NSW		
	Envirowest Consulting Pty Ltd	
Job: R8593c	Drawn by: AP	Date: 4/07/2017

Figure 4. Photographs of the site

Test pit 1 in investigation area 1

Test pit 4 in investigation area 1

Looking across fill bank in investigation area 2

Looking north across fill bank in investigation area 2

Looking east across investigation area 3

Looking north across investigation area 3

Appendices

Appendix 1. Sample analysis, quality assurance and quality control (QAQC) report
Appendix 2. Borelogs
Appendix 3. Field sampling log
Appendix 4. Soil analysis results – SGS report number SE163619 and chain of custody form
Appendix 5. Unexpected finds protocol

Appendix 1. 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

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	Frequency of 5%, results to be within +/-40% or discussion required
Surrogate spikes	Frequency of 5%, results to be within +/-40% or discussion required
Laboratory control samples	It is to be within +/-40% or discussion required
Laboratory prepared spikes	Frequency of 5%, results to be within +/-40% or discussion required

2. Laboratory analysis summary

One analysis batch was undertaken over the investigation program. Soil samples were collected on 20 July 2017. A total of ten soil samples were submitted for analytical testing. The samples were collected in the field by an environmental scientist from Envirowest Consulting Pty Ltd, placed into laboratory prepared receptacles as recommended in NEPC (1999). The samples preservation and storage was undertaken using standard industry practices (NEPC 1999). A chain of custody form accompanied transport of the samples to the laboratory.

The samples were analysed at the laboratory of SGS, Alexandria, NSW which is National Association of Testing Authorities (NATA) accredited for the tests undertaken. The analyses undertaken, number of samples tested and methods are presented in the following tables:

Laboratory analysis schedule

Sample id. (sampling location)	Number of samples	Duplicate	Analyses	Date collected	Substrate	Laboratory report
S201-0.1, S202-0.1, S202-0.2, S202-0.3, S203-0.1, S203-0.2, S203-0.3, S204-0.1, S205-0.1, S206-0.1	10	1	Pb, OCP	20/7/2017	Soil	SE168593

Analytical methods

Analyte	Extraction	Laboratory methods
Metals	USEPA 200.2 Mod	APHA USEPA SW846-6010
Chromium (III)	-	APHA 3500 CR-A&B & 3120 and USEPA SW846-3060A
Chromium (VI)	USEPA SW846-3060A	USEPA SW846-3060A
Mercury	USEPA 200.2 Mod	APHA 3112
TRH(C6-C9)	USPEA SW846-5030A	USPEA SW 846-8260B
TRH(C10-C40), PAH	Tumbler extraction of solids	USEPA SW 846-8270B
PCB	Tumbler extraction of solids	USEPA SW 846-8270B
OC Pesticides	Tumbler extraction of solids	USEPA SW 846-8270B
BTEX	Tumbler extraction of solids	USEPA SW 846-8260B

3. Field quality assurance and quality control

One intra laboratory duplicate sample was collected for the investigation. The frequency was greater than the recommended frequency of 5%. Table A5.1 outlines the samples collected and differences in replicate analyses. Relative differences were deemed to pass if they were within the acceptance limits of +/- 40% for replicate analyses or less than 5 times the detection limit.

Field duplicate frequency

Sample id.	Number of samples	Duplicate	Frequency (%)	Date collected	Substrate	Laboratory report
S201-0.1, S202-0.1, S202-0.2, S202-0.3, S203-0.1, S203-0.2, S203-0.3, S204-0.1, S205-0.1, S206-0.1	10	1	10	20/7/2017	Soil	SE168217

Table A5.1. Relative differences for intra laboratory duplicates

	S206-0.1, DA	
	Relative difference (%)	Pass/Fail
Lead	0	Pass
OCP	0	Pass

NA – relative difference unable to be calculated as results are less than laboratory detection limit

No trip blanks or spikes were submitted for analysis. This is not considered to create significant uncertainty in the analysis results because of the following rationale:

- The fieldwork was completed within a short time period and consistent methods were used for soil sampling.
- Soil samples were placed in insulated cooled containers after sampling to ensure preservation during transport and storage.
- The samples were placed in single use jars using clean sampling tools and disposable gloves from material not in contact with other samples. This reduces the likelihood of cross contamination.
- Samples in the analysis batch contain analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

4. Laboratory quality assurance and quality control

Sample holding times are recommended in NEPC (1999). The time between collection and extraction for all samples was less than the criteria listed below:

Analyte	Maximum holding time
Metals, cyanide	6 months
OCP, TPH, PCB, BTEX, PAH	14 days

The laboratory interpretative reports are presented with individual laboratory report. Assessment is made of holding time, frequency of control samples and quality control samples. No significant outliers exist for the sampling batches. The laboratory report also contains a detailed description of preparation methods and analytical methods.

The results, quality report, interpretative report and chain of custody are presented in the attached appendices. The quality report contains the laboratory duplicates, spikes, laboratory control samples, blanks and where appropriate matrix spike recovery (surrogate).

5. Data quality indicators (DQI) analysis

5.1 Completeness

A measure of the amount of usable data for a data collection activity (total to be greater than 95%).

The data set was found to be complete based on the scope of work. No critical areas of contamination were omitted from the data set.

5.1.1 Field

Consideration	Accepted	Comment
Locations to be sampled	Yes	In accordance with sampling methodology, described in the report. Sampling locations described in figures.
Depth to be sampled	Yes	In accordance with sampling methodology
SOP appropriate and compiled	Yes	In accordance with sampling methodology Sampled with stainless steel spade into lab prepared containers, decontamination between samples, latex gloves worn by sampler
Experienced sampler	Yes	Same soil sampler, environmental scientist
Documentation correct	Yes	Sampling log completed Chain of custody completed

5.1.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	All critical samples analysed in accordance with chain of custody and analysis plan.
Analytes	Yes	All analytes in accordance with chain of custody and analysis plan
Methods	Yes	Analysed in NATA accredited laboratory with recognised methods and suitable PQL
Sample documentation	Yes	Completed including chain of custody and sample results and quality results report for each batch
Sample holding times	Yes	Metals less than 6 months. OCP, TRH, PCB, BTEX less than 14 days

5.2 Comparability

The confidence that data may be considered to be equivalent for each sampling and analytical event.

The data sets were found to be acceptable.

5.2.1 Field

Consideration	Accepted	Comment
SOP	Yes	Same sampling procedures used and sampled on one date
Experienced sampler	Yes	Experienced scientist
Climatic conditions	Yes	Described in field sampling log
Samples collected	Yes	Suitable size, storage and transport

5.2.2 Laboratory

Consideration	Accepted	Comment
Analytical methods	Yes	Same methods all samples, in accordance with NEPC(1999) or USEPA
PQL	Yes	Suitable for analytes
Same laboratory	Yes	ALS Environmental is NATA accredited for the test
Same units	Yes	-

5.3 Representativeness

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

The data sets were found to be acceptable.

5.3.1 Field

Consideration	Accepted	Comment
Appropriate media sampled	Yes	Sampled according to sampling and quality plan
All media identified	Yes	Soil Sampling media identified in the sampling and quality plan

5.3.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	Undertaken in NATA accredited laboratory. No blanks analysed. Samples in the analysis batch contain analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

5.4 Precision

A quantitative measure of the variability (or reproduced of the data).
The data sets were found to be acceptable.

5.4.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field duplicates	Yes	Collected

5.4.2 Laboratory

Consideration	Accepted	Comment
Laboratory and inter lab duplicates	Yes	Frequency of 5%, results to be within +/-40% or discussion required.
Field duplicates	Yes	Results to be within +/-40% or discussion required
Laboratory prepared volatile trip spikes	NA	The target analytes were not volatiles

5.5 Accuracy

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

The data sets were found to be acceptable.

5.5.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field blanks	NA	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Rinsate blanks	NA	Frequency of 5%, <5 times the PQL, PQL may be adjusted

5.5.2 Laboratory

Consideration	Accepted	Comment
Method blanks	Yes	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Matrix spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required.
Matrix duplicates	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Surrogate spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Laboratory control samples	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Laboratory prepared spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required

No trip blanks, field spikes or sample rinsates were submitted for analysis. This is not considered to create significant uncertainty in the analysis results because of the following rationale:

- The fieldwork methods used for soil sampling were consistent throughout the project with all in situ samples collected from material which had not been subject to exposure.

- The fieldwork was completed within a short time period and consistent methods were used for soil sampling.

- Soil samples were placed in insulated cooled containers as quickly as possible, with the containers filled to minimize headspace. The sample containers were sealed immediately after the sample was collected and chilled in an esky containing ice.

- The samples were stored in a refrigerator and transported with ice bricks to ensure preservation during transport and storage.

- The samples were placed in single use jars using clean sampling tools and disposable gloves from material not in contact with other samples. This reduces the likelihood of cross contamination.

- Samples in the analysis batches contained analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

6. Conclusion

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.

Appendix 2. Borelogs

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP1 Location: Within removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		FILL, silty sand, brown	SM		
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: Level *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill identified to 0.3m

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP2 Location: South of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		FILL, crushed granite, brown	G		
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: Level *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill identified to 0.3m

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP3 Location: South east of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		FILL, silty sand, brown With brick at 150mm	SM		Asbestos fragment on surface
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill identified to 0.3m

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP4 Location: West of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		Asbestos fragment on surface
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW		Borehole No: TP5 Location: North west of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	G		
0.5		SANDY CLAY, reddish brown	Cl		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW		Borehole No: TP6 Location: North west of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		FILL, silty sand, brown	SM		
0.5		SANDY CLAY, reddish brown	**Cl**		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill identified to 0.3m

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP7 Location: North west of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP8 Location: North of removed shed pad (investigation area 1)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		SANDY CLAY, reddish brown	CI		
1.0		End of hole			
1.5					

Slope/nature of surface: 0-1% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP9 Location: Eastern end of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		End of hole			
1.0					
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP10 Location: North eastern end of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		End of hole			
1.0					
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP11 Location: North side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		End of hole			
1.0					
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP12 Location: Northern side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		End of hole			
1.0					
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP13 Location: North western side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		SILTY SAND, reddish brown	SM		
0.5		End of hole			
1.0					
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP14 Location: Northern side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
		FILL, silty sand, reddish brown	SM		
0.5					
1.0		End of hole			
1.5					

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Nil

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW		Borehole No: TP15 Location: South eastern side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
0.5		FILL, silty sand, reddish brown	SM		
1.0					
1.5		End of hole			

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill to depth of pit

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW		Borehole No: TP16 Location: South eastern side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
0.5		FILL, silty sand, reddish brown	SM		
1.0		FILL, sandy clay, reddish brown	CI		
1.5		End of hole			

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill to depth of pit

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Bore Log Sheet

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP17 Location: Southern side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
0.5		FILL, silty sand, reddish brown With concrete and brick	SM		
1.0		FILL, sandy clay, reddish brown	CI		
1.5		End of hole			

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill to depth of pit

Envirowest Consulting Pty Ltd, 9 Cameron Place, Orange NSW

Job: 8593 Client: Bathurst Regional Council Site: 197 Limekilns Road Kelso NSW	Borehole No: TP18 Location: South western side of tree line (investigation area 2)	Sampling method: 5.5T excavator Logged by: AP Date: 20/07/2017

Depth (m)	Graphic Log	SOIL DESCRIPTION Soil type/rock, grain size, structure, colour, minor components	Unified symbol	Samples	COMMENTS
0.5		FILL, silty sand, reddish brown With concrete and brick	SM		
1.0		FILL, sandy clay, brownish red	CI		
1.5		End of hole			

Slope/nature of surface: 1-2% S *Groundwater:* No free water identified in soil profile	*Remarks* (fill, odour, root holes): Fill to depth of pit

Appendix 3. Field sampling log

Sampling log

Client	Bathurst Regional Council
Contact	Aaron McDonald
Job number	8593
Location	197 Limekilns Road, Kelso
Date	20 July 2017
Investigator(s)	Ashleigh Pickering
Weather conditions	Cold and windy

Sample id	Matrix	Date	Analysis required	Observations/comment
S201-0.1	Soil	20/07/2017	Lead (Pb), organochlorine pesticides (OCP)	
S202-0.1	Soil	20/07/2017	Pb, OCP	
S202-0.2	Soil	20/07/2017	Pb, OCP	
S202-0.3	Soil	20/07/2017	Pb, OCP	
S203-0.1	Soil	20/07/2017	Pb, OCP	
S203-0.2	Soil	20/07/2017	Pb, OCP	
S203-0.3	Soil	20/07/2017	Pb, OCP	
S204-0.1	Soil	20/07/2017	Pb, OCP	
S205-0.1	Soil	20/07/2017	Pb, OCP	
S206-0.1	Soil	20/07/2017	Pb, OCP	
DA	Soil	20/07/2017	Pb, OCP	Duplicate of S206-0.1

Appendix 4. Soil analysis results – SGS report number SE168217 and chain of custody form

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Ashleigh Pickering
Client	ENVIROWEST CONSULTING PTY LIMITED
Address	PO BOX 8158 ORANGE NSW 2800
Telephone	61 2 63614954
Facsimile	(Not specified)
Email	ashleigh@envirowest.net.au
Project	**8593**
Order Number	(Not specified)
Samples	11

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	**SE168217 R0**
Date Received	21/7/2017
Date Reported	28/7/2017

COMMENTS

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

SIGNATORIES

Ly Kim Ha
Organic Section Head

OC Pesticides in Soil [AN420] Tested: 24/7/2017

PARAMETER	UOM	LOR	S201-0.1 SOIL - 20/7/2017 SE168217.001	S202-0.1 SOIL - 20/7/2017 SE168217.002	S202-0.2 SOIL - 20/7/2017 SE168217.003	S202-0.3 SOIL - 20/7/2017 SE168217.004	S203-0.1 SOIL - 20/7/2017 SE168217.005
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	**0.2**	**0.1**	**0.2**	<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: 24/7/2017 (continued)

PARAMETER	UOM	LOR	S203-0.2 SOIL - 20/7/2017 SE168217.006	S203-0.3 SOIL - 20/7/2017 SE168217.007	S204-0.1 SOIL - 20/7/2017 SE168217.008	S205-0.1 SOIL - 20/7/2017 SE168217.009	S206-0.1 SOIL - 20/7/2017 SE168217.010
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	**1.5**	**0.7**	**0.7**
Dieldrin	mg/kg	0.2	<0.2	<0.2	**0.4**	<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	**0.3**	<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	**0.3**
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	**2**	<1	**1**

OC Pesticides in Soil [AN420] Tested: 24/7/2017 (continued)

PARAMETER	UOM	LOR	DA SOIL - 20/7/2017 SE168217.011
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
o,p'-DDE	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
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	**0.2**
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
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
Total CLP OC Pesticides	mg/kg	1	<1

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 27/7/2017

PARAMETER	UOM	LOR	S201-0.1 SOIL - 20/7/2017 SE168217.001	S202-0.1 SOIL - 20/7/2017 SE168217.002	S202-0.2 SOIL - 20/7/2017 SE168217.003	S202-0.3 SOIL - 20/7/2017 SE168217.004	S203-0.1 SOIL - 20/7/2017 SE168217.005
Lead, Pb	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	S203-0.2 SOIL - 20/7/2017 SE168217.006	S203-0.3 SOIL - 20/7/2017 SE168217.007	S204-0.1 SOIL - 20/7/2017 SE168217.008	S205-0.1 SOIL - 20/7/2017 SE168217.009	S206-0.1 SOIL - 20/7/2017 SE168217.010
Lead, Pb	mg/kg	1	<1	<1	**40**	**14**	<1

PARAMETER	UOM	LOR	DA SOIL - 20/7/2017 SE168217.011
Lead, Pb	mg/kg	1	<1

Moisture Content [AN002] Tested: 25/7/2017

PARAMETER	UOM	LOR	S201-0.1 SOIL - 20/7/2017 SE168217.001	S202-0.1 SOIL - 20/7/2017 SE168217.002	S202-0.2 SOIL - 20/7/2017 SE168217.003	S202-0.3 SOIL - 20/7/2017 SE168217.004	S203-0.1 SOIL - 20/7/2017 SE168217.005
% Moisture	%w/w	0.5	5.1	7.7	6.4	16	10

PARAMETER	UOM	LOR	S203-0.2 SOIL - 20/7/2017 SE168217.006	S203-0.3 SOIL - 20/7/2017 SE168217.007	S204-0.1 SOIL - 20/7/2017 SE168217.008	S205-0.1 SOIL - 20/7/2017 SE168217.009	S206-0.1 SOIL - 20/7/2017 SE168217.010
% Moisture	%w/w	0.5	7.7	6.4	20	9.3	6.0

PARAMETER	UOM	LOR	DA SOIL - 20/7/2017 SE168217.011
% Moisture	%w/w	0.5	4.0

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.
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.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples 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 criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE168217 R0

CLIENT DETAILS

Contact	Ashleigh Pickering
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Telephone	61 2 63614954
Facsimile	(Not specified)
Email	ashleigh@envirowest.net.au
Project	**8593**
Order Number	(Not specified)
Samples	11

LABORATORY DETAILS

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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE168217 R0**
Date Received	21 Jul 2017
Date Reported	28 Jul 2017

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 and was supplied by the Client.
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 Metals in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE168217 R0

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.

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S201-0.1	SE168217.001	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S202-0.1	SE168217.002	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S202-0.2	SE168217.003	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S202-0.3	SE168217.004	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S203-0.1	SE168217.005	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S203-0.2	SE168217.006	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S203-0.3	SE168217.007	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S204-0.1	SE168217.008	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S205-0.1	SE168217.009	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
S206-0.1	SE168217.010	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017
DA	SE168217.011	LB128675	20 Jul 2017	21 Jul 2017	03 Aug 2017	25 Jul 2017	30 Jul 2017	26 Jul 2017

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S201-0.1	SE168217.001	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S202-0.1	SE168217.002	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S202-0.2	SE168217.003	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S202-0.3	SE168217.004	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S203-0.1	SE168217.005	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S203-0.2	SE168217.006	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S203-0.3	SE168217.007	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S204-0.1	SE168217.008	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S205-0.1	SE168217.009	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
S206-0.1	SE168217.010	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017
DA	SE168217.011	LB128526	20 Jul 2017	21 Jul 2017	03 Aug 2017	24 Jul 2017	02 Sep 2017	26 Jul 2017

Total Recoverable Metals 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
S201-0.1	SE168217.001	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S202-0.1	SE168217.002	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S202-0.2	SE168217.003	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S202-0.3	SE168217.004	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S203-0.1	SE168217.005	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S203-0.2	SE168217.006	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S203-0.3	SE168217.007	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S204-0.1	SE168217.008	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S205-0.1	SE168217.009	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
S206-0.1	SE168217.010	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017
DA	SE168217.011	LB128842	20 Jul 2017	21 Jul 2017	16 Jan 2018	27 Jul 2017	16 Jan 2018	28 Jul 2017

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 identifer 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)	S201-0.1	SE168217.001	%	60 - 130%	71
	S202-0.1	SE168217.002	%	60 - 130%	72
	S202-0.2	SE168217.003	%	60 - 130%	81
	S202-0.3	SE168217.004	%	60 - 130%	75
	S203-0.1	SE168217.005	%	60 - 130%	75
	S203-0.2	SE168217.006	%	60 - 130%	73
	S203-0.3	SE168217.007	%	60 - 130%	75
	S204-0.1	SE168217.008	%	60 - 130%	77
	S205-0.1	SE168217.009	%	60 - 130%	74
	S206-0.1	SE168217.010	%	60 - 130%	71
	DA	SE168217.011	%	60 - 130%	74

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.

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB128526.001	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)	%	-	70

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

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

Sample Number	Parameter	Units	LOR	Result
LB128842.001	Lead, Pb	mg/kg	1	<1

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE168216.007	LB128675.011	% Moisture	%w/w	0.5	2.72314674732	2.8963414634	66	6
SE168217.009	LB128675.022	% Moisture	%w/w	0.5	9.3	8.9	41	4
SE168225.002	LB128675.026	% Moisture	%w/w	0.5	53.5050071536	54.7839506172	32	2

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE168217.002	LB128526.014		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	106	2
			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	-	0.11	0.11	30	2
SE168217.010	LB128526.026		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	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	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	0.7	0.678	45	1
			Dieldrin	mg/kg	0.2	<0.2	0	200	0
			Endrin	mg/kg	0.2	<0.2	0	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	200	0
			p,p'-DDD	mg/kg	0.1	0.1	0.11	121	0
			p,p'-DDT	mg/kg	0.1	0.3	0.29	65	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	0	200	0
			Methoxychlor	mg/kg	0.1	<0.1	0	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	0	200	0
			Isodrin	mg/kg	0.1	<0.1	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE168217.010	LB128526.026		Mirex	mg/kg	0.1	<0.1	0	200	0
			Total CLP OC Pesticides	mg/kg	1	1	1.078	123	1
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.11	0.112	30	6

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.

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB128526.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	98
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	92
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	94
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	87
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	88
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	117
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.11	0.15	40 - 130	72

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

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB128842.002	Lead, Pb	mg/kg	1	52	50	80 - 120	103

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 identifer 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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE168216.001	LB128526.025		Hexachlorobenzene (HCB)	mg/kg	0.1	0	-	-
			Alpha BHC	mg/kg	0.1	0	-	-
			Lindane	mg/kg	0.1	0	-	-
			Heptachlor	mg/kg	0.1	0	0.2	108
			Aldrin	mg/kg	0.1	0	0.2	98
			Beta BHC	mg/kg	0.1	0	-	-
			Delta BHC	mg/kg	0.1	0	0.2	105
			Heptachlor epoxide	mg/kg	0.1	0	-	-
			o,p'-DDE	mg/kg	0.1	0	-	-
			Alpha Endosulfan	mg/kg	0.2	0	-	-
			Gamma Chlordane	mg/kg	0.1	0	-	-
			Alpha Chlordane	mg/kg	0.1	0	-	-
			trans-Nonachlor	mg/kg	0.1	0	-	-
			p,p'-DDE	mg/kg	0.1	0	-	-
			Dieldrin	mg/kg	0.2	0.206	0.2	105
			Endrin	mg/kg	0.2	0	0.2	93
			o,p'-DDD	mg/kg	0.1	0	-	-
			o,p'-DDT	mg/kg	0.1	0	-	-
			Beta Endosulfan	mg/kg	0.2	0	-	-
			p,p'-DDD	mg/kg	0.1	0	-	-
			p,p'-DDT	mg/kg	0.1	0	0.2	125
			Endosulfan sulphate	mg/kg	0.1	0	-	-
			Endrin Aldehyde	mg/kg	0.1	0	-	-
			Methoxychlor	mg/kg	0.1	0	-	-
			Endrin Ketone	mg/kg	0.1	0	-	-
			Isodrin	mg/kg	0.1	0	-	-
			Mirex	mg/kg	0.1	0	-	-
			Total CLP OC Pesticides	mg/kg	1	0.206	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.109	-	72

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE168216.001	LB128842.004	Lead, Pb	mg/kg	1	51	40.8702306134€	50	21 ④

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x 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 identifer 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: http://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.
-	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 Analytical Report comments for further information.

Chain of Custody Form – Ref 8593

Ref: 8593
Investigator: Envirowest Consulting
9 Cameron Place
PO Box 8158
ORANGE NSW 2800
Telephone: (02) 6361 4954
Facsimile: (02) 6360 3960
Email: ashleigh@envirowest.net.au
Contact Person: Ashleigh Pickering
Invoice: accounts@envirowest.net.au

Laboratory: SGS SYDNEY
16/33 Maddox Street
ALEXANDRIA NSW 2015

Quotation #:
Courier/CN:

	Sample ID	Container*	Sampling Date/Time	Sample matrix: Water	Soil	Sludge	Sample preservation: Cool	HNO3/HCl	Unpreserved	Analysis (SGS Method Code): Lead	OCP			
1	S201-0.1	A	20/07/2017		X		X		X	X	X			
2	S202-0.1	A	20/07/2017		X		X		X	X	X			
3	S202-0.2	A	20/07/2017		X		X		X	X	X			
4	S202-0.3	A	20/07/2017		X		X		X	X	X			
5	S203-0.1	A	20/07/2017		X		X		X	X	X			
6	S203-0.2	A	20/07/2017		X		X		X	X	X			
7	S203-0.3	A	20/07/2017		X		X		X	X	X			
8	S204-0.1	A	20/07/2017		X		X		X	X	X			
9	S205-0.1	A	20/07/2017		X		X		X	X	X			
10	S206-0.1	A	20/07/2017		X		X		X	X	X			
11	DA	A	20/07/2017		X		X		X	X	X			

SGS EHS Alexandria Laboratory

SE168217 COC
Received: 21–Jul–2017

Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler name: Ashleigh Pickering
Date : 20/07/2017 Time:

Relinquished by: (print and signature)	Date	Time	Received by: (print and signature)	Date	Time
Ashleigh Pickering	20/07/2017	17:00		21/7/17	9:40

*A = Solvent rinsed glass jar with Teflon lined lid and orange label

Appendix 5. Unexpected finds protocol

1. Introduction

Investigations have been undertaken including boreholes, soil sampling and analysis to evaluate the contamination status of Lot 5 DP847225, 197 Limekilns Road, Bathurst NSW.

A procedure is required describing the actions if potential contamination or hazards are encountered during excavation/construction activities.

2. Scope

Prepare a procedure to enable the identification and management of unexpected hazards identified during excavation works and/or construction activities.

3. Site identification

Lot 5 DP847225, 197 Limekilns Road, Bathurst

4. Responsible person

The landowner is responsible for implementation of the unexpected finds protocol. The land owner will appoint an environmental scientist to induct and provide information on hazard identification and responses to earthwork supervisors and personnel which may uncover unexpected hazards.

5. Identification of unexpected hazards

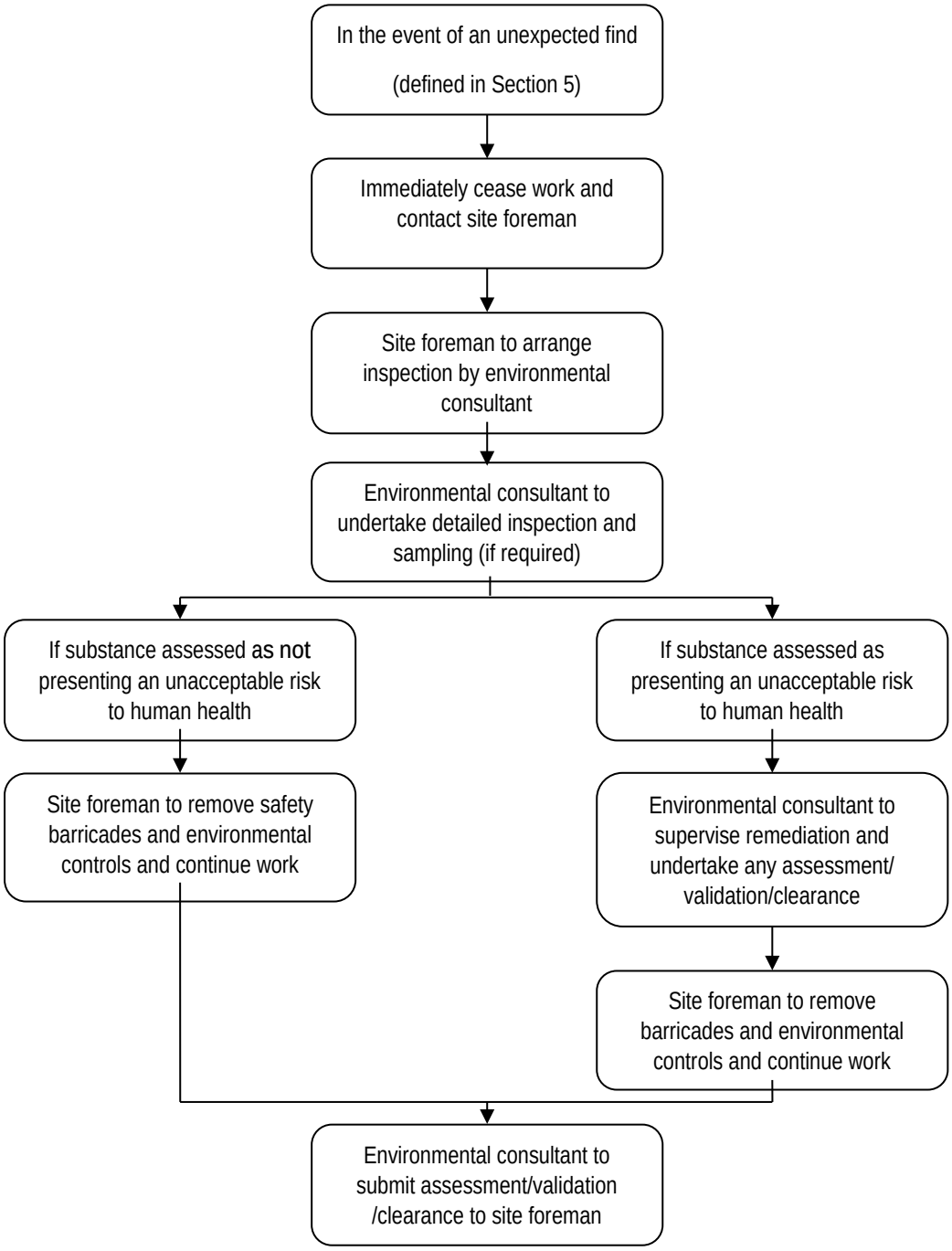
Potential hazards will be identified by appearance and odour and include:

- A filled pit or gully
- Demolition waste
- Discoloured soil
- Oil/diesel/tar
- Sheens on water
- An offensive odour
- Asbestos cement sheeting
- Ash or slag
- Underground storage tank

6. Training and induction

All excavation/construction personnel are to be inducted on the identification of potential hazards. The induction can be undertaken at the time of general site induction and toolbox meetings. The training will include display of the poster below to alert worker of potential hazards.

7. Procedure



8. Recommencement of works

The potential hazards will be assessed by the environmental scientist and a report prepared describing:

- Preliminary assessment of the contamination and need for cleanup
- Preparation of a remediation action plan
- All works to be undertaken in accordance with contaminated site regulations and guidelines
- Remediation works
- Validation of the remediation
- Works can commence on the potentially hazardous area after the environmental scientist has provided a clearance.

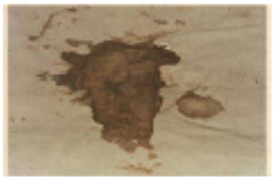
BE AWARE

UNEXPECTED HAZARDS MAY BE PRESENT

drums

asbestos

chemical bottles



blood stains

odour

ash / slag

demolition waste

if you <u>SEE</u> or <u>SMELL</u> anything unusual

<u>STOP WORK</u> & contact the Site Foreman

do not restart working before the area has been investigated and cleared by an Environmental Consultant