

Preliminary contamination investigation

Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW

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Summary report

Introduction

A residential subdivision is proposed for Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW. Land-use on the site will change from agricultural to residential. A preliminary contamination assessment was undertaken by Envirowest Consulting Pty Ltd in 2017 (report number R8532c). An assessment is required to determine potential changes in the contamination status on Parcel 2 since the 2017 assessment and suitability for residential land-use.

Scope

The scope was to identify past potentially contaminating activities, identify potential types of contamination, discuss the site condition, provide a preliminary assessment of site contamination and assess the need for further investigation to determine suitability for residential land-use. The scope of works included review of previous reports, site inspection, soil sampling and analysis of the soil samples for contaminants of concern.

Summary

An inspection of the site was made on 19 April 2021. The site is a rural-residential lot and has an area of approximately 33ha. Previous investigations of the site in 2017 recommended the site was suitable for residential land-use following removal of stockpiles. The stockpiles remain in the central eastern and central southern section of the site. The stockpiles comprise an estimated volume of approximately 1,000m³. The stockpiles have not been assessed for chemical contaminants.

Surface cover on the site consisted of native and introduced pasture species with weeds. The site has been predominately cleared of native tree species. Remnant native trees are present along the drainage lines. Dense blackberry shrubs are present in sections of the drainage line.

No obvious changes were identified during the site walkover since the 2017 investigation. Land-use appeared similar. The site representative indicated no changes had been made to the site since the 2017 investigation. Historic building footings were identified in the central section which had not been previously identified. A sample collected from this area contained levels of potential contaminants below adopted thresholds. No other potentially contaminating activities were identified which were not assessed in the 2017 investigation.

General refuse including tyres, tiles, plastic and steel drums and bricks was identified in the 2017 assessment along and within the drainage gullies on site. Blackberry growth in the drainage lines prevented inspection for these locations or additional disposal areas.

Recommendations

The site is suitable for residential land-use following removal of the stockpiles.

An unexpected finds procedure should be developed for the site.

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1. Introduction

A residential subdivision is proposed for Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW. Land-use on the site will change from agricultural to residential. A preliminary contamination assessment was undertaken by Envirowest Consulting Pty Ltd in 2017 (report number R8532c).

An assessment is required to determine potential changes in the contamination on Parcel 2 since the 2017 assessment and suitability for residential land-use.

2. Objectives

The objective of the investigation was to determine suitability of the site for the proposed residential land-use.

3. Scope of work

Envirowest Consulting Pty Ltd was commissioned by Maas Group to undertake a preliminary contamination assessment, 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)*, of Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW. The objective was to identify past potentially contaminating activities since the 2017 assessment, identify potential contamination types, discuss the site condition, provide a preliminary assessment of site contamination and assess the need for further investigation or suitability for residential land-use.

4. Site identification

Address	Parcel 2 33 Magpie Hollow Road South Bowenfels NSW
Deposited plans	Lot 2 DP1229039
Latitude and longitude	-33.51° 150.12°
Geographic coordinates	56H E232335m S6288861m
Client	Maas Group
Owner	Rosaton Pty Ltd
Current occupier	Rosaton Pty Ltd
Area	Approximately 33ha
Local government area	Lithgow City Council
Current zoning	R2 – Low density residential and E3 – Environmental Management (Lithgow LEP 2014)
Trigger for investigation	Change in land-use
Locality map	Figure 1

5. Site history

5.1 Land-uses

The site is located in a rural-residential and residential area on the south western fringes of Lithgow. The site was grazing land at the time of inspection.

5.2 Summary of council records

A planning certificate was obtained for 33 Magpie Hollow Road, South Bowenfels NSW (Appendix 3).

Lithgow City Council has not received notice under the *Contaminated Land Management Act 1997*

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

The site is mapped in an area of biodiversity and groundwater vulnerable (Lithgow LEP 2014).

5.3 EPA contaminated sites list

The investigation area is not listed on the NSW EPA register of contaminated sites (28 April 2021) or sites notified to the EPA (12 April 2021). The Shell Service Station located to the north east of the site is listed as notified to the EPA. Contamination has been identified on the site and the EPA has determined that regulation under the Contaminated Land Management Act 1997 is not required.

5.4 Sources of information

- Site inspection 19 April 2021
- NSW EPA records of public notices under the CLM Act 1997
- Soil and geological maps
- Historical aerial photographs – Google Earth, Nearmaps and NSW Government Historical Imagery Viewer
- NSW Planning and Environment planning viewer
- Previous assessments

5.5 Review of historic aerial photographs, maps and plans

5.5.1 Aerial photographs

Year	Comment
1958	• The aerial photograph does not include the extreme northern section of the site. • Potential structures are located in the central northern section of the site and may potentially be part of a slaughter house historically located in this area. • The site has been mostly cleared with trees remaining along the drainage lines. • Bare soil is visible along the northern boundary in the north western section. • Depressions are visible in the south western section of the site.
1966	• Some of the potential structures have been removed. • A structure is located along the western boundary expected to be outside the investigation area.
1975	• A track traverses the site along the eastern boundary. • The area of the historic slaughterhouse appears disturbed. No structures are present. • The structure along the western boundary is no longer visible.
1979	• A track traverses the site along the western boundary.

1984	• The track along the western boundary is no longer visible.
1989	• An entrance is present at the location of 41 Magpie Hollow Road (outside the investigation area). A track traverses the site through 41 Magpie Hollow Road south west towards a drainage line. The area where the track ends appears disturbed.
1990	• No changes identified.
1991	• No changes identified.
1994	• Materials are being stored in the central section of the site. • A disturbed area is present in the historic slaughterhouse location.
1999	• A small area of bare soil is present in the central section of the site.
21/3/2002	• The bare area of soil in the central section appears to be a dam.
23/5/2006	• No changes identified.
1/1/2009	• No changes identified.
25/2/2014	• A dam has been constructed in the central northern section of the site. • Some of the materials in the storage area in the central section of the site have been removed.
12/11/2014	• No changes identified.
10/3/2015	• No changes identified.
14/8/2018	• Stockpiles appear present in the dam in the central section of the site.
(Appendix 1.1)	• Bare soil potentially stockpiles are located in the central southern section of the site.
16/1/2019	• Additional material is located in the former dam.
(Appendix 1.2)	
21/4/2020	• No changes identified.
(Appendix 1.3)	
14/1/2021 (Figure 2)	• Materials appearing to be timber are stored in the central northern section of the site.

5.5.2 Topographic map

The 1982 topographic map developed off the 1975 aerial photograph shows the investigation area is generally vacant with no structures or vehicle tracks present. Vegetation around the drainage line is identified as scattered timber. A 132KV power transmission line traverses the eastern section of the site.

The 2002 topographic map developed off the 1999 aerial photograph depicts the site as generally vacant with yards located in the central section. Two dams are present on the site. A 132KV power transmission line traverses the eastern section of the site.

5.5.3 Interviews

Discussions were undertaken with site representative Frank Inzitari on 19 April 2021. Mr Inzitari indicated that no changes had been made to Parcel 2 since the 2017 investigation.

5.5.4 Title deeds

The first date of acquisition was 25 March 1908 when the site was purchased by John Thomas Cary who was a grazier. The site was identified as Volume 1098 Folio 164. The site was transferred to Perpetual Trustee Company (Limited) on 24 December 1943 who was acting for the Estate of John Thomas Carey. The site was identified as Volume 1876 Folio 37. The site was transferred to Troy Holdings Pty Limited on 14 November 1973 and was known as Volume 11496 Folio 31. On 25 February 1986 the site was transferred to Antonio and Rosa Inzitari and was known. The title was transferred to Rosa Inzitari on 28 April 2011. The site was later identified as Lot 1 DP700204. A three lot subdivision was registered on 28 February 2017 and the lots were identified as Lots 1, 2 and 3 DP1229039.

5.5.5 Historical parish maps

The 1890 Historical Parish Maps indicate the site was owned by Alexander Binning and included land to the west outside the investigation area. The 1892, 1897, 1905, 1914, 1924 and 1930 Historic Parish Maps identifies Magpie Hollow Road had been formed along the northern boundary. A transmission line is proposed to traverse the site in the 1946 Historic Parish Map and an easement for Lawson to Wallerawang Transmission Line is depicted in the 1967 Historic Parish Map.

5.6 Chronological list of site uses

The investigation area has historically been used as grazing land. A slaughterhouse was present in the northern section prior to 1958.

Stockpiles have been identified on the central eastern and central southern sections of the site since 2006.

No changes to the site were identified since the 2017 assessment.

5.7 Buildings and infrastructure

A transmission line traverses the site.

Cattle yards and storage areas exist in the central section. Wooden piers were present in this area indicating a potential structure which has been removed. Above ground parts of the building had been removed. Farm tracks are present providing access from Magpie Hollow Road to the yards and storage area.

Ruins were identified in the north western section of the site. The ruins are reportedly associated with a small slaughterhouse which operated from the site prior to 1958. No evidence of machinery was located around the slaughterhouse ruins. No evidence of wastewater ponds or yards associated with the slaughterhouse were identified.

No other buildings are located or known to have been historically located in the investigation area.

5.8 Spills, losses or discharges

Discharges from the slaughterhouse were not identified from the site inspection. The discharges may have included wastewater but this is not expected to be present in sufficient quantity to result in contamination. No carcass burial areas were identified.

No records for other discharges to land, water or air were available. No records for spills or losses in the investigation area were available.

5.9 Relevant complaint history

None known

5.10 Previous investigations

Envirowest Consulting Pty Ltd (2017) *Preliminary contamination investigation, Proposed subdivision of Lot 2 DP1229039 Magpie Hollow Road, South Bowenfels NSW (R8532c)*

An inspection of the site was made on 13 July 2017. The site is located in a developing residential area on the southern fringes of Lithgow and has an area of approximately 34ha. A residential subdivision with open space is proposed for the site.

The site has an agricultural land-use history of grazing. Several building ruins were identified in the northern section of the site forming a historic slaughterhouse. The slaughterhouse was reportedly used for the slaughtering of sheep and goats by hand with no machinery being used in the process. A dwelling is visible in the 1994 aerial photograph with cattle yards and a shed evident from 2002. The dwelling was outside of the investigation area. There is no evidence of orchards, mines, sheep dips, mixing sheds or contaminating industrial activities on the site from the review of site history or site walkover. The use of agricultural pesticides over the area in the past is expected to be low.

General refuse including tyres, tiles, plastic and steel drums and bricks was identified along and within the drainage gullies on site. Fill stockpiles comprising silty sand and sandy clay with bricks and concrete were identified in several areas across the site.

Ten boreholes were constructed across the general site area to identify potential fill. No fill was identified in the boreholes. The natural soil profile consisted of brown clayey sand and silty sand overlaying yellow, greyish brown and yellowish brown sandy clay.

The contamination status of the site was assessed from a soil sampling and laboratory analysis program. Ninety-two discrete soil samples were collected over the general area from the 0 to 100mm soil depth. The discrete samples were combined to form twenty-three composite samples for analysis. The soil samples were analysed for arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury. Eight discrete soil samples from within the paddocks were analysed for organochlorine pesticides (OCP). Six discrete samples were collected from around the shed and historic cattle/sheep yards and historic slaughterhouse and were analysed for arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury, OCP, total recoverable hydrocarbons (TRH) (C6-C40), benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN).

The levels of all metals, OCP's and TRH analysed in the shed and cattle/sheep yard area soil samples were not detected or at environmental background levels and below the adopted residential and recreational land-use thresholds.

The soil sampling program did not detect elevated levels of the analysed metals or OCP within the general site areas. The levels of all substances evaluated were below the adopted investigation threshold for residential and recreational land-use with access to soil.

The investigation area is suitable for proposed residential and recreational land-use. The stockpiles identified on-site were not assessed and require off-site removal or further assessment to remain on-site.

5.11 Historical neighbouring land-use

North – Magpie Hollow Road, Shell Service Station, rural, residential

South – Rural

East – Rural, Great Western Highway, service station, residential, rural-residential

West – Rural

The service stations have potential to impact on the site if fuel tanks or feeder lines are leaking. Contamination has been identified at the Shell Service Station. The status of the soil downslope of the site is unknown.

5.12 Contaminant sources

A shed was historically present in the central section of the site and may have been used to store chemicals.

The historic agricultural land-use may have resulted in application of pesticides or fertilisers in routine management. No bio solids are known to have been applied to the site. Organochlorine pesticides may have been applied in the general management of pastures. Previous investigations did not identify contaminants across the site.

Yards in the central section may have been used to assist in animal health treatment of stock. Previous investigations did not identify contaminants within the yards.

General refuse including tyres, tiles, plastic and steel drums and bricks was identified along and within the drainage gullies on site during the 2017 assessment.

Importation of soil from and unknown source may have resulted contamination.

5.13 Contaminants of concern

Based on historical activities and site inspection the contaminants of concern associated with former building footings are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)
- Organochlorine pesticides (OCP)

Based on historical activities and site inspection the contaminants of concern associated with stockpiles are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)
- Organochlorine pesticides (OCP)
- Foreign materials
- Asbestos

Based on historical activities and site inspection the contaminants of concern associated with the general refuse are:

- Foreign materials
- Asbestos

Fill may have been illegally dumped on the site containing a range of contaminants.

5.14 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.

6. Site condition and surrounding environment

6.1 Site inspection

The site was inspected by environmental scientists of Envirowest Consulting Pty Ltd on 19 April 2021.

6.2 Land-use

Current land-use is grazing land.

6.3 Current neighbouring land-use

North – Magpie Hollow Road, Shell Service Station, rural, residential

South – Rural

East – Rural, Great Western Highway, residential, rural-residential

West – Rural

Contaminants from the Shell Service Station are not expected to be moving off-site and impacting on the site. Contamination which is moving off-site is required to be regulated by the NSW EPA.

6.4 Surface cover and vegetation

Surface cover on the site consisted of improved pasture including native and introduced pasture species with weeds. The site has been predominately cleared of native tree species. Remnant native trees are present along the drainage lines in strips 20 to 80m wide. Pine trees are present along a fenceline in the central section. Dense blackberry shrubs are present in sections of the drainage line.

6.5 Evidence of visible contamination

No signs of discolouration or staining was identified on the surface of the site. No signs of settlement or subsidence was identified on the site.

6.6 Topography

The site is a mid-slope with a gentle inclination of less than 5% across the general site area. Drainage gullies traverse the site from the north west to south and from the east to the south. The drainage lines are highly eroded with steep banks.

6.7 Soils and geology

The site is within the Lithgow and Marrangaroo Soil Landscape (eSpade 2021). Soil in the Lithgow landscape consists of moderately deep and moderately well drained red podzolic soils, yellow leached earths and yellow earths on upper slopes and well-drained area. Moderately deep to deep imperfectly drained solods/yellow solodic soils on lower slopes and in areas of poor drainage.

Soil from the Marrangaroo Soil Landscape (eSpade 2021) is located along the drainage gully. Soils consist of moderately deep, imperfectly drained yellow solodic soils and yellow podzolic soils on lower slopes and near drainage lines.

The site is underlain by the Berry Formation and Illawarra Coal Measures. Horizontal bedded shale, sandstone, siltstone, mudstone, claystone, limestone, coal, torbanite and conglomerate are the main rock types (eSpade 2021).

6.8 Water

6.8.1 Surface water

Surface water flows into the drainage gullies which traverse the site in the central section. Several smaller drainage lines are also located in the western section of the site and drain into the drainage gullies. The drainage gullies join south of the site and form Bowen's Creek. Bowen's Creek flows into Cox's River which is a tributary of Warragamba Dam.

One dam was identified in the northern section of the site.

6.8.2 Groundwater

No bores have been identified on the site. Five bores have been identified within 500m from the site. The bores are located north of the site and are licensed for stock, irrigation and domestic purposes. The bores are from 51.8m to 53.4m deep and have water bearing zones 29.2 metres. Standing water levels were not provided.

No.	Date drilled	Location	SWL (m)	Use	Status
GW045761	1977	130m N	13.7	Domestic	Current
GW115854	2018	Lot 1	11.5	Domestic	Current
GW053934	1987	40m N	10	Horticulture	-
GW115819	2018	180m N	7.5	Domestic	Current
GW071207	1992	290m N	8	Stock/Domestic	Current

6.9 Evidence of possible naturally occurring contaminants

No natural sources of PAH were identified.

The site is not mapped as an acid sulphate soil risk (NSW SEED Portal accessed 8 May 2021).

The site is not mapped as a geological unit with asbestos potential (NSW SEED Portal accessed 8 May 2021).

6.10 Environmentally sensitive features or habitats

The drainage lines on the site may provide habitat to fauna. Sections of the drainage lines were overgrown with blackberry.

The Cox's River is part of Sydney water supply and administrated by Water NSW.

7. Conceptual site model

7.1 Contaminant sources

Potential exists for contaminating activities to have been undertaken on site which may impact on the suitability for the proposed land-use. Storage of chemicals may have been undertaken in the historic shed.

The agricultural land-use may have resulted in application of pesticides for weed control. Operation of the former slaughterhouse may have resulted in spills of fuels, chemicals or wastewater. Use of the cattle yards may have resulted in spillage of chemicals used for animal health treatment. Storage of building materials may have resulted in an amenity issue. The agricultural land-use, slaughterhouse, cattle yards and storage areas were assessed as part of the 217 investigation and no contamination was identified.

Importation of fill or waste may have occurred in various locations over the site.

7.2 Contaminants of concern

Based on historical activities and site inspection the contaminants of concern associated with historic building footings and fill are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- TRH
- BTEXN
- PAH
- OCP

- Asbestos
- Foreign materials

7.3 Potential receptors

The proposed land-use of the site is residential. The site is located in a rural locality.

Human receptors include:

- Residents
- Visitors
- Construction workers
- Intrusive maintenance workers
- Surface water used for drinking water and recreational use
- Groundwater used for potable supplies and irrigation

Ecological receptors include

- Terrestrial flora and fauna on the site and adjacent to the site
- Aquatic flora and fauna receptors on-site and off-site

7.4 Exposure pathways

Pathways for exposure to contaminants are:

- Dermal contact following soil disturbance
- Ingestion and inhalation after soil disturbance
- Surface water and sediment runoff into waterways
- Leaching of contaminants into the groundwater
- Direct contact of flora and fauna with the soil

7.5 Source receptor linkages

Potential source pathway receptor linkages are identified to enable evaluation of any adverse impact on human health or ecology.

The proposed land-use of the site is residential and human receptors to the investigation area are likely. Proposed users of the site may have a risk of exposure if contaminants are present and the soil is disturbed. Residents, visitors, construction workers and intrusive maintenance workers may potentially be receptors to soil contaminants through direct contact to soil which includes ingestion and dermal contact.

The contaminants of concern include volatile organics and inhalation of soil material is considered a pathway for exposure. Inhalation may occur as a result of soil disturbance and dust production. Major soil disturbance before and after the development of the site is considered unlikely. Soil disturbance during construction and development of the site is expected to be accompanied by erosion control measures which will reduce the incidence of dust.

Vegetation on the site may be potential receptors to soil contamination through direct uptake of contaminants. Significant production of fruit and vegetables on the site is unlikely.

The source receptor linkage to aquatic organisms and ecosystems is considered incomplete as the site is well vegetated and movement of sediments from the site is unlikely. During construction work it is expected that erosion control measures will be implemented and movement of sediment off site will be

unlikely. Following development of the site it is expected that vegetation will be re-established or hard surfaces constructed which will control sediment movement from the site.

Mobilisation of contaminants downslope or into groundwater is possible depending on leachability. The distance to receptors results in unlikely impacts. Groundwater is a potential receptor to contamination. Groundwater in the locality is located at depths greater than 8m and confined in granite. Overlying substrate is sand which can easily transport potential contaminants vertically and laterally. Contaminants are expected to originate from the soil surface.

Source/contaminants	Transport	Potential exposure pathways	Receptors
☒ Pesticides (heavy metals, OCP)	☒ Wind	☒ Direct contact (ingestion and absorption) (human and environment)	☒ Residents (adults and children)
☒ Fuels (TRH, BTEXN, PAH)	☒ Sedimentation	☒ Inhalation	☒ Construction workers
	☒ Groundwater	☒ Runoff	☒ Intrusive maintenance workers
	☒ Surface water	☒ Leaching	☒ Terrestrial flora and fauna
	☒ Volatilisation		☐ Aquatic flora and fauna

☒ Potential, ☐ unknown/unlikely

8. Data quality objectives (DQO)

8.1 State the problem

The site is a proposed residential subdivision. The property has historically been used as agricultural grazing land-use which may have resulted in application of pesticides and contaminating activities. Previous investigations did not identify contamination across the general site. Footings indicating a removed shed was located in the central section of the site and may have been used to store chemicals and fuels. The site requires investigation to ensure suitability for the proposed land-use.

8.2 Identify the decision

The land-use proposed 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.

8.3 Identify the inputs decision

Investigations of the site is required to identify any potential contaminants since the 2017 assessment.

8.4 Define the boundaries of the study

The investigation area is Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW. The investigation depth was 100mm.

8.5 Develop a decision rule

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

If soil contamination was identified then the contaminant source and extent of contamination was determined.

8.6 Specify acceptable limits on the decision errors.

The 95% upper confidence limit of average levels of samples collected is less than the threshold levels and the results are less than 250% of relevant thresholds.

8.7 Optimize the design for obtaining data

A soil sample was collected from the shed footprint.

9. Sampling analysis plan and sampling methodology

9.1 Sampling strategy

9.1.1 Sampling design

Visual inspections were undertaken over the site for indicators of contamination. A systematic sampling pattern was adopted to assess the probable location of contamination. The site was traversed to determine potentially contaminating activities since the 2017 assessment. The only area identified for sampling was around a former building.

9.1.2 Sampling locations

One discrete sample was collected from shed footprint.

The sampling location is described in Figure 2.

9.1.3 Sampling density

The sample collected is expected to be representative of the historic footings.

9.1.4 Sampling depth

Any heavy metals present are generally immobile and expected to be contained in the 0-100mm soil layer which was the target sampling depth as minimal soil disturbance is expected to have occurred within the shed footprint.

9.2 Analytes

The soil sample collected from the historic footings was evaluated for arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury, TRH, BTEXN, PAH and OCP.

9.3 Sampling methods

The soil sample was taken using a stainless-steel soil push corer. Soil was taken at the sampling location below the vegetated and detrital layer.

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

Table 1. Schedule of samples and analyses

Sample ID	Discrete sample ID (Figure 2)	Date	Depth (mm)	Analysis undertaken
HS3	HS3	19/4/2021	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH, OCP

10. Quality assurance and quality control

10.1 Sampling design

The sampling program is intended to provide data as to the presence and levels of contaminants.

10.2 Field

The collection of samples was undertaken in accordance with accepted standard protocols (NEPC 1999).

The discrete sample was analysed for heavy metals, TRH, BTEXN, PAH and 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 5).

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

Samples collected from outside the investigation area formed part of the analysis batch. Five duplicate sample was collected. 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 4.

10.3 Laboratory

Chemical analysis was conducted by SGS Laboratories, Alexandria, which is NATA accredited for the tests undertaken. The laboratories have 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.

10.4 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 2.

11. Assessment criteria

The proposed land-use is residential and will include residential lots with dwellings and landscaped areas. The laboratory results were assessed against the proposed land-use of residential (*HIL A*). The health-based investigation levels of contaminants in the soil for residential sites, for the substances for which criteria are available, are listed in Table 2, as recommended in the NEPC (1999).

The NEPC (1999) also provides health screening levels (HSL) for hydrocarbons in soil. The HSLs have been developed to be protective of human health for soil types, depths below surface and apply to exposure to hydrocarbons through the predominant vapour exposure pathway. The appropriate HSL for the site is listed in Table 3. TRH>16 have physical properties which make the TRH fractions non-volatiles and therefore these TRH fractions are not applicable for vapour intrusion.

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). Ecological screening levels (ESL) assess the risk to terrestrial ecosystems from petroleum hydrocarbons in the soil. The EILs and ESLs consider the properties of the soil and contaminants and the capacity of the local ecosystem to accommodate increases in contaminant levels.

Typical CEC value for the site is >10-15cmol(+)/kg, clay content of 25%, pH values of between 4.5 and 5 and organic carbon of 2% (eSPADE 2021). The proposed land-use is residential (urban residential areas). The contaminants have been identified in the soil for at least two years and are considered aged.

EILs vary with land-use and apply to contaminants up to 2m depth below the surface. The EILs for residential land-use are listed in Table 2.

ESLs are dependent on land-use, soil types and are applicable to contaminants up to 2m below the surface. The appropriate ESL for the site is residential and recreational in fine soil as listed in Table 3.

Management limits have been developed to assess petroleum hydrocarbons following evaluation of human health and ecological risks (NEPC 1999). Management limits are applicable as screening levels after consideration of relevant ESLs and HSLs. The appropriate management limit for the site is listed in Table 3.

Chromium is analysed as total chromium which is the sum of chromium (III) and chromium (VI). Chromium (VI) is a potential contaminant from industrial processes including ferrochrome production, electroplating, pigment production and tanning (WHO 1998). Chromium (VI) is reduced to chromium (III) when it comes into contact with organic matter in biota, soil and water. Chromium in the environment is present in the trivalent state (WHO 1998).

Table 2. EIL Calculation sheet, residential land-use

Analyte	Rationale	ACL (mg/kg)	ABC (mg/kg)	EIL (mg/kg)
Arsenic	Aged	100	-	100
Chromium (III)	Clay content 25%, aged	550	0	550
Copper	CEC 15cmol/kg, pH 5, organic carbon 2%	100	0	100
Lead	Generic	1,100	0	1,100
Nickel	CEC 15cmol/kg	220	0	220
Zinc	CEC 15cmol/kg, pH 5	260	0	260
DDT	Aged	180	-	180
Naphthalene	Aged	170	-	170

ACL – added contaminant limit, ABC – ambient background concentration, EIL – Ecological investigation limit (ACL+ABC)

12. Results and discussion

No obvious changes were identified during the site walkover since the 2017 investigation by Envirowest Consulting Pty Ltd. Land-use was generally grazing over the site with overgrown areas of weeds. Agricultural infrastructure and storage areas were located in the central section of the site. Historic footings were identified in the central section which had not been previously identified. The sample collected from the footing area (HS3) contained levels of potential contaminants below adopted thresholds (Tables 4, 5 and 6). No other potentially contaminating activities were identified which were not assessed in the 2017 investigation. No asbestos containing materials were identified.

The central section was continuing to be used for the storage of building materials. Blackberry growth in the drainage line prevented inspection for disposal locations identified in 2017 or additional disposal areas.

Stockpiles identified on the site in the 2017 assessment were still present on the site at the time of inspection (Figure 2). Some foreign materials including concrete and bricks were identified in the stockpiles. No asbestos containing materials were identified on the surface of the stockpiles.

Table 3. Soil assessment criteria (mg/kg) (NEPC 1999) for residential land-use

Analyte	HIL A Residential	EIL Urban Residential and public open space	HSL Residential - clay soil 0 to <1m	ESL Residential and public open space- Fine soil	Management limits for TRH in fine soil / Residential, parkland and public open space
Arsenic	100	100	-	-	-
Cadmium	20	-	-	-	-
Chromium (total)	100 ¹	550 ²	-	-	-
Copper	6,000	100	-	-	-
Lead	300	1,100	-	-	-
Nickel	400	220	-	-	-
Zinc	7,400	260	-	-	-
Mercury	40	-	-	-	-
OCP (DD's)	240	180	-	-	-
TRH (C6-C10)	-	-	50	180	800
TRH (C10-C16)	-	-	280	120	1,000
TRH (>C16-C34)	-	-	NA	1,300	3,500
TRH (>C34-C40)	-	-	NA	5,600	10,000
Benzene	-	-	0.7	65	-
Toluene	-	-	480	105	-
Ethylbenzene	-	-	NL	125	-
Xylenes	-	-	110	45	-
Naphthalene	-	170	5	-	-
Benzo(a)pyrene	-	-	-	0.7	-
Total PAH	300	-	-	-	-
Carcinogenic PAH	3	-	-	-	-

¹ Threshold for Chromium (VI), ² Threshold for Chromium (III), HIL- health investigation level, EIL- ecological investigation level, HSL- health screening level, ESL- ecological screening level

Table 4. Analytical results and threshold concentrations – metals (mg/kg)

Sample ID	Location (Figure 3)	Depth (mm)	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury	PAH	Carcinogenic PAH
HS3	Historic footings	0-100	2	<0.3	8.1	3.4	7	1.0	17	<0.05	<0.8	<0.3
Health Investigation Levels (NEPC 1999)												
			100	20	100 ¹	6,000	300	400	7,400	40	300	3
Ecological Investigation Levels (NEPC 1999)												
			100	-	550 ²	100	1,100	220	260	-	-	-

¹ Threshold for Chromium (VI), ² Threshold for Chromium (III)

Table 5. Analytical results and threshold concentrations – OCP (mg/kg)

Sample ID	Location (Figure 3)	Depth (mm)	OCP (Total)	DD's
HS3	Historic footings	0-100	<1	<0.3
Health Investigation Levels (NEPC 1999)				240
Ecological Investigation Levels (NEPC 1999)				180

Table 8. Analytical results and threshold concentrations – hydrocarbons (mg/kg)

Sample id.	Location (Figure 3)	Depth (mm)	TRH (C6-C10)	TRH (>C10-C16)	TRH (>C16-C34)	TRH (>C34-C40)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Benzo(a)pyrene
HS3	Historic footings	0-100	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HSL A – residential clay soil 0m to <1m			50	280	NA	NA	0.7	480	NL	110	5	-
EIL – residential and recreational			-	-	-	-	-	-	-	-	170	-
ESL – residential/recreational fine soil			180	120	1,300	5,600	65	105	125	45	-	0.7
Management limits – residential/ recreational			800	1,000	3,500	10,000	-	-	-	-	-	-

EIL - ecological investigation level, HSL - health screening level, ESL - ecological screening level

13. Site characterisation

13.1 Environmental contamination

Stockpiles were identified in the central eastern and central southern sections of the site. Foreign materials including concrete and bricks were identified in the stockpiles.

General refuse comprising inert materials were identified along the drainage lines.

13.2 Chemical degradation production

Identified contaminants will be removed.

13.3 Exposed population

The foreign materials are an amenity issue.

14. Conclusions and recommendations

14.1 Summary

An inspection of the site was made on 19 April 2021. The site is a rural-residential lot and has an area of approximately 33ha. Previous investigations of the site in 2017 recommended the site was suitable for residential land-use following removal of stockpiles. The stockpiles remain in the central eastern and central southern section of the site. The stockpiles comprise an estimated volume of approximately 1,000m². The stockpiles have not been assessed for chemical contaminants.

Surface cover on the site consisted of native and introduced pasture species with weeds. The site has been predominately cleared of native tree species. Remnant native trees are present along the drainage lines. Dense blackberry shrubs are present in sections of the drainage line.

No obvious changes were identified during the site walkover since the 2017 investigation. Land-use appeared similar. The site representative indicated no changes had been made to the site since the 2017 investigation. Historic building footings were identified in the central section which had not been previously identified. A sample collected from this area contained levels of potential contaminants below adopted thresholds. No other potentially contaminating activities were identified which were not assessed in the 2017 investigation.

General refuse including tyres, tiles, plastic and steel drums and bricks was identified in the 2017 assessment along and within the drainage gullies on site. Blackberry growth in the drainage lines prevented inspection for these locations or additional disposal areas.

14.2 Assumptions in reaching the conclusions

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

14.3 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.

14.4 Suitability for proposed use of the site

The site can be made suitable for residential land-use after removal of the stockpiles.

14.5 Limitations and constraints on the use of the site

An unidentified finds procedure should be implemented for potentially contaminated areas that may be identified during intrusive works.

14.6 Recommendation for further work

Soil stockpiles require removal off-site. The foreign materials located in various areas should be removed as the site is developed to prevent an amenity issue.

An unidentified finds procedure should be prepared.

15. 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.

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.

16. References

Environment Protection Authority (2020) *Consultants Reporting on Contaminated Land* (NSW Environment Protection Authority, Chatswood)

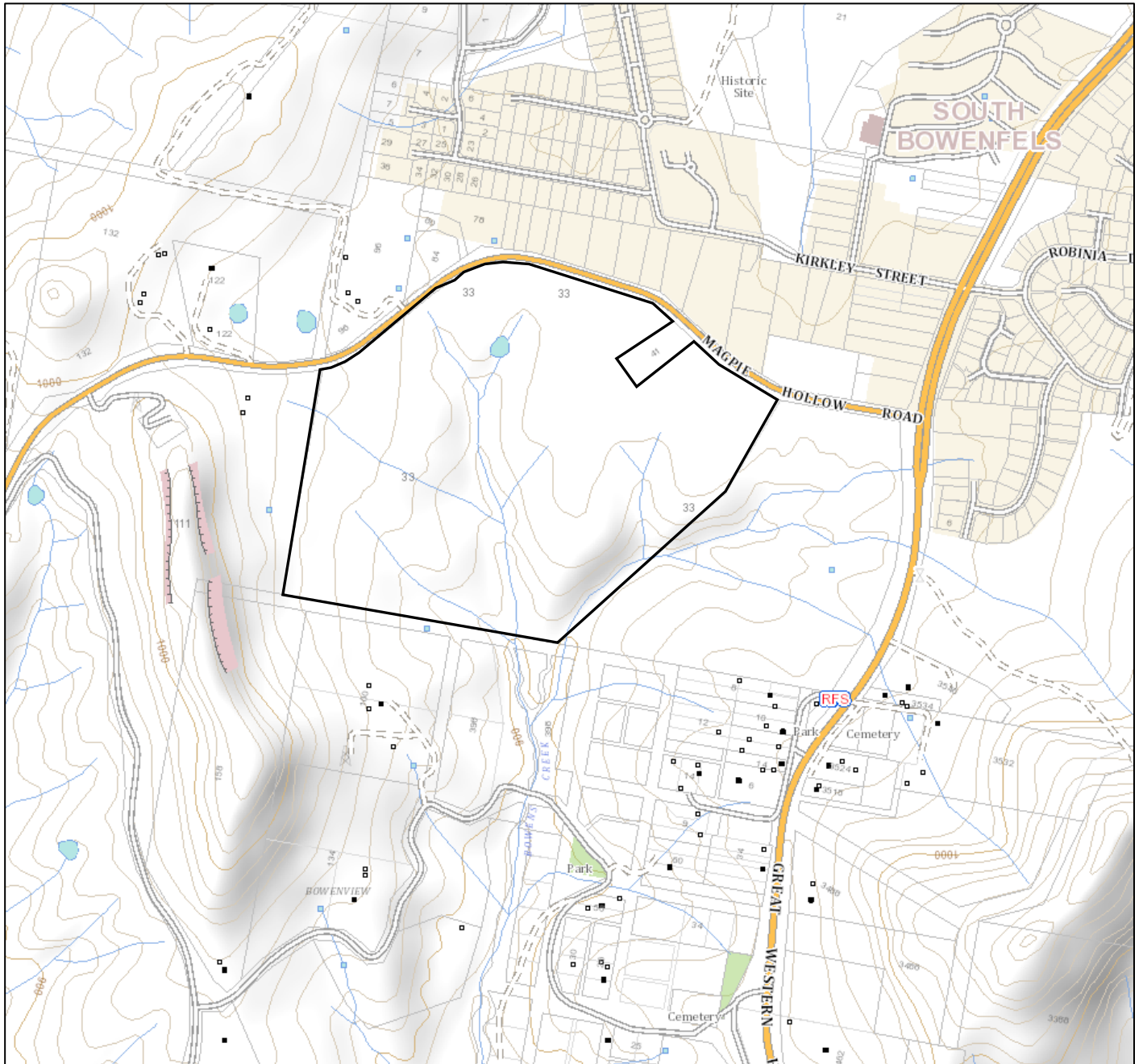
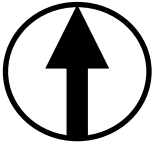
EPA (2017) *Contaminated Sites: Guidelines for the NSW Site Auditors Scheme* (NSW Department of Environment and Conservation, Chatswood)

Environment.nsw.gov.au, 'Espade | NSW Environment & Heritage' Version 2. N.p., 2015. Web. 8 May 2021

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

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

Figures



Legend

— Lot boundary

Approximate Scale 1: 10,000



Figure 1. Locality map

Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW

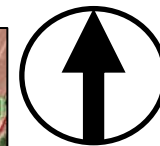


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Date: 26/5/2021



Legend

— Lot boundary

Approximate Scale 1: 4,900



Figure 2. Aerial photograph (14/1/2021)

Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW

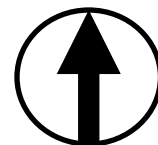


Envirowest Consulting Pty Ltd

Job: R13079c2

Drawn by: -

Date: 26/5/2021



Legend

- Lot boundary
- ⊗ Sampling locations

Approximate Scale 1: 3,100

Figure 3. Sampling locations		
Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW		
	Envirowest Consulting Pty Ltd	
Job: R13079c2	Drawn by: LD	Date: 26/5/2021

Figure 3. Photographs of the site



Looking south across central section of site



Looking south across the western section of site



Historic footings



Historic footings

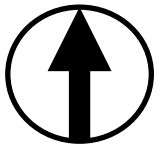


Stockpiles in central eastern section to be removed



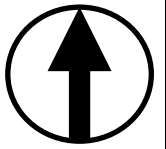
Stockpiles in central southern section to be removed

Appendices



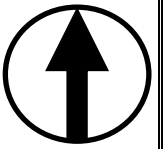
Investigation area

Appendix 1.1 14 August 2018 aerial photograph		
Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW		
		Envirowest Consulting Pty Ltd
Job: R13079c2	Drawn by: LD	Date: 26/5/2021



Investigation area

Appendix 1.2 16 January 2019 aerial photograph		
Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW		
		Envirowest Consulting Pty Ltd
Job: R13079c2	Drawn by: LD	Date: 26/5/2021



Investigation area

Appendix 1.3 21 April 2020 aerial photograph		
Parcel 2, 33 Magpie Hollow Road, South Bowenfels NSW		
		Envirowest Consulting Pty Ltd
Job: R13079c2	Drawn by: LD	Date: 26/5/2021

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 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). An 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:

- 60-140% 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

2. Laboratory analysis summary

One analysis batch was undertaken over the preliminary investigation program. Samples were included in the analysis batch which formed part of a separate investigation. Samples were collected on 19 April 2021. A total of 81 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 NEPM (1999). The samples preservation and storage was undertaken using standard industry practices. A chain of custody form accompanied transport of the samples to the laboratory.

The samples were analysed at the laboratories of SGS Laboratories, 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.	Number of samples	Duplicate	Analyses	Date collected	Substrate	Laboratory report
MR1C, MR2C, MR3C, MR4C, MR5C, MR6C, MR7C, MR8C, MR9C, MR10C, MR11C, MR12C, MR13C, MR14C, MR15C, MR16C, MR17C, MR18C, MR19C, MR20C, MR21C, MR22C, MR23C, MR24C, MR25C, MR26C, MR27C, MR28C, MR29C, MR30C, MR31C, MR32C	32	2	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), zinc (Zn)	19/4/2021	Soil	SE218849
MR11D, MR21D, MR31D, MR41D, MR51D, MR61D, MR71D, MR81D, MR91D, MR101, MR111D, MR121D, MR131D, MR141D, MR151D, MR161D, MR171D, MR184D, MR191D, MR201D, MR211D, MR221D, MR231D, MR241D, MR251D, MR261D, MR271D, MR281D, MR291D,	32	2	Organochlorine pesticides (OCP)	19/4/2021	Soil	SE218849

MR301D, MR311D, MR321D							
HS1	1	0	As, Cd, Cr, Cu, Pb, Ni, Zn, mercury (Hg), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH)	19/4/2021	Soil	SE218849	
HS2, HS3, BH1(200), BH1(900), BH2(400), BH2(800), BH2(1000), BH3(400), BH3(1000), BH5(100), BH6(200), BH6(600), BH7(100), BH7(200), BH7(400), BH7(800)	16	1	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH, OCP	19/4/2021	Soil	SE218849	

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
BTEX	Tumbler extraction of solids	USEPA SW 846-8260B
OC Pesticides	Tumbler extraction of solids	USEPA SW 846-8270B

3. Field quality assurance and quality control

Five intra laboratory duplicate sample was collected for the investigation. The frequency was 7% which was in accordance with the recommended frequency of 5%. Table A1 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
MR15C, MR25C, MR151D, MR251D, BH1(200)	81	5	6	19/4/2021	Soil	SE218849

Table A1. Relative differences for intra laboratory duplicates

	MR15C, MR15DA		MR25D, MR25DA		MR151D, MR151DA		MR251D, MR251DA		BH1(200), BH1(200)DA	
	Relative difference (%)	Pass/Fail	Relative difference (%)	Pass/Fail	Relative difference (%)	Pass/Fail	Relative difference (%)	Pass/Fail	Relative difference (%)	Pass/Fail
Arsenic	NA	-	0	Pass	-	-	-	-	22	Pass
Cadmium	NA	-	NA	-	-	-	-	-	NA	-
Chromium	13	Pass	8	Pass	-	-	-	-	16	Pass
Copper	7	Pass	12	Pass	-	-	-	-	9	Pass
Lead	13	Pass	6	Pass	-	-	-	-	10	Pass
Nickel	25	Pass	7	Pass	-	-	-	-	5	Pass
Zinc	7	Pass	1	Pass	-	-	-	-	3	Pass
Mercury	-	-	-	-	-	-	-	-	NA	-
OCP	-	-	-	-	NA	-	-	-	NA	-
TRH	-	-	-	-	-	-	-	-	NA	-
BTEXN	-	-	-	-	-	-	-	-	NA	-
PAH	-	-	-	-	-	-	-	-	NA	-

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 NEPM (1999). The time between collection and extraction for all samples was less than the criteria listed below:

Analyte	Maximum holding time
Metals	6 months
Mercury	28 days
BTEXN, TRH, PAH, OCP, OPP	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 outliers exist for the sampling batch. 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)

5.1 Completeness

A measure of the amount of usable data for a data collection activity (total to be greater than 90%)

5.1.1 Field

Consideration	Accepted	Comment
Locations to be sampled	Yes	In accordance with sampling methodology, described in the report.
SOP appropriate and compiled	Yes	In accordance with sampling methodology
Experienced sampler	Yes	Environmental scientist
Documentation correct	Yes	Chain of custody completed

5.1.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	In accordance with chain of custody and analysis plan.
Analytes	Yes	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
Sample holding times	Yes	Metals < 6 months Mercury < 28 days OCP, OPP, PAH, TRH, PCB, BTEXN < 14 days

5.2 Comparability

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

5.2.1 Field

Consideration	Accepted	Comment
SOP	Yes	Same sampling procedures used and sampled on one date
Experienced sampler	Yes	Experienced environmental scientist
Climatic conditions	Yes	Sampling log
Samples collected	Yes	Suitable size and storage

5.2.2 Laboratory

Consideration	Accepted	Comment
Analytical methods	Yes	Same methods all samples
PQL	Yes	Suitable for analytes
Same laboratory	Yes	-
Same units	Yes	-

5.3 Representativeness

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

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. 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)

5.4.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field duplicates	Yes	Collected

5.4.2 Laboratory

Consideration	Accepted	Comment
Laboratory duplicates	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Field duplicates (intra and inter laboratory)	Yes	Frequency of 5%, results to be within +/-40% or discussion required.
Laboratory prepared volatile trip spikes	NA	Frequency of 5%, results to be within +/-40% or discussion required.

5.5 Accuracy

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

5.5.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field blanks	No	Not collected

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	No	Frequency of 5%, results to be within +/-40% or discussion required. RPD failed acceptance criteria due to matrix interference
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 3. Planning Certificate Section 10.7

Infotrack
GPO Box 4029
SYDNEY NSW 2001



PLANNING CERTIFICATE UNDER SECTION 10.7, ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

CERTIFICATE NO: PLANC5-20-0163

YOUR REF: 46586
RECEIPT NO: 344337

PROPERTY NO: 106763
ISSUE DATE: 19/04/2021

PROPERTY ADDRESS: 33 Magpie Hollow Road SOUTH BOWENFELS NSW 2790
OWNER: Mrs R Inzitari

LAND PARCEL DESCRIPTIONS: Lot 2 DP 1229039

IN ACCORDANCE WITH SECTION 10.7(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979, IT IS CERTIFIED THAT AT THE DATE OF THIS CERTIFICATE THE FOLLOWING PRESCRIBED MATTERS RELATE TO THE LAND:

1. Names of relevant planning instruments and DCPs

(1) The name of each planning instrument that applies to the carrying out of development on the land:

LITHGOW LOCAL ENVIRONMENTAL PLAN 2014 (LEP)

E3 Environmental Management

R2 Low Density Residential

Further, the following State Environmental Planning Policies apply to the land:

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

State Environmental Planning Policy (Concurrences and Consents) 2018

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Koala Habitat Protection) 2020

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy No 21 – Caravan Parks

State Environmental Planning Policy No 33 – Hazardous and Offensive Development

State Environmental Planning Policy No 36 – Manufactured Homes Estates

State Environmental Planning Policy No 50 – Canal Estate Development

State Environmental Planning Policy No 55 – Remediation of Land

State Environmental Planning Policy No 64 – Advertising and Signage

State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development

State Environmental Planning Policy No 70 – Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Primary Production and Rural Development) 2019

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

A copy of the SEPPs are available on the NSW Legislation website- www.legislation.nsw.gov.au

(2) The name of each proposed planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Director- General has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved):

The following draft State Environmental Planning Policies apply to the land:

- Draft Design and Place SEPP
- Draft Environment SEPP
- Draft Housing Diversity SEPP
- Draft Remediation of Land SEPP
- Draft Short Term Accommodation SEPP

A copy of the draft SEPPs are available on the NSW Planning Portal website at <https://www.planningportal.nsw.gov.au/draftplans>

(3) The name of each development control plan that applies to the carrying out on development on the land:

Nil.

Note: All previous Lithgow City Council development control plans have been repealed and are currently under review. A new comprehensive development control plan for the Lithgow City Council area is expected to be considered by Council in 2021-2022.

(4) Any proposed environmental planning instrument including a planning proposal for a LEP or a draft environmental planning instrument:

Nil.

2. Zoning and land use under relevant LEPs

(a) Identify the zone:

E3 ENVIRONMENTAL MANAGEMENT

R2 LOW DENSITY RESIDENTIAL

(b) Development that may be carried out within the zone without the need for development consent:

E3 ENVIRONMENTAL MANAGEMENT

Extensive agriculture; Home occupations

R2 LOW DENSITY RESIDENTIAL

Home occupations; roads;

(c) Development that may not be carried out within the zone except with development consent:

E3 ENVIRONMENTAL MANAGEMENT

Building identification signs; Business identification signs; Community facilities; Dual occupancies; Dwelling houses; Eco-tourist facilities; Emergency services facilities; Environmental facilities; Environmental protection works; Farm buildings; Flood mitigation works; Information and education facilities; Oyster aquaculture; Pond-based aquaculture; Recreation areas; Research stations; Roads; Secondary dwellings; Tank-based aquaculture; Water recycling facilities; Water supply systems

R2 LOW DENSITY RESIDENTIAL

Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Caravan parks; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health services facilities; Home-based child care; Home businesses; Kiosks; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Pond-based aquaculture; Recreation areas; Respite day care centres; Seniors housing; Shop top housing; Tank-based aquaculture; Water recycling facilities; Water supply systems

(d) Development that is prohibited within the zone:

E3 ENVIRONMENTAL MANAGEMENT

Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; any other development not specified in item (b) or (c).

R2 LOW DENSITY RESIDENTIAL

Any development not specified in item (b) or (c).

(e) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling- house on the land and, if so, the minimum land dimensions so fixed:

R2 LOW DENSITY RESIDENTIAL

2000m² as per the Lot Size Map for Lithgow Local Environmental Plan 2014.

E3 ENVIRONMENTAL MANAGEMENT

40ha as per the Lot Size Map for Lithgow Local Environmental Plan 2014.

- Note:**
1. For zones R1 General Residential and R2 Low Density Residential, no minimum land size applies for a 'dwelling-house' and the above land size applies to the minimum lot size for the purpose of a Torrens Title subdivision or additional dwellings in relation to Clause 4.1A of LEP2014.
 2. A 'dwelling-house' may be permissible if it does not meet the minimum lot size for zones RU1, RU2, E3, E4, RU5 and R5 if it can comply with Clause 4.2A or 4.2B of LEP2014. A search in this regard may be sought separately from Council.
 3. The above minimum land size is as per the 'Lot Size Map' for the purpose of a subdivision (Clause 4.1 of LEP2014) and does not necessarily state that a 'dwelling-house' is permissible in that particular zoning.

(f) Whether the land includes or comprises of critical habitat:

No.

(g) Whether the land is in a conservation area (however described):

No.

(h) Whether an item of environmental heritage (however described) is situated on the land:

No.

2A. Zoning and land use under *State Environmental Planning Policy (Sydney Region Growth Centres) 2006*

Is the land zoned under Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (SEPP 2006)*, or a Precinct Plan (within the meaning of SEPP 2006), or a proposed Precinct Plan that is or has been the subject of community consultation or on public consultation?

No.

3. Complying Development

(1) Whether or not the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*:

No.

(2) If complying development may not be carried out on that land because of the provisions of clause 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy, the reasons why it may not be carried out under that clause:

- A. Complying Development may not be carried out on the land under Clause 1.17A(1)(e) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is within an environmentally sensitive area as identified in Lithgow Local Environmental Plan 2014.
- B. Complying Development under the Inland Code or the Low Rise Housing Diversity Code may not be carried out on the land under Clause 1.19(1)(e)(iv) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is identified as environmentally sensitive land as identified in Lithgow Local Environmental Plan 2014.

Complying Development under the Commercial and Industrial (New Buildings and Additions) Code may not be carried out on the land under Clause 1.19(5)(f)(iv) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is identified as environmentally sensitive land as identified in Lithgow Local Environmental Plan 2014.

- C. Complying Development under the Inland Code or the Low Rise Housing Diversity Code may not be carried out on the land if that development will result in an increase to the number of bedrooms on the site or in a site disturbance area of more than 250m², under Clause 1.19(1)(j)(i) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is known to be unsewered land to which the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* applies,.

Complying Development under the Housing Alterations Code and General Development Code may not be carried out on the land if that development will result in an increase to the number of bedrooms on the site or in a site disturbance area of more than 250m², under Clause 1.19(4)(a) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is known to be unsewered land to which the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* applies.

Complying Development under the Commercial and Industrial (New Buildings and Additions) Code may not be carried out on the land under Clause 1.19(5)(i)(i) of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* because the land or part thereof is known to be unsewered land to which the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* applies.

Note: The above responses apply only to the land exemptions for Exempt and Complying Development set out in clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* for the Housing Code, Rural Housing Code, Housing Alterations Code, General Development Code and the Commercial and Industrial (New Buildings and Additions) Code. Other clauses within the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* may permit some development occurring on the subject land.

Note: clause 1.19 (6) states that specific land exemptions may apply only to part of a lot Nothing in this clause prevents complying development being carried out on part of a lot that is not land referred to in this clause even if other parts of the lot are such land.

4B. Annual charges under *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works

Not applicable to Lithgow City Council Local Government Area.

5. Mine Subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*.

No.

6. Road widening and road realignment

Whether or not the land affected by any road widening or road realignment under:

- a) Division 2 of Part 3 of the *Roads Act 1993*, or**
- b) any environmental planning instrument, or**
- c) any resolution of council:**

The property fronts a Council managed road. No widening or realignment is proposed by Council for this road as at the date of this certificate.

7. Council and other public authority policies on hazard risk restrictions

Whether land is affected by a policy:

- a) adopted by council, or
- b) adopted by another public authority and notified to council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of landslip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding):

No.

7A. Flood related development controls information

- (1) Whether or not development on the land or part of the land for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purpose of group homes or seniors housing) is subject to flood related development controls:**

Yes - Land is affected by the Interim Flood Planning Area identified within the Lithgow Flood Study Review (Lyll and Associates 2017). Flood related development controls as detailed in Clause 7.2 under Lithgow Local Environmental Plan 2014 will apply.

- (2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls:**

Yes - Land is affected by the Interim Flood Planning Area identified within the Lithgow Flood Study Review (Lyll and Associates 2017). Flood related development controls as detailed in Clause 7.2 under Lithgow Local Environmental Plan 2014 will apply.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in Clause 1 makes provisions in relation to the acquisition of the land by a public authority, as referred to in Section 27 of the Act:

No.

9. Contributions Plans

The name of each contributions plan applying to the land:

Lithgow Section 94A (Section 7.12) Development Contributions Plan 2015 applies to this land.

9A. Biodiversity Certified Land

If the land is biodiversity certified land (within the meaning of Part 5 of the *Biodiversity Conservation Act 2016*) Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016*:

No.

10. Biodiversity stewardship sites

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* (but only if the Council has been notified of the existence of the agreement by the Chief Executive of the office of Environment & Heritage). Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that is taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016*:

No.

10A. Native vegetation clearing set asides

If the land contains a set aside area under section 60ZC of the *Local Land Services Act 2013* (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section):

No.

11. Bush Fire Prone Land

If any of the land is bush fire prone land (as defined in the Act):

Yes - The land is entirely bushfire prone as identified on Council's adopted bushfire mapping.

12. Property Vegetation Plans

If the land is land to which a property vegetation plan under *The Native Vegetation Act 2003* (and that continues in force) applies (but only if Council has been notified of the existence of the plan by the person or body that approved the plan under that Act):

No.

13. Orders under *Trees (Disputes Between Neighbours) Act 2006*

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land (but only if the Council has been notified of the order):

No.

14. Directions under Part 3A

Is there a direction by the Minister in force under Section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect:

No.

15. Site compatibility certificates and conditions for seniors housing

If the land is land to which *State Environmental Planning policy (Housing for Seniors or People with a Disability) 2004* applies:

No.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

If the land has a valid site compatibility certificate (infrastructure or site compatibility certificate (schools or TAFE establishment):

No.

17. Site compatibility certificates and conditions for affordable rental housing

If the land is land to which a site compatibility certificate was issued under *State Environmental Planning Policy (Affordable Rental Housing)* :

No.

18. Is there any development plan adopted by a relevant authority regarding paper subdivisions that apply to this land?

No.

19. Is there a current site verification certificate of which Council is aware, in respect of the land? If there is, what are the particulars of the certificate?

No.

20. The following matters are prescribed by *Environmental Planning and Assessment Amendment (Loose-fill Asbestos Insulation) Regulation 2016* as additional matters to be specified in a planning certificate:

Is the property listed on the NSW Fair Trading Loose-Fill Asbestos Insulation Public Register?

No.

21. Affected Building notices and building product rectification orders

Is Council aware of any affected building notice, building product rectification order or notice of intention to make a building product rectification order that is in force in respect of the land, as per the *Building Products (Safety) Act 2017*?

No.

NOTE:

The following matters are prescribed by section 59 (2) of the *Contaminated Land Management Act 1997* as additional matters to be specified in a planning certificate:

- a) Is the land significantly contaminated land within the meaning of the *Contaminated Land Management Act 1997*— or is the land (or part of the land) significantly contaminated land at the date when the certificate is issued?

No.

- b) Is the land subject to a management order within the meaning of the *Contaminated Land Management Act 1997*— or is the land subject to such an order at the date when the certificate is issued?

No.

- c) Is the land subject of an approved voluntary management proposal within the meaning of *Contaminated Land Management Act 1997*— or is the land subject to such an order at the date when the certificate is issued?

No.

- d) Is the land to subject to an ongoing maintenance order within the meaning of *Contaminated Land Management Act 1997*— or is the land subject to such an order at the date when the certificate is issued?

No.

- e) Is the land to subject of a site audit statement within the meaning of *Contaminated Land Management Act 1997*— or has a copy of such a statement been provided to council?

No.



for the GENERAL MANAGER
LITHGOW CITY COUNCIL

For any further information, please contact the Environment & Development Department on (02) 63549999.

DISCLAIMER

THIS SECTION 10.7 CERTIFICATE CONTAINS INFORMATION PROVIDED TO LITHGOW CITY COUNCIL BY OTHER AUTHORITIES AND IS AS CURRENT AS THE LATEST INFORMATION AVAILABLE TO COUNCIL AT THE TIME OF PRODUCTION OF THIS DOCUMENT. IT IS STRONGLY RECOMMENDED THAT YOU CONTACT THE RELEVANT AUTHORITIES TO CONFIRM THE ACCURACY OF THE INFORMATION.

SECTION 10.7(5) ADVICE

(a) Has any development consent with respect to the land been granted within the previous five years?	Yes DA022/18 – Subdivision 79 Lots
(b) Additional information	Threatened species and Endangered Ecological Communities currently exist within the Lithgow Local Government Area. Information on species reported and their localities can be found on the NSW Office of Environment and Heritage website below: http://www.environment.nsw.gov.au/wildlifeatlas/about.htm
	Information regarding loose-fill asbestos insulation Some residential homes located in the Lithgow Local Government Area have been identified as containing loose-fill asbestos insulation, for example in the roof space. NSW Fair Trading maintains a Register of homes that are affected by loose-fill asbestos insulation. You should make your own enquiries as to the age of the buildings on the land to which this certificate relates and, if it contains a building constructed prior to 1980, Council strongly recommends that any potential purchaser obtain advice from a licensed asbestos assessor to determine whether loose-fill asbestos is present in any building on the land and, if so, the health risks (if any) this may pose for the building's occupants. Please contact NSW Fair Trading for further information.
	Lithgow Flood Study Review (Lyll and Associates 2017) Council is in possession of a flood study review that covers the catchment in which this property is located. Lithgow Flood Study Review (Lyll and Associates 2017) is available for inspection at Council's Administration Centre or on line at http://council.lithgow.com/ The Flood Study Review constitutes the first stage of the Floodplain Risk Management process for this area and has been prepared to define flood behaviour under current conditions. The next two stages of this process being the development of the Floodplain Risk Management Study and Floodplain Risk Management Plan are to follow.

DA022/18 LGS:HP
Economic Development & Environment Dept.

30 October 2018

Frank Inzitari - Rosaton Pty Ltd
C/- CEH Survey
PO Box 71
LITHGOW NSW 2790

Dear Sir/Madam

**Development Approval - DA022/18
Proposed - Subdivision 1 Lot into 79
Lot 2 & 3 DP 1229039 - 33 Magpie Hollow Road SOUTH BOWENFELS NSW 2790**

Please find enclosed your abovementioned Development Approval. You are advised to read the conditions of your consent carefully and to contact your Development Planner if you have any queries.

Your Development Planner is Lauren Stevens who is available between 8:15am-12:00pm on 63549999 Monday to Friday in Council's Economic Development & Environment Department. Interviews at other times may be arranged by appointment.

Please do not hesitate to contact your Development Planner should you have any concern or enquiry in respect to your development.

Yours sincerely



A C Muir
DIRECTOR ECONOMIC DEVELOPMENT & ENVIRONMENT

enc

**NOTICE OF DETERMINATION
OF DEVELOPMENT APPLICATION**

(Pursuant to Section 4.16 of the Environmental Planning & Assessment Act 1979)

Application No	DA022/18
Applicant's Name & Address	Frank Inzitari - Rosaton Pty Ltd C/- CEH Survey PO Box 71 LITHGOW NSW 2790
Owner's Name(s)	Rosa Inzitari
Land to Be Developed	Lot 2 & 3 DP 1229039 33 Magpie Hollow Road SOUTH BOWENFELS NSW 2790
Proposed Development	Subdivision 1 Lot into 79
Classification of Building(s) (Under Building Code of Australia)	N/A
Determination	Consent granted subject to conditions in attached Schedule A
Integrated Approval Bodies / General Terms of Approval	Attached Schedule B
Approved Documentation	Subdivision Plans prepared by CEH Survey (Drawing No. 4786_LOT dated 6/12/2017 & 4786_STAGE dated 5/12/2017), Concept Road Plans prepared by CEH Survey (Drawing No. 4786_C_RD_01, 4786_C_RD_02, 4786_C_RD_04, 4786_C_RD_05 & 4786_C_RD_06 dated 6/12/2017, 4786_C_RD_03 dated 7/12/2017, 4786_C_RD_07 dated 28/12/2017, 4786_INTER dated 31/1/2018, 4786_Frontage dated 4/12/2017, 4786_SW dated 20/12/2017, 4786_SEWER & 4786_RIPARIAN dated 5/12/2017, 4786_VI dated 30/1/2018 and 4786_WQT dated 31/1/2018), Servicing Plans prepared by CEH Survey (4786_SERVICE_STG1 - 4786_SERVICE_STG6 dated 4/5/2018), Vegetation Management Plan prepared by New Era Mine Site Revegetation (dated July 2018), Bushfire Assessment Report (Ref: R8532bf dated 5/9/2017) and Preliminary Contamination Investigation (Ref: R8532c dated 23/8/2017) prepared by Envirowest Consulting, Traffic Impact Assessment prepared by Transport and Traffic Planning Associates (Ref: 17189 dated December 2017), Stormwater Management Report & Statement of Environmental Effects prepared by CEH Survey

Other Approvals Under Section 68 of Local Government Act 1993	Nil
Consent to Lapse On	30 October 2023 (unless 'physically commenced' in accordance with provisions of the Environmental Planning & Assessment Act 1979)
Consent to Operate from	30 October 2018
Determination Made On	29 October 2018
Schedules / Attachments	A. Conditions of Consent (Consent Authority) B. General Terms of Approval C. Servicing Requirements for Water and Sewerage
Rights of Appeal	In accordance with Part 8, Division 8.2 of the Environmental Planning Assessment Act 1979 you may request the Council to review the determination of the application within 6 months from the date of this determination. However, this right of review does not apply to Designated Development, Integrated Development or State Significant development. If you are dissatisfied with the decision, Part 8, Division 8.3 of the Environmental Planning and Assessment Act 1979 gives you the right to appeal to the Land and Environment Court within 6 months after the date on which you receive this notice. Part 8, Division 8.3 of the Environmental Planning Assessment Act 1979 allows an objector who is dissatisfied with the determination of a consent authority to grant consent to a development application for Designated Development within 28 days after the date on which notice of the determination was given, appeal to the Land and Environment Court.
Name of Authorised Officer	A C Muir
Signature of Authorised Officer (on behalf of the Consent Authority)	
Position of Authorised Officer	DIRECTOR ECONOMIC DEVELOPMENT & ENVIRONMENT

Schedule A

Conditions of Consent (Consent Authority) and General Terms of Approval (Integrated Approval Body)

Please Note: It should be understood that this consent in no way relieves the owner or applicant from any obligation under any covenant affecting the land.

ADMINISTRATIVE CONDITIONS

1. That the development be carried out in accordance with the application, Statement of Environmental Effects, accompanying information, plans listed in the approval and any further information provided during the process unless otherwise amended by the following conditions.
2. That the a Subdivision Certificate Application, release fee, Registered Surveyors Plans (original & 11 copies) along with associated 88B instrument if applicable, be submitted to Council for finalisation following the compliance with all conditions of this consent.
3. Minor boundary alterations will need to be adjusted so that Lot 16 does not dissect/include any of the electrical easement.
4. No coal burning appliances are to be installed on the residential allotments. A restrictive covenant shall be placed on each lot created through an 88(b) Instrument of the *Conveyancing Act 1919* with Council having the right to vary, modify or release this restriction.
5. A street tree planting plan is to be submitted to Council and approved for the overall subdivision prior to Subdivision Certificate release of Stage 1. The street trees are to be implemented within each stage prior to Subdivision Certificate release of those stages respectively.
6. Prior to the issue of the Subdivision or Construction Certificate in connection with a development, the developer (whether or not a constitutional corporation) is to provide evidence satisfactory to the Certifying Authority that arrangements have been made for:
 - (i) the installation of fibre-ready facilities to all individual lots and/or premises in a real estate development project so as to enable fibre to be readily connected to any premises that is being or may be constructed on those lots. Demonstrate that the carrier has confirmed in writing that they are satisfied that the fibre ready facilities are fit for purpose.and
 - (ii) the provision of fixed-line telecommunications infrastructure in the fibre-ready facilities to all individual lots and/or premises in a real estate development project demonstrated through an agreement with a carrier.Note: real estate development project has the meanings given in section 372Q of the Telecommunications Act.

Section 64

7. An application shall be submitted to Council for the supply of a Certificate of Compliance under Section 305 of the Water Management Act for each Stage. A Subdivision Certificate shall not be issued until such time as the contributions applicable to release the Certificate of Compliance are paid in full to Council. Each Stage requires payment for the following allotments created being: Stage 1= 7 lots, Stage 2=12 lots, Stage 3= 13 lots, Stage 4= 14 lots, Stage 5= 4 lots and Stage 6= 29 lots. The rate of contribution per lot/ET is \$2,921 for water and \$14,213 for sewer as set by *Lithgow City Council Development Servicing Plan for water supply and sewerage, August 2018* or the rate adopted in any subsequent Development Servicing Plan annually adjusted for CPI (Sydney) applicable at the time of payment.

Voluntary Planning Agreement

8. That a Voluntary Planning Agreement (VPA) be endorsed by all parties as proposed by Rosaton Pty Ltd on 23 October 2018 prior to the Subdivision Certificate release of Stage 1. Additionally, the contribution agreed to within the VPA is to be paid at a rate of \$2,550 per lot for community facilities and public open space prior to the issue of the Subdivision Certificate release of each Stage 1 to 6.

Stage 1 - \$1,7850 for 7 lots + 250m of cycleway as per #2 in VPA

Stage 2 - \$30,600 for 12 lots + shared cycleway to GWH as per #5 in VPA

Stage 3 - \$33,150 for 13 lots

Stage 4 - \$35,700 for 14 lots

Stage 5 - \$10,200 for 4 lots + steel bridge as per #4 in VPA

Stage 6 - \$73,950 for 29 lots + 140m of cycleway as per #3 in VPA.

Site Remediation

9. That the fill stockpiles and general refuse identified within Envirowest Consulting's Preliminary Contamination Investigation Report August 2017 is required to be removed from the site to a licenced waste facility to provide suitability of residential and recreational land uses. A report and photographic record of this removal, transport and disposal of this waste is required to be submitted to Council. The removal of these materials is to be completed prior to release of Stage 1 Subdivision Certificate.

Utilities

10. The applicant shall consult with an Authorised telecommunications, Electricity and Gas Authorities for the provision of telephone, electricity and gas to each allotment. Confirmation of connection to each allotment or a 'Notification of Arrangement' shall be lodged from each authority, with Council prior to the issue of a Subdivision Certificate.

Environmental Protection

11. The applicant, upon the release of Stage 1 Subdivision Certificate shall commence implementation of the recommendations of the Vegetation Management Plan (VMP) prepared by *New Era Mine Site Revegetation* accompanying the development application as it relates to proposed Lot 79.
12. The applicant is to ensure that all recommendations of the VMP are implemented. Once all conditions have been implemented, the applicant will undertake a maintenance and reporting regime for a minimum period of two years to ensure the outcomes of the VMP are being achieved. Council will not accept dedication of lot 79 until the completion of the 2 year maintenance period and demonstration that the VMP outcomes have been met. The release of the subdivision certificate for stage 6 can happen independently of the terms of this condition.
13. The applicant is to pay a maintenance bond to ensure compliance of this condition. The bond amount is to be agreed to by Council and the proponent prior to the release of Stage 1 Subdivision Certificate based on a cost estimate to be provided by the applicant. Council will routinely inspect the site to monitor compliance and at the completion of the bond period. If work is deemed to be either outstanding or defective in any way Council reserves the right to expend the bond monies on rehabilitation work.

DEPARTMENT OF PRIMARY INDUSTRIES – WATER

14. The Natural Resources Access Regulator's (NRAR) General Terms of Approval (GTA), for part of the proposed development requires a Controlled Activity approval under the Water Management Act 2000 (WM Act). The development consent holder must apply to NRAR for a Controlled Activity approval. The General Terms of Approval is attached to this consent and is to be complied with prior to works or activities commencing on the site.

15. A completed application form must be submitted to NRAR together with any required plans, documents, application fee, security deposit or bank guarantee (if required) and proof of Council's development consent. Finalisation of an approval can take up to eight (8) weeks from the date the application and all required supporting documentation is received. Application forms are available from the NRAR website at:

www.industry.nsw.gov.au WaterLicensing & TradeApprovals.

WATER NSW CONDITIONS

General

16. The lot layout, works and staging shall be as specified in the Statement of Environmental Effects (undated) and shown on the proposed Concept Lot Layout Plan (Dwg No. 4786_LOT_v2; Amdt 1; dated 28/03/2018) and Staging Plans (Dwg No. 4786_SERVICE_STG1 to 4786_SERVICE_STG6; dated 4/5/2018) all prepared by CEH Survey. No revisions to lot layout, works or staging of the subdivision that will impact on water quality, shall be permitted without the agreement of Water NSW.

Reason for the above Condition - Water NSW has based its assessment under State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 on this version of the subdivision.

Sewage Pump Station and Associated Infrastructure

17. The existing sewage pump station on proposed Lot 2 shall be decommissioned as part of the Stage 1 development as specified in a letter from CEH Survey to Council (dated 26 April 2018).
18. Final design and construction of the sewage pump station proposed to be located in the southern portion of proposed Lot 79 and associated sewer main as shown on the Proposed Concept Servicing Plan – Pump Station (Dwg No. 4786_SERVICE_PUMP; dated 16/05/2018) and the Servicing Plan (Dwg No. 4786_SERVICE_STG1; dated 4/5/2018) all prepared by CEH Survey shall be finalised to the satisfaction of Council prior to the issuance of a Subdivision Certificate for Stage 1. The final design of the sewage pump station shall have consideration for and include the following:
- the electrical switchgear and access points associated with the sewage pump station shall be located above the 1% Annual Exceedance Probability (1 in 100 year) flood level,
 - the sewage pump station shall have a minimum emergency storage volume equivalent to at least 3 hours peak wet weather flow,
 - the sewage pump station and the rising main(s) shall be designed with sufficient capacity to collect and transfer all wastewater generated by the subdivision,
 - the upgrade of any existing sewerage infrastructure shall ensure it has sufficient hydraulic capacity to accommodate the additional wastewater load generated by the subdivision,
 - an appropriate emergency storage capacity of the sewage pump station to accommodate wet weather flow, including a permanent standby pump and access to an emergency power generation unit to ensure continuity of operation in the event of pump or power failure,
 - an alarm system to trigger when the pump fails or when the system is reaching its capacity to ensure sufficient residual capacity for emergencies such as power failure or pump malfunction,
 - appropriate bunding around the sewage pump station so as to divert run-on away from the sewage pump station and prevent any overflows reaching natural drainage system or stormwater drains, and
 - the sewer main crossing of the tributary of Bowens Creek within proposed Lot 79 shall be appropriately designed and located, consistent with the Proposed Concept Servicing Plan – Pump Station and the Concept Sewer Crossing Longitudinal Section (All with Dwg No. 4786_SERVICE_PUMP; dated 16.05.2018) all prepared by CEH Survey; and any requirements for Controlled Activities Approval under the *Water Management Act, 2000* issued by the Department of Industry - Water.

19. Prior to issuance of Subdivision Certificate for each stage of the subdivision, wastewater from the proposed lots, as relevant to each stage of the subdivision, shall be connected to via sewer main to the sewerage pumping station as shown on the Servicing Plans (Dwg No. 4786_SERVICE_STG1 to 4786_SERVICE_STG6; dated 4/5/2018) prepared by CEH Survey.

Reason for the above Conditions – To ensure that the design and operation of the sewerage infrastructure is undertaken in a way that minimises the risk of sewage overflows so as to ensure a sustainable neutral or beneficial effect on water quality over the longer term.

Subdivision Roads

20. The subdivision roads shall be located and constructed as shown on the Concept Lot Layout Plan (Dwg No. 4786_LOT_v2; Amdt 1; dated 28/03/2018) and the Servicing Plans (Dwg No. 4786_SERVICE_STG1 to 4786_SERVICE_STG6; dated 4/5/2018) prepared by CEH Survey, but with the following specifications and requirements:
- be sealed and otherwise constructed in accordance with Council's engineering standards, and
 - Incorporate suitable crossfall with runoff to be collected via a series of pits and pipes and directed to various water quality treatment measures detailed in the following conditions.
21. All stormwater structures and drainage works associated with the proposed subdivision roads shall be wholly included in the road or drainage reserve or within suitably defined easements.

Reason for the above Conditions – To ensure that the proposed subdivision roads and associated infrastructure will have a sustainable neutral or beneficial impact on water quality during the operational phase of the development.

Stormwater Management

22. All stormwater management measures as specified in the Stormwater Management Plan (dated May 2018) and shown on the MUSIC Treatment Train Plans (Dwg No. 4786_MUSIC_STG2 to 4786_MUSIC_STG6; dated 6/6/18) and Servicing Plans (Dwg No. 4786_SERVICE_STG1 to 4786_SERVICE_STG6; dated 4/5/2018) all prepared by CEH Survey, shall be implemented in particular as elaborated or varied in the following conditions. The stormwater management measures as a minimum shall include:
- pits, pipes, and interallotment drainage
 - grassed swales, and
 - bioretention basins for Stages 2 to 6.
23. Bioretention basins shall be designed and constructed as per the Stormwater Management Plan (dated May 2018) and shown on the MUSIC Treatment Train Plan – Typical Bio Retention & Outlet Scour Protection (Dwg No. 4786_MUSIC_OSP; dated 6/6/2018) both prepared by CEH Survey to capture and treat all runoff from all subdivision roads and residential areas. Each bioretention basin shall also incorporate the following specifications and requirements:
- **For Stage 2:** two bioretention basins shall be located and constructed as per the MUSIC TREATMENT PLAN - STAGE 2 (Dwg No. 4786_MUSIC_STG2; dated 6/6/2018) prepared by CEH Survey with a total combined surface area and filter area of 55 square metres.
 - **For Stage 3:** a bioretention basin shall be located and constructed as per the MUSIC TREATMENT PLAN - STAGE 3 (Dwg No. 4786_MUSIC_STG3; dated 6/6/2018) prepared by CEH Survey with a total surface area and filter area of 40 square metres.
 - **For Stage 4:** two bioretention basins shall be located and constructed as per the MUSIC TREATMENT PLAN - STAGE 4 (Dwg No. 4786_MUSIC_STG4; dated 6/6/2018) prepared by CEH Survey with a combined total surface area and filter area of 80 square metres.
 - **For Stage 5:** a bioretention basin shall be located and constructed as per the MUSIC TREATMENT PLAN - STAGE 5 (Dwg No. 4786_MUSIC_STG5; dated 6/6/2018) prepared by CEH

Survey with a total surface area and filter area of 45 square metres.

- **For Stage 6:** two bioretention basins shall be located and constructed as per the MUSIC TREATMENT PLAN - STAGE 6 (Dwg No. 4786_MUSIC_STG6; dated 6/6/2018) prepared by CEH Survey with a combined total surface area and filter area of 120 square metres
- all bioretention basins shall be designed consistent with the Adoption Guidelines for Stormwater Biofiltration Systems Version 2 (Payne *et al*, 2015, Melbourne, CRC for Water Sensitive Cities) and shall also incorporate the following specifications:
 - a filter media consisting of a clean sandy loam with a certified median particle diameter of 0.5 mm, a maximum orthophosphate concentration of 40 mg/kg and a maximum total nitrogen concentration of 400 mg/kg,
 - be planted with appropriate deep-rooted, moisture-tolerant vegetation protected by rock mulch (grass and turf is not appropriate vegetation and organic mulch is not suitable),
 - direct all discharge and overflow to the unnamed tributaries of Bowens Creek via armoured discharge points such that discharge does not cause erosion, as per the Outlet Scour Protection Cross Section (Dwg No. 4786_MUSIC_OSP; dated 6/6/18) prepared by CEH Survey,
 - be accessible from the subdivision roads by machinery to facilitate cleaning, monitoring and maintenance of the structures,
 - ensure the discharge outlets are consistent with the requirements of any Controlled Activity Approval under the *Water Management Act (2000)* from the Department of Industry-Water
 - be permanently protected from vehicular damage by bollards, fences, castellated kerbs or similar structures, with a sign to be erected to advise of its nature and purpose in water quality management, and
 - be protected by sediment and erosion control measures during any construction and post-construction phase until the ground surface is revegetated or stabilised.

24. The bioretention basins **for Stages 2 to 6** of the subdivision shall be constructed after all hardstand areas i.e. road construction for that stage of the subdivision, have been completed and all ground surfaces have been stabilised.
25. No changes to stormwater treatment and management that will impact on water quality, shall be permitted without the agreement of Water NSW.
26. A suitably qualified stormwater consultant or engineer shall certify in writing to Water NSW and Council **prior to the issuance of a Subdivision Certificate** for each stage of the subdivision that all stormwater management structures have been installed as per these conditions of consent and are in a functional state.
27. An Operational Environmental Management Plan (OEMP) **for each stage** of the subdivision shall be prepared in consultation with Water NSW and Council by a person with knowledge and experience in the preparation of such plans. Each OEMP shall be prepared prior to the issuance of a Subdivision Certificate for that stage of the subdivision, and may be updated from the OEMP for the previous stage. The OEMP shall be provided to Council when the management and maintenance of the bioretention basins is handed over to Council. The OEMP as a minimum shall include but not be limited to:
 - details on the location, description and function of stormwater management structures such as pits, pipes, interallotment drainage, bioretention basins, swales, and any other stormwater structures and drainage works
 - an identification of the responsibilities and detailed requirements for the inspection, monitoring and maintenance of all stormwater management structures, before and after handing over to Council, including the frequency of such activities

- the identification of the individuals or positions responsible for inspection and maintenance activities, before and after handing over to Council, including a reporting protocol and hierarchy
- the identification of detailed requirements and measures for the protection of bioretention basins from future upstream construction works i.e. construction of dwellings on future lots, and
- checklists for recording inspections and maintenance activities.

28. All stormwater treatment devices, particularly bioretention basins, shall be monitored, maintained and managed as per the Operational Environmental Management Plan referred in the Condition above.

Reason for the above Conditions – To ensure that the stormwater quality management measures and structures for the proposed subdivision have a sustainable neutral or beneficial impact on water quality over the longer term.

Construction Activities

29. A Soil and Water Management Plan shall be prepared for all works proposed or required as part of Stages 2 to 6 of the subdivision, including the subdivision roads, by a person with knowledge and experience in the preparation of such plans. The Plan shall meet the requirements outlined in Chapter 2 of NSW Landcom's Soils and Construction: Managing Urban Stormwater (2004) manual - the "Blue Book". The Plan shall be developed in consultation with Water NSW and be prepared prior to Council issuance of a Construction Certificate for that stage of the subdivision and shall be to the satisfaction of Council.
30. A suitably qualified, certified professional shall oversee the implementation of the Soil and Water Management Plan for Stages 2 to 6 of the subdivision and effective erosion and sediment controls at the site prior to and during any construction activity including site access and works within waterways and shall certify in writing to Water NSW and Council that erosion and sediment controls have been installed and maintained at the site in accordance with Condition 14 above. The controls shall prevent sediment or polluted water leaving the site or entering any stormwater drain or natural drainage system. The controls shall be regularly maintained and retained until works have been completed and ground surface stabilised or groundcover re-established.

Reason for the above Conditions – To manage adverse environmental and water quality impacts during the construction phase of the development so as to minimise the risk of erosion, sedimentation and pollution within or from the site during this phase.

Subsequent Development Applications

31. Any subsequent applications for dwellings and/or other developments on the proposed lots will be subject to the provisions of State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (the SEPP) and will need to be assessed according to the Neutral or Beneficial Effects test (NorBE) in relation to the potential effect of the development on water quality.

RURAL FIRE SERVICE (RFS) REQUIREMENTS

Asset Protection Zones

The intent of measures is to provide sufficient space and maintain reduced fuel loads so as to ensure radiant heat levels of buildings are below critical limits and to prevent direct flame contact with a building. To achieve this, the following conditions shall apply:

32. At the issue of subdivision certificate and in perpetuity the entire property of each residential lot shall be managed as an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 5 of

'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones'.

33. At the issue of subdivision certificate and in perpetuity the entire property of the open space between lot 27 and 47 as per the subdivision plan drawn by CEH Survey, DWG No. 4786_STAGE, dated 5/12/2017 shall be managed as an outer protection area (OPA) as outlined within section 4.1.3 and Appendix 5 of 'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones'.

Water and Utilities

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions shall apply:

34. Water, electricity and gas are to comply with section 4.1.3 of 'Planning for Bush Fire Protection 2006'.

Access

The intent of measures for public roads is to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area. To achieve this, the following conditions shall apply:

35. Public road access shall comply with section 4.1.3 (1) of 'Planning for Bush Fire Protection 2006'.

ENDEAVOUR ENERGY REQUIREMENTS

Network Capacity/Connection

36. In due course the applicant, for the future proposed development of the site will need to submit an application for connection of load via Endeavour Energy's Network Connections Branch to carry out the final load assessment and the method of supply will be determined. Depending on the outcome of the assessment, any required padmount substation will need to be located within the property (in a suitable and accessible location) and be protected (including any associated cabling) by an easement and associated restrictions benefiting and gifted to Endeavour Energy.

Urban Residential Subdivision

37. The site is subject to Endeavour Energy Underground Residential Distribution (URD) policy that states:

5.16.1 Distribution reticulation

In order to improve the reliability performance of and to reduce the operating expenditure on the network over the long term the company has adopted the strategy of requiring new lines to be either underground cables or where overhead is permitted, to be predominantly of covered or insulated construction.

5.16.2 Urban areas

Reticulation of new residential subdivisions will be underground. In non-bushfire prone areas, new lines within existing overhead areas can be overhead, unless underground lines are cost justified or required by local council.

Extensions to the existing overhead 11kV/22kV network must generally be underground.

Bushfire

38. The network required to service the proposed development must be fit for purpose and meet the technical specifications, design, construction and commissioning standards based on Endeavour Energy's risk assessment associated with the implementation and use of the network connection/infrastructure for a bushfire prone site.

Earthing

39. The construction of any building or structure (including fencing, signage, flag poles etc.) that is connected to or in close proximity to Endeavour Energy's electrical network is required to comply with AS/NZS 3000:2007 'Electrical installations' to ensure that there is adequate connection to the earth. Inadequate connection to the earth places persons and the electricity network at risk.

Easement Management/Network Access

40. The following is a summary of the usual/main terms of Endeavour Energy's electrical easements requiring that the land owner:

- o Not install or permit to be installed any services or structures within the easement site.
- o Not alter the surface level of the easement site.
- o Not do or permit to be done anything that restricts access to the easement site without the prior written permission of Endeavour Energy and in accordance with such conditions as Endeavour Energy may reasonably impose.

Endeavour Energy's preference is for no activities or encroachments to occur within its easement areas. If any proposed works or activities (other than those approved/ certified by Endeavour Energy's Network Connections Branch as part of an enquiry/ application for load) will encroach/affect Endeavour Energy's easements, contact must first be made with the Endeavour Energy's Easements Officer.

It is imperative that the access to the existing electrical infrastructure adjacent and on the site is maintained at all times. To ensure that supply electricity is available to the community, access to the electrical assets may be required at any time.

Vegetation Management

41. The planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting needs to be undertaken in proximity of electricity infrastructure. Only low growing shrubs not exceeding 3.0 metres in height, ground covers and smaller shrubs, with non-invasive root systems are the best plants to use. Larger trees should be planted well away from electricity infrastructure (at least the same distance from overhead power lines as their potential full grown height) and even with underground cables, be installed with a root barrier around the root ball of the plant.

Noise

42. Where development is proposed in the vicinity of electricity infrastructure, Endeavour Energy is not responsible for any acoustic/noise amelioration measures for such noise that may impact on the nearby proposed development.

Dial before You Dig

43. Before commencing any underground activity the applicant is required to obtain advice from the ***Dial before You Dig 1100*** service in accordance with the requirements of the *Electricity Supply Act 1995* (NSW) and associated Regulations. This should be obtained by the applicant not only to identify the location of any underground electrical and other utility infrastructure across the site, but also to identify them as a hazard and to properly assess the risk.

Public Safety

44. Workers involved in work near electricity infrastructure run the risk of receiving an electric shock and causing substantial damage to plant and equipment. Endeavour Energy's public safety training resources, which were developed to help general public/workers to understand why you may be at risk and what you can do to work safely is available via Endeavour Energy's website via the following link:

<http://www.endeavourenergy.com.au/wps/wcm/connect/ee/nsw/nsw+homepage/communitynav/safety/safety+brochures>

Emergency Contact

45. In case of an emergency relating to Endeavour Energy's electrical network, the applicant should note the Emergencies Telephone is 131 003 which can be contacted 24 hours/7 days.

Engineering Requirements

46. A Construction Certificate must be obtained prior to the commencement of any Civil Works.
47. Plans are to be lodged to Council for the issue of a Construction Certificate prior to the commencement of any Civil Works.
48. All engineering works are to be to the standard specified in Council's "Guidelines for Civil Engineering Design and Construction for Development". This document is available on Council's website or upon request from Council's administration desk.
49. That a Geotechnical Report be provided for all proposed roads, including subgrade design prior to a Construction Certificate being issued. Geotechnical compaction tests and visual deflection tests are to be undertaken and to be approved by Council prior to the application of seal. Such tests are to be included with the Construction Certificate Engineering Drawings.
50. The road crossfall must not exceed a maximum of 3% at any point.
51. The footpath crossfall must not exceed a maximum of 4% at any point.
52. All batters must not exceed a maximum gradient of 1:5. Where variation to this condition is required, approval may be granted subject to discussion with Council.
53. The road grade must not exceed a maximum of 12% at any point. Where variation to this condition is required, approval may be granted subject to discussion with Council. All internal roads shall have a minimum of 150mm (subject to testing) of DGB-20 road base applied and compacted providing a smooth transitional surface. Road 1 is to be a 13m wide carriage way within a minimum 20m wide road reserve along the frontage of lot 80 and an 11m wide carriage way within a minimum 18m wide road reserve elsewhere. Roads 2, 3 and 4 are to be an 8m wide carriage way within a minimum 15m wide road reserve.
54. All internal residential roads are to be surfaced with a minimum 40mm thickness of Asphaltic Concrete (AC) laid upon a sprayed bituminous prime coat, designed in accordance with the RTA publication "Sprayed Sealing Guide". Layers of asphaltic concrete may be included in the total design pavement depth, but should not be assigned a layer equivalency of greater than unity. Where variation to this condition is required, approval may be granted subject to discussion with Council.

55. All cul-de-sacs/turning circles are to be surfaced with a minimum 40mm thickness of Asphaltic Concrete (AC) laid upon a sprayed bituminous prime coat, designed in accordance with the RTA publication "Sprayed Sealing Guide". Cul-de-sacs/turning circles are to be constructed so that a minimum kerbline radius of 9.5 metres is achieved from the centre of the cul-de-sac/turning circle. The boundary of the road reserve should be curved with a minimum radius of 14 metres to provide for a 4.5 metre wide footpath. Where the head of the cul-de-sac is located on the low side of the road, special provision should be made to convey overland storm water flows through easements or drainage reserves.
56. Roll top kerb and guttering is to be provided on both sides of all internal roads. Where variation to this condition is required, approval may be granted subject to discussion with Council. This will allow potential use of edge strip if water modelling/engineering deems suitable.
57. 2 x 3.5m wide footways are to be provided adjacent to all internal roads. Footpaths must continue to all intersections.
58. Prior to the release of Stage 2 subdivision certificate the Shared Path on Magpie Hollow Road, from the intersection of Road 1 to the intersection with the Great Western Highway, is to be constructed in accordance with Council's standard engineering drawing EN1009. Council's standard drawings are available on Council's website.
59. Street signs are required at all road junctions. Signs shall be purchased from Council. The location of proposed street signs is to be shown on the Engineering Drawings submitted with the construction certificate.
60. Traffic signs, traffic signals, pavement markings, guide posts, delineators, safety barriers and the like, whether permanent or temporary, are to be designed and installed at all roads in accordance with guidelines contained within the Austroads publication, "Guide to Traffic Engineering Practice – Part 8: Traffic Control Devices", Australian Standard 1742 – Manual of Uniform Traffic Control Devices and the Roads and Traffic Authority "Road Design Guide". All traffic control devices and signage are to be detailed in the engineering drawings submitted with the construction certificate. The consent of Lithgow City Council's Executive Manager of Operations or appointed officer will be required prior to the installation of any traffic control devices on existing roads.
61. Two street trees per lot are to be planted within the road reserve. The developer shall consult with and seek approval from Council regarding the species to be used. Only non-frangible trees, having a mature diameter of less than 100mm, shall be planted near road verges and medians. A landscaping plan showing, but not limited to, plant species and estimated height and spread of mature trees is to be provided to Council with the construction certificate.
62. Street lighting shall be provided on all internal access roads in accordance with Australian Standard 1158 – Road Lighting. Energy absorbing columns may be required where fallen columns would be particularly hazardous. The use of energy-saving lighting fixtures is encouraged, however no rebate will be issued to the developer if these types of lamps are approved.
63. A fully certified traffic control plan and road works signage will be required where machinery may obstruct traffic on any Public Road whilst construction work is being undertaken. A traffic control plan and certification of fully qualified contractors/persons will be required to be submitted to Council prior to any work commencing on the shoulder of any Public Road. Failure to comply may result in Work Cover Intervention and may also include Council stopping all work immediately until such time the developer complies with suitable traffic management procedures.

64. A maintenance bond of 5% of final construction costs shall be paid to Council upon final inspection and approval of all civil works. The value of the maintenance bond shall be approved by Council after witnessing a certified copy of the contract documentation showing all civil construction costs for the subdivision. The maintenance period will start from the date of final inspection for a period of 12 months. At the conclusion of the 12 month period a final inspection is to be undertaken by Council at the request of the developer to determine if any defects have arisen during this time. All deficiencies are to be rectified by the developer, should outstanding works remain Lithgow City Council reserves the right to expend bond monies on rectification works.
65. A site investigation is to be performed which is to include logging of test holes to a depth not less than one metre below design subgrade levels (unless rock is encountered). Soil tests shall be taken at the design depth and samples taken for CBR testing in accordance with Australian Standard 1289. The design California Bearing Ratio (CBR) shall be selected following a careful assessment of the materials encountered in the site investigation and the variability of subgrade moisture and density conditions likely in service. The design CBR value should assume poor drainage and shall be determined from soaked CBR. A copy of the site investigation, including test results, is to be included with the Engineering Drawings. Where the design subgrade CBR is below 3, the subgrade shall be chemically stabilised to a minimum depth of 150mm, and the pavement design based on a CBR of 3.
66. Each layer of pavement shall be tested for compaction and deflection as detailed below. The Executive Manager of Operations or his delegate must approve each layer prior to the placing and compaction of subsequent layers.

(a) Compaction Testing:

The subgrade, and all pavement layers, shall be density tested in-situ at the start and finish of the work (within the first/last five metres), and thereafter at intervals of no more than 50 metres, or as indicated by Council's Development Engineer. A minimum of two tests will be required for road pavements less than 50 metres in length. At cul-de-sacs, additional testing will be required at the turning head. The test sites selected should be representative of the likely minimum pavement compaction levels achieved. Density testing must be undertaken by an authorised representative of a laboratory registered by the National Association of Testing Authorities (NATA). Density testing may be conducted using either the sand replacement test, nuclear gauge, or other NATA approved method.

Where a nuclear gauge in direct transmission mode is used to determine pavement density, the test method shall comply with RTA Test Method T173. Results of density testing shall be forwarded directly to Council for approval. No pavement layer shall be covered by a subsequent layer until the results of the density testing have been delivered to and approved by Council's Development Engineer. Table 1 below sets out the minimum compaction requirement for each pavement layer.

Layer	Compaction Requirement	Standard
Subgrade	98% standard maximum dry density California Bearing Ratio (CBR) test	AS 1289 E1 1 AS 1289 F1 1
Sub-Base	100% standard maximum dry density	AS 1289 E1 1
Base	100% standard maximum dry density • <i>Unbound Materials</i> • <i>Cemented Materials</i> Density in place test California Bearing Ratio (CBR) test	AS 1289 E2 1 AS 1289 E3 1 AS 1289 E3 1 AS 1289 F1 1

Laboratory determination of maximum dry density for pavement materials which have been modified with cement must be undertaken within 4 hours of the cement being added to the

material. Materials tested outside this time will be subject to an adjustment to correctly determine the maximum dry density of the sample. For either natural or modified material, the laboratory determination of maximum dry density shall be undertaken at a frequency of no less than one determination for each day's production of material.

(b) Deflection Testing:

All pavement layers must be proof-rolled, and approved by Council's Development Engineer prior to the placement of subsequent pavement layers.

The proof-rolling will be conducted using either:

- i) a roller having a load intensity of seven (7) tonnes per metre width of roller.
- ii) a tandem axle rigid vehicle, having a maximum load of 15 tonnes per axle group (8 tyres), 12 tonnes per axle group (6 tyres), or 10 tonnes per axle group (4 tyres). Single axle vehicles should have maximum loads of 8.5 tonnes (dual tyres), or 5.4 tonnes (single tyres).

Any movement of the pavement layer under loading will be deemed a failure.

Although not a subdivision requirement at this stage, Council strongly encourages Developers to specify in their contracts the use of Benkelman Beam tests to test for any deflection in the pavement layers, and as a means of quality assurance.

(c) Final Road Profile:

The mean construction tolerance on pavement surface crossfalls should be within $\pm 5\%$ of the design crossfall. The maximum allowable construction tolerance is $\pm 5\%$, and the maximum standard deviation of crossfalls is 5%. The vertical alignment should not deviate by more than 25mm from the value shown on the drawings.

67. All road, drainage, kerb and gutter, water and sewerage reticulation works associated with a development shall be inspected by Council's Operations Department. The whole of the works are to be carried out to the satisfaction of the Executive Manager of Operations. Council shall inspect engineering works at the following stages as a minimum:

- Following site regrading and shaping, and prior to installation of footway services;
- Installation of erosion and sedimentation control measures;
- Storm water drainage lines prior to backfill;
- Water and sewer lines prior to backfill;
- Testing of water and sewer lines;
- Subgrade preparation, before placing pavement;
- Establishment of line and level for kerb and gutter placement;
- Completion of each pavement layer ready for testing;
- Road pavement surfacing;
- Completion of works

The developer or contractor shall give Council a minimum 24 hours' notice when requesting an inspection to ensure that development works are not delayed. The developer shall, if required by a Council Engineer, submit delivery dockets for all materials used, and all material and performance test results obtained in the development.

68. Works as Executed (WAE) Plans detailing all services and infrastructure are to be prepared by a registered surveyor or professional engineer, and submitted to Council. The WAE plans shall be lodged prior to the release of the linen plan. The applicant is required to submit three complete sets of hard copy plans (one A1-sized, two A3-sized) and one set of electronic plans in AUTOCAD format.

69. A "Work-As-Executed" (WAE) plan is required to be prepared by a Registered Surveyor or professional engineer and forwarded to Council prior to the final inspection. The WAE is to include, as a minimum:
- certification that all works have been completed generally in accordance with the approved plans and specification,
 - any departure from the approved plans,
 - any additional/deleted work,
 - the location of conduits, subsoil lines, stub mains and inter-allotment drainage lines,
 - pipeline long sections showing the constructed invert levels of each pipe at each pit and pipe dimensions,
 - details of overland flow provisions,
 - site regrading areas by new contours, and
 - all other details which have a bearing on the extent of works and their acceptance by Council.
70. All Engineering Drawings submitted to Council for approval are to have a title block showing the following:
- Applicant's Name,
 - Consultant's Name, Address, Phone No. and Contact Name,
 - Drawing Number, Sheet Number and Amendment Number,
 - Schedule showing Date and Nature of Amendments,
 - Site Address, including Lot and Deposited Plan (DP) Number,
 - Council's File Reference,
 - Stage Number,
 - Drawing Title,
 - Scale with Scale Bar, and
 - Signature of Authorised Person
71. Construction noise shall be in accordance with the 'Noise Control Guidelines for Construction Noise Standards'. Hours of operation shall be permitted between 7am and 6pm Monday to Friday and 8am and 1pm Saturdays. No heavy machinery work or usage shall be permitted on Sundays or Public Holidays.
72. The applicant shall submit a soil erosion and sedimentation control plan with the engineering design for Council approval. Such shall address both short and long term management of all disturbed areas and specified methods and structures to be employed to minimise any impact.
73. Prior to and during the commencement of works the applicant shall erect soil erosion and sedimentation controls for the following purposes:
- control of soil erosion and sedimentation movement during the bulk earthworks stage,
 - control of run off and diversion of the sedimentation trap prior to the development of land,
 - method of stabilising the land from erosion and sediment movement after the completion of works and prior to the development of the land.
74. The applicant is to comply with all reasonable requests from Council with regard to any complaints received during construction works.
75. All stormwater drainage is the responsibility of the applicant and shall be satisfactorily disposed of into Council's existing stormwater infrastructure or natural drainage features.

76. The following conditions apply to Stormwater Drainage design and construction:

- a) Stormwater Drainage plans shall submitted to Council as part of the construction certificate, drawn at a scale sufficient to show all necessary details, nominally 1:200, 1:500, 1:1000 or 1:2000. The following data is to be included with a contoured catchment area plan:
- i. Catchment areas and sub-areas, watershed (catchment boundary), overland flow paths, existing and proposed pipe layout. For large catchments, the total catchment area should be shown at a large scale on a separate plan or inset.
 - ii. All sub-areas, drainage lines and pits are to be logically numbered.
 - iii. A schedule of pipe details, including pipe number, size, class, bedding type, joint type, invert levels at inlet and outlet, slope, and length.
 - iv. A schedule of pit details, including pit number, type, road chainage, surface level to the Australian Height Datum (AHD), invert level to AHD, depth, and lintel length.
 - v. North point and legend.
 - vi. Setout information.
 - vii. Accurate position and level of all services and utilities which cross underground drainage pipelines.
 - viii. Identify those building allotments adjacent to channels and major storm flow paths which may be liable to flooding in major flood events, and the minimum design habitable floor level adjacent to prevent flooding in the design flood event.
 - ix. Inlet and outlet treatments.
 - x. Measures for the prevention of erosion and sedimentation.

b) Stormwater pit construction:

- i. Pits shall be provided in drainage lines at all changes in grade, level, and direction, and at all pipe junctions and shall be spaced at no more than 85m apart.
- ii. Drainage pits are to conform to Council's standard Drawings, or RTA standards for Classified Roads. Non-standard structures shall be constructed as detailed in the design drawings. Such designs shall comply with AS3600 –Concrete Code, AS4100 – Steel Structures, AS1657 – SAA code for fixed platforms, walkways, stairways and ladders; and any other relevant standard.
- iii. Pits used for storm water drainage shall be fitted with square lids to distinguish them from sewer manholes.
- iv. Junction pits shall be fitted with reinforced lids and approved lifting eyes.
- v. Grated inlet pits shall not be used for street or roadway drainage.
- vi. Precast pits, incorporating insitu bases, may be used if the prior approval of the pit type and design are approved by the Group Manager of Operations.
- vii. Every endeavour shall be made to maintain flow velocities through pits. Excessive drops will not be permitted.
- viii. Pipe grading across pits should be designed on the following basis:
 - No change in direction or diameter - minimum 50mm;
 - Direction change but no change in diameter - minimum 70mm;
 - Changes in pipe diameter should be graded from obvert to obvert;
- ix. At pit connections, a 3 metre length of approved subsoil drainage pipe enclosed in a geofabric sock shall be placed alongside the main pipe so as to enter the pit at the same invert level and adequately drain the main trench, in accordance with Council's standard drawing EN 1016 (copy attached).

c) Location of pits in roadways, for the adopted minor drainage system annual exceedance probability:

- i. Inlet pits shall be located so as to restrict the maximum gutter flow width to 2.5 metres.
- ii. Maximum spacing between any two consecutive pits is 85 metres.

- iii. Pit bypass flows should be limited to 15% of the gutter flow at that location.
- iv. At intersections, kerb inlet pits shall be constructed adjacent to the upstream kerb return tangent point where flows exceed 20 litres per second or gutter flow width is more than 1 metre.
- v. The minimum clearance from the top of the manhole to the design pit water level should be 150mm.
- vi. The product of flow velocity and depth of flow in the kerb and gutter should not exceed 0.4 m²/s.
- vii. Kerb inlet pits should be located clear of horizontal curves, pedestrian desire lines, and vehicle driveways.
- viii. Inlet conditions shall be designed so that the potential for blockage by silt and debris is minimised. This may require special treatment of the inlet sump under some conditions.

d) Hydraulic Design

- i. Pit inlet capacities shall be estimated from design charts and formulae, based on lintel size for on-grade pits and depth of ponding for sag pits. The calculated inlet capacity shall be reduced by a factor of 50% for sag pits, and 20% for on-grade pits, on the assumption that debris is preventing some inflow.
- ii. Standard lintel sizes of 1.8, 2.4, 3.0, or 3.6 metres should be used when possible.
- iii. The minimum internal lintel size on a sag should be 2.4 metres.
- iv. The head loss through pits shall be determined from Missouri Charts or other recognised methods.

- 77. The Bio-Retention Basins are to be constructed to sedimentation basin stage prior to the release of the relevant subdivision certificate.
- 78. The Bio-Retention Swales are to be constructed to a grassed swale standard prior to the release of the relevant subdivision certificate.
- 79. Prior to the handover of stormwater assets the following conditions must be met:
 - a. Certification that the asset has been constructed in accordance with approved plans
 - b. Work as executed drawings and engineering certifications have been provided
 - c. All required sediment and water management controls are in place and functioning as intended
 - d. Details of any incidents including Work Health and Safety incidents, public safety and complaints received are documented and provided to Council
 - e. Any required maintenance and security bonds have been received
- 80. The following stormwater asset maintenance and security bonds are required prior to asset handover:
 - a. Bio-Retention Basins – a bond totalling the cost to complete the Bio-Retention Basin construction (if not already constructed to bio-retention stage) and expected maintenance costs for a 2 year maintenance period are to be provided to Council prior to asset handover. The value of which is to be agreed between the developer and Council prior to the release of the relevant subdivision certificate.
 - b. Bio Swales - a bond totalling the cost to complete the Bio-Swale construction (if not already constructed) and expected maintenance costs for a 2 year maintenance period are to be provided to Council prior to asset handover. The value of which is to be agreed between

the developer and Council prior to the release of the relevant subdivision certificate.

Water and Sewer Requirements

81. S68 Approval issued under the provision of the *Local Government Act 1993* or a Subdivision Works Certificate issued under the provision of the Environmental Planning and Assessment Act 1979 shall be required for all Water and Sewer works. If the development is staged then each stage will require a separate Section 68 Approval or Subdivision Works Certificate for construction work covered under that stage.
82. All lots to connect to a gravity sewer reticulation system. This will coincide with the construction of new sewerage pump station to service this area in accordance with Councils Development Services Plan and the West Bowenfels Sewerage Strategy.
83. The sewer pump station shall be located as shown in the Concept Plan by CEH SURVEY Dated 4/5/18. Council is to be dedicated the land proposed upon registration of the plan for the first lots created.
84. Council will construct the sewage pump station and rising main with design advice to be provided by the applicant. The cost of the construction will be borne by Council and recovered through Development Contributions in accordance with Council's Development Servicing Plan. Should the applicant wish to proceed prior to Council allocating a budget for the construction the applicant can opt to pay contributions in advance to fund the construction.
85. All reticulation works, water and sewer are to be constructed by the developer at full cost to the developer.
86. The existing Sewer Pump Station located on Magpie Hollow Road shall be decommissioned and removed. The applicant shall design the connection of the existing gravity sewer pipeline to include a changeover manhole once the new sewer pump station has been completed and commissioned.
87. Lot 1 DP1229039 (existing house) shall be provided with a gravity sewer point of connection. When the applicant submits a Section 68 application for Stage 1 then full consideration shall be given in the design to provide a sewer point of connection for the allotment via the boundary of Lot 7. If the levels do not allow gravity connection to Stage 1 sewer design then a sewer point of connection will be provided prior to the completion of stage 2. All works at developers costs.
88. The applicant is to include a sewer point of connection for Lot 80 in the sewer design via a receiving manhole prior to completion of stage 2.
89. The applicant shall provide a full Water and Sewer Design Plan for approval prior to the release of the S68 Approval or Subdivision Works Certificate. Design is to include, longitudinal sections for each main, minimum depth and cover, maximum depth, grade, chainage, inverts, size, depths, manholes, manhole numbers, manhole depths, pipe velocity, proposed material and positions of junctions and dead ends for all Lots.

OTHER

90. The applicant shall submit a geotechnical report over Lots 28/29 following the removal of the dam from the site to ensure that the dam has been filled and compacted to the standard required for residential development prior to the release of the subdivision certificate for Stage 3.

91. The applicant to provide 0.5ha of active open space of suitable grade to be developed as a local park to service the development. This area can be contained within proposed Lot 79 provided that a shared pedestrian/cycle path is developed at full cost to the applicant to connect the area to both the eastern and western sides of the creek.



General Terms of Approval

for proposed development requiring approval
under s89, 90 or 91 of the Water Management Act 2000

Reference Number:	IDAS1105167
Issue date of GTA:	18 September 2018
Type of Approval:	Controlled Activity
Description:	Subdivision of 1 lot into 79
Location of work/activity:	33 Magpie Hollow Road SOUTH BOWENFELS
DA Number:	DA022/18
LGA:	Lithgow City Council
Water Sharing Plan Area:	Greater Metropolitan Region Unregulated River Water Sources

The GTA issued by NRAR do not constitute an approval under the *Water Management Act 2000*. The development consent holder must apply to NRAR for the relevant approval **after development consent** has been issued by Council **and before** the commencement of any work or activity.

Condition Number	Details
Design of works and structures	
GT0009-00010	Before commencing any proposed controlled activity on waterfront land, an application must be submitted to Natural Resources Access Regulator, and obtained, for a controlled activity approval under the Water Management Act 2000.
GT0019-00003	Any proposed excavation on waterfront land must be undertaken in accordance with a plan submitted as part of a controlled activity approval, to be approved by Natural Resources Access Regulator.

Erosion and sediment controls

GT0014-00007	A. The consent holder must ensure that any proposed materials or cleared vegetation, which may: i. obstruct water flow, or ii. wash into the water body, or iii. cause damage to river banks, are not stored on waterfront land, unless in accordance with a plan held by Natural Resources Access Regulator as part of a controlled activity approval. B. When the carrying out of the controlled activity has been completed, surplus materials must be removed from waterfront land.
GT0021-00001	The proposed erosion and sediment control works must be inspected and maintained throughout the carried out; construction or operation period of the controlled activity and must not be removed until the site is fully stabilised.

Plans, standards and guidelines

GT0002-00523	A. This General Terms of Approval (GTA) only applies to the proposed controlled activity described in the plans and associated documents found in Schedule 1, relating to Development Application 02218 provided by Council to Natural Resources Access Regulator. B. Any amendments or modifications to the proposed controlled activity may render the GTA invalid. If the proposed controlled activity is amended or modified, Natural Resources Access Regulator, Parramatta Office, must be notified in writing to determine if any variations to the GTA will be required.
GT0004-00003	A. A security deposit must be provided, if required by Natural Resources Access Regulator. B. The deposit must be: i. a bank guarantee, cash deposit or equivalent, and ii. equal to the amount required by Natural Resources Access Regulator for that controlled activity approval.
GT0005-00232	A. The application for a controlled activity approval must include the following



General Terms of Approval

for proposed development requiring approval
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DA Number:	DA022/18
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Water Sharing Plan Area:	Greater Metropolitan Region Unregulated River Water Sources

Plan(s): -i. Erosion and Sediment Control Plan, ii. Stormwater Management Plan, iii. Stormwater Outlet Structure Plan, iv. Vegetation Management Plan, v. Watercourse Crossing Plan. B. The plan(s) must be prepared in accordance with Natural Resources Access Regulator's guidelines located on the website
<https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities>.

GT0010-00006 All documents submitted to Natural Resources Access Regulator as part of an application for a controlled activity approval must be prepared by a suitable qualified person.

GT0012-00004 Any proposed controlled activity must be carried out in accordance with plans submitted as part of a controlled activity approval application, and approved by Natural Resources Access Regulator.

GT0030-00006 The application for a controlled activity approval must include plans prepared in accordance with Natural Resources Access Regulator's guidelines located on the website
<https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities>.

Rehabilitation and maintenance

GT0023-00001 Vegetation clearance associated with the proposed controlled activity must be limited to where the controlled activity is to be carried out, as shown on the approved plan(s).

Reporting requirements

GT0016-00003 The consent holder must inform Natural Resources Access Regulator in writing when any proposed activity carried out under a controlled activity approval has been completed.

SCHEDULE 1

The plans and associated documentation listed in this schedule are referred to in general terms of approval (GTA) issued by NRAR for integrated development associated with DA022/18 as provided by Council:

- Proposed 80 Lot Subdivision 41 Magpie Hollow Road, South Bowenfels NSW 2790, Concept Lot Layout, Dwg No. 4786_LOTv3, CEH Survey, Dated 27/08/2018.

Schedule C

Please find attached general design requirements in relation to the servicing requirements for water and sewerage as part of the abovementioned Development Application based on Preliminary Design drawing received by Council.

The attached conditions do not constitute approval under *section 68, Local Government Act 1993*. Prior to the commencement of any works as described below;

- Undertaking of water supply works
- Undertaking of sewerage works
- Installation, alteration, disconnection or removal of a meter connected to a service pipe
- Connect a private drain or sewer with a public drain or sewer under the control of a council or with a drain or sewer which connects with such a public drain or sewer
- The developer must obtain written Section 68 approval from Council; this will be required prior to the issue of the Construction Certificate. The Section 68 application requires the submission of all detailed engineering drawings/design, specifications and any applicable supporting information for the proposed works.

If your Section 68 application is approved, Council will issue you with a Section 68 approval containing conditions that must be complied with during construction.

-
1. S68 Approval issued under the provision of the *Local Government Act 1993* or a Subdivision Works Certificate issued under the provision of the Environmental Planning and Assessment Act 1979 shall be required for all Water and Sewer works. If the development is staged then each stage will require a separate Section 68 Approval or Subdivision Works Certificate for construction work covered under that stage.
 2. All lots to connect to a gravity sewer reticulation system. This will coincide with the construction of new sewerage pump station to service this area in accordance with Councils Development Services Plan and the West Bowenfels Sewerage Strategy.
 3. The sewer pump station shall be located as shown in the Concept Plan by CEH SURVEY Dated 4/5/18. Council is to be dedicated the land proposed upon registration of the plan for the first lots created.
 4. Council will construct the sewage pump station and rising main with design advice to be provided by the applicant. The cost of the construction will be borne by Council and recovered through Development Contributions in accordance with Council's Development Servicing Plan. Should the applicant wish to proceed prior to Council allocating a budget for the construction the applicant can opt to pay contributions in advance to fund the construction.
 5. All reticulation works, water and sewer are to be constructed by the developer at full cost to the developer.

6. The existing Sewer Pump Station located on Magpie Hollow Road shall be decommissioned and removed. The applicant shall design the connection of the existing gravity sewer pipeline to include a changeover manhole once the new sewer pump station has been completed and commissioned.
7. The On-site sewerage management system located on Lot 1 DP1229039 (existing house) temporary septic pump out to sewer system shall be re - routed and connected to the end of line sewer man hole constructed on proposed lot 7 prior to commencement of Stage 2. All works at developers costs.
8. Prior to completion of Stage 2 the On-site sewerage management waste system located on lot 1 DP1229039 shall be decommissioned to the satisfaction of Council and the sanitary drainage reconnected to the 150mm sewer point of connection at the South Eastern corner of the allotment at the developers costs.
9. The applicant is to include a sewer point of connection for Lot 80 in the sewer design via a receiving manhole prior to completion of stage 2.
10. The applicant shall provide a full Water and Sewer Design Plan for approval prior to the release of the S68 Approval or Subdivision Works Certificate. Design is to include, longitudinal sections for each main, minimum depth and cover, maximum depth, grade, chainage, inverts, size, depths, manholes, manhole numbers, manhole depths, pipe velocity, proposed material and positions of junctions and dead ends for all Lots.
11. Maximum Grade of 20% is permitted for gravity sewer design purposes. Applicant is to provide details of addressing hydraulic jump, odour suppression and the use of energy dissipaters and sewer vents.
12. The maximum allowable sewer flow velocity shall be 3.0 m/s.
13. Applicant to gain full approval for any easements required for water and sewer works prior to release of construction certificate.
14. Privately owned Low Pressurised Sewer Systems and Package Pump Stations shall not be accepted.
15. Sewer mains located within lots adjacent to stormwater drainage lines shall be a minimum of 750 mm clear of the stormwater pipe.
16. Plans showing all proposed easements to be created over water and sewer infrastructure shall be submitted to Council prior to the release of S68 Approval or Subdivision Works Certificate.
17. All Water and Sewer works, including minimum and maximum flows and velocities, shall be designed in accordance WSAA code.
18. Manholes that have been elevated for flood zone requirements shall require work platforms for WHS purposes.
19. Full vehicular access shall be provided to all sewer man holes to allow for servicing and maintenance.
20. Rain gardens, Bio Retention Basins and Swales are not to be constructed over sewer mains. A sewer design plan with stormwater overlay shall be required for assessment prior to the issue of S68 Approval or Subdivision Works Certificate.

21. The applicant shall provide detailed water design to include a ring main. Stage 1 (7 lots) water reticulation system shall be connected to the existing 100mm AC line located on the Northern side of Magpie Hollow Road. The new water supply network shall connect into the Council reticulation network via two points of connection. Live connections by Council at owner's costs.
22. The applicant is to ensure completion of the proposed 200mm water main supplied from Gills Hill reservoir and make connection prior to the release of the Subdivision Certificate for Stage 5. The new water supply shall terminate with a ring main and property service for lot 80.
23. The design of water reticulation shall generally be in accordance with the latest version of the Water Services Association of Australia (WSAA) "Water Supply Code of Australia" (WSA 03).
24. The applicant shall provide fire flow analysis for all water supply networks prior to the release of the Construction Certificate, to ensure that the network is capable of providing the performance for the design of pressure for spring hydrants. Maximum spacing of hydrants shall be 60 metres. (Residential)
25. Construction Certificate design drawings and specifications shall clearly address the following:
 - a. Location of pipelines, valves, hydrants, pipe materials, size, pressure class, jointing methods and corrosion protection measures.
 - b. Specifications for products, materials, site investigation, excavation / trench details and other technical matters.
 - c. Documentation of design assumptions, constraints and issues relevant to the design and not otherwise noted in the Concept Plan.
26. Water supply design to provide Desirable Minimum Static Pressure of 350kpa. Static Pressure shall not to exceed 500kpa at each house hold boundary.
27. Stop (dividing and isolating) and control valves shall be positioned to give required control of the system and to provide an alternative means of supply when a distribution main is taken out of service.
28. Minimum and maximum allowable service pressures will not be exceeded in each zone.
29. Minimum and maximum flows and velocities shall be in accordance with the WSAA Code.
30. A geotechnical report shall be submitted to Council prior to the release of the Construction Certificate. All Pipe and fitting materials must be suitable for application and environment.
31. The spacing and positioning of valves shall allow for isolation of individual zones.
32. Water mains shall only be installed in undisturbed ground.
33. All stop valves shall be anticlockwise closing and be positioned at a minimum of every 300 metres. Valves shall be positioned adjacent to branch take offs.
34. Each lot shall have an individual water meter, which shall be purchased from Council at the applicants full cost and held at Council store.
35. Right angled 90 degree brass lockable meter ball valves to be used as meter control valves and a type approved by the Water and Wastewater Manager. Council will secure the water meter valve with a stainless steel locking device prior to the subdivision certificate being released.

36. Water meters to be purchased by the owner after submitting to Council an Application for Work at Owners Cost Payment Authority Application and the completion of a Water Service Connection Application. Council will installed the meter when a Development Application has been approved for the new allotment and a S68 Approval granted for connection to draw water.

Sewerage

1. General Design Considerations

A sewerage service is to be provided for each property; joint sewerage services are prohibited under the *Local Government (General) Regulation 2005, Part 6, Division 3, section 162*

1.1 Objectives

The sewerage objectives are seen as being achieved when:

- i. The planning, design and construction of new facilities are adequate in servicing new and future developments.
- ii. there is compatibility with the existing facilities, methods of operation, and maintenance techniques; and
- iii. The facilities provide public health, environmental, and asset protection consistent with the accepted design and construction requirements set out in this document and with developments in technology as approved from time to time.

The pipe system may, on occasions, be subject to "surcharge" (where the hydraulic grade line is higher than the pipe obvert) or "overflows" (where sewage overflows out of maintenance holes). These situations may be the result of blockages and/or flows in excess of the design flows. In establishing the layout of the pipe network, designers should take care to ensure that any overflows are likely to cause only minimal nuisance or damage.

1.2 Maintenance Aspects

1.2.1 General

The sewerage system is to be designed with due regard to the continuing maintenance requirements after the works have been constructed. A system that can be easily and economically maintained is essential.

Maintenance holes located in readily identifiable locations (e.g. opposite a building line), and not within leased properties, are an aid to rapid clearance of sewer blockages.

1.2.2 Special equipment

The purchase of special maintenance equipment and plant requires considerable lead times, special approvals and funding. As a consequence, no design incorporating the need for special or unusual equipment should be prepared without the prior written approval of Lithgow City Council.

1.3 Discharges from stormwater systems to sewers

Unless approved otherwise, under the specific *Trade Waste Agreement*, no stormwater discharge will be accepted into sewers.

2. Location of Sewers

2.1 Sewer Locations

2.1.1 Sewers located outside privately owned lands

The design of a sewer system should take into account the fact that there is a significant increase in the risk of tree root blockages after a period of about 20 years. Further, the access to sewers for maintenance is a major problem in the Lithgow despite the use of sewerage reserves for this purpose. Therefore minimising the use of sewer alignments and reserves in leased land is an important feature of good sewer design. Where there is public land at the rear or the side of privately owned block the sewer should be located within the public land rather than within the leased/privately owned block.

i. Diversion of principal carrier sewers around leased lands

Blockages in the sewer system have the potential to result in sewage overflows into leased properties. To minimise problems caused by blockages, wherever practicable, sewers, particularly main carriers, shall be located in public areas rather than within leases.

ii. Other situations

Where a sewer is to be constructed across open areas it is to be sited to;

- (1) Maximise its use for future development, and
- (2) Minimise its impact on possible future use of the site.

Wherever possible sewers under playing fields are to be sited so that maintenance holes are not located within the playing area.

2.1.2 Sewers located within leased lands

Where a sewer is to be constructed within privately owned properties a 3m wide easement is to be created in favour of Council, with the pipe(s) centrally located within the easement and in a location that minimises the impact on the future development potential of the leased/ privately owned land(s).

2. Hydraulic Design

2.1 General Hydraulic Aspects

All sewer works in connection with the application are to be of a size no less than 150mm to the service tie or buried vertical riser

i. Minimum grades for DN150 pipes

Minimum permissible grades of the uppermost reaches of sewers are to be no less than 1.00%

This is the absolute minimum grades that shall be used. In general, it is not considered good practice to use a minimum grade on a short intermediate section of sewer when the upstream and downstream sections are laid at steeper grades.

ii. Maximum grades for sewers

Restrictions are placed on the maximum grades of sewers to limit internal erosion of pipe material, and/or pipe movement (due to trench flows causing loss of bedding).

The maximum pipe grade for sewers larger than DN150 is 15%. Where grades steeper than 15% are planned the circumstances are to be referred to Lithgow City Council for assessment.

To limit the scouring effect arising from water flow within the pipe bedding material, and also to anchor the pipe, special bedding, scour stops or trench stops may be required. To enable easy location, scour and trench stops shall be placed at intervals of equal length with spacing not exceeding that which is specified. The actual spacing and number of stops shall be nominated on layout drawings.

iii. Grade changes between pipe reaches

It is essential in the lower reaches of the sewerage system, where sewage may have low dissolved oxygen levels, that turbulence leading to the release of hydrogen sulphide from solution be avoided. In these areas, conditions such as a rapid change from steep to flat pipe slope, which favors the formation of a hydraulic jump at dry weather flows, must be avoided.

3. Structural Design

3.1 Sewer pipe materials and construction methods

3.1.1 Types of pipe

Sewers shall be constructed from materials proven to be structurally sound and durable, and shall have satisfactory jointing systems. The use of two or more types of pipe material on a single run of pipe between adjacent maintenance holes is not acceptable.

Materials approved for use in sewers are:

- Vitrified Clay - VC
- Reinforced Concrete - RC, see notes 1, 2 and 3
- Ductile Iron - DI, see notes 1, 2
- Unplasticised Poly Vinyl Chloride – uPVC (Equivalent to class SEH, solid wall or approved structured wall), **150mm x 3m RRJ SN8 pipes and junctions are Councils preferred material**
- Glass Reinforced Plastics - GRP, see note 4 (Polyester Based)
- Polyethylene – HD-PE, see note 4

Notes

1. Not to be used within, nor up to 1 km downstream of industrial areas or hospitals.
2. Concrete shall be made with Type "SR" sulphate resisting cement with a tri-calcium aluminate content not greater than 5%, or Type "LH" low heat cement. Concrete pipes intended for other than trunk sewers shall be manufactured with a minimum 10mm sacrificial layer on the inside of the pipe.
3. Concrete pipes are not acceptable for DN150 and DN225 sewers.
4. Subject to special conditions and only with written approval of Lithgow City Council.

Proposals for the use of other materials will be considered if supported by adequate technical and performance data.

Where the pipe material is known it shall be shown on the drawings. Where the pipe material is not known prior to submission for detailed design acceptance, the drawings are to contain notes ensuring that the above requirements are satisfied.

4.1.2 Class of pipes

- Sewerage pipes must be of adequate strength to meet overburden and traffic loads. Loads are to include loads created from likely construction and maintenance activities;
- VC pipes shall be Class 4 or stronger;
- Class 2 (X), 3 (Y) and 4 (Z) reinforced concrete pipes manufactured in accordance with the latest version of AS 4058 are acceptable if used in accordance with the requirements of AS 3725;
- uPVC pipes shall be of grade Sewer Extra Heavy (SEH) or of equivalent SN grade in accordance with AS/NZS 1260;
- Classes for Ductile Iron, Glass Reinforced Plastics, Polyethylene, or ABS pipes shall be approved by Lithgow City Council prior to use.

Notes

1. Where load limits apply the locations shall be clearly designated on drawings.
2. During the construction phase specific load provision shall be made for heavy construction equipment where required.
3. No more than one type of pipe material will be used between successive maintenance holes or sewer maintenance shafts.

4.1.3 Pipe jointing

The sewer pipes are to be capable of excluding groundwater, resisting root intrusion, and withstanding pressure loading, both internal and external. Sewer systems must also have some flexibility, either through controlled deflection at joints (rigid materials) or pipe bending (flexible materials).

Acceptable pipe jointing systems are:

- i. VC pipes with rubber ring jointing comprising:
 - Spigot - Socket system;
 - Spigot - Spigot system utilising approved Socket-Socket coupler.
- ii. Reinforced Concrete Pipes, Spigot-Socket, with rubber ring jointing.
- iii. PVC pipes:
 - DN100: solvent welded;
 - DN150: rubber ring jointed or solvent welded; *
 - Larger than DN150: rubber ring jointed. *

Note: For proclaimed mine subsidence areas, the Mine Subsidence Board should be referred to for advice of subsidence design parameters for proposed drainage systems.

4.2 Depth of sewer and cover

- i. Depth of Cover

Sewers shall be laid with a depth of cover, measured from the top of the pipe socket or inspection opening to the ground surface as per section 3.7 of AS/NZS 3500.2, unless the product specific Standard specifies, or the manufacturer recommends, a greater depth.

ii. Maximum Depth

Sewer mains are to be designed for a maximum depth to invert of 5.0 metres. In special cases (e.g. to avoid a pump station or for a short length of line through a ridge) specific approval may be sought from Council to exceed this limit.

4.3 Sewer main junctions

Within a sewerage system it is mandatory that all sewer main junctions occur within maintenance holes. However, DN150 sewer tie connections can be connected by means of maintenance holes or sloped junctions. For connection of service ties see section 4.4.

4.4 Sewer Service Connections

Service ties (house junctions)

A sewerage service is to be provided for each property; joint sewerage services are prohibited under the *Local Government (General) Regulation 2005, Part 6, Division 3, section 162*.

4.4.1 Location

A service tie connecting to a sewer outside a residential block should generally be at right angles to the sewer. Where a service is a maintenance hole (manhole) or "dead-end", the service shall be at an angle between 90° and 180° from the downstream sewer to ensure a smooth flow of entry into the main line.

Service ties shall be located clear of all authorities easements, driveways and retaining walls.

Where the sewer main is located outside of the residential block, the service tie shall extend inside the property boundary and an inspection shaft extended vertically upward to the surface ground level to form a shaft. The tie should generally be located on the sewer main line at 1.0 metre from the lowest corner of the property and extend 1 metre into the boundary.

The upstream end of any "dead-end" sewer shall extend to at least 1 metre past the boundary to accommodate a service tie within a maintenance hole.

4.4.2 Size of Tie

Sewer service ties are normally 150mm solvent welded pipes or rubber ring (in mine subsidence areas). For multiple dwellings a single tie is to be provided per property.

4.4.3 Depth of Tie

A service tie is required to serve the entire leased block. However where building restrictions do not permit part of the block to be developed (e.g. set back distances from the front building line), then depths need to make allowance for this limitation.

In calculating the depth the designer should be familiar with the requirements for grade and depth provided in *AS/NZS 3500.2 sections 3.4 and 3.7*.

An acceptable design will have the following minimum depths of tie:

- For residential blocks: calculated on the basis of minimum cover with a property of 300mm and a maximum possible length of house drain at a grade of 1 in 60
- For residential blocks: calculated on the basis of minimum cover with in the property, if subject to vehicular traffic, of 500mm and a maximum possible length of house drain at a grade of 1 in 60.

4.4.4 Grades

The service tie shall have a minimum grade of 1.0 % and a maximum of 20 %. For ties to deep sewers, a buried vertical riser is to be used (refer section 4.4.5)

4.4.5 Buried Vertical Risers (BVR)

On deep sewers that are near boundaries it may be necessary to use a BVR. These are to be noted on work-as-executed drawings

It is absolutely critical that BVR's are installed on a compacted trench base with suitable concrete support

4.4.6 Manholes

Manholes shall be located along a sewer main at all changes in grade, level and direction and at the intersections with other mains or dead-ends. Manholes will not be accepted within the carriageway of public roads.

The maximum permissible spacing between adjoining manholes is 80 metres.

Manholes are to be designed so that sewage is not forced to deflect by an angle of more than 90 degrees.

Manholes shall be constructed using 20 MPa concrete cast in-situ base. Either Type C or Type D cement shall be used in the concrete mix.

Chamber and covers shall be constructed from precast concrete components of a type authorised by Council.

Drop manholes or Jump-ups may only be used to avoid underground services, or at the intersection of shallow and deep mains where the difference in the invert level exceeds 450mm. The maximum difference in invert levels is 2.0 metres. Drop manholes or Jump-ups are to be constructed as per the requirements of *section 4.10 of AS/NZS 3500.2*

5. Testing

All drainage work is subject to testing and shall comply with the with the requirements of *section 12 of AS/NZS 3500.2*

Water

1.1.1 General

Lithgow's Water Supply System is to be designed with due regard to the continuing maintenance requirements after the works have been constructed. A system that can be easily and economically maintained is essential.

1.1.2 Special Equipment

The purchase of special maintenance equipment and plant requires considerable lead times, special approvals and funding. As a consequence, no design incorporating the need for special or unusual equipment should be prepared without the prior written approval of Lithgow City Council.

This requirement also extends to the need to use special techniques or hired equipment. To ensure that maintenance personnel can respond and overcome operational problems consistent with service

objectives, it is essential that maintenance of the system is not dependent on non-standard techniques or equipment

2 Location of Water Mains

Water mains shall be constructed within road or public reserves or require the creation of a 3 metre wide easement for water supply, in favour of Council and subject to approval by Council. The pipe is to be centrally located within that easement should approval be given.

Easements across privately owned lands should be avoided.

Marking tape to *AS 2648* shall be laid in a continuous length on top of the pipe embedment material, 150mm above all water mains.

2.1 Provision of branches for future connection

Many branches provided for future development turn out to be either the wrong size, in the wrong place, or not eventually required. Temporary end caps on such branches are often not satisfactorily anchored, and become a liability if the branch is not subsequently used. To avoid this, the following is required:

- branches for future development shall not be provided unless the alignment and diameter of the future connecting mains are confidently known, and the extension is to occur within a short time span (less than 12 months);
- To avoid anchorage problems and future shut downs of the main, a flanged branch with a stop valve is preferred to a branch with an end cap. Valves shall be blank flanged. Where an end cap is necessary a full and adequate thrust block shall be provided;
- Where a branch is proposed to be laid across a road, the section across the road should be end capped at both ends rather than connected at one end initially (to avoid future road openings). If the pipes are not to be connected within 24 months, consideration should be given to charging it via a DN20 service connection and then flushing periodically.

3 Material, Size and Cover Requirements

Unless specifically approved otherwise by Lithgow City Council, pipes for water supply shall be selected from the following approved materials:

- Ductile iron, cement lined and rubber ring jointed, produced in standard lengths of 5.5 metres to AS 2280, having sizes of DN100, 150, 225, 300, 375, 450, 500, 600 and 750. For pipes up to DN300 an approved seal coating on the internal cement mortar lining is applied to reduce leaching. Class K9 shall be used for general application and class K12 where additional structural capability is required;
- PVC Class 16 to AS/NZS 1477 Series 2, having sizes of DN100, 150, 225, 300 and 375.
- **Modified PVC (PVC-M) Class 16 to AS/NZS 4765 (Int) Series 2**, having sizes **DN100**, 150, 225, 300, 375 and 450.
- Molecular Oriented PVC (PVC-O) Class 16 to AS/NZS 4441 (Int) Series 2, having sizes DN100, 150, 225, 300 and 375.
- for sizes above DN750, steel pipe to AS 1579, cement mortar lined to AS 1281, and externally coated with fusion bonded polyethylene;
- PE, pressure class PN16, to AS/NZS 4130 having size DN63. Direct tapping not permitted.

The minimum **cover to water mains** shall normally be **750mm** in roadways or traffic areas and 600mm elsewhere. The minimum **cover to water services** shall be 450mm in roadways or traffic areas and 375mm elsewhere. Provision shall be made for transient loads such as construction equipment where cover is reduced during the construction phase.

A pipeline shall be lowered when cover is removed from existing pipelines for new works (such as roads). If this is physically impossible then consideration shall be given to protection by a suitably designed reinforced concrete relieving slab; extending at least 500mm into natural ground beyond existing pipe trench lines. This slab shall be segmented by construction joints into maximum 1.0 metre long easily removed segments, and separated from the pipe obvert by no less than 25mm of granular or compressible material.

Thrust or anchor blocks of plain or reinforced concrete, which have been designed to resist unbalanced hydraulic forces, shall be provided at all bends, tees, tapers, in-line stop valves and dead ends. To limit the scouring effect arising from water flow within the pipe bedding material, and also to anchor the pipe, special bedding, trench stops and scour stops may be required. Scour stops shall be provided along inclined mains where the slope is 5 to 30%. Trench stops can be regarded as an alternative to scour stops and may be provided along inclined mains where the slope is 5 to 15%. To enable easy location, trench and scour stops shall be placed at intervals of equal length with spacing not exceeding that which is specified

4. Service Connections

Water service connections works are to be undertaken under the provisions of *section 152 of the Local Government (General) Regulations 2005*

Water services should be of single service drawn **copper pipe, Type A**, manufactured in accordance with *AS 1432*. Services are to be a minimum of 20mm diameter, with 1.4mm wall thickness.

Right angled 90 degree brass lockable meter ball valves to be used as meter control valves and a type approved by the Water and Wastewater Manager. Council will secure the water meter valve with a stainless steel locking device prior to the subdivision certificate being released.

Water meters to be purchased by the owner after submitting to Council an Application for Work at Owners Cost Payment Authority Application and the completion of a Water Service Connection Application. Council will installed the meter when a Development Application has been approved for the new allotment and a S68 Approval granted for connection to draw water.

Brass or copper capillary fittings are to be installed at all joints, branches, and bends. Meter boxes, meters, maincocks and elbows are to be of a type approved by the Water and Wastewater Manager or alternatively these fitting can be provided by Council at full cost recovery.

Separate metered water services are to be provided to every allotment, as well as parks, reserves and landscaped roundabouts.

The meter box for each lot should be located approximately **500mm outside the front and side property boundaries**. Services should be located in pairs at side property boundaries. Note that the stop valve should be located no more than 450mm from the water meter, measured from the road alignment.

All service connections should cross the road perpendicular to the road centreline. Non-detectable marking tape to *AS 2648* shall be laid 150mm above all water services. Such connections should be marked on each kerb with a "W"

A Work as Executed plan (WAE) **MUST** be submitted to council prior to the release of the linen plan, outlining the following:

- Service meter location
- All main isolation valves hydrants and scours
- Water mains lay out and property services

5. Pipe Fittings

Fire hydrants of an approved type are to be installed along the water main at such convenient distances, and at such places, as may be necessary for the ready supply of water to extinguish fires accordance with AS/NZS 2419.

On water mains without hydrants (e.g. generally bulk supply mains), scour (or drain) outlets, with isolating valve control, shall be provided at all low points. Wherever possible, on water mains with hydrants (e.g. reticulation), a hydrant should be located at or near all low points, and are to be discharged via a pipe to a storm water drainage pit.

Stop valves are generally located adjacent to tees, and so that no more than 25 properties are isolated at any one time, by closing no more than four valves. To close a valve, the spindle will turn anticlockwise, as viewed, when facing the spindle cap

Provision shall be made concerning air release from all high points on water mains. This should normally be achieved in reticulation mains by means of a fire hydrant, a branch, or a service pipe located at the high point. Where this cannot be achieved a DN25 single orifice air valve should be provided

All maincocks, tees, hydrants, stop valves, scour valves, and air valves should be located within the public footway and shall be of type approved by Council.

All gibaults are to be long sleeved.

At road intersections, two forty-five degree (45o) bends should be used to negotiate the corner.

Thrust blocks shall be provided at all bends, tees, and dead-ends.

All valves and hydrants shall be enclosed within valve chambers.

Markings and indicator posts shall be provided at all hydrants and valves.

6. Testing

Prior to acceptance of the water reticulation network, all pipelines shall be inspected and pressure testing will be carried out.

7. Mains in Cul-de-Sacs

Where the cul-de-sac incorporates an adjacent street connected by a pathway, or ends in a public reserve, the water main shall extend through the pathway or reserve so that a dead-end is not created in the main.

In all other cases, the main is to be looped around the cul-de-sac.

Work as Executed Plans

Following the satisfactory completion of works, 'Works-As-Executed' (W.A.E.) plans prepared by a registered surveyor or professional engineer shall be submitted to Council's Group Manager of Operations. Such plan must be lodged prior to the release of the subdivision linen plan, or prior to occupation or use of the development.

The W.A.E. plans shall be Engineering Drawings as modified, and shall include the following items:

- invert levels of all drainage and sewerage lines at entrance and exit of MH;
- location, class, size, and material of all pipes and subsoil lines;
- location and diameter of service conduits;
- location of stop valves, hydrants, water services,
- longitudinal sections for each sewer main,
- depth of sewer manholes,
- sewer man hole schedule numbered
- location of sewer junctions measured from downstream of MH
- minimum depth and cover, maximum depth, grade, chainage, inverts,
- storm water and interallotment drainage pits;
- location of water meters and serial number of meter installed in relation to the lot it is installed on
- site regarding details – finished surface levels at centre of front and rear boundaries;
- the location and level of any permanent survey marks;

Each Works-As-Executed plan must include certification by the Registered Surveyor responsible for the preparation of the plan

- location, class, size, and material of all pipes and subsoil lines;
- location and diameter of service conduits;
- location of stop valves, hydrants, water services,
- longitudinal sections for each sewer main,
- depth of sewer manholes,
- sewer man hole schedule numbered
- location of sewer junctions measured from downstream of MH
- minimum depth and cover, maximum depth, grade, chainage, inverts,
- storm water and interallotment drainage pits;
- location of water meters and serial number of meter installed in relation to the lot it is installed on
- site regarding details – finished surface levels at centre of front and rear boundaries;
- the location and level of any permanent survey marks;

Each Works-As-Executed plan must include certification by the Registered Surveyor responsible for the preparation of the plan.

Sampling log

[illegible]

Appendix 5. Soil analysis results – SGS report number SE218849

CLIENT DETAILS

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Project **13079**
Order Number **13079**
Samples 86

LABORATORY DETAILS

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SGS Reference **SE218849 R0**
Date Received 22/4/2021
Date Reported 30/4/2021

COMMENTS

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

SIGNATORIES



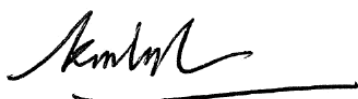
Akheequeq BENIAEMEEN
Chemist



Bennet LO
Senior Organic Chemist/Metals Chemist



Dong LIANG
Metals/Inorganics Team Leader



Ly Kim HA
Organic Section Head



Teresa NGUYEN
Organic Chemist

VOC's in Soil [AN433] Tested: 23/4/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	BH1(200)	BH1(900)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH2(400)	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH5(100)	BH6(200)	BH6(600)	BH7(100)	BH7(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080	19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH7(400)	BH7(800)	BH1(200)DA
			SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.084	19/4/21 16:30 SE218849.085	19/4/21 16:30 SE218849.086
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 23/4/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	BH1(200)	BH1(900)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH2(400)	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH5(100)	BH6(200)	BH6(600)	BH7(100)	BH7(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080	19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH7(400)	BH7(800)	BH1(200)DA
			SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.084	19/4/21 16:30 SE218849.085	19/4/21 16:30 SE218849.086
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 23/4/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	BH1(200)	BH1(900)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	59	<45	<45
TRH C29-C36	mg/kg	45	<45	110	62	45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	94	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	120	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH2(400)	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH5(100)	BH6(200)	BH6(600)	BH7(100)	BH7(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080	19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 23/4/2021 (continued)

PARAMETER	UOM	LOR	BH7(400)	BH7(800)	BH1(200)DA
			SOIL - 19/4/21 16:30 SE218849.084	SOIL - 19/4/21 16:30 SE218849.085	SOIL - 19/4/21 16:30 SE218849.086
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 23/4/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	BH1(200)	BH1(900)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.6	0.7	<0.1	0.2	0.2
Anthracene	mg/kg	0.1	0.2	0.2	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	1.2	0.9	<0.1	0.3	0.2
Pyrene	mg/kg	0.1	1.1	0.8	<0.1	0.3	0.3
Benzo(a)anthracene	mg/kg	0.1	0.4	0.2	<0.1	0.2	0.2
Chrysene	mg/kg	0.1	0.5	0.2	<0.1	0.2	0.2
Benzo(b&j)fluoranthene	mg/kg	0.1	0.4	0.2	<0.1	0.2	0.2
Benzo(k)fluoranthene	mg/kg	0.1	0.3	0.1	<0.1	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.5	0.3	<0.1	0.3	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.3	0.2	<0.1	0.2	0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.4	0.2	<0.1	0.2	0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	0.6	0.3	<0.2	0.3	0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	0.7	0.4	<0.3	0.4	0.4
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.7	0.4	<0.2	0.4	0.3
Total PAH (18)	mg/kg	0.8	5.8	4.1	<0.8	2.2	1.7
Total PAH (NEPM/WHO 16)	mg/kg	0.8	5.8	4.1	<0.8	2.2	1.7

PARAMETER	UOM	LOR	BH2(400)	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.2	0.1	<0.1	0.2	<0.1
Pyrene	mg/kg	0.1	0.2	0.2	<0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.1	0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	0.1	0.1	0.1	<0.1	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	0.1	0.1	<0.1	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.1	0.1	<0.1	0.2	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.2	0.2	<0.2	0.2	<0.2
Total PAH (18)	mg/kg	0.8	1.0	<0.8	<0.8	1.2	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	1.0	<0.8	<0.8	1.2	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 23/4/2021 (continued)

PARAMETER	UOM	LOR	BH5(100)	BH6(200)	BH6(600)	BH7(100)	BH7(200)
			SOIL - 19/4/21 16:30 SE218849.079	SOIL - 19/4/21 16:30 SE218849.080	SOIL - 19/4/21 16:30 SE218849.081	SOIL - 19/4/21 16:30 SE218849.082	SOIL - 19/4/21 16:30 SE218849.083
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	0.4	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	0.8	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	0.9	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	0.5	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.4	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.4	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	0.6	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	0.4	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	0.3	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	0.8	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	0.9	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	0.8	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	5.3	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	5.3	<0.8	<0.8

PARAMETER	UOM	LOR	BH7(400)	BH7(800)	BH1(200)DA
			SOIL - 19/4/21 16:30 SE218849.084	SOIL - 19/4/21 16:30 SE218849.085	SOIL - 19/4/21 16:30 SE218849.086
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.5	<0.1	<0.1
Anthracene	mg/kg	0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.8	<0.1	0.1
Pyrene	mg/kg	0.1	0.9	0.1	0.1
Benzo(a)anthracene	mg/kg	0.1	0.6	<0.1	<0.1
Chrysene	mg/kg	0.1	0.6	<0.1	0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	<0.1	0.1
Benzo(k)fluoranthene	mg/kg	0.1	0.4	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.7	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.4	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.4	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	0.9	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	1.0	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.9	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	6.0	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	6.0	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 23/4/2021

PARAMETER	UOM	LOR	MR11D	MR21D	MR31D	MR41D	MR51D
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.001	19/4/21 16:30 SE218849.002	19/4/21 16:30 SE218849.003	19/4/21 16:30 SE218849.004	19/4/21 16:30 SE218849.005
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR61D	MR71D	MR81D	MR91D	MR101D
			SOIL - 19/4/21 16:30 SE218849.006	SOIL - 19/4/21 16:30 SE218849.007	SOIL - 19/4/21 16:30 SE218849.008	SOIL - 19/4/21 16:30 SE218849.009	SOIL - 19/4/21 16:30 SE218849.010
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR111D	MR121D	MR131D	MR141D	MR151D
			SOIL - 19/4/21 16:30 SE218849.011	SOIL - 19/4/21 16:30 SE218849.012	SOIL - 19/4/21 16:30 SE218849.013	SOIL - 19/4/21 16:30 SE218849.014	SOIL - 19/4/21 16:30 SE218849.015
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

OC Pesticides in Soil [AN420] Tested: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR161D	MR171D	MR184D	MR191D	MR201D
			SOIL - 19/4/21 16:30 SE218849.016	SOIL - 19/4/21 16:30 SE218849.017	SOIL - 19/4/21 16:30 SE218849.018	SOIL - 19/4/21 16:30 SE218849.019	SOIL - 19/4/21 16:30 SE218849.020
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR211D	MR221D	MR231D	MR241D	MR251D
			SOIL - 19/4/21 16:30 SE218849.021	SOIL - 19/4/21 16:30 SE218849.022	SOIL - 19/4/21 16:30 SE218849.023	SOIL - 19/4/21 16:30 SE218849.024	SOIL - 19/4/21 16:30 SE218849.025
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR261D	MR271D	MR281D	MR291D	MR301D
			SOIL - 19/4/21 16:30 SE218849.026	SOIL - 19/4/21 16:30 SE218849.027	SOIL - 19/4/21 16:30 SE218849.028	SOIL - 19/4/21 16:30 SE218849.029	SOIL - 19/4/21 16:30 SE218849.030
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	MR311D	MR321D	MR151DA	MR251DA	HS2
			SOIL - 19/4/21 16:30 SE218849.031	SOIL - 19/4/21 16:30 SE218849.032	SOIL - 19/4/21 16:30 SE218849.033	SOIL - 19/4/21 16:30 SE218849.034	SOIL - 19/4/21 16:30 SE218849.070
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	HS3	BH1(200)	BH1(900)	BH2(400)	BH2(800)
			SOIL - 19/4/21 16:30 SE218849.071	SOIL - 19/4/21 16:30 SE218849.072	SOIL - 19/4/21 16:30 SE218849.073	SOIL - 19/4/21 16:30 SE218849.074	SOIL - 19/4/21 16:30 SE218849.075
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	BH2(1000)	BH3(400)	BH3(1000)	BH5(100)	BH6(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078	19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080
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: 23/4/2021 (continued)

PARAMETER	UOM	LOR	BH6(600)	BH7(100)	BH7(200)	BH7(400)	BH7(800)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083	19/4/21 16:30 SE218849.084	19/4/21 16:30 SE218849.085
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: 23/4/2021 (continued)

			BH1(200)DA
			SOIL
			-
			19/4/21 16:30
			SE218849.086
PARAMETER	UOM	LOR	
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	<0.1
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 Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 27/4/2021

PARAMETER	UOM	LOR	MR1C	MR2C	MR3C	MR4C	MR5C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.035	19/4/21 16:30 SE218849.036	19/4/21 16:30 SE218849.037	19/4/21 16:30 SE218849.038	19/4/21 16:30 SE218849.039
Arsenic, As	mg/kg	1	1	1	7	4	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	3.0	3.9	8.6	5.8	9.3
Copper, Cu	mg/kg	0.5	13	14	18	13	9.2
Lead, Pb	mg/kg	1	7	9	12	16	12
Nickel, Ni	mg/kg	0.5	1.0	0.9	2.1	2.0	3.3
Zinc, Zn	mg/kg	2	11	17	14	16	17

PARAMETER	UOM	LOR	MR6C	MR7C	MR8C	MR9C	MR10C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.040	19/4/21 16:30 SE218849.041	19/4/21 16:30 SE218849.042	19/4/21 16:30 SE218849.043	19/4/21 16:30 SE218849.044
Arsenic, As	mg/kg	1	1	<1	<1	1	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	5.0	3.7	3.7	2.9	7.4
Copper, Cu	mg/kg	0.5	12	7.6	13	9.2	12
Lead, Pb	mg/kg	1	10	6	6	7	12
Nickel, Ni	mg/kg	0.5	1.5	1.5	1.5	1.1	2.1
Zinc, Zn	mg/kg	2	13	8.0	10	9.4	15

PARAMETER	UOM	LOR	MR11C	MR12C	MR13C	MR14C	MR15C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.045	19/4/21 16:30 SE218849.046	19/4/21 16:30 SE218849.047	19/4/21 16:30 SE218849.048	19/4/21 16:30 SE218849.049
Arsenic, As	mg/kg	1	1	4	6	<1	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	3.5	6.3	8.9	2.2	2.5
Copper, Cu	mg/kg	0.5	11	21	19	12	14
Lead, Pb	mg/kg	1	6	28	23	7	7
Nickel, Ni	mg/kg	0.5	1.3	4.5	3.7	0.8	0.9
Zinc, Zn	mg/kg	2	9.5	29	17	6.5	5.9

PARAMETER	UOM	LOR	MR16C	MR17C	MR18C	MR19C	MR20C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.050	19/4/21 16:30 SE218849.051	19/4/21 16:30 SE218849.052	19/4/21 16:30 SE218849.053	19/4/21 16:30 SE218849.054
Arsenic, As	mg/kg	1	4	4	3	2	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	5.2	5.5	5.5	3.4	4.4
Copper, Cu	mg/kg	0.5	9.6	17	17	14	15
Lead, Pb	mg/kg	1	12	21	33	9	13
Nickel, Ni	mg/kg	0.5	1.7	3.6	1.8	1.3	1.0
Zinc, Zn	mg/kg	2	8.5	14	21	11	7.0

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 27/4/2021 (continued)

PARAMETER	UOM	LOR	MR21C	MR22C	MR23C	MR24C	MR25C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.055	19/4/21 16:30 SE218849.056	19/4/21 16:30 SE218849.057	19/4/21 16:30 SE218849.058	19/4/21 16:30 SE218849.059
Arsenic, As	mg/kg	1	3	2	3	3	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	4.3	3.1	5.4	6.0	5.0
Copper, Cu	mg/kg	0.5	13	12	17	14	16
Lead, Pb	mg/kg	1	13	10	20	14	15
Nickel, Ni	mg/kg	0.5	1.0	1.1	2.1	2.4	1.5
Zinc, Zn	mg/kg	2	7.8	9.5	22	20	9.8

PARAMETER	UOM	LOR	MR26C	MR27C	MR28C	MR29C	MR30C
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.060	19/4/21 16:30 SE218849.061	19/4/21 16:30 SE218849.062	19/4/21 16:30 SE218849.063	19/4/21 16:30 SE218849.064
Arsenic, As	mg/kg	1	2	5	3	2	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	9.5	8.2	6.7	5.3	8.5
Copper, Cu	mg/kg	0.5	11	23	15	20	21
Lead, Pb	mg/kg	1	12	26	15	31	60
Nickel, Ni	mg/kg	0.5	4.6	10	3.3	1.8	8.1
Zinc, Zn	mg/kg	2	24	51	17	13	190

PARAMETER	UOM	LOR	MR31C	MR32C	NR15DA	NR25DA	HS1
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.065	19/4/21 16:30 SE218849.066	19/4/21 16:30 SE218849.067	19/4/21 16:30 SE218849.068	19/4/21 16:30 SE218849.069
Arsenic, As	mg/kg	1	3	3	1	3	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	8.6	5.3	2.2	5.4	9.6
Copper, Cu	mg/kg	0.5	19	39	15	18	25
Lead, Pb	mg/kg	1	89	21	8	16	44
Nickel, Ni	mg/kg	0.5	1.4	1.7	0.7	1.4	9.6
Zinc, Zn	mg/kg	2	18	66	5.5	9.7	100

PARAMETER	UOM	LOR	HS2	HS3	BH1(200)	BH1(900)	BH2(400)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073	19/4/21 16:30 SE218849.074
Arsenic, As	mg/kg	1	1	2	4	3	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	11	8.1	7.9	6.6	8.1
Copper, Cu	mg/kg	0.5	5.9	3.4	12	9.8	9.5
Lead, Pb	mg/kg	1	12	7	100	18	25
Nickel, Ni	mg/kg	0.5	2.7	1.0	1.9	2.0	1.9
Zinc, Zn	mg/kg	2	26	17	71	37	52

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 27/4/2021 (continued)

PARAMETER	UOM	LOR	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)	BH5(100)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078	19/4/21 16:30 SE218849.079
Arsenic, As	mg/kg	1	4	1	5	3	1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	8.2	5.6	10	12	2.2
Copper, Cu	mg/kg	0.5	12	3.7	8.6	14	16
Lead, Pb	mg/kg	1	32	5	31	17	14
Nickel, Ni	mg/kg	0.5	2.7	1.0	1.5	2.0	1.2
Zinc, Zn	mg/kg	2	52	8.2	33	13	14

PARAMETER	UOM	LOR	BH6(200)	BH6(600)	BH7(100)	BH7(200)	BH7(400)
			SOIL	SOIL	SOIL	SOIL	SOIL
			19/4/21 16:30 SE218849.080	19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083	19/4/21 16:30 SE218849.084
Arsenic, As	mg/kg	1	4	6	4	2	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	8.1	6.8	14	8.7	6.6
Copper, Cu	mg/kg	0.5	7.4	19	6.9	9.2	22
Lead, Pb	mg/kg	1	12	30	11	10	36
Nickel, Ni	mg/kg	0.5	2.3	2.3	1.5	2.8	2.7
Zinc, Zn	mg/kg	2	19	85	9.0	12	60

PARAMETER	UOM	LOR	BH7(800)	BH1(200)DA
			SOIL	SOIL
			19/4/21 16:30 SE218849.085	19/4/21 16:30 SE218849.086
Arsenic, As	mg/kg	1	2	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	4.8	9.3
Copper, Cu	mg/kg	0.5	15	11
Lead, Pb	mg/kg	1	33	110
Nickel, Ni	mg/kg	0.5	1.8	2.0
Zinc, Zn	mg/kg	2	15	69

Mercury in Soil [AN312] Tested: 27/4/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	BH1(200)	BH1(900)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070	19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073
Mercury	mg/kg	0.05	0.06	<0.05	<0.05	<0.05	0.15

PARAMETER	UOM	LOR	BH2(400)	BH2(800)	BH2(1000)	BH3(400)	BH3(1000)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075	19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH5(100)	BH6(200)	BH6(600)	BH7(100)	BH7(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080	19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH7(400)	BH7(800)	BH1(200)DA
			SOIL	SOIL	SOIL
			-	-	-
			19/4/21 16:30 SE218849.084	19/4/21 16:30 SE218849.085	19/4/21 16:30 SE218849.086
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 26/4/2021

PARAMETER	UOM	LOR	MR11D	MR21D	MR31D	MR41D	MR51D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.001	19/4/21 16:30 SE218849.002	19/4/21 16:30 SE218849.003	19/4/21 16:30 SE218849.004	19/4/21 16:30 SE218849.005
% Moisture	%w/w	1	18.5	9.1	10.4	23.4	37.6

PARAMETER	UOM	LOR	MR61D	MR71D	MR81D	MR91D	MR101D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.006	19/4/21 16:30 SE218849.007	19/4/21 16:30 SE218849.008	19/4/21 16:30 SE218849.009	19/4/21 16:30 SE218849.010
% Moisture	%w/w	1	8.1	8.6	10.8	9.8	9.4

PARAMETER	UOM	LOR	MR111D	MR121D	MR131D	MR141D	MR151D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.011	19/4/21 16:30 SE218849.012	19/4/21 16:30 SE218849.013	19/4/21 16:30 SE218849.014	19/4/21 16:30 SE218849.015
% Moisture	%w/w	1	14.9	41.2	38.7	12.0	24.9

PARAMETER	UOM	LOR	MR161D	MR171D	MR184D	MR191D	MR201D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.016	19/4/21 16:30 SE218849.017	19/4/21 16:30 SE218849.018	19/4/21 16:30 SE218849.019	19/4/21 16:30 SE218849.020
% Moisture	%w/w	1	12.8	45.3	16.3	21.3	30.0

PARAMETER	UOM	LOR	MR211D	MR221D	MR231D	MR241D	MR251D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.021	19/4/21 16:30 SE218849.022	19/4/21 16:30 SE218849.023	19/4/21 16:30 SE218849.024	19/4/21 16:30 SE218849.025
% Moisture	%w/w	1	14.9	12.3	29.3	8.8	16.2

PARAMETER	UOM	LOR	MR261D	MR271D	MR281D	MR291D	MR301D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.026	19/4/21 16:30 SE218849.027	19/4/21 16:30 SE218849.028	19/4/21 16:30 SE218849.029	19/4/21 16:30 SE218849.030
% Moisture	%w/w	1	9.2	36.1	8.7	13.6	32.2

PARAMETER	UOM	LOR	MR311D	MR321D	MR151DA	MR251DA	MR1C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.031	19/4/21 16:30 SE218849.032	19/4/21 16:30 SE218849.033	19/4/21 16:30 SE218849.034	19/4/21 16:30 SE218849.035
% Moisture	%w/w	1	12.2	19.9	27.7	17.7	7.7

Moisture Content [AN002] Tested: 26/4/2021 (continued)

PARAMETER	UOM	LOR	MR2C	MR3C	MR4C	MR5C	MR6C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.036	19/4/21 16:30 SE218849.037	19/4/21 16:30 SE218849.038	19/4/21 16:30 SE218849.039	19/4/21 16:30 SE218849.040
% Moisture	%w/w	1	11.5	13.8	22.4	12.4	10.9

PARAMETER	UOM	LOR	MR7C	MR8C	MR9C	MR10C	MR11C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.041	19/4/21 16:30 SE218849.042	19/4/21 16:30 SE218849.043	19/4/21 16:30 SE218849.044	19/4/21 16:30 SE218849.045
% Moisture	%w/w	1	11.0	10.8	8.0	11.9	5.8

PARAMETER	UOM	LOR	MR12C	MR13C	MR14C	MR15C	MR16C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.046	19/4/21 16:30 SE218849.047	19/4/21 16:30 SE218849.048	19/4/21 16:30 SE218849.049	19/4/21 16:30 SE218849.050
% Moisture	%w/w	1	49.3	31.7	8.8	15.2	17.3

PARAMETER	UOM	LOR	MR17C	MR18C	MR19C	MR20C	MR21C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.051	19/4/21 16:30 SE218849.052	19/4/21 16:30 SE218849.053	19/4/21 16:30 SE218849.054	19/4/21 16:30 SE218849.055
% Moisture	%w/w	1	30.3	19.1	16.7	14.2	16.8

PARAMETER	UOM	LOR	MR22C	MR23C	MR24C	MR25C	MR26C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.056	19/4/21 16:30 SE218849.057	19/4/21 16:30 SE218849.058	19/4/21 16:30 SE218849.059	19/4/21 16:30 SE218849.060
% Moisture	%w/w	1	14.6	14.3	14.1	14.7	11.2

PARAMETER	UOM	LOR	MR27C	MR28C	MR29C	MR30C	MR31C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.061	19/4/21 16:30 SE218849.062	19/4/21 16:30 SE218849.063	19/4/21 16:30 SE218849.064	19/4/21 16:30 SE218849.065
% Moisture	%w/w	1	34.5	13.3	13.0	30.3	11.1

PARAMETER	UOM	LOR	MR32C	NR15DA	NR25DA	HS1	HS2
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.066	19/4/21 16:30 SE218849.067	19/4/21 16:30 SE218849.068	19/4/21 16:30 SE218849.069	19/4/21 16:30 SE218849.070
% Moisture	%w/w	1	18.7	16.3	15.0	54.5	12.8

Moisture Content [AN002] Tested: 26/4/2021 (continued)

PARAMETER	UOM	LOR	HS3	BH1(200)	BH1(900)	BH2(400)	BH2(800)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.071	19/4/21 16:30 SE218849.072	19/4/21 16:30 SE218849.073	19/4/21 16:30 SE218849.074	19/4/21 16:30 SE218849.075
% Moisture	%w/w	1	7.6	11.8	12.2	12.1	11.5

PARAMETER	UOM	LOR	BH2(1000)	BH3(400)	BH3(1000)	BH5(100)	BH6(200)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.076	19/4/21 16:30 SE218849.077	19/4/21 16:30 SE218849.078	19/4/21 16:30 SE218849.079	19/4/21 16:30 SE218849.080
% Moisture	%w/w	1	8.6	13.2	12.5	9.1	10.9

PARAMETER	UOM	LOR	BH6(600)	BH7(100)	BH7(200)	BH7(400)	BH7(800)
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			19/4/21 16:30 SE218849.081	19/4/21 16:30 SE218849.082	19/4/21 16:30 SE218849.083	19/4/21 16:30 SE218849.084	19/4/21 16:30 SE218849.085
% Moisture	%w/w	1	11.3	12.1	16.2	12.1	13.3

PARAMETER	UOM	LOR	BH1(200)DA
			SOIL
			-
			19/4/21 16:30 SE218849.086
% Moisture	%w/w	1	12.0

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.

AN312

Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500

AN403

Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.

AN403

Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.

AN403

The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.

AN420

(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

AN420

SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

AN433

VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	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 $\pm$ sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

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

Note that in terms of units of radioactivity:

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

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

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

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STATEMENT OF QA/QC PERFORMANCE

SE218849 R0

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Project **13079**
Order Number **13079**
Samples 86

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SGS Reference **SE218849 R0**
Date Received 22 Apr 2021
Date Reported 30 Apr 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	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	3 items
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SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	86 Soil
Date documentation received	22/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15.4°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Mercury in Soil

Method: ME-(AU)-ENVJAN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE218849.069	LB223415	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
HS2	SE218849.070	LB223415	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
HS3	SE218849.071	LB223415	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223415	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223417	19 Apr 2021	22 Apr 2021	17 May 2021	27 Apr 2021	17 May 2021	29 Apr 2021

Moisture Content

Method: ME-(AU)-ENVJAN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR11D	SE218849.001	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR21D	SE218849.002	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR31D	SE218849.003	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR41D	SE218849.004	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR51D	SE218849.005	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR61D	SE218849.006	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR71D	SE218849.007	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR81D	SE218849.008	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR91D	SE218849.009	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR101D	SE218849.010	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR111D	SE218849.011	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR121D	SE218849.012	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR131D	SE218849.013	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR141D	SE218849.014	LB223474	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR151D	SE218849.015	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR161D	SE218849.016	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR171D	SE218849.017	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR184D	SE218849.018	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR191D	SE218849.019	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR201D	SE218849.020	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR211D	SE218849.021	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR221D	SE218849.022	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR231D	SE218849.023	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR241D	SE218849.024	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR251D	SE218849.025	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR261D	SE218849.026	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR271D	SE218849.027	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR281D	SE218849.028	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR291D	SE218849.029	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR301D	SE218849.030	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR311D	SE218849.031	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR321D	SE218849.032	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR151DA	SE218849.033	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR251DA	SE218849.034	LB223378	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
MR1C	SE218849.035	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR2C	SE218849.036	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR3C	SE218849.037	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR4C	SE218849.038	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR5C	SE218849.039	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 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

Moisture Content (continued)

Method: ME-(AU)-ENVJAN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR6C	SE218849.040	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR7C	SE218849.041	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR8C	SE218849.042	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR9C	SE218849.043	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR10C	SE218849.044	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR11C	SE218849.045	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR12C	SE218849.046	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR13C	SE218849.047	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR14C	SE218849.048	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR15C	SE218849.049	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR16C	SE218849.050	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR17C	SE218849.051	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR18C	SE218849.052	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR19C	SE218849.053	LB223433	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR20C	SE218849.054	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR21C	SE218849.055	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR22C	SE218849.056	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR23C	SE218849.057	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR24C	SE218849.058	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR25C	SE218849.059	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR26C	SE218849.060	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR27C	SE218849.061	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR28C	SE218849.062	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR29C	SE218849.063	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR30C	SE218849.064	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR31C	SE218849.065	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
MR32C	SE218849.066	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
NR15DA	SE218849.067	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
NR25DA	SE218849.068	LB223434	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	02 May 2021	29 Apr 2021
HS1	SE218849.069	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
HS2	SE218849.070	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
HS3	SE218849.071	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223377	19 Apr 2021	22 Apr 2021	03 May 2021	26 Apr 2021	01 May 2021	29 Apr 2021

OC Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR11D	SE218849.001	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR21D	SE218849.002	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR31D	SE218849.003	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR41D	SE218849.004	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR51D	SE218849.005	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR61D	SE218849.006	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR71D	SE218849.007	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR81D	SE218849.008	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR91D	SE218849.009	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR101D	SE218849.010	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 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

OC Pesticides in Soil (continued)

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR111D	SE218849.011	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR121D	SE218849.012	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR131D	SE218849.013	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR141D	SE218849.014	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR151D	SE218849.015	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR161D	SE218849.016	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR171D	SE218849.017	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR184D	SE218849.018	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR191D	SE218849.019	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR201D	SE218849.020	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR211D	SE218849.021	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR221D	SE218849.022	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR231D	SE218849.023	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR241D	SE218849.024	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR251D	SE218849.025	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR261D	SE218849.026	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR271D	SE218849.027	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR281D	SE218849.028	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR291D	SE218849.029	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR301D	SE218849.030	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR311D	SE218849.031	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR321D	SE218849.032	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR151DA	SE218849.033	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR251DA	SE218849.034	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS1	SE218849.069	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
HS2	SE218849.070	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS3	SE218849.071	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR11D	SE218849.001	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR21D	SE218849.002	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR31D	SE218849.003	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR41D	SE218849.004	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR51D	SE218849.005	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR61D	SE218849.006	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR71D	SE218849.007	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR81D	SE218849.008	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR91D	SE218849.009	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR101D	SE218849.010	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR111D	SE218849.011	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR121D	SE218849.012	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR131D	SE218849.013	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR141D	SE218849.014	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	29 Apr 2021
MR151D	SE218849.015	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR161D	SE218849.016	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR171D	SE218849.017	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR184D	SE218849.018	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR191D	SE218849.019	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR201D	SE218849.020	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR211D	SE218849.021	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR221D	SE218849.022	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR231D	SE218849.023	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR241D	SE218849.024	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR251D	SE218849.025	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR261D	SE218849.026	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR271D	SE218849.027	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR281D	SE218849.028	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR291D	SE218849.029	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR301D	SE218849.030	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR311D	SE218849.031	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR321D	SE218849.032	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR151DA	SE218849.033	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
MR251DA	SE218849.034	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS1	SE218849.069	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS2	SE218849.070	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS3	SE218849.071	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021

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

Method: ME-(AU)-ENVJAN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR1C	SE218849.035	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR2C	SE218849.036	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR3C	SE218849.037	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR4C	SE218849.038	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR5C	SE218849.039	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR6C	SE218849.040	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR7C	SE218849.041	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR8C	SE218849.042	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR9C	SE218849.043	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR10C	SE218849.044	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR11C	SE218849.045	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR12C	SE218849.046	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR13C	SE218849.047	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR14C	SE218849.048	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR15C	SE218849.049	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR16C	SE218849.050	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR17C	SE218849.051	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR18C	SE218849.052	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR19C	SE218849.053	LB223405	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR20C	SE218849.054	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 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

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

Method: ME-(AU)-ENVJAN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR21C	SE218849.055	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR22C	SE218849.056	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR23C	SE218849.057	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR24C	SE218849.058	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR25C	SE218849.059	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR26C	SE218849.060	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR27C	SE218849.061	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR28C	SE218849.062	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR29C	SE218849.063	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR30C	SE218849.064	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR31C	SE218849.065	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
MR32C	SE218849.066	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
NR15DA	SE218849.067	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
NR25DA	SE218849.068	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
HS1	SE218849.069	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
HS2	SE218849.070	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
HS3	SE218849.071	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223406	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223412	19 Apr 2021	22 Apr 2021	16 Oct 2021	27 Apr 2021	16 Oct 2021	29 Apr 2021

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-ENVJAN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR11D	SE218849.001	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR21D	SE218849.002	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR31D	SE218849.003	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR41D	SE218849.004	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR51D	SE218849.005	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR61D	SE218849.006	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR71D	SE218849.007	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR81D	SE218849.008	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR91D	SE218849.009	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR101D	SE218849.010	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR111D	SE218849.011	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR121D	SE218849.012	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR131D	SE218849.013	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR141D	SE218849.014	LB223473	19 Apr 2021	22 Apr 2021	03 May 2021	27 Apr 2021	06 Jun 2021	30 Apr 2021
MR151D	SE218849.015	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR161D	SE218849.016	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR171D	SE218849.017	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR184D	SE218849.018	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR191D	SE218849.019	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR201D	SE218849.020	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR211D	SE218849.021	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR221D	SE218849.022	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR231D	SE218849.023	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR241D	SE218849.024	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR251D	SE218849.025	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-ENVJAN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MR261D	SE218849.026	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR271D	SE218849.027	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR281D	SE218849.028	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR291D	SE218849.029	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR301D	SE218849.030	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR311D	SE218849.031	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR321D	SE218849.032	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR151DA	SE218849.033	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
MR251DA	SE218849.034	LB223262	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
HS1	SE218849.069	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
HS2	SE218849.070	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
HS3	SE218849.071	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH1(200)	SE218849.072	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH1(900)	SE218849.073	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH2(400)	SE218849.074	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH2(800)	SE218849.075	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH2(1000)	SE218849.076	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH3(400)	SE218849.077	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH3(1000)	SE218849.078	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH5(100)	SE218849.079	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH6(200)	SE218849.080	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH6(600)	SE218849.081	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH7(100)	SE218849.082	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH7(200)	SE218849.083	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH7(400)	SE218849.084	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH7(800)	SE218849.085	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021
BH1(200)DA	SE218849.086	LB223261	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	30 Apr 2021

VOC's in Soil

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE218849.069	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS2	SE218849.070	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS3	SE218849.071	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH5(100)	SE218849.079	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE218849.069	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS2	SE218849.070	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
HS3	SE218849.071	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)	SE218849.072	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(900)	SE218849.073	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(400)	SE218849.074	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(800)	SE218849.075	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH2(1000)	SE218849.076	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(400)	SE218849.077	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH3(1000)	SE218849.078	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 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

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH5(100)	SE218849.079	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(200)	SE218849.080	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH6(600)	SE218849.081	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(100)	SE218849.082	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(200)	SE218849.083	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(400)	SE218849.084	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH7(800)	SE218849.085	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 2021
BH1(200)DA	SE218849.086	LB223260	19 Apr 2021	22 Apr 2021	03 May 2021	23 Apr 2021	02 Jun 2021	29 Apr 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)	MR11D	SE218849.001	%	60 - 130%	98
	MR21D	SE218849.002	%	60 - 130%	96
	MR31D	SE218849.003	%	60 - 130%	97
	MR41D	SE218849.004	%	60 - 130%	98
	MR51D	SE218849.005	%	60 - 130%	103
	MR61D	SE218849.006	%	60 - 130%	96
	MR71D	SE218849.007	%	60 - 130%	94
	MR81D	SE218849.008	%	60 - 130%	90
	MR91D	SE218849.009	%	60 - 130%	98
	MR101D	SE218849.010	%	60 - 130%	95
	MR111D	SE218849.011	%	60 - 130%	99
	MR121D	SE218849.012	%	60 - 130%	110
	MR131D	SE218849.013	%	60 - 130%	102
	MR141D	SE218849.014	%	60 - 130%	100
	MR151D	SE218849.015	%	60 - 130%	99
	MR161D	SE218849.016	%	60 - 130%	87
	MR171D	SE218849.017	%	60 - 130%	98
	MR184D	SE218849.018	%	60 - 130%	92
	MR191D	SE218849.019	%	60 - 130%	90
	MR201D	SE218849.020	%	60 - 130%	93
	MR211D	SE218849.021	%	60 - 130%	93
	MR221D	SE218849.022	%	60 - 130%	95
	MR231D	SE218849.023	%	60 - 130%	97
	MR241D	SE218849.024	%	60 - 130%	93
	MR251D	SE218849.025	%	60 - 130%	95
	MR261D	SE218849.026	%	60 - 130%	92
	MR271D	SE218849.027	%	60 - 130%	101
	MR281D	SE218849.028	%	60 - 130%	94
	MR291D	SE218849.029	%	60 - 130%	92
	MR301D	SE218849.030	%	60 - 130%	93
	MR311D	SE218849.031	%	60 - 130%	92
	MR321D	SE218849.032	%	60 - 130%	96
	MR151DA	SE218849.033	%	60 - 130%	100
	MR251DA	SE218849.034	%	60 - 130%	96
	HS2	SE218849.070	%	60 - 130%	95
	HS3	SE218849.071	%	60 - 130%	96
	BH1(200)	SE218849.072	%	60 - 130%	94
	BH1(900)	SE218849.073	%	60 - 130%	99
	BH2(400)	SE218849.074	%	60 - 130%	91
	BH2(800)	SE218849.075	%	60 - 130%	100
	BH2(1000)	SE218849.076	%	60 - 130%	93
	BH3(400)	SE218849.077	%	60 - 130%	94
	BH3(1000)	SE218849.078	%	60 - 130%	96
	BH5(100)	SE218849.079	%	60 - 130%	94
	BH6(200)	SE218849.080	%	60 - 130%	92
	BH6(600)	SE218849.081	%	60 - 130%	95
	BH7(100)	SE218849.082	%	60 - 130%	101
	BH7(200)	SE218849.083	%	60 - 130%	96
	BH7(400)	SE218849.084	%	60 - 130%	95
	BH7(800)	SE218849.085	%	60 - 130%	95
	BH1(200)DA	SE218849.086	%	60 - 130%	95

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	HS1	SE218849.069	%	70 - 130%	97
	HS2	SE218849.070	%	70 - 130%	111
	HS3	SE218849.071	%	70 - 130%	98
	BH1(200)	SE218849.072	%	70 - 130%	94
	BH1(900)	SE218849.073	%	70 - 130%	95
	BH2(400)	SE218849.074	%	70 - 130%	95
	BH2(800)	SE218849.075	%	70 - 130%	97

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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH2(1000)	SE218849.076	%	70 - 130%	104
	BH3(400)	SE218849.077	%	70 - 130%	102
	BH3(1000)	SE218849.078	%	70 - 130%	107
	BH5(100)	SE218849.079	%	70 - 130%	88
	BH6(200)	SE218849.080	%	70 - 130%	97
	BH6(600)	SE218849.081	%	70 - 130%	93
	BH7(100)	SE218849.082	%	70 - 130%	92
	BH7(200)	SE218849.083	%	70 - 130%	94
	BH7(400)	SE218849.084	%	70 - 130%	98
	BH7(800)	SE218849.085	%	70 - 130%	92
	BH1(200)DA	SE218849.086	%	70 - 130%	116
d14-p-terphenyl (Surrogate)	HS1	SE218849.069	%	70 - 130%	102
	HS2	SE218849.070	%	70 - 130%	100
	HS3	SE218849.071	%	70 - 130%	103
	BH1(200)	SE218849.072	%	70 - 130%	101
	BH1(900)	SE218849.073	%	70 - 130%	105
	BH2(400)	SE218849.074	%	70 - 130%	103
	BH2(800)	SE218849.075	%	70 - 130%	102
	BH2(1000)	SE218849.076	%	70 - 130%	101
	BH3(400)	SE218849.077	%	70 - 130%	109
	BH3(1000)	SE218849.078	%	70 - 130%	104
	BH5(100)	SE218849.079	%	70 - 130%	98
	BH6(200)	SE218849.080	%	70 - 130%	104
	BH6(600)	SE218849.081	%	70 - 130%	97
	BH7(100)	SE218849.082	%	70 - 130%	102
	BH7(200)	SE218849.083	%	70 - 130%	101
	BH7(400)	SE218849.084	%	70 - 130%	100
	BH7(800)	SE218849.085	%	70 - 130%	102
	BH1(200)DA	SE218849.086	%	70 - 130%	119
d5-nitrobenzene (Surrogate)	HS1	SE218849.069	%	70 - 130%	108
	HS2	SE218849.070	%	70 - 130%	108
	HS3	SE218849.071	%	70 - 130%	114
	BH1(200)	SE218849.072	%	70 - 130%	106
	BH1(900)	SE218849.073	%	70 - 130%	103
	BH2(400)	SE218849.074	%	70 - 130%	111
	BH2(800)	SE218849.075	%	70 - 130%	106
	BH2(1000)	SE218849.076	%	70 - 130%	104
	BH3(400)	SE218849.077	%	70 - 130%	122
	BH3(1000)	SE218849.078	%	70 - 130%	109
	BH5(100)	SE218849.079	%	70 - 130%	107
	BH6(200)	SE218849.080	%	70 - 130%	110
	BH6(600)	SE218849.081	%	70 - 130%	100
	BH7(100)	SE218849.082	%	70 - 130%	109
	BH7(200)	SE218849.083	%	70 - 130%	105
	BH7(400)	SE218849.084	%	70 - 130%	110
	BH7(800)	SE218849.085	%	70 - 130%	110
	BH1(200)DA	SE218849.086	%	70 - 130%	108

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE218849.069	%	60 - 130%	67
	HS2	SE218849.070	%	60 - 130%	74
	HS3	SE218849.071	%	60 - 130%	80
	BH1(200)	SE218849.072	%	60 - 130%	78
	BH1(900)	SE218849.073	%	60 - 130%	76
	BH2(400)	SE218849.074	%	60 - 130%	75
	BH2(800)	SE218849.075	%	60 - 130%	77
	BH2(1000)	SE218849.076	%	60 - 130%	73
	BH3(400)	SE218849.077	%	60 - 130%	76
	BH3(1000)	SE218849.078	%	60 - 130%	73
	BH5(100)	SE218849.079	%	60 - 130%	78

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.

VOC's in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH6(200)	SE218849.080	%	60 - 130%	76
	BH6(600)	SE218849.081	%	60 - 130%	70
	BH7(100)	SE218849.082	%	60 - 130%	71
	BH7(200)	SE218849.083	%	60 - 130%	68
	BH7(400)	SE218849.084	%	60 - 130%	73
	BH7(800)	SE218849.085	%	60 - 130%	70
d4-1,2-dichloroethane (Surrogate)	BH1(200)DA	SE218849.086	%	60 - 130%	75
	HS1	SE218849.069	%	60 - 130%	77
	HS2	SE218849.070	%	60 - 130%	81
	HS3	SE218849.071	%	60 - 130%	89
	BH1(200)	SE218849.072	%	60 - 130%	90
	BH1(900)	SE218849.073	%	60 - 130%	85
	BH2(400)	SE218849.074	%	60 - 130%	85
	BH2(800)	SE218849.075	%	60 - 130%	89
	BH2(1000)	SE218849.076	%	60 - 130%	83
	BH3(400)	SE218849.077	%	60 - 130%	87
	BH3(1000)	SE218849.078	%	60 - 130%	84
	BH5(100)	SE218849.079	%	60 - 130%	89
	BH6(200)	SE218849.080	%	60 - 130%	86
	BH6(600)	SE218849.081	%	60 - 130%	80
	BH7(100)	SE218849.082	%	60 - 130%	82
	BH7(200)	SE218849.083	%	60 - 130%	79
	BH7(400)	SE218849.084	%	60 - 130%	84
	BH7(800)	SE218849.085	%	60 - 130%	82
	BH1(200)DA	SE218849.086	%	60 - 130%	82
d8-toluene (Surrogate)	HS1	SE218849.069	%	60 - 130%	76
	HS2	SE218849.070	%	60 - 130%	82
	HS3	SE218849.071	%	60 - 130%	90
	BH1(200)	SE218849.072	%	60 - 130%	89
	BH1(900)	SE218849.073	%	60 - 130%	83
	BH2(400)	SE218849.074	%	60 - 130%	83
	BH2(800)	SE218849.075	%	60 - 130%	86
	BH2(1000)	SE218849.076	%	60 - 130%	79
	BH3(400)	SE218849.077	%	60 - 130%	84
	BH3(1000)	SE218849.078	%	60 - 130%	82
	BH5(100)	SE218849.079	%	60 - 130%	88
	BH6(200)	SE218849.080	%	60 - 130%	86
	BH6(600)	SE218849.081	%	60 - 130%	77
	BH7(100)	SE218849.082	%	60 - 130%	80
	BH7(200)	SE218849.083	%	60 - 130%	75
	BH7(400)	SE218849.084	%	60 - 130%	80
	BH7(800)	SE218849.085	%	60 - 130%	79
	BH1(200)DA	SE218849.086	%	60 - 130%	81

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE218849.069	%	60 - 130%	67
	HS2	SE218849.070	%	60 - 130%	74
	HS3	SE218849.071	%	60 - 130%	80
	BH1(200)	SE218849.072	%	60 - 130%	78
	BH1(900)	SE218849.073	%	60 - 130%	76
	BH2(400)	SE218849.074	%	60 - 130%	75
	BH2(800)	SE218849.075	%	60 - 130%	77
	BH2(1000)	SE218849.076	%	60 - 130%	73
	BH3(400)	SE218849.077	%	60 - 130%	76
	BH3(1000)	SE218849.078	%	60 - 130%	73
	BH5(100)	SE218849.079	%	60 - 130%	78
	BH6(200)	SE218849.080	%	60 - 130%	76
	BH6(600)	SE218849.081	%	60 - 130%	70
	BH7(100)	SE218849.082	%	60 - 130%	71
	BH7(200)	SE218849.083	%	60 - 130%	68

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.

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH7(400)	SE218849.084	%	60 - 130%	73
	BH7(800)	SE218849.085	%	60 - 130%	70
	BH1(200)DA	SE218849.086	%	60 - 130%	75
d4-1,2-dichloroethane (Surrogate)	HS1	SE218849.069	%	60 - 130%	77
	HS2	SE218849.070	%	60 - 130%	81
	HS3	SE218849.071	%	60 - 130%	89
	BH1(200)	SE218849.072	%	60 - 130%	90
	BH1(900)	SE218849.073	%	60 - 130%	85
	BH2(400)	SE218849.074	%	60 - 130%	85
	BH2(800)	SE218849.075	%	60 - 130%	89
	BH2(1000)	SE218849.076	%	60 - 130%	83
	BH3(400)	SE218849.077	%	60 - 130%	87
	BH3(1000)	SE218849.078	%	60 - 130%	84
	BH5(100)	SE218849.079	%	60 - 130%	89
	BH6(200)	SE218849.080	%	60 - 130%	86
	BH6(600)	SE218849.081	%	60 - 130%	80
	BH7(100)	SE218849.082	%	60 - 130%	82
	BH7(200)	SE218849.083	%	60 - 130%	79
	BH7(400)	SE218849.084	%	60 - 130%	84
	BH7(800)	SE218849.085	%	60 - 130%	82
	BH1(200)DA	SE218849.086	%	60 - 130%	82
d8-toluene (Surrogate)	HS1	SE218849.069	%	60 - 130%	76
	HS2	SE218849.070	%	60 - 130%	82
	HS3	SE218849.071	%	60 - 130%	90
	BH1(200)	SE218849.072	%	60 - 130%	89
	BH1(900)	SE218849.073	%	60 - 130%	83
	BH2(400)	SE218849.074	%	60 - 130%	83
	BH2(800)	SE218849.075	%	60 - 130%	86
	BH2(1000)	SE218849.076	%	60 - 130%	79
	BH3(400)	SE218849.077	%	60 - 130%	84
	BH3(1000)	SE218849.078	%	60 - 130%	82
	BH5(100)	SE218849.079	%	60 - 130%	88
	BH6(200)	SE218849.080	%	60 - 130%	86
	BH6(600)	SE218849.081	%	60 - 130%	77
	BH7(100)	SE218849.082	%	60 - 130%	80
	BH7(200)	SE218849.083	%	60 - 130%	75
	BH7(400)	SE218849.084	%	60 - 130%	80
	BH7(800)	SE218849.085	%	60 - 130%	79
	BH1(200)DA	SE218849.086	%	60 - 130%	81

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)-ENVJAN312

Sample Number	Parameter	Units	LOR	Result
LB223415.001	Mercury	mg/kg	0.05	<0.05
LB223417.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Sample Number	Parameter	Units	LOR	Result
LB223261.001	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)	%	-	94
LB223262.001	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)	%	-	83
LB223473.001	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

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 (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB223473.001	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)	%	-	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB223261.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
	Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
	Benzo(ghi)perylene	mg/kg	0.1	<0.1
	Total PAH (18)	mg/kg	0.8	<0.8
Surrogates	d5-nitrobenzene (Surrogate)	%	-	105
	2-fluorobiphenyl (Surrogate)	%	-	96
	d14-p-terphenyl (Surrogate)	%	-	103

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

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

Sample Number	Parameter	Units	LOR	Result
LB223405.001	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	<2.0
LB223406.001	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	<2.0
LB223412.001	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

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.

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

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

Sample Number	Parameter	Units	LOR	Result
LB223412.001	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB223261.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB223260.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	92
		d8-toluene (Surrogate)	%	-	93
		Bromofluorobenzene (Surrogate)	%	-	88
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB223260.001	TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-

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

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

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

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

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)-ENVJAN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.072	LB223415.008	Mercury	mg/kg	0.05	<0.05	<0.05	145	0
SE218849.082	LB223417.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE218871.001	LB223417.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-ENVJAN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.010	LB223474.011	% Moisture	%w/w	1	9.4	9.2	41	3
SE218849.024	LB223378.011	% Moisture	%w/w	1	8.8	7.1	43	22
SE218849.034	LB223378.022	% Moisture	%w/w	1	17.7	15.6	36	13
SE218849.044	LB223433.011	% Moisture	%w/w	1	11.9	11.9	38	0
SE218849.053	LB223433.021	% Moisture	%w/w	1	16.7	15.9	36	4
SE218849.063	LB223434.011	% Moisture	%w/w	1	13.0	13.1	38	0
SE218849.068	LB223434.017	% Moisture	%w/w	1	15.0	14.5	37	3
SE218849.078	LB223377.011	% Moisture	%w/w	1	12.5	12.4	38	1
SE218849.086	LB223377.020	% Moisture	%w/w	1	12.0	11.4	39	5
SE218954.006	LB223474.022	% Moisture	%w/w	1	27.9	27.8	34	0
SE218954.014	LB223474.031	% Moisture	%w/w	1	4.6	4.7	52	1

OC Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.010	LB223473.014	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
SE218849.024	LB223262.014	Surrogates						
		Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	0
		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

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

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

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

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

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)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.024	LB223262.014	trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
		Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	3
SE218849.034	LB223262.025	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Lindane	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
		Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
		Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
Mirex	mg/kg	0.1	<0.1	<0.1	200	0		
Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0		
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	30	6
SE218849.078	LB223261.014	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

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

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

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

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

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)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.078	LB223261.014	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	-	0.14	0.14	30	1	
	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0	
SE218849.086	LB223261.023	Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Lindane	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
		Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
		Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
		Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	1	
	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0	
SE218954.014	LB223473.034	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

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

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: $MAD = 100 \times \frac{SDL}{Mean} + LR$

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]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218954.014	LB223473.034	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
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.14	30	10

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.077	LB223261.026	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	0.1	<0.1	126	12
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	0.2	0.2	84	21
		Pyrene	mg/kg	0.1	0.2	0.2	80	18
		Benzo(a)anthracene	mg/kg	0.1	0.1	0.1	115	23
		Chrysene	mg/kg	0.1	0.1	0.1	105	22
		Benzo(b&j)fluoranthene	mg/kg	0.1	0.1	0.1	108	21
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	163	0
		Benzo(a)pyrene	mg/kg	0.1	0.2	0.1	106	32
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	166	0
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	155	0
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	139	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	119	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.2	<0.2	103	20
		Total PAH (18)	mg/kg	0.8	1.2	<0.8	116	38
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.6	30	1
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	5
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	3
SE218849.084	LB223261.027	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	184	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	0.5	0.5	49	3
		Anthracene	mg/kg	0.1	0.2	0.2	83	3
		Fluoranthene	mg/kg	0.1	0.8	0.6	44	25
		Pyrene	mg/kg	0.1	0.9	0.7	42	20
		Benzo(a)anthracene	mg/kg	0.1	0.6	0.4	49	35
		Chrysene	mg/kg	0.1	0.6	0.4	50	34
		Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	0.5	52	3
		Benzo(k)fluoranthene	mg/kg	0.1	0.4	0.2	63	89 @
		Benzo(a)pyrene	mg/kg	0.1	0.7	0.4	48	41
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.4	0.2	62	44
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	173	0
		Benzo(ghi)perylene	mg/kg	0.1	0.4	0.2	64	63
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0.9	0.6	38	41 @
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	1.0	0.7	46	36
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.9	0.6	36	39 @
		Total PAH (18)	mg/kg	0.8	6.0	4.4	45	31
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0

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

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.084	LB223261.027	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	3

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

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.044	LB223405.014	Arsenic, As	mg/kg	1	3	3	67	12
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	7.4	7.2	37	2
		Copper, Cu	mg/kg	0.5	12	13	34	4
		Nickel, Ni	mg/kg	0.5	2.1	2.1	53	1
		Lead, Pb	mg/kg	1	12	12	39	3
		Zinc, Zn	mg/kg	2	15	15	43	4
SE218849.053	LB223405.024	Arsenic, As	mg/kg	1	2	2	85	11
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	3.4	4.5	43	27
		Copper, Cu	mg/kg	0.5	14	15	33	7
		Nickel, Ni	mg/kg	0.5	1.3	1.2	70	6
		Lead, Pb	mg/kg	1	9	11	40	22
		Zinc, Zn	mg/kg	2	11	10	49	2
SE218849.063	LB223406.014	Arsenic, As	mg/kg	1	2	3	66	22
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	5.3	6.7	38	24
		Copper, Cu	mg/kg	0.5	20	21	32	1
		Nickel, Ni	mg/kg	0.5	1.8	2.1	56	12
		Lead, Pb	mg/kg	1	31	36	33	17
		Zinc, Zn	mg/kg	2	13	14	45	14
SE218849.072	LB223406.024	Arsenic, As	mg/kg	1	4	4	57	2
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	7.9	8.1	36	3
		Copper, Cu	mg/kg	0.5	12	11	34	7
		Nickel, Ni	mg/kg	0.5	1.9	2.1	55	11
		Lead, Pb	mg/kg	1	100	91	31	11
		Zinc, Zn	mg/kg	2	71	68	33	5
SE218849.082	LB223412.014	Arsenic, As	mg/kg	1	4	4	53	3
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	14	11	34	23
		Copper, Cu	mg/kg	0.5	6.9	6.5	37	5
		Nickel, Ni	mg/kg	0.5	1.5	1.3	66	13
		Lead, Pb	mg/kg	1	11	11	39	2
		Zinc, Zn	mg/kg	2	9.0	9.8	51	9
SE218871.001	LB223412.024	Arsenic, As	mg/kg	1	3	3	61	7
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	8.9	8.2	36	8
		Copper, Cu	mg/kg	0.5	41	45	31	9
		Nickel, Ni	mg/kg	0.5	5.1	5.3	40	2
		Lead, Pb	mg/kg	1	9	10	41	6
		Zinc, Zn	mg/kg	2	51	54	34	4

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.077	LB223261.026	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	<45	<45	200	0
		TRH C29-C36	mg/kg	45	<45	<45	200	0
		TRH C37-C40	mg/kg	100	<100	<100	200	0
		TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH >C10-C16	mg/kg	25	<25	<25	200	0
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE218849.084	LB223261.027	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	<45	<45	200	0

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

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

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

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

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.084	LB223261.027	TRH C29-C36	mg/kg	45	<45	<45	200	0
		TRH C37-C40	mg/kg	100	<100	<100	200	0
		TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	mg/kg	25	<25	<25	200	0
		TRH >C10-C16	mg/kg	25	<25	<25	200	0
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218849.078	LB223260.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	8.4	50	1
			d8-toluene (Surrogate)	mg/kg	-	8.2	8.1	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	7.3	50	0
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE218849.086	LB223260.023	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	7.8	50	6
			d8-toluene (Surrogate)	mg/kg	-	8.1	7.6	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	6.5	50	14
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE218849.078	LB223260.014	TRH C6-C10	mg/kg	25	<25	<25	200	0	
		TRH C6-C9	mg/kg	20	<20	<20	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	8.4	30	1
			d8-toluene (Surrogate)	mg/kg	-	8.2	8.1	30	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	7.3	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE218849.086	LB223260.023	TRH C6-C10	mg/kg	25	<25	<25	200	0	
		TRH C6-C9	mg/kg	20	<20	<20	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	7.8	30	6
			d8-toluene (Surrogate)	mg/kg	-	8.1	7.6	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	6.5	30	14
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223415.002	Mercury	mg/kg	0.05	0.19	0.2	70 - 130	93
LB223417.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223261.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	110
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	104
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	87
	Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	104
	Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	81
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130
LB223262.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	82
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	78
	Delta BHC	mg/kg	0.1	0.1	0.2	60 - 140	74
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	81
	Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	88
	p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	71
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130
LB223473.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	83
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	78
	Delta BHC	mg/kg	0.1	0.1	0.2	60 - 140	74
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	77
	Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	82
	p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	63
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223261.002	Naphthalene	mg/kg	0.1	4.9	4	60 - 140	122
	Acenaphthylene	mg/kg	0.1	5.0	4	60 - 140	125
	Acenaphthene	mg/kg	0.1	4.9	4	60 - 140	121
	Phenanthrene	mg/kg	0.1	4.9	4	60 - 140	122
	Anthracene	mg/kg	0.1	5.4	4	60 - 140	136
	Fluoranthene	mg/kg	0.1	4.9	4	60 - 140	123
	Pyrene	mg/kg	0.1	5.1	4	60 - 140	128
	Benzo(a)pyrene	mg/kg	0.1	5.5	4	60 - 140	137
Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	106
	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	95

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 %
LB223405.002	Arsenic, As	mg/kg	1	340	318.22	80 - 120	107
	Cadmium, Cd	mg/kg	0.3	4.4	4.81	70 - 130	92
	Chromium, Cr	mg/kg	0.5	38	38.31	80 - 120	100
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	104
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	100
	Lead, Pb	mg/kg	1	92	89.9	80 - 120	102
	Zinc, Zn	mg/kg	2	280	273	80 - 120	101
LB223406.002	Arsenic, As	mg/kg	1	320	318.22	80 - 120	99
	Cadmium, Cd	mg/kg	0.3	4.2	4.81	70 - 130	87
	Chromium, Cr	mg/kg	0.5	36	38.31	80 - 120	95
	Copper, Cu	mg/kg	0.5	290	290	80 - 120	100
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	98
	Lead, Pb	mg/kg	1	89	89.9	80 - 120	99
	Zinc, Zn	mg/kg	2	270	273	80 - 120	97
LB223412.002	Arsenic, As	mg/kg	1	340	318.22	80 - 120	105
	Cadmium, Cd	mg/kg	0.3	4.4	4.81	70 - 130	92
	Chromium, Cr	mg/kg	0.5	39	38.31	80 - 120	102
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	105

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.

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223412.002	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	101
	Lead, Pb	mg/kg	1	90	89.9	80 - 120	100
	Zinc, Zn	mg/kg	2	270	273	80 - 120	101

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223261.002	TRH C10-C14	mg/kg	20	41	40	60 - 140	103
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	93
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	95
	TRH F Bands	mg/kg	25	40	40	60 - 140	100
	TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	95
	TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	95

VOC's in Soil
Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223260.002	Monocyclic	Benzene	mg/kg	0.1	4.5	5	60 - 140	90
	Aromatic	Toluene	mg/kg	0.1	4.6	5	60 - 140	92
		Ethylbenzene	mg/kg	0.1	4.9	5	60 - 140	98
		m/p-xylene	mg/kg	0.2	9.9	10	60 - 140	99
		o-xylene	mg/kg	0.1	4.9	5	60 - 140	99
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	10	70 - 130
	d8-toluene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94	
	Bromofluorobenzene (Surrogate)	ma/ka	-	8.7	10	70 - 130	87	

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB223260.002	TRH C6-C10	mg/kg	25	75	92.5	60 - 140	81	
	TRH C6-C9	mg/kg	20	65	80	60 - 140	81	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.5	10	70 - 130	95
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	10	70 - 130	87
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	46	62.5	60 - 140	73

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%
SE218849.069	LB223415.004	Mercury	mg/kg	0.05	0.21	0.06	0.2	74
SE218849.073	LB223417.004	Mercury	mg/kg	0.05	0.41	0.15	0.2	128

OC Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218849.001	LB223473.004	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Lindane	mg/kg	0.1	<0.1	<0.1	-	-
		Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	101
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	94
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	92
		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	90
		Endrin	mg/kg	0.2	0.2	<0.2	0.2	98
		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	78
		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	-	-
SE218849.015	LB223262.004	Surrogates Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	-	102
		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	102
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	94
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	100
		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	99
		Endrin	mg/kg	0.2	0.2	<0.2	0.2	113
		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	86
		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	-	-

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.

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OC Pesticides in Soil (continued)

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218849.015	LB223262.004	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	-	0.15	0.15	-	102
SE218849.072	LB223261.028	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	84
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	78
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	88
		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	77
		Endrin	mg/kg	0.2	<0.2	<0.2	0.2	94
		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	76
		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	-	0.15	0.14	-	98

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218849.071	LB223261.025	Naphthalene	mg/kg	0.1	4.7	<0.1	4	117
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	5.0	<0.1	4	124
		Acenaphthene	mg/kg	0.1	4.6	<0.1	4	116
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	5.0	<0.1	4	124
		Anthracene	mg/kg	0.1	5.3	<0.1	4	133
		Fluoranthene	mg/kg	0.1	5.0	<0.1	4	125
		Pyrene	mg/kg	0.1	5.1	<0.1	4	129
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
		Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(a)pyrene	mg/kg	0.1	5.3	<0.1	4	132
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	5.3	<0.2	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.4	<0.3	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.4	<0.2	-	-
		Total PAH (18)	mg/kg	0.8	40	<0.8	-	-
		Surrogates						
		d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.6	-	106
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	93
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	96

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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.

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218849.035	LB223405.004	Arsenic, As	mg/kg	1	52	1	50	101
		Cadmium, Cd	mg/kg	0.3	46	<0.3	50	91
		Chromium, Cr	mg/kg	0.5	54	3.0	50	102
		Copper, Cu	mg/kg	0.5	62	13	50	97
		Nickel, Ni	mg/kg	0.5	50	1.0	50	97
		Lead, Pb	mg/kg	1	55	7	50	95
		Zinc, Zn	mg/kg	2	62	11	50	102
SE218849.054	LB223406.004	Arsenic, As	mg/kg	1	54	3	50	103
		Cadmium, Cd	mg/kg	0.3	47	<0.3	50	94
		Chromium, Cr	mg/kg	0.5	56	4.4	50	103
		Copper, Cu	mg/kg	0.5	68	15	50	106
		Nickel, Ni	mg/kg	0.5	51	1.0	50	101
		Lead, Pb	mg/kg	1	60	13	50	92
		Zinc, Zn	mg/kg	2	59	7.0	50	103
SE218849.073	LB223412.004	Arsenic, As	mg/kg	1	49	3	50	93
		Cadmium, Cd	mg/kg	0.3	43	<0.3	50	85
		Chromium, Cr	mg/kg	0.5	52	6.6	50	92
		Copper, Cu	mg/kg	0.5	58	9.8	50	96
		Nickel, Ni	mg/kg	0.5	47	2.0	50	91
		Lead, Pb	mg/kg	1	62	18	50	89
		Zinc, Zn	mg/kg	2	83	37	50	92

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218849.070	LB223261.029	TRH C10-C14	mg/kg	20	43	<20	40	108
		TRH C15-C28	mg/kg	45	66	<45	40	93
		TRH C29-C36	mg/kg	45	130	110	40	65
		TRH C37-C40	mg/kg	100	<100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	240	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F	mg/kg	25	41	<25	40	103
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	41	<25	-	-
		TRH >C16-C34 (F3)	mg/kg	90	120	94	40	70
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE218849.069	LB223260.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.0	<0.1	5	80	
			Toluene	mg/kg	0.1	4.2	<0.1	5	81	
			Ethylbenzene	mg/kg	0.1	4.3	<0.1	5	86	
			m/p-xylene	mg/kg	0.2	8.8	<0.2	10	87	
			o-xylene	mg/kg	0.1	4.4	<0.1	5	87	
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-	
			Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	7.7	10	83
				d8-toluene (Surrogate)	mg/kg	-	8.4	7.6	10	84
		Bromofluorobenzene (Surrogate)		mg/kg	-	7.5	6.7	10	75	
		Totals	Total Xylenes	mg/kg	0.3	13	<0.3	-	-	
			Total BTEX	mg/kg	0.6	26	<0.6	-	-	

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE218849.069	LB223260.004	TRH C6-C10	mg/kg	25	68	<25	92.5	73	
		TRH C6-C9	mg/kg	20	59	<20	80	74	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	7.7	10	83
			d8-toluene (Surrogate)	mg/kg	-	8.4	7.6	10	84
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	6.7	-	75
		VPH F	Benzene (F0)	mg/kg	0.1	4.0	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	42	<25	62.5	67

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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Chain of Custody Form – Ref 13079

Sheet 1 of 6

Ref: 13079		Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954			Sample matrix			Sample preservation			Analysis		
Telephone:		Email: leah@envirowest.net.au			Water			Cool			CL1		
Contact Person: Leah Desborough		Invoice: accounts@envirowest.net.au			Sludge			HNO3/H Cl			OCP		
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015		Unpre- served			8 METALS, TRH, BTEXN, PAH			CL10					
Quotation #: Envir_70119_2019													
Courier/CN: Toll													
Sample ID	Container*	Sampling Date/Time	Water	Soil	Sludge	Cool	HNO3/H Cl	Unpre- served	7 METALS	OCP	CL10		
MR11D	A	19/04/2021		X		X				X			
MR21D	A	19/04/2021		X		X				X			
MR31D	A	19/04/2021		X		X				X			
MR41D	A	19/04/2021		X		X				X			
MR51D	A	19/04/2021		X		X				X			
MR61D	A	19/04/2021		X		X				X			
MR71D	A	19/04/2021		X		X				X			
MR81D	A	19/04/2021		X		X				X			
MR91D	A	19/04/2021		X		X				X			
MR101D	A	19/04/2021		X		X				X			
MR111D	A	19/04/2021		X		X				X			
MR121D	A	19/04/2021		X		X				X			
MR131D	A	19/04/2021		X		X				X			
MR141D	A	19/04/2021		X		X				X			
MR151D	A	19/04/2021		X		X				X			
MR161D	A	19/04/2021		X		X				X			
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.			Sampler name: Leah Desborough			Date: 19/04/2021			Time: 1630				
Relinquished by: (print and signature)			Virginia Bragg			Date: 20/04/2021			Time: 14:00				
Received by: (print and signature)			P. Desborough			Date: 22/04/21			Time: 10:40				

SGS EHS Sydney COC

SE218849



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

Chain of Custody Form – Ref 13079

Sheet 2 of 6

Ref: 13079 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Email: leah@envirowest.net.au Contact Person: Leah Desborough Invoice: accounts@envirowest.net.au				Sample matrix				Sample preservation				Analysis			
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll				Water				Soil				Sludge			
Sample ID				Container*				Sampling Date/Time				CL1			
MR171D				A				19/04/2021				CL10			
MR184D				A				19/04/2021				OCP			
MR191D				A				19/04/2021				CL10			
MR201D				A				19/04/2021				OCP			
MR211D				A				19/04/2021				CL10			
MR221D				A				19/04/2021				OCP			
MR231D				A				19/04/2021				CL10			
MR241D				A				19/04/2021				OCP			
MR251D				A				19/04/2021				CL10			
MR261D				A				19/04/2021				OCP			
MR271D				A				19/04/2021				CL10			
MR281D				A				19/04/2021				OCP			
MR291D				A				19/04/2021				CL10			
MR301D				A				19/04/2021				OCP			
MR311D				A				19/04/2021				CL10			
MR321D				A				19/04/2021				OCP			
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.								Sampler name: Leah Desborough Date: 19/04/2021							
Relinquished by: (print and signature)								Received by: (print and signature)							
Date 20/04/2021								Date 22/04/21							
Time 14:00								Time 10:40							

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Chain of Custody Form – Ref 13079

Sheet 3 of 6

Ref: 13079 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Email: leah@envirowest.net.au Contact Person: Leah Desborough Invoice: accounts@envirowest.net.au				Sample matrix Water Soil Sludge			Sample preservation Cool HNO3/HCl Unpreserved			Analysis CL1 OCP CL10		
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir. 70119_2019 Courier/CN: Toll												
Sample ID	Container*	Sampling Date/Time										
33 MR151DA	A	19/04/2021	X			X						
34 MR251DA	A	19/04/2021	X			X						
35 MR1C	A	19/04/2021	X			X						
36 MR2C	A	19/04/2021	X			X						
37 MR3C	A	19/04/2021	X			X						
38 MR4C	A	19/04/2021	X			X						
39 MR5C	A	19/04/2021	X			X						
40 MR6C	A	19/04/2021	X			X						
41 MR7C	A	19/04/2021	X			X						
42 MR8C	A	19/04/2021	X			X						
43 MR9C	A	19/04/2021	X			X						
44 MR10C	A	19/04/2021	X			X						
45 MR11C	A	19/04/2021	X			X						
46 MR12C	A	19/04/2021	X			X						
47 MR13C	A	19/04/2021	X			X						
48 MR14C	A	19/04/2021	X			X						
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.			Sampler name: Leah Desborough Date: 19/04/2021 Time: 1630									
Relinquished by: Virginia Bragg (print and signature)			Date: 20/04/2021 Time: 14:00			Received by: P. Buhay (print and signature)			Date: 20/04/21 Time: @ 10:40			

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Chain of Custody Form – Ref 13079

Sheet 4 of 6

Ref: 13079 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Telephone: Email: leah@envirowest.net.au Contact Person: Leah Desborough Invoice: accounts@envirowest.net.au		Sample matrix <table border="1"> <tr> <th>Water</th> <th>Soil</th> <th>Sludge</th> <th>Unpre-served</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>			Water	Soil	Sludge	Unpre-served					Sample preservation <table border="1"> <tr> <th>Cool</th> <th>HNO3/H Cl</th> <th>Unpre-served</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>		Cool	HNO3/H Cl	Unpre-served				Analysis <table border="1"> <tr> <th colspan="3">SGS Method Code</th> </tr> <tr> <th>CL1</th> <th>OCP</th> <th>CL10</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>			SGS Method Code			CL1	OCP	CL10			
Water	Soil	Sludge	Unpre-served																													
Cool	HNO3/H Cl	Unpre-served																														
SGS Method Code																																
CL1	OCP	CL10																														
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll																																
Sample ID	Container*	Sampling Date/Time																														
MR15C	A	19/04/2021	X																													
MR16C	A	19/04/2021	X																													
MR17C	A	19/04/2021	X																													
MR18C	A	19/04/2021	X																													
MR19C	A	19/04/2021	X																													
MR20C	A	19/04/2021	X																													
MR21C	A	19/04/2021	X																													
MR22C	A	19/04/2021	X																													
MR23C	A	19/04/2021	X																													
MR24C	A	19/04/2021	X																													
MR25C	A	19/04/2021	X																													
MR26C	A	19/04/2021	X																													
MR27C	A	19/04/2021	X																													
MR28C	A	19/04/2021	X																													
MR29C	A	19/04/2021	X																													
MR30C	A	19/04/2021	X																													
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.			Sampler name: Leah Desborough Date: 19/04/2021		Time: 1630																											
Relinquished by: Virginia Bragg			Date: 20/04/2021		Time: 14:00																											
Received by: <i>P. Bragg</i>			Date: 20/04/21		Time: 10:40																											

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

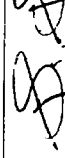
Sheet 5 of 6

NR 153 DA
NR 254 DA

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Chain of Custody Form – Ref 13079

Sheet 6 of 6

Ref: 13079 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Email: leah@envirowest.net.au Contact Person: Leah Desborough Invoice: accounts@envirowest.net.au		Sample matrix		Sample preservation		Analysis		
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll		Water	Soil	Sludge	Cool	HNO3/H Cl	Unpre- served	
Sample ID	Container*	Sampling Date/Time	SGS Method Code					
BH6(200)	A	19/04/2021	CL1					
BH6(600)	A	19/04/2021	CL10					
BH7(100)	A	19/04/2021	OCP					
BH7(200)	A	19/04/2021	8 METALS, TRH					
BH7(400)	A	19/04/2021	BTEXN, PAH					
BH7(800)	A	19/04/2021						
BH1(200)DA	A	19/04/2021						
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples			Sampler name: Leah Desborough Date: 19/04/2021 Time: 1630					
Relinquished by: Virginia Bragg (print and signature)			Received by:  (print and signature)					
Date 20/04/2021 Time 14:00			Date 22/04/24 Time 01040					

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

Appendix 6. Soil sampling protocols

1. Sampling

The samples will be collected from the auger tip, mattock, hand auger or excavator bucket immediately on withdrawal.

The time between retrieval of the sample and sealing of the sample container will be kept to a minimum.

The material will be collected using single use disposal gloves or a stainless-steel spade which represented material which has not been exposed to the atmosphere prior to sampling.

All sampling jars will be filled as close to the top as possible to minimise the available airspace within the jar.

2. Handling, containment and transport

Daily sampling activities will be recorded including sampling locations, numbers, observations, measurements, sampler, date and time and weather condition.

The sampling jars will be new sterile glass jars fitted with plastic lid and airtight Teflon seals, supplied by the laboratories for the purpose of collecting soil samples for analysis. Sample containers will be marked indelibly with the sample ID code to waterproof labels affixed to the body of the container.

All samples will be removed from direct sunlight as soon as possible after sampling and placed in insulated containers. Samples will be stored in a refrigerator at 4°C prior to transportation to the laboratory in insulated containers with ice bricks in accordance with AS4482.1.

Handling and transportation to the laboratory will be accompanied with a chain of custody form to demonstrate the specimens are properly received, documents, processed and stored.

Maximum holding time for extraction (AS4482.1) are:

Analyte	Maximum holding time
Metals	6 months
Mercury	28 days
Sulfate	7 days
Organic carbon	7 days
OCP, OPP, PCB	14 days
TRH, BTEX, PAH, phenols	14 days

3. Decontamination of sampling equipment

Sampling tools will be decontaminated between sampling locations by

- Removing soil adhering to the sampling equipment by scraping, brushing or wiping
- Washing with a phosphate-free detergent
- Rinsing thoroughly with clean water
- Repeating if necessary
- Collect rinsate per sampling time and preserve according to AS 2031.1
- Dry equipment with disposable towels or air