McMahon EARTH SCIENCE

# 344 MOLKENTIN ROAD AND 111 & 167 FUNK ROAD JINDERA NSW 2642

## PRELIMINARY SITE INVESTIGATION

## FOR PROPOSED REZONING OF LAND

**JUNE 2023**

**REPORT NO: 9349**

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## Report type

Preliminary Site Investigation

For proposed rezoning

## Site address

344 Molkentin Road and

111 & 167 Funk Road

Jindera NSW 2642

## Report number

9349

## Prepared for

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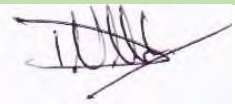
| **Prepared by** | **David McMahon** CEnvP SC<br>BAppSc SA<br>GradDip WRM<br>MEnvMgmt<br>MALGA MEIANZ MSSA |  | 03/07/2023 | 0 |

## Contents

## 1.0 Executive summary

DM McMahon Pty Ltd (McMahon) conducted this Preliminary Site Investigation (PSI) at the request of Peter O'Dwyer of Bioplan Pty Ltd on behalf of Hurst Earthmoving Pty Ltd for a proposed rezoning of land at 344 Molkentin Road, 111 Funk Road, and 167 Funk Road Jindera NSW. The 187ha development area (the site) has a historical broadacre agricultural land use. A map of the site investigated as part of this PSI and the potential future subdivision plan can be seen in **Attachment A**.

The issue of potential contamination is required to be considered whenever a planning proposal is presented to a planning authority where the new use may increase risk from contamination if it is present. Therefore, the purpose of this investigation is to provide Hurst Earthmoving Pty Ltd, Bioplan Pty Ltd and the planning authority with a statement of site suitability for the proposed land use and recommendations for further investigation and site management.

The scope of work includes:

- A desktop study used to collect basic site information and identify the site characteristics.
- A detailed site inspection to complement the findings of the desktop study and site history and to identify any additional relevant site information.
- Conduct limited sampling using data quality objectives to assess the need for further investigation.
- From the information collected, develop a conceptual site model detailing the potential contamination source-pathway-receptor linkages.
- Conduct a risk assessment for site suitability regarding potential contamination and the proposed development.
- Provide a statement of site suitability for the proposed land use and recommendations for further investigation and site management.

Findings of the investigation include:

- The desktop study found the site has a history of broadacre agricultural land use with 111 and 167 Funk Road having improvements while 344 Molkentin Road is vacant.
- This site inspection complemented the desktop study and found the following sources of potential contamination that may materially affect the development:
    - Agricultural chemicals that have been used across the paddocks, in the sheep and cattle yards, and in a boom spray fill area.
    - Asbestos and hazardous building material from a demolished house, the small old farm shed, and the small old garage at 167 Funk Road.
    - Fuel and oil leaks and spills in the small paddock (1ha) at 167 Funk Road that is used as a laydown area for old cars, trucks, earthmoving equipment, farm equipment, and empty fuel tanks.
    - Septic systems at 111 and 167 Funk Road.
- Soil testing was conducted across the paddocks, in the sheep and cattle yards, and in the boom spray fill area, and found levels of contaminants of low significance and below the residential criteria. Based on the past agricultural land use and the sampling

undertaken, it is assessed that widespread contamination from agricultural chemicals is not present at the site. The areas sampled cover most of the site and they are suitable for the proposed rezoning from a contamination perspective.

- The asbestos and hazardous building material, and fuel and oil leaks and spills in the small paddock (1ha) at 167 Funk Road, and the septic systems can pose a risk to future site users (through inhalation of fibres, dermal contact, ingestion, or inhalation of potentially contaminated soils) and will require further investigation and management. These sources do not preclude the rezoning of the site given further investigation is undertaken at the planning and development stage for appropriate site management (see recommendations in **Section 10.0**).

This executive summary and the findings of this PSI are subject to the recommendations in **Section 10.0** and limitations as stated in **Section 11.0**. A protocol for unexpected finds as outlined in **Section 12.0** has also been developed as part of this risk assessment framework if additional potential contamination sources are identified during planning or development.

## 2.0 Objectives

The objective of this investigation is to:

- Provide information regarding potential contamination on site.
- Provide a factual record of the works completed and results.
- Undertaking a risk assessment for health risk to future site users and the environment.
- Provide a statement of site suitability or recommendations for further investigation and site management.
- To prepare the PSI in general accordance with the relevant guidelines and legislation, namely:
    - NSW EPA, Consultants Reporting on Contaminated Land: Contaminated Land Guidelines, (2020).
    - State Environmental Planning Policy (Resilience and Hazards) 2021.
    - National Environment Protection (Assessment of Site Contamination) Measure (NEPM), (2013).

## 3.0 Scope of work

The scope of work includes the following:

- Review the available information regarding historical, current, and proposed land use of the site and surrounds.
- Review the environmental setting of the site and surrounds.
- Assess the potential contamination sources and contaminants of potential concern.
- Conduct limited sampling to assess the need for further investigation.
- Assess the potential contamination source-pathway-receptor linkages from the contaminants of potential concern, environmental setting, and land use.
- Develop a conceptual site model to assess potential contamination risk from the source-pathway-receptor linkages.
- Provide a clear statement on site suitability for the present and future land use and the need for further investigation and site management.

## 4.0 Site identification

The site identification and details are as follows.

- Addresses: 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642.
- Real property descriptions:
    - 344 Molkentin Road – Lot 5 DP 260275.
    - 111 Funk Road – Lot 1 DP 785168.
    - 167 Funk Road – Lot 22 DP 635058 and Lots 121, 122 and 153 DP 753345.
- Development area centre co-ordinate: 493416E 6019849N MGA GDA z55.
- Property size: 195ha (total development area).
- Owner:
    - 344 Molkentin Road – Nunnya Pty Ltd and Hurst Property Holdings Pty Ltd.
    - 111 Funk Road – Michael James Unthank and Tracy Marie Unthank.
    - 167 Funk Road – Cheryl Anne Hurst.
- Local Government Area: Greater Hume Council.
- Current zoning: RU4 Primary Production Small Lots.
- Proposed zoning: R5 Large Lot Residential.
- Present use: Broadacre agriculture.
- Development Application reference: Not known.

## 5.0 Site history

From research of the available resources, the following site history is offered.

### Historical owners and occupiers

As follows are the registered owners and occupiers:

344 Molkentin Road (Lot 5 DP 260275)

- 1915 owned by Gottlob Simpfendorfer (farmer). Known as Portion 123.
- 1918 owned by Carl Julius Molkentin (farmer)
- 1949 owned by Edwin George Molkentin (farmer).
- 1972 owned by Allan Gowan Begg (farmer) and Helen Begg.
- Other owners unknown until it was purchased in 2021 by Nunnya Pty Ltd and Hurst Property Holdings Pty Ltd.

111 Funk Road (Lot 1 DP 785168)

- 1919 owned by The Bank of New South Wales. Known as Portion 84.
- 1933 owned by Gustav Nathaniel Funk (farmer).
- 1934 owned by Theodor Oscar Funk (farmer).
- 1969 owned by Barry John Funk (farmer).
- Other owners unknown until it was purchased in 2017 by Michael James Unthank and Tracy Marie Unthank.

167 Funk Road (Lot 22 DP 635058 and Lots 121, 122 and 153 DP 753345)

- 1913 owned by The Commercial Banking Company of Sydney Limited. Known as Portions 93, 121, 122 and Portion 153.
- 1948 owned by Amalia Louise Schmidt (widow) and Henry August Fredrich (farmer).
- 1948 owned by Adolph Reginold Schmidt (farmer).
- 1959 owned by Elsie Serena Schmidt (widow).
- 1968 owned by Leslie Norman Lindner (farmer).
- 1968 owned by John Milton Klein (orchardist) and Dorothy Jean Klein.
- 1988 owned by Adadel Pty Ltd.
- Other owners unknown until it was purchased in 2003 by Cheryl Anne Hurst.

### Council records

Section 10.7 Planning Certificates (Certificate No: 5091, 5092 and 5095) were obtained from Council on 2 June 2023 and the certificates state that Council has nil relevant information regarding matters prescribed within the meaning of the Contaminated Land Management Act 1997.

### EPA records

There are no records on the Contaminated Land Record Database for the site or adjacent properties pertaining to Preliminary Investigation Orders, Declaration of Significantly Contaminated Land, Approved Voluntary Management Plans, Management Orders, Ongoing Maintenance Orders, Repeal Revocation or Variation Notice, Site Audit Statement, or Notice

of Completion or Withdrawal of Approved VMP. The site or adjacent properties have not been "notified" to the EPA on the list of NSW Contaminated sites as of May 2023.

**Internet search**

- The Albury Banner and Wodonga Express (Albury and Wodonga) December 1933 - The death occurred at a private hospital in Albury on Tuesday of Mr. Gustav Nathaniel Funk, aged 67 years, of 'Red Hill', Jindera. Mr. Funk had lived at Jindera practically all his life. He leaves a widow and a family of four sons [including] Theodor O., 'Red Hill'.
- Government Gazette of the State of NSW (Sydney) *Pastures Protection Act 1912* Issue 229, December 1934 – Theodor Oscar Funk, Red Hill, Jindera. Sheep Brands and Marks.
- Government Gazette of the State of NSW (Sydney) *Pastures Protection Act 1934-1951* Issue 98, August 1960 – Elsie Serena Schmidt, Hill-view, Jindera. Sheep Brands and Earmarks.
- Australian National University. Hume Shire map (no date) - T.O Funk 'Red Hill', Lindner 'Hillview'.
- onthehouse.com.au – 167 Funk Road. Sold 2003
- realestate.com.au – 111 Funk Road. Sold 2017.
- Greater Hume Council. Development Application. DA10.2020.126.1 – 111 Funk Road Jindera – Demolition of dwelling and associated structures.
- realestate.com.au – 344 Molkentin Road. Sold 2021.
- realestate.com.au – 344 Molkentin Road. Dress circle block ripe for subdivision. Flat to gently sloping land, many grey and red box trees. Eligible for five 8ha lots (STCA), long frontage Molkentin Road. Water from two catchment dams, town water available, not connected. The property is suited to livestock grazing, sheep or cattle and is in a prime location for subdivision, being close to the centre of the booming town of Jindera.

**Previous reports**

*Habitat Planning (2021) Jindera Residential Land Use Strategy. Ref: N/A.*

The Jindera Residential Land Use Strategy provides the strategic framework and vision to guide the future of residential growth of Jindera.

- The area investigated by the Strategy comprises the main urban area of Jindera. An additional area located on the eastern side of Jindera and outside of the study area on Molkentin and Funk Roads was identified during the public exhibition process and has been included via an addendum.
- Addendum – Following the completion of the public exhibition period, Council received a submission seeking the inclusion of additional land on the eastern side of Jindera as part of the study area for R5 Large Lot Residential zone purposes (the site).
- Following a review of all relevant environmental constraints, only the south western portion of 344 Molkentin Road is subject to a bushfire and terrestrial biodiversity overlay. All other land in unconstrained.
- An assessment of infrastructure and services has confirmed that the subject land has access to the reticulated water supply network along Molkentin Road. Given the size of the lot sizes sought (2ha), sewerage will be disposed of on-site.

- The rezoning and subsequent subdivision of this land would result in the creation of approximately 75 additional lots. Based on current take-up rates, the equates to a land supply of approximately 9 years.
- In recognition of the large sizes of these lots, their unfragmented nature and general lack of R5 zoned land (current and proposed), it is considered appropriate to include these properties as part of this Strategy via addendum.
- More specifically, it is recommended that this land be rezoned R5 Large Lot Residential with a 2 hectare minimum lot size.

*Bioplan Pty Ltd (2022) Planning Proposal – Amend Greater Hume LEP 2012. Ref: 21025.*

- The proposal seeks support for an amendment to the Greater Hume Local Environment Plant 2012 so as to change the Land Zoning Maps as they apply to 344 Molkentin Road and 111 and 167 Funk Road Jindera from RU4 Primary Production Small Lots to R5 Large Lot Residential. The Planning proposal also seeks to amend the minimum lot size maps applicable to the subject land by reducing the minimum lot size from 8ha down to 2ha.
- The subject land comprises largely cleared rural land used predominately for grazing purposes. There are a number of scattered paddock trees across the area.
- An unnamed waterway drains north easterly through property running roughly parallel with Molkentin Road.
- Part of the subject land (Lot 5 DP 260275) is identified as 'biodiversity' on the terrestrial biodiversity map within the Greater Hume LEP. The planning proposal does not seek to reduce the relevant conservation standards that apply to the land, ensuring development pursues the aim of avoiding, minimising or if necessary off-setting any impacts.
- Future lots will be serviced by on-site waste water disposal facilities consistent with Australian Standards.

*NSW DPIE (2023) Gateway determination report – PP-2022-2454. Ref: IRF22/3592.*

- Objective of the planning proposal is to: amend the Greater Hume LEP 2012 by rezoning the subject land from RU4 Primary Production Small Lots to R5 Large Lot Residential; reduce the minimum lot size from 8ha to 2ha; increase residential land supply in Jindera. This proposal will provide approximately 78 residential lots; update zoning maps to reflect existing residential uses of dwellings in the subject area.
- The Department requested that the planning proposal include an indicative staging plan to manage land use change and the release of residential land in an orderly and economic manner.
- The site is located 3km to the east and south east of the Jindera township. The site has a total area of 187ha held by 3 separate landowners. Topographic features include Red Hill to the east of the site; however, site topography does not pose a significant flooding risk at the site. The site contains 4 existing dwellings, with capacity for approximately 78 dwellings following rezoning and minimum lot size reduction.
- The planning proposal does not apply to land that is within an investigation area according to the Contaminated Land Management Act 1997. Council notes that soils on the site may be contaminated from previous agricultural uses. The Department

accepts Council's recommendation for a preliminary contamination assessment to be conducted at the site and is included as a condition of the Gateway determination.

- Council advises that soil contamination is likely to be a minor, localised issue if relevant.

**Aerial photographs and satellite images**

McMahon observed the following from a review of the available aerial photography.

**344 Molkentin Road**

**1961 to 2023 –** Scattered paddock trees can be seen across the site, concentrated in the south of the site. A large square dam can be seen in the north west corner with a smaller oval dam in the east corner. The site is fenced into three paddocks. Molkentin Road was asphalted in 2014.

**111 Funk Road**

**1961 –** A house can be seen in the approximate centre of the site with access via Funk Road to the west. Two small garden sheds and a water tank can be seen to the north house within the house paddock. A small shed can be seen to the north east of the house. Another small shed can be seen further north, fenced off from the main paddocks. Farm infrastructure can be seen within the surrounding yard. Four more sheds can be seen to the south east of the house and a large shearing shed with sheep yards to the east of the house. A windmill and raised water tank exist to the north east of the house. Trees are scattered across the paddocks to the south of the house and the paddocks to the north of the house have been cultivated. Two dams exist on site, one near the access point along Funk Road and one to the north of the house.

**1975 –** No change from 1961.

**1987 –** No change from 1975.

**1990 –** The four smaller sheds have been demolished and replaced with one large shed.

**1996 –** No change from 1990.

**2003 –** A pool can be seen to the north of the house. Overhead telecommunications lines can be seen from the adjacent property to the south and branching towards the house and then north west. The lines then follow the western boundary, heading north.

**2007 –** No change from 2003.

**2009 –** No change from 2003.

**2010 –** Sheep can be seen grazing to the east of the shearing shed.

**2011 –** No change from 2003.

**2014 –** No change from 2003.

**2015 –** No change from 2003.

**2016 –** No change from 2003.

**2017 –** No change from 2003.

**2018 –** An unpaved access road leads from the large shed south to Red Hill Road. A large horse arena has been constructed to the south of the shearing shed. A dam has been constructed to the east of the house, between the house and the shearing shed. Cattle yards

have been built at the entrance to Red Hill Road. The shed and surrounding yard and farm infrastructure to the north of the house have been removed.

**2019 –** Jumps are visible in the horse arena. The paddocks to the south of the horse arena have been divided into three fenced areas with round water troughs in each. Two water tanks have been added to the large shed.

**2020 –** The original house and garden sheds have been demolished. The pool remains. Horse shelters have been built in the three paddocks south of the horse area and in the paddock to the east of the arena. Horse shelters have been built in the paddocks to the east and south west of the former house paddock.

**2021 –** A new house has been constructed in the same area as the demolished house. Trees have been planted to line the driveway from Funk Road. The windmill and raised water tank to the north east of the house have been removed, the concrete apron remains.

**2023 –** A dam has been built in the paddock south west of the house. Soil stockpiles can be seen around the shearing shed, assumed to be from the excavation of the dam.

**167 Funk Road**

**1961 –** A house and associated garages/shed exists in the approximate centre of the site within a fenced house paddock, with access via Funk Road to the north west. A small garden shed, water tank and potential septic can be seen within the fenced house paddock, which has trees along its western perimeter. There are three farm sheds and some yards east of the house. There are six dams across the site. There is an unnamed waterway running parallel with Molkentin Road. Paddock trees line the drain and are also scattered across the site, concentrated in the east of the site. Most of the site has been cultivated.

**1975 –** An additional two farm sheds have been built to the east of the house.

**1987 –** The house has been demolished and the concrete footprint is still visible. The small garden shed, water tank and potential septic remains. Some trees in the east of the site have been cleared and it appears a quarry has been established on the high ground.

**1990 –** A dam has been constructed to the north of the demolished house.

**1996 –** No change to 1990.

**2003 –** No change to 1996. Overhead telecommunications lines can be seen from the southern corner of the site reaching north east towards the house paddock and north west, through the northern paddocks and into the adjacent site.

**2009 –** Machinery, cars, trailers, building materials and hay bales can be seen in the approximate centre of the site, around the original house paddock and to the north of farm sheds. Felled trees can be seen around the quarry. Sheep can be seen grazing to the south of the farm sheds.

**2010 –** Hay bales can be seen in the original house paddock and the east of the farm sheds. Cows can be seen grazing to the north west of the house paddock and to the south east of the shearing shed.

**2011 –** The paddocks have been harvested and hay bales can be seen across the site

**2014 –** The yards have been demolished. Some of the smaller farm sheds have been demolished and a large new shed is being built in their place. A soil stockpile is visible in front of farm sheds. Cows can be seen grazing to the south of the quarry.

**2015 –** The large new shed has been completed. Two water tanks are visible on the southern wall. Cattle yards have been built alongside one of the farm sheds. Another small farm shed has been demolished. Hay bales and old tyres can be seen in this area. Cows can be seen grazing in the north of site.

**2016** – The northern paddocks have been harvested and hay bales can be seen. The paddocks to the south and west of the farm sheds and to the north of the quarry have not been cropped.

**2017 –** Cows can be seen grazing to the west of the sheds.

**2018 –** Cows can be seen grazing in the northern paddocks.

**2019 –** A third water tank has been added to the large new shed.

**2020 –** The soil stockpile in front of the farm sheds has been removed. Hay bales and a small tire pile can be seen in front of the cattle yards. A small shed has been built to the south of the large new shed. Most trees have been cleared from the former house paddock. Cows can be seen grazing to the west of the sheds.

**2021 –** Cows can be seen grazing to the south and to the west of the sheds. Another small farm shed has been removed. Soil stockpiles are visible to the south of the farm sheds.

**2023 –** Multiple soil stockpiles can be seen to north east of the former house paddock. The small stockpiles to the south of the farm sheds have been removed. Cows can be seen grazing in the northern paddocks.

The aerial photographs and satellite images can be seen in **Attachment B**.

## 6.0 Site condition and surrounding environment

McMahon notes the following observations of the site condition as part of this PSI.

**344 Molkentin Road**

- Undeveloped broadacre farmland located on an alluvial plain of imperfectly drained brownish clayey soil.
- There are two dams on site, one in the north west and one in the east.
- There are scattered grey and yellow box trees mainly in the south west.
- Rudimentary sheep yards lie in the middle of the site on the corner of the south east boundary. These yards consists of two corrugated iron panels and some steel posts held together by fencing wire.

**111 Funk Road**

- Mostly undeveloped broadacre farmland located on a north west trending hillslope of moderately well drained reddish clayey soil.
- A modern house, large shed, and wool shed exists on site with access via a gravel road from both Funk Road and Red Hill Road.
- Some old sheep yards are attached to the wool shed, and some new cattle yards have been built off Red Hill Road next to the gravel access road.
- A large horse arena with a sand surface lies upslope of the house and sheds.
- There are three dams on site, one along Funk Road in the west and two smaller ones closer to the house and sheds.

**167 Funk Road**

- Mostly undeveloped broadacre farmland located on a west trending crest, hillslope, and alluvial plain of moderately well drained reddish clayey soil to imperfectly drained brownish clayey soil.
- A large new shed with an attached bricked living area, a small old farm shed, and a small old garage exist on site with access via a gravel road from both Funk Road and Red Hill Road. The small old shed and small old garage are lined and clad with asbestos containing material with some fragments observed on the ground around the garage.
- The foundations for a demolished house can be seen next to the house (to the west).
- There are cattle yards located near the house and sheds.
- There is a boom spray fill area next to the water tanks next to the large new shed.
- A concrete septic tank lies down gradient of this demolished house.
- Around and downslope of the house and sheds there is a small paddock (around 1ha) that is used as lay down area for old cars, trucks, earthmoving equipment, farm equipment, and empty fuel tanks.
- A disused quarry exists in the north east of the site on the crest of a granite hill. This quarry extends north east further up the crest onto adjacent land.
- There are seven dams spread across the site and an incised drainage (a tributary of Bowna Creek) that runs to the north along Funk Road.

Maps of the site features can be seen in **Attachment C and s**ite photographs can be seen in **Attachment D**.

A summary of the site environmental setting is as follows.

**Topography**

The site is located on the western side of a granite rise that runs to an alluvial plain at an elevation of approximately 245m to 325m AHD.

**Vegetation**

The site is mostly cleared tall woodland with some scattered paddock trees more heavily concentrated around the drainage line. The higher ground is a mix of broadacre crops and improved pasture while the alluvial plan is unimproved pasture.

**Natural Resources Sensitivity**

A search of the Greater Hume Local Environment Plan (2012) found the southern portion of 344 Molkentin Road and a small portion of the north west corner of 111 Funk Road is mapped as being in a natural resource sensitivity area for terrestrial biodiversity. The site is not in an identified area of riparian lands and waterways.

**Weather**

The average rainfall for Jindera is approximately 640mm per annum, with the wettest months being June, July, August, and November. Jindera is characterised by cold wet winters and hot dry summers.

**Hydrology**

An unnamed intermittent incised drainage runs parallel to Molkentin Drive along the western boundary of 167 Funk Road and drains north east to Bowna Creek. Bowna Creek drains to the south east into the northern end of Lake Hume which is a major dam across the Murray River. A small portion of the western corner and along the Molkentin Road frontage of 167 Funk Road is mapped as being in a flood planning area.

**Soil**

Soils are reddish clayey soils underlain by decomposed granite on the higher ground and imperfectly drained yellowish clays on the plain.

**Geology**

The geology is Devonian aged granite on the higher ground and Quaternary alluvium on the plain.

**Hydrogeology**

Groundwater beneath the site is likely to exist in unconfined to semi-confined aquifers with intermediate flow lengths and moderate hydraulic conductivity within topographic catchments. Some localised perching is likely after extended periods of wet weather but the depth to groundwater is typically >8m. There are no registered groundwater bores on site however nearby registered bores are constructed to deep depths in the underlying granite geology.

## 7.0 Sampling and analysis quality plan and sampling methodology

The Data Quality Objectives (DQOs) of the site assessment have been developed to define the type and quality of data to meet the project objectives. The DQOs have been developed generally in accordance with the seven step DQO process as outlined in AS 4482.1 (2005) and the USA EPA Guidance on Systematic Planning Using the Data Quality Objectives Process (2006a). These DQOs are as follows:

1. **The problem**
2. **The goal of the study**
3. **Information inputs**
4. **Study boundaries**
5. **The analytical approach**
6. **Performance and acceptance criteria**
7. **Obtaining data**

These objectives have been further outlined in the following sections.

### DQO 1 - The problem

Potential contamination from chemicals associated with agricultural land use may be present across the site and insufficient data relating to this source is available to determine land use suitability and the need for further investigation with the necessary level of confidence.

### DQO 2 - The goal of the study

Goals of the study include:

- Undertake limited investigations, based on the data gaps to determine if there is agricultural chemical contamination within the soil associated with the identified contamination sources.
- Determine if any contamination, should it be identified, poses a risk to current and future receptors at the site or within potential exposure pathways from the site, and if further investigation is required.
- Determining whether the site is currently, or can be made, suitable for the proposed development regarding contamination.

### DQO 3 - Information inputs

- Desktop data including site inspections, site condition, history, geology, hydrogeology, and laboratory analysis to characterise the site.
- Observational data including visual and olfactory conditions obtained from the sampling.
- Analytical data relative to the assessment criteria.

### DQO 4 - Study boundaries

- Intrusive investigation across the site.
- Temporal boundaries are limited to the proposed fieldwork timeframes in the second quarter of the year 2023.

**DQO 5 - The analytical approach**

Samples will be tested for heavy metals and organochlorine and organophosphate pesticides that may be persistent in the soil from the sites historical agricultural land use.

**DQO 6 - Performance and acceptance criteria**

Specific limits for the investigation are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate data quality indicators, and industry standard procedures for field sampling and handling. To assess the validity of data for decision making, the data is assessed against a set of data quality indicators, the following predetermined data quality indicators have been adopted.

The key decision rules for the investigation are:

1) Has the analytical data been collected as part of the testing and met the data quality indicators? If they have then the data can be used to answer the decision rule/s and the decision statements developed in Step 2 of the DQOs. If not, then the need to collect additional data may be required.
2) Do contaminant concentrations exceed the investigation and screening criteria? If not, then the potential contamination does not pose an above low level of risk. Where results exceed the investigation and screening criteria, this may indicate an unacceptable level of risk. Further risk assessment and investigations may be warranted to determine the potential for impacts.

The key decision errors for the investigation are:

i. deciding that the site is contaminated when it truly is not.
ii. deciding that the site is not contaminated when it truly is.

The true state of nature for decision error (i) is that the site is not contaminated.
The true state of nature for decision error (ii) is that the site is contaminated.

The site assessment criteria were specifically derived and incorporate the following:

- The samples are not composited so the direct reading of contaminant levels will be found from each sample point on which an appropriate decision can be based off.
- The duplicate sample should have a Relative Percentage Difference (RPD) of <30%.
- The rinsate sample should return negligible concentrations for all parameters tested to ensure an appropriate sampling and decontamination procedure.
- If contaminant levels exceed the Tier 1 and statistical assessment criteria further investigation, assessment and management may be required.

Specific Tier 1 assessment criteria can be seen below, **Table 1**.

**Table 1:** *Assessment criteria*

| Material | Analytes | Criteria |
|---|---|---|
| **Soil** | Heavy metals<br>Pesticides | **Health Investigation Levels (HILs)**<br>-Residential A NEPM (2013)<br>-Table 1A(1) Heavy metals and pesticides<br>-Soils within 3m of surface<br>**Added Contaminants Limits (ACLs)**<br>-Residential A NEPM (2013)<br>-Table 1B(1) Zinc<br>-Table 1B(2) Copper<br>-Table 1B(3) Nickel<br>-Table 1B(4) Lead<br>-Soils within 2m of surface<br>-pH of 6.0 ($CaCl_2$) and CEC of 10 assumed from local knowledge<br>**Environmental Investigation Levels (EILs)**<br>-Residential A NEPM (2013)<br>-Table 1B(5) Arsenic and pesticides<br>-Soils within 2m of surface<br>**Ecological Screening Levels (ESLs)**<br>-Residential A NEPM (2013)<br>-Clay soils within 2m of surface |

The Tier 1 assessment criteria are used as an initial screening of the data to determine whether further assessment is required. Where above criteria exceedance indicates a risk to human health or the environment, site specific risk assessment, statistical analysis, management, or remediation will be undertaken or recommended as appropriate.

### DQO 7 - Obtaining data

The sampling pattern and strategy identifies the occurrence of potential contamination for suitable site characterisation. The sampling pattern and strategy has been devised based on site history, land uses, aerial imagery, site inspections, previous investigations and the NEPM (2013). The sampling pattern has been described in more detail below.

*Sampling strategy and pattern*

A systematic and judgemental sampling pattern has been chosen based on potential contamination sources, previous land use, and requirements to inform the need for further investigation. The adopted sampling pattern is suitable to make a quantitative statement about the level of confidence regarding the quality and accuracy of results. McMahon assesses that the sampling pattern is suitable to be used for decision making and site characterisation.

Key features of the sampling pattern include:

- 24 systematic and judgemental soil sample locations taken across the site. Samples analysed for heavy metals and pesticides (organochlorines and organophosphates).

- One soil duplicate sample.
- One soil rinsate sample.

By reference to the DQOs, maps of the investigation locations can be seen in **Attachment E**.

*Sampling design justification*

- Samples 1 - 4: to assess the near surface soil contamination from potential persistent agricultural chemicals from diffuse broadacre application at 111 Funk Road.
- Samples 5 & 6: to assess the near surface soil contamination from potential persistent agricultural chemicals from application in the old sheep yards at 111 Funk Road.
- Sample 7 & 8: to assess the near surface soil contamination from potential persistent agricultural chemicals from application in the cattle yards at 111 Funk Road.
- Samples 9 – 11 & 16 - 19: to assess the near surface soil contamination from potential persistent agricultural chemicals from diffuse broadacre application at 167 Funk Road.
- Samples 12 – 15: to assess the near surface soil contamination from potential persistent agricultural chemicals from application in the cattle yards and boom spray fill area at 167 Funk Road.
- Sample 20 - 21: to assess the near surface soil contamination from potential persistent agricultural chemicals from application in the rudimentary sheep yards at 344 Molkentin Road.
- Sample 22 - 24: to assess the near surface soil contamination from potential persistent agricultural chemicals from diffuse broadacre application at 344 Molkentin Road.

*Failure to meet objectives procedure*

If the procedures undertaken do not satisfy the expected data quality objectives, a review of the sampling plan will be conducted prior to any further works.

*Sampling and analysis methodology*

The sampling officer wore unused disposable nitrile gloves to extract samples directly from the excavated pit to place into appropriately preserved sample receptacles. Collected sample containers were placed into a chilled esky for preservation prior to analysis. All in-field observations and any relevant comments are detailed in the field sheets and a Chain of Custody form was produced to accompany the samples to the laboratory.

*Sampling standards*

Sampling was undertaken by reference to:

- AS 4482.1:2005 - Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.
- AS 4482.2:1999 - Guide to the sampling and investigation of potentially contaminated soil Part 2: Volatile substances.

Although these standards have been recently withdrawn, they have been used in the absence of other national guidelines.

## 8.0 Results

The site inspection and sampling for this PSI was conducted over one day on 15 June 2023. The weather was cold with light winds. A summary of the field observations and sample analytical results are as follows.

**Soil and site surface**

- There were no visual or olfactory indicators of agricultural chemical contamination in the soil or on the surface.

**Soil analysis**

- Heavy metals are below the adopted criteria. The results of heavy metals that are above the laboratory limit of reporting are assessed to be at background levels.
- Pesticides are below the adopted criteria. Impacts from organochlorine pesticides were detected in two samples (6 & 14) in the sheep and cattle yards at very low levels when compared to the criteria.

**Quality control and quality assurance results**

- The duplicate sample (24) returned relative percent differences of <30% except for lead with a result of 58%. Given the lead primary and duplicate samples are less than 10 times the criteria this is assessed to be of low significance.
- The rinsate sample retuned results below the laboratory limit of reporting.
- There were no laboratory outliers except for a duplicate for zinc. Given the zinc results are less than 10 times the criteria this is assessed to be of low significance.
- Based on the above the laboratory quality control and quality assurance is of a suitable quality to rely on the results.

Tabulated results can be seen in **Attachment F**.

Laboratory reports can be seen in **Attachment G**.

## 9.0 Conceptual site model

A conceptual site model is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors and is presented and follows.

### Summary

Based on the past agricultural land use and the sampling undertaken, it is assessed that widespread contamination from agricultural chemicals is not present at the site. Impacts from organochlorine pesticides were detected in two samples (6 & 14) in the sheep and cattle yards at very low levels. These impacts are surficial and localised. These concentrations are well below levels that warrant further investigation or other management measures. If elevated concentrations of contaminants were identified then they could present potential health risks to construction workers or future site occupants (through dermal contact, ingestion, or inhalation of contaminated soils), if not adequately managed during development.

However, additional sources of potential contamination were identified that will require further investigation and site management during development. This conceptual site model outlines the source-pathway-receptor relationship for the identified contamination sources.

### Potential and known sources of contamination

- Asbestos and hazardous building material from the demolished house, the small old farm shed, and small old garage at 167 Funk Road.
- Fuel and oil leaks and spills in the small paddock (1ha) at 167 Funk Road that is used as a laydown area for old cars, trucks, earthmoving equipment, farm equipment, and empty fuel tanks.
- Septic systems at 111 and 167 Funk Road.

### List of contaminants of potential concern

From the potential contamination sources, the contaminants of potential concern are:

- Asbestos and lead paint (hazardous building material).
- Fuels and oils from leaks and spills.
- Oils, solvents, heavy metals, and pesticides from the septic systems.

### Mechanism of contamination

The mechanism of contamination is predominantly top-down vertical and lateral migration of chemical into the soil, and the release of fibres from the disturbance of asbestos.

### Potentially affected environmental media

- Soil, vapour, and air.
- Surface water, but it is unlikely to be impacted owing to the distance to waterways.
- Groundwater, but it is unlikely to be impacted owing to the deep depths.

**Consideration of spatial and temporal variations**

Spatial variation in potential contamination is possible. Temporal variation is unlikely owing to the aged nature of potential contaminants.

**Actual or potential exposure pathways**

- Direct skin contact with soil for future construction workers, and future on-site occupants.
- Inhalation and/or ingestion of fibres, soil, vapour, and dust.
- Direct surface water contact, however, this is unlikely.
- Groundwater ingestion, however, this is unlikely.

**Human and ecological receptors**

- Future on-site users.
- Construction workers.
- Down gradient ecological receptors.
- Future landscaping and ecological receptors.

**Frequency of exposure**

- Construction workers are assessed to be a short-term exposure risk.
- Future on-site users are assessed to have a long-term exposure risk.
- Ecological receptors are assessed to be a medium to long-term exposure risk.

**Source pathway receptor linkage assessment**

- Future on-site construction workers have a risk of inhalation of fibres and contact with potentially contaminated soil during construction and maintenance.
- Future on-site users have a risk of dermal contact with potentially contaminated soil during occupation and maintenance.
- Future on-site users have a risk of inhalation of fibres and potentially contaminated soil and dust.
- Ecological receptors are limited at present, but this could change with landscaping and land use.
- The site is assessed to be suitable for the development given the adoption of the recommended site management strategies during development.

**Discussion of multiple lines of evidence**

A multiple lines of evidence approach is the process for evaluating and integrating information from different sources of data and uses best professional judgement to assess the consistency and plausibility of the conclusions which can be drawn, NEPM (2013).

Definitive information concerning the sources of potential contamination on site is satisfactory therefore the risk assessment relies heavily on the information provided by this PSI and is supplemented by the data collected during sampling.

## 10.0 Conclusions and recommendations

This investigation met the objective of investigating and assessing potential contamination and providing a statement of site suitability for the proposed land use and recommendations for further investigation and site management.

The results of the investigation conclude that there is no gross contamination across the site from agricultural chemical use and most of the site is assessed to be suitable for the proposed development. However additional sources of contamination were identified that will require further investigation and site management which are as follows:

- Asbestos and hazardous building material from the demolished house, the small old farm shed, and small old garage at 167 Funk Road. As asbestos fragments were observed on the surface around the small old farm shed and the small old garage these areas will require remediation. It is important to note that thick grass hampered a thorough visual inspection around these structures and the demolished house so the asbestos impact could be larger than what is readily observed. Therefore, further investigation in these areas is recommended in line with the WA Department of Health (2021) Guidelines for the assessment, remediation and management of asbestos contaminated sites.
- Fuel and oil leaks and spills in the small paddock (1ha) at 167 Funk Road that is used as a laydown area for old cars, trucks, earthmoving equipment, farm equipment, and empty fuel tanks. Further investigation by systematic soil sampling is recommended in this area and testing the soil samples for hydrocarbons, solvents, heavy metals, polycyclic aromatic hydrocarbons, phenols, pesticides, and polychlorinated biphenyls.
- Septic systems at 111 and 167 Funk Road. Septic systems are regulated by Council and present low health and environmental risk when regularly inspected and serviced. However, if the septic systems are proposed to be decommissioned, management by remediation is recommended. This is generally a standard development consent condition issued by Council when agricultural land is developed into residential.

Although no filled gullies and dams were identified as part of this PSI, it is not uncommon to find these on agricultural land. Care must be taken to identify and evaluated unexpected finds such as these during development under the unexpected finds protocol in **Section 12.0**.

This executive summary and the findings of this PSI are subject to the limitations as stated in **Section 11.0**.

## 11.0 Limitations and disclaimer

DM McMahon Pty Ltd has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of the Bioplan Pty Ltd and Hurst Earthmoving Pty Ltd and only those third parties who have been authorised by DM McMahon Pty Ltd to rely on this report.

The information contained in this report has been extracted from field and laboratory sources believed to be reliable and accurate. DM McMahon Pty Ltd does not assume any responsibility for the misinterpretation of information supplied in this report. The accuracy and reliability of recommendations identified in this report need to be evaluated with due care according to individual circumstances. It should be noted that the recommendations and findings in this report are based solely upon the said site location and conditions at the time of assessment. The results of the said investigations undertaken are an overall representation of the conditions encountered. The properties of the soil, vapour and groundwater within the location may change due to variations in ground conditions outside of the assessed area. The author has no control or liability over site variability that may warrant further investigation that may lead to significant design and land use changes.

## 12.0 Unexpected findings

If any unconsolidated, odorous, stained, or deleterious soils and fill, or suspect bonded/friable/fibrous asbestos containing material, fuel tanks, or septic systems are encountered during any further excavation, suspected historical contaminating activities are encountered, or conditions that are not alike the above descriptions, the site supervisor should be informed, the work stopped, and this office be contacted immediately for further evaluation by an appropriately qualified environmental consultant. The unexpected findings may trigger the need for more investigation and assessment dependant on the scope and context of the unexpected finding.

## 13.0 Notice of Copyright



## 14.0 Attachments

**Attachment A** : *Site location and potential future subdivision plan*

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Google Earth image 2019

Legend
Boundary

Dights Forest Rd
Jindera
Urana St
Urana Rd
Hueske Rd
Gerogery Rd
N
2 km
Google Earth

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Google Earth image 2019

**Legend**

- 111 Funk Road
- 167 Funk Road
- 344 Molkentin Road

N

900 m

Google Earth

**Attachment B** : *Aerial photographs and satellite images*

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
NSW LPI image 1961

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
NSW LPI image 1975

Legend
Boundary

N

900 m

Google Earth

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
NSW LPI image 1987

Legend
Boundary

N

900 m

Google Earth

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
NSW LPI image 1990

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
NSW LPI image 1996

Legend
Boundary

N

900 m

Google Earth

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Google Earth image 2003

Legend
Boundary



N

900 m

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Google Earth image 2009

Legend
Boundary

Google Earth
Image © 2023 Maxar Technologies

N

900 m

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2010

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2011

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2014

Legend
Boundary

Google Earth

N

900 m

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2015

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2016

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2017

Legend
Boundary

Google Earth

N

900 m

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2018

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Google Earth image 2019

Legend
Boundary

Google Earth

900 m

N

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2020

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2021

Legend
Boundary

Google Earth

N

900 m

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2023

Legend
Boundary

Google Earth

900 m

N

**Attachment C** : *Site features*

# 111 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Satellite image 2021

# 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Satellite image 2021

Legend
Boundary
Site feature

Septic tank
House
Old sheep yards
Wool shed
Shed
Horse arena
New cattle yards
Funk Rd
Redhill Rd

Google Earth
Image © 2023 Airbus

N
100 m

# 344 Molkentin Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Satellite image 2021

**Legend**

- Boundary
- Site feature

Molkentin Rd

Molkentin Rd

Funk Rd

Molkentin Rd

Sheep yards

Molkentin Rd

N

200 m

Google Earth

Image © 2023 Airbus

**Attachment D** : *Site photographs*

Photograph 1: The alluvial plain at 344 Molkentin Road.

Photograph 2: The dam in the north west of 344 Molkentin Road.

Photograph 3: The rudimentary sheep yards at 344 Molkentin Road

Photograph 4: The north west trending hillslope at 111 Funk Road.


Photograph 5: The front gate of 111 Funk Road with the modern house in the background.

Photograph 6: The woolshed and old sheep yards at 111 Funk Road.

Photograph 7: The new cattle yards at 111 Funk Road.

Photograph 8: The horse arena at 111 Funk Road.

Photograph 9: The large new shed an attached bricked living area at 167 Funk Road.

Photograph 10: The old farm shed at 167 Funk Road.

Photograph 11: The internal asbestos lining in the old farm shed at 167 Funk Road.

Photograph 12: The small old garage clad with asbestos at 167 Funk Road.

Photograph 13: The remnants of the demolished house at 167 Funk Road.

Photograph 14: The septic tank at 167 Funk Road.

Photograph 15: The boom spray fill area at 167 Funk Road.

Photograph 16: The cattle yards at 167 Funk Road.

Photograph 17: The laydown area at 167 Funk Road.

Photograph 18: The laydown area at 167 Funk Road.

Photograph 19: The laydown area at 167 Funk Road.

Photograph 20: The laydown area at 167 Funk Road.

Photograph 21: The disused quarry at 167 Funk Road.

Photograph 22: The incised drainage at 167 Funk Road.

**Attachment E** : *Sampling map*

# 344 Molkentin Road and 111 & 167 Funk Road Jindera NSW 2642

Preliminary Site Investigation
Report No. 9349
Nearmap image 2023

**Legend**

- Boundary
- Investigation locations

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

N

700 m

Google Earth

**Attachment F** : *Tabulated results*

Job number: 9349
Project: Molkentein Road Jindera NSW

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Sample date** | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | | | | | |
| | | **Sample location** | Paddock | Paddock | Paddock | Paddock | Yards | Yards | Yards | Yards | Paddock | Paddock | Paddock | Paddock | | | | | |
| | | **Sample ID** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | | | |
| | | **Sample depth (m)** | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | | | | | |
| **Compound** | **LOR** | **Unit** | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | **HILs** | **HSLs** | **ACLs** | **EILs** | **ESLs** |
| Arsenic | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 100 | - | - | 100 | - |
| Cadmium | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 20 | - | - | - | - |
| Chromium | 2 | mg/kg | 16 | 16 | 13 | 12 | 11 | 10 | 17 | 12 | 11 | 9 | 12 | 14 | - | - | 400 | - | - |
| Copper | 5 | mg/kg | <5 | <5 | 10 | 8 | 9 | 9 | 12 | 7 | 12 | 10 | <5 | <5 | 6000 | - | 190 | - | - |
| Lead | 5 | mg/kg | 8 | 8 | 12 | 9 | 13 | 18 | 15 | 12 | 13 | 11 | 6 | 7 | 300 | - | 1100 | - | - |
| Nickel | 2 | mg/kg | 4 | 2 | 7 | 7 | 6 | 5 | 12 | 6 | 6 | 5 | <2 | 2 | 400 | - | 170 | - | - |
| Zinc | 5 | mg/kg | 12 | 7 | 18 | 16 | 34 | 53 | 21 | 36 | 164 | 120 | 5 | 6 | 7400 | - | 400 | - | - |
| Mercury | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 40 | - | - | - | - |
| PCBs | 0.1 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| HCB | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 10 | - | - | - | - |
| Heptachlor | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 6 | - | - | - | - |
| Chlordane | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 50 | - | - | - | - |
| Endrin | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 10 | - | - | - | - |
| Endosulfan | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 270 | - | - | - | - |
| Aldrin+dieldrin | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.99 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 6 | - | - | - | - |
| DDT+DDE+DDD | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.98 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 240 | - | - | - | - |
| Chlorpyrifos | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 160 | - | - | - | - |
| Phenols | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 3000 | - | - | - | - |
| PAHs | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 300 | - | - | - | - |
| Benzo(a)pyrene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | |
| Benzo(a)pyrene TEQ (half LOR) | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | 0.7 |
| TRH C6-C10 minux BTEX (F1) | 10 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 50/4400 | - | - | 180 |
| TRH C10-C16 minus napthalene (F2) | 50 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 280/3300 | - | - | 120 |
| TRH C16-C34 (F3) | 100 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | -/4500 | - | - | 1300 |
| TRH C34-C40 (F4) | 100 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | -/6300 | - | - | 5600 |
| Benzene | 0.2 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.7 | - | - | 65 |
| Toluene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 480 | - | - | 105 |
| Ethylbenzene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 125 |
| Xylenes | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | - | - | 45 |
| Napthalene | 1 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | 170 | - |

**Residential A Criteria**

Page: 2 of 2
Job number: 9349
Project: Molkentein Road Jindera NSW

| | | | | | | | | | | | | | | | | Residential A Criteria | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Sample date** | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | 15/6/23 | | | | | |
| | | **Sample location** | Yards | Yards | Yards | Paddock | Paddock | Paddock | Paddock | Yards | Yards | Paddock | Paddock | Paddock | | | | | |
| | | **Sample ID** | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | | |
| | | **Sample depth (m)** | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | 0-0.3 | | | | | |
| **Compound** | **LOR** | **Unit** | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | **HILs** | **HSLs** | **ACLs** | **EILs** | **ESLs** |
| Arsenic | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 100 | - | - | 100 | - |
| Cadmium | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 20 | - | - | - | - |
| Chromium | 2 | mg/kg | 14 | 12 | 10 | 30 | 25 | 8 | 14 | 18 | 18 | 15 | 18 | 18 | - | - | 400 | - | - |
| Copper | 5 | mg/kg | <5 | 8 | <5 | <5 | 6 | <5 | <5 | <5 | <5 | <5 | 5 | <5 | 6000 | - | 190 | - | - |
| Lead | 5 | mg/kg | 8 | 86 | 9 | 11 | 14 | 5 | 8 | 8 | 9 | 8 | 8 | 6 | 300 | - | 1100 | - | - |
| Nickel | 2 | mg/kg | 5 | 3 | 3 | 3 | 4 | <2 | <2 | 2 | 2 | <2 | 5 | 2 | 400 | - | 170 | - | - |
| Zinc | 5 | mg/kg | 31 | 203 | 23 | 8 | 6 | <5 | <5 | 17 | 15 | 5 | 7 | <5 | 7400 | - | 400 | - | - |
| Mercury | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 40 | - | - | - | - |
| PCBs | 0.1 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| HCB | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 10 | - | - | - | - |
| Heptachlor | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 6 | - | - | - | - |
| Chlordane | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 50 | - | - | - | - |
| Endrin | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 10 | - | - | - | - |
| Endosulfan | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 270 | - | - | - | - |
| Aldrin+dieldrin | 0.05 | mg/kg | <0.05 | 0.13 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 6 | - | - | - | - |
| DDT+DDE+DDD | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 240 | - | - | - | - |
| Chlorpyrifos | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 160 | - | - | - | - |
| Phenols | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 3000 | - | - | - | - |
| PAHs | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 300 | - | - | - | - |
| Benzo(a)pyrene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | |
| Benzo(a)pyrene TEQ (half LOR) | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | 0.7 |
| TRH C6-C10 minux BTEX (F1) | 10 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 50/4400 | - | - | 180 |
| TRH C10-C16 minus napthalene (F2) | 50 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 280/3300 | - | - | 120 |
| TRH C16-C34 (F3) | 100 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | -/4500 | - | - | 1300 |
| TRH C34-C40 (F4) | 100 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | -/6300 | - | - | 5600 |
| Benzene | 0.2 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.7 | - | - | 65 |
| Toluene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 480 | - | - | 105 |
| Ethylbenzene | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 125 |
| Xylenes | 0.5 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | - | - | 45 |
| Napthalene | 1 | mg/kg | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | 170 | - |

**Attachment G** : *Laboratory reports*

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2320345** | Page | : 1 of 14 |
| Client | : **DM MCMAHON PTY LTD** | Laboratory | : Environmental Division Sydney |
| Contact | : ADMIN | Contact | : Customer Services ES |
| Address | : 6 JONES ST<br>Wagga Wagga NSW, AUSTRALIA 2650 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : +61 02 6931 0510 | Telephone | : +61-2-8784 8555 |
| Project | : Molkentin Road Jindera | Date Samples Received | : 20-Jun-2023 12:00 |
| Order number | : 9349 | Date Analysis Commenced | : 22-Jun-2023 |
| C-O-C number | : ---- | Issue Date | : 27-Jun-2023 15:05 |
| Sampler | : DAVID MCMAHON | | |
| Site | : ---- | | |
| Quote number | : EN/222 | | |
| No. of samples received | : 26 | | |
| No. of samples analysed | : 26 | | |

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

## *Signatories*

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

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Ankit Joshi | Senior Chemist - Inorganics | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, Smithfield, NSW |
| Evie Sidarta | Inorganic Chemist | Sydney Inorganics, Smithfield, NSW |

## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

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

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

- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EG005T: Poor precision was obtained for Zinc on sample ES2320345 # 014. Confirmed by re-digestion and reanalysis.
- EP068: Positive results have been confirmed by re-extraction and re-analysis.

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-001 | ES2320345-002 | ES2320345-003 | ES2320345-004 | ES2320345-005 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | **13.8** | **13.2** | **12.7** | **13.1** | **13.9** |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | **16** | **16** | **13** | **12** | **11** |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | **10** | **8** | **9** |
| Lead | 7439-92-1 | 5 | mg/kg | **8** | **8** | **12** | **9** | **13** |
| Nickel | 7440-02-0 | 2 | mg/kg | **4** | **2** | **7** | **7** | **6** |
| Zinc | 7440-66-6 | 5 | mg/kg | **12** | **7** | **18** | **16** | **34** |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-001 | ES2320345-002 | ES2320345-003 | ES2320345-004 | ES2320345-005 |
| | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| **Methoxychlor** | 72-43-5 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Sum of Aldrin + Dieldrin** | 309-00-2/60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ **Sum of DDD + DDE + DDT** | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | |
| **Dichlorvos** | 62-73-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Demeton-S-methyl** | 919-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Monocrotophos** | 6923-22-4 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Dimethoate** | 60-51-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Diazinon** | 333-41-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos-methyl** | 5598-13-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion-methyl** | 298-00-0 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Malathion** | 121-75-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenthion** | 55-38-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos** | 2921-88-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion** | 56-38-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pirimphos-ethyl** | 23505-41-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorfenvinphos** | 470-90-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Bromophos-ethyl** | 4824-78-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenamiphos** | 22224-92-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Prothiofos** | 34643-46-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Ethion** | 563-12-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Carbophenothion** | 786-19-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Azinphos Methyl** | 86-50-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| **Dibromo-DDE** | 21655-73-2 | 0.05 | % | **82.4** | **82.6** | **98.2** | **76.2** | **102** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | **87.4** | **64.9** | **76.5** | **70.5** | **83.8** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-006 | ES2320345-007 | ES2320345-008 | ES2320345-009 | ES2320345-010 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | **13.2** | **22.4** | **20.3** | **19.0** | **17.7** |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | **7** | **6** | <5 | <5 | <5 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | **10** | **17** | **12** | **11** | **9** |
| Copper | 7440-50-8 | 5 | mg/kg | **9** | **12** | **7** | **12** | **10** |
| Lead | 7439-92-1 | 5 | mg/kg | **18** | **15** | **12** | **13** | **11** |
| Nickel | 7440-02-0 | 2 | mg/kg | **5** | **12** | **6** | **6** | **5** |
| Zinc | 7440-66-6 | 5 | mg/kg | **53** | **21** | **36** | **164** | **120** |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | **0.99** | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | **0.49** | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | **0.09** | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | **0.4** | <0.2 | <0.2 | <0.2 | <0.2 |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-006 | ES2320345-007 | ES2320345-008 | ES2320345-009 | ES2320345-010 |
| | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| **Methoxychlor** | 72-43-5 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Sum of Aldrin + Dieldrin** | 309-00-2/60-57-1 | 0.05 | mg/kg | **0.99** | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ **Sum of DDD + DDE + DDT** | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | **0.98** | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | |
| **Dichlorvos** | 62-73-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Demeton-S-methyl** | 919-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Monocrotophos** | 6923-22-4 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Dimethoate** | 60-51-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Diazinon** | 333-41-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos-methyl** | 5598-13-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion-methyl** | 298-00-0 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Malathion** | 121-75-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenthion** | 55-38-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos** | 2921-88-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion** | 56-38-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pirimphos-ethyl** | 23505-41-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorfenvinphos** | 470-90-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Bromophos-ethyl** | 4824-78-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenamiphos** | 22224-92-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Prothiofos** | 34643-46-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Ethion** | 563-12-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Carbophenothion** | 786-19-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Azinphos Methyl** | 86-50-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| **Dibromo-DDE** | 21655-73-2 | 0.05 | % | **102** | **77.5** | **82.0** | **86.2** | **82.5** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | **111** | **54.2** | **95.0** | **95.2** | **90.6** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-011 | ES2320345-012 | ES2320345-013 | ES2320345-014 | ES2320345-015 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | **11.7** | **11.3** | **16.1** | **11.7** | **14.1** |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | **12** | **14** | **14** | **12** | **10** |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | <5 | **8** | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | **6** | **7** | **8** | **86** | **9** |
| Nickel | 7440-02-0 | 2 | mg/kg | <2 | **2** | **5** | **3** | **3** |
| Zinc | 7440-66-6 | 5 | mg/kg | **5** | **6** | **31** | **203** | **23** |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | **0.13** | <0.05 |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-011 | ES2320345-012 | ES2320345-013 | ES2320345-014 | ES2320345-015 |
| | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| **Methoxychlor** | 72-43-5 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Sum of Aldrin + Dieldrin** | 309-00-2/60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | **0.13** | <0.05 |
| ^ **Sum of DDD + DDE + DDT** | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | |
| **Dichlorvos** | 62-73-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Demeton-S-methyl** | 919-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Monocrotophos** | 6923-22-4 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Dimethoate** | 60-51-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Diazinon** | 333-41-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos-methyl** | 5598-13-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion-methyl** | 298-00-0 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Malathion** | 121-75-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenthion** | 55-38-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos** | 2921-88-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion** | 56-38-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pirimphos-ethyl** | 23505-41-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorfenvinphos** | 470-90-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Bromophos-ethyl** | 4824-78-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenamiphos** | 22224-92-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Prothiofos** | 34643-46-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Ethion** | 563-12-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Carbophenothion** | 786-19-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Azinphos Methyl** | 86-50-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| **Dibromo-DDE** | 21655-73-2 | 0.05 | % | **90.6** | **93.5** | **81.9** | **89.4** | **77.0** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | **88.7** | **106** | **77.3** | **97.4** | **54.6** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-016 | ES2320345-017 | ES2320345-018 | ES2320345-019 | ES2320345-020 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | **15.4** | **17.1** | **10.6** | **10.4** | **10.4** |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | **6** | <5 | <5 | <5 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | **30** | **25** | **8** | **14** | **18** |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | **6** | <5 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | **11** | **14** | **5** | **8** | **8** |
| Nickel | 7440-02-0 | 2 | mg/kg | **3** | **4** | <2 | <2 | **2** |
| Zinc | 7440-66-6 | 5 | mg/kg | **8** | **6** | <5 | <5 | **17** |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-016 | ES2320345-017 | ES2320345-018 | ES2320345-019 | ES2320345-020 |
| | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| **Methoxychlor** | 72-43-5 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ^ **Sum of Aldrin + Dieldrin** | 309-00-2/60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ^ **Sum of DDD + DDE + DDT** | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | |
| **Dichlorvos** | 62-73-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Demeton-S-methyl** | 919-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Monocrotophos** | 6923-22-4 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Dimethoate** | 60-51-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Diazinon** | 333-41-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos-methyl** | 5598-13-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion-methyl** | 298-00-0 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Malathion** | 121-75-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenthion** | 55-38-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorpyrifos** | 2921-88-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Parathion** | 56-38-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pirimphos-ethyl** | 23505-41-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Chlorfenvinphos** | 470-90-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Bromophos-ethyl** | 4824-78-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Fenamiphos** | 22224-92-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Prothiofos** | 34643-46-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Ethion** | 563-12-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Carbophenothion** | 786-19-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **Azinphos Methyl** | 86-50-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| **Dibromo-DDE** | 21655-73-2 | 0.05 | % | **110** | **86.0** | **87.9** | **88.0** | **88.5** |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | **109** | **66.4** | **72.1** | **92.0** | **97.4** |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 21 | 22 | 23 | 24 | Duplicate |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-021 | ES2320345-022 | ES2320345-023 | ES2320345-024 | ES2320345-025 |
| | | | | Result | Result | Result | Result | Result |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 1.0 | % | 13.2 | 12.3 | 17.3 | 11.5 | 11.4 |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | 5 |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| Chromium | 7440-47-3 | 2 | mg/kg | 18 | 15 | 18 | 18 | 14 |
| Copper | 7440-50-8 | 5 | mg/kg | <5 | <5 | 5 | <5 | <5 |
| Lead | 7439-92-1 | 5 | mg/kg | 9 | 8 | 8 | 6 | 11 |
| Nickel | 7440-02-0 | 2 | mg/kg | 2 | <2 | 5 | 2 | 2 |
| Zinc | 7440-66-6 | 5 | mg/kg | 15 | 5 | 7 | <5 | <5 |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | ---- |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | 21 | 22 | 23 | 24 | Duplicate |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 | 15-Jun-2023 00:00 |
| Compound | CAS Number | LOR | Unit | ES2320345-021 | ES2320345-022 | ES2320345-023 | ES2320345-024 | ES2320345-025 |
| | | | | Result | Result | Result | Result | Result |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | |
| Methoxychlor | 72-43-5 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | ---- |
| ^ Sum of Aldrin + Dieldrin | 309-00-2/60-57-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| ^ Sum of DDD + DDE + DDT | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | |
| Dichlorvos | 62-73-7 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Demeton-S-methyl | 919-86-8 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Monocrotophos | 6923-22-4 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | ---- |
| Dimethoate | 60-51-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Diazinon | 333-41-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Chlorpyrifos-methyl | 5598-13-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Parathion-methyl | 298-00-0 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | ---- |
| Malathion | 121-75-5 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Fenthion | 55-38-9 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Chlorpyrifos | 2921-88-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Parathion | 56-38-2 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | ---- |
| Pirimphos-ethyl | 23505-41-1 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Chlorfenvinphos | 470-90-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Bromophos-ethyl | 4824-78-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Fenamiphos | 22224-92-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Prothiofos | 34643-46-4 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Ethion | 563-12-2 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Carbophenothion | 786-19-6 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| Azinphos Methyl | 86-50-0 | 0.05 | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | ---- |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | **75.7** | **80.9** | **75.4** | **76.1** | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | **78.2** | **75.6** | **68.2** | **61.4** | ---- |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Sample ID | Rinsate | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 15-Jun-2023 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2320345-026 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EG020T: Total Metals by ICP-MS** | | | | | | | | | |
| **Arsenic** | 7440-38-2 | 0.001 | mg/L | | <0.001 | ---- | ---- | ---- | ---- |
| **Cadmium** | 7440-43-9 | 0.0001 | mg/L | | <0.0001 | ---- | ---- | ---- | ---- |
| **Chromium** | 7440-47-3 | 0.001 | mg/L | | <0.001 | ---- | ---- | ---- | ---- |
| **Copper** | 7440-50-8 | 0.001 | mg/L | | <0.001 | ---- | ---- | ---- | ---- |
| **Nickel** | 7440-02-0 | 0.001 | mg/L | | <0.001 | ---- | ---- | ---- | ---- |
| **Lead** | 7439-92-1 | 0.001 | mg/L | | <0.001 | ---- | ---- | ---- | ---- |
| **Zinc** | 7440-66-6 | 0.005 | mg/L | | <0.005 | ---- | ---- | ---- | ---- |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | | |
| **Mercury** | 7439-97-6 | 0.0001 | mg/L | | <0.0001 | ---- | ---- | ---- | ---- |

## Surrogate Control Limits

| Sub-Matrix: **SOIL** | | Recovery Limits (%) | |
|---|---|---|---|
| *Compound* | *CAS Number* | *Low* | *High* |
| **EP068S: Organochlorine Pesticide Surrogate** | | | |
| **Dibromo-DDE** | 21655-73-2 | 49 | 147 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | |
| **DEF** | 78-48-8 | 35 | 143 |

# QA/QC Compliance Assessment to assist with Quality Review

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2320345** | Page | : 1 of 7 |
| Client | : **DM MCMAHON PTY LTD** | Laboratory | : Environmental Division Sydney |
| Contact | : ADMIN | Telephone | : +61-2-8784 8555 |
| Project | : Molkentin Road Jindera | Date Samples Received | : 20-Jun-2023 |
| Site | : ---- | Issue Date | : 27-Jun-2023 |
| Sampler | : DAVID MCMAHON | No. of samples received | : 26 |
| Order number | : 9349 | No. of samples analysed | : 26 |

**This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.**

Brief method summaries and references are also provided to assist in traceability.

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

### *Outliers : Analysis Holding Time Compliance*

- **NO Analysis Holding Time Outliers exist.**

### *Outliers : Frequency of Quality Control Samples*

- **NO Quality Control Sample Frequency Outliers exist.**

## Outliers : Quality Control Samples

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

Matrix: **SOIL**

| Compound Group Name | Laboratory Sample ID | Client Sample ID | Analyte | CAS Number | Data | Limits | Comment |
|---|---|---|---|---|---|---|---|
| **Duplicate (DUP) RPDs** | | | | | | | |
| EG005(ED093)T: Total Metals by ICP-AES | ES2320345--014 | 14 | **Zinc** | 7440-66-6 | 36.2 % | 0% - 20% | **RPD exceeds LOR based limits** |

# Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

| Method / Container / Client Sample ID(s) | | Sample Date | Extraction / Preparation | | | Analysis | | |
|---|---|---|---|---|---|---|---|---|
| | | | Date extracted | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| **Soil Glass Jar - Unpreserved (EA055)** | | | | | | | | |
| 1, | 2, | **15-Jun-2023** | **----** | ---- | ---- | **22-Jun-2023** | 29-Jun-2023 | ✓ |
| 3, | 4, | | | | | | | |
| 5, | 6, | | | | | | | |
| 7, | 8, | | | | | | | |
| 9, | 10, | | | | | | | |
| 11, | 12, | | | | | | | |
| 13 | | | | | | | | |
| **Soil Glass Jar - Unpreserved (EA055)** | | | | | | | | |
| 14, | 15, | **15-Jun-2023** | **----** | ---- | ---- | **23-Jun-2023** | 29-Jun-2023 | ✓ |
| 16, | 17, | | | | | | | |
| 18, | 19, | | | | | | | |
| 20, | 21, | | | | | | | |
| 22, | 23, | | | | | | | |
| 24, | Duplicate | | | | | | | |

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

| Method / Container / Client Sample ID(s) | Sample Date | Extraction / Preparation | | | Analysis | | |
|---|---|---|---|---|---|---|---|
| | | Date extracted | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | |
| **Soil Glass Jar - Unpreserved (EG005T)** | | | | | | | |
| 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | **15-Jun-2023** | **22-Jun-2023** | 12-Dec-2023 | ✓ | **23-Jun-2023** | 12-Dec-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EG005T)** | | | | | | | |
| 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, Duplicate | **15-Jun-2023** | **23-Jun-2023** | 12-Dec-2023 | ✓ | **26-Jun-2023** | 12-Dec-2023 | ✓ |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | |
| **Soil Glass Jar - Unpreserved (EG035T)** | | | | | | | |
| 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | **15-Jun-2023** | **22-Jun-2023** | 13-Jul-2023 | ✓ | **26-Jun-2023** | 13-Jul-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EG035T)** | | | | | | | |
| 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, Duplicate | **15-Jun-2023** | **23-Jun-2023** | 13-Jul-2023 | ✓ | **27-Jun-2023** | 13-Jul-2023 | ✓ |

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

| Method / Container / Client Sample ID(s) | Sample Date | Extraction / Preparation | | | Analysis | | |
|---|---|---|---|---|---|---|---|
| | | Date extracted | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | |
| **Soil Glass Jar - Unpreserved (EP068)**<br>1, 2, 3, 4, 5, 21, 22, 23, 24 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **23-Jun-2023** | 01-Aug-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EP068)**<br>7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **24-Jun-2023** | 01-Aug-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EP068)**<br>6, 14 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **27-Jun-2023** | 01-Aug-2023 | ✓ |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | |
| **Soil Glass Jar - Unpreserved (EP068)**<br>1, 2, 3, 4, 5, 21, 22, 23, 24 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **23-Jun-2023** | 01-Aug-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EP068)**<br>7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **24-Jun-2023** | 01-Aug-2023 | ✓ |
| **Soil Glass Jar - Unpreserved (EP068)**<br>6, 14 | **15-Jun-2023** | **22-Jun-2023** | 29-Jun-2023 | ✓ | **27-Jun-2023** | 01-Aug-2023 | ✓ |

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

| Method / Container / Client Sample ID(s) | Sample Date | Extraction / Preparation | | | Analysis | | |
|---|---|---|---|---|---|---|---|
| | | Date extracted | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| **EG020T: Total Metals by ICP-MS** | | | | | | | |
| **Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)**<br>Rinsate | **15-Jun-2023** | **22-Jun-2023** | 12-Dec-2023 | ✓ | **22-Jun-2023** | 12-Dec-2023 | ✓ |

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

| Method / Container / Client Sample ID(s) | Sample Date | Extraction / Preparation | | | Analysis | | |
|---|---|---|---|---|---|---|---|
| | | Date extracted | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | |
| **Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)** | | | | | | | |
| Rinsate | **15-Jun-2023** | **----** | ---- | **----** | **26-Jun-2023** | 13-Jul-2023 | ✓ |

# Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

| Quality Control Sample Type | | Count | | Rate (%) | | | Quality Control Specification |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC* | *Regular* | ***Actual*** | ***Expected*** | *Evaluation* | |
| Laboratory Duplicates (DUP) | | | | | | | |
| Moisture Content | EA055 | 4 | 40 | **10.00** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Pesticides by GCMS | EP068 | 3 | 24 | **12.50** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Mercury by FIMS | EG035T | 4 | 36 | **11.11** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-AES | EG005T | 4 | 38 | **10.53** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS) | | | | | | | |
| Pesticides by GCMS | EP068 | 2 | 24 | **8.33** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Mercury by FIMS | EG035T | 2 | 36 | **5.56** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-AES | EG005T | 2 | 38 | **5.26** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB) | | | | | | | |
| Pesticides by GCMS | EP068 | 2 | 24 | **8.33** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Mercury by FIMS | EG035T | 2 | 36 | **5.56** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-AES | EG005T | 2 | 38 | **5.26** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS) | | | | | | | |
| Pesticides by GCMS | EP068 | 2 | 24 | **8.33** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Mercury by FIMS | EG035T | 2 | 36 | **5.56** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-AES | EG005T | 2 | 38 | **5.26** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

| Quality Control Sample Type | | Count | | Rate (%) | | | Quality Control Specification |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC* | *Regular* | ***Actual*** | ***Expected*** | *Evaluation* | |
| Laboratory Duplicates (DUP) | | | | | | | |
| Total Mercury by FIMS | EG035T | 2 | 20 | **10.00** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-MS - Suite A | EG020A-T | 2 | 9 | **22.22** | **10.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS) | | | | | | | |
| Total Mercury by FIMS | EG035T | 1 | 20 | **5.00** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-MS - Suite A | EG020A-T | 1 | 9 | **11.11** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB) | | | | | | | |
| Total Mercury by FIMS | EG035T | 1 | 20 | **5.00** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-MS - Suite A | EG020A-T | 1 | 9 | **11.11** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS) | | | | | | | |
| Total Mercury by FIMS | EG035T | 1 | 20 | **5.00** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |
| Total Metals by ICP-MS - Suite A | EG020A-T | 1 | 9 | **11.11** | **5.00** | ✓ | NEPM 2013 B3 & ALS QC Standard |

## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

| Analytical Methods | Method | Matrix | Method Descriptions |
|---|---|---|---|
| Moisture Content | EA055 | SOIL | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3). |
| Total Metals by ICP-AES | EG005T | SOIL | In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3) |
| Total Mercury by FIMS | EG035T | SOIL | In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3) |
| Pesticides by GCMS | EP068 | SOIL | In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3). |
| Total Metals by ICP-MS - Suite A | EG020A-T | WATER | In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. |
| Total Mercury by FIMS | EG035T | WATER | In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3). |

| Preparation Methods | Method | Matrix | Method Descriptions |
|---|---|---|---|
| Hot Block Digest for metals in soils sediments and sludges | EN69 | SOIL | In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3). |
| Tumbler Extraction of Solids | ORG17 | SOIL | In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis. |
| Digestion for Total Recoverable Metals | EN25 | WATER | In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3) |

# Chain of Custody

DM McMahon Pty Ltd
6 Jones Street
PO Box 6118, Wagga Wagga NSW 2650
Ph: (02) 69 310 510

**Turnaround Requirements:** ☑ Standard TAT ☐ Non Standard or Urgent TAT (List Due Date):

| | |
|---|---|
| **Relinquished by:** | D. McMahon |
| **Date:** | 15/06/2023 |
| **Signature:** | DM |
| **Received by:** | Zac G |
| **Date:** | 20/6/23 12pm |
| **Signature:** | |
| **Relinquished by:** | |
| **Date:** | |
| **Signature:** | |
| **Received by:** | |
| **Date:** | |
| **Signature:** | |

| | |
|---|---|
| **Analysing Laboratory:** | ALS Environmental - Sydney |
| **Project:** | Molkentin Road Jindera |
| **Order No.:** | 9349 |
| **Project Manager:** | David McMahon |
| **Contact Ph:** | (02) 69 310 510 |
| **Sampling Officer:** | D. McMahon |
| **Report Format:** | Default |
| **Email Reports to:** | admin@dmmcmahon.com.au |
| **Email Invoice to:** | admin@dmmcmahon.com.au |

**Lab Comments:**

**For Laboratory Use Only (Circle)**

| | | | |
|---|---|---|---|
| Custody Seal Intact? | Yes | No | N/A |
| Free ice/ Frozen ice bricks present upon sample | Yes | No | N/A |
| Random sample temp on receipt: | | | °C |
| Other comments: | | | |

**QUOTE NO.:**

**COC SEQUENCE NUMBER**

COC: 1 2 3 4 5 6 7 8
OF: 1 2 3 4 5 6 7 8

| LAB USE | SAMPLE DETAILS | | | CONTAINER INFORMATION | | ANALYSIS REQUIRED including suites (where metals are required, specify Total or Dissolved) | | | | | | | | | | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAB ID | SAMPLE ID | DATE/TIME | MATRIX (ref below) | TYPE & PRESERVATIVE (see codes below) | TOTAL CONTAINERS | (S-2) Metals | (S-12) OC/OP Pesticides | (W-2 Metals) | | | | | | | | Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. |
| 1-24 | 1 to 24 | 15/06/2023 | S | Unpreserved Glass Jar | 24 | ✓ | ✓ | | | | | | | | | |
| 25 | Duplicate | 15/06/2023 | S | Unpreserved Glass Jar | 1 | ✓ | | | | | | | | | | |
| 26 | Rinsate | 15/06/2023 | W | Nitric plastic | 1 | | | ✓ | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| | | | | TOTAL | 26 | | | | | | | | | | | |

Environmental Division
Sydney
Work Order Reference
ES2320345

Telephone : +61-2-8784 8555

| Matrix | Container Codes: |
|---|---|
| W- Water; S - Soil; Sed - Sediment; Sl - Sludge; A - Air; D - Dust. | P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag. |

# SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order** : **ES2320345**

| | | | |
|---|---|---|---|
| Client | : **DM MCMAHON PTY LTD** | Laboratory | : Environmental Division Sydney |
| Contact | : ADMIN | Contact | : Customer Services ES |
| Address | : 6 JONES ST<br>Wagga Wagga NSW, AUSTRALIA 2650 | Address | : 277-289 Woodpark Road Smithfield<br>NSW Australia 2164 |
| E-mail | : admin@dmmcmahon.com.au | E-mail | : ALSEnviro.Sydney@ALSGlobal.com |
| Telephone | : +61 02 6931 0510 | Telephone | : +61-2-8784 8555 |
| Facsimile | : ---- | Facsimile | : +61-2-8784 8500 |
| Project | : Molkentin Road Jindera | Page | : 1 of 3 |
| Order number | : 9349 | Quote number | : EB2017DMMCMA0001 (EN/222) |
| C-O-C number | : ---- | QC Level | : NEPM 2013 B3 & ALS QC Standard |
| Site | : ---- | | |
| Sampler | : DAVID MCMAHON | | |

## Dates

| | | | |
|---|---|---|---|
| Date Samples Received | : 20-Jun-2023 12:00 | Issue Date | : 21-Jun-2023 |
| Client Requested Due Date | : 27-Jun-2023 | Scheduled Reporting Date | : **27-Jun-2023** |

## Delivery Details

| | | | |
|---|---|---|---|
| Mode of Delivery | : Undefined | Security Seal | : Not Available |
| No. of coolers/boxes | : ---- | Temperature | : 14.9'C - Ice Bricks present |
| Receipt Detail | : | No. of samples received / analysed | : 26 / 26 |

## General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

| *Laboratory sample ID* | *Sampling date / time* | *Sample ID* | SOIL - EA055-103 Moisture Content | SOIL - S-02 8 Metals (incl. Digestion) | SOIL - S-12 OC/OP Pesticides |
|---|---|---|---|---|---|
| ES2320345-001 | 15-Jun-2023 00:00 | 1 | ✓ | ✓ | ✓ |
| ES2320345-002 | 15-Jun-2023 00:00 | 2 | ✓ | ✓ | ✓ |
| ES2320345-003 | 15-Jun-2023 00:00 | 3 | ✓ | ✓ | ✓ |
| ES2320345-004 | 15-Jun-2023 00:00 | 4 | ✓ | ✓ | ✓ |
| ES2320345-005 | 15-Jun-2023 00:00 | 5 | ✓ | ✓ | ✓ |
| ES2320345-006 | 15-Jun-2023 00:00 | 6 | ✓ | ✓ | ✓ |
| ES2320345-007 | 15-Jun-2023 00:00 | 7 | ✓ | ✓ | ✓ |
| ES2320345-008 | 15-Jun-2023 00:00 | 8 | ✓ | ✓ | ✓ |
| ES2320345-009 | 15-Jun-2023 00:00 | 9 | ✓ | ✓ | ✓ |
| ES2320345-010 | 15-Jun-2023 00:00 | 10 | ✓ | ✓ | ✓ |
| ES2320345-011 | 15-Jun-2023 00:00 | 11 | ✓ | ✓ | ✓ |
| ES2320345-012 | 15-Jun-2023 00:00 | 12 | ✓ | ✓ | ✓ |
| ES2320345-013 | 15-Jun-2023 00:00 | 13 | ✓ | ✓ | ✓ |
| ES2320345-014 | 15-Jun-2023 00:00 | 14 | ✓ | ✓ | ✓ |
| ES2320345-015 | 15-Jun-2023 00:00 | 15 | ✓ | ✓ | ✓ |
| ES2320345-016 | 15-Jun-2023 00:00 | 16 | ✓ | ✓ | ✓ |
| ES2320345-017 | 15-Jun-2023 00:00 | 17 | ✓ | ✓ | ✓ |
| ES2320345-018 | 15-Jun-2023 00:00 | 18 | ✓ | ✓ | ✓ |
| ES2320345-019 | 15-Jun-2023 00:00 | 19 | ✓ | ✓ | ✓ |
| ES2320345-020 | 15-Jun-2023 00:00 | 20 | ✓ | ✓ | ✓ |
| ES2320345-021 | 15-Jun-2023 00:00 | 21 | ✓ | ✓ | ✓ |
| ES2320345-022 | 15-Jun-2023 00:00 | 22 | ✓ | ✓ | ✓ |
| ES2320345-023 | 15-Jun-2023 00:00 | 23 | ✓ | ✓ | ✓ |
| ES2320345-024 | 15-Jun-2023 00:00 | 24 | ✓ | ✓ | ✓ |
| ES2320345-025 | 15-Jun-2023 00:00 | Duplicate | ✓ | ✓ | |

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID | WATER - W-02T 8 metals (Total) |
|---|---|---|---|
| ES2320345-026 | 15-Jun-2023 00:00 | Rinsate | ✓ |

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

**ADMIN**

| | | |
|---|---|---|
| - *AU Certificate of Analysis - NATA (COA) | Email | admin@dmmcmahon.com.au |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) | Email | admin@dmmcmahon.com.au |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) | Email | admin@dmmcmahon.com.au |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | admin@dmmcmahon.com.au |
| - A4 - AU Tax Invoice (INV) | Email | admin@dmmcmahon.com.au |
| - Chain of Custody (CoC) (COC) | Email | admin@dmmcmahon.com.au |
| - EDI Format - XTab (XTAB) | Email | admin@dmmcmahon.com.au |