McMahon EARTH SCIENCE

1-132 MAYBAL LANE
CHARLES STURT UNIVERSITY NSW 2678

PRELIMINARY SITE INVESTIGATION

FOR A PROPOSED PRESCHOOL

APRIL 2024

REPORT NO: 9956

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Report type

Preliminary Site Investigation

For a proposed preschool

Site address

1-132 Maybal Lane

Charles Sturt University NSW 2678

Report number

9956

Prepared for

Anglican Diocese of Canberra and Goulburn

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1.0 Executive summary

DM McMahon Pty Ltd (McMahon) conducted this Preliminary Site Investigation (PSI) at the request of Matina Ujdur of Colliers International Project Management Pty Ltd (Colliers) on behalf of the Anglican Diocese of Canberra and Goulburn (ADCG) for the proposed St. Mary's Preschool at 1-132 Maybal Lane Charles Sturt University NSW. The location of the proposed preschool is on land currently owned by Charles Sturt University and this land will be partitioned to create a lease area of around 1ha (the site). The site has an historical agricultural/horticultural land use, primarily as a vineyard. Maps of the site can be seen in **Attachment A**. Development plans were not made available at the time of investigation and reporting.

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. The proposed development of the site for a preschool presents a more sensitive land use than the historical agricultural land use. Therefore, the purpose of this investigation is to provide Colliers, ADCG and the planning authority with a statement of site suitability for the proposed land use and an appropriate risk assessment framework for the management of the site during development, if required.

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 assessment, if required.

Findings of the investigation include:

- The desktop study found the site has a history of agricultural land use, primarily used for viticulture. Some sheep grazing was also evident.
- A site inspection complemented the desktop study and found the following sources of potential contamination that may materially affect the development:
    - Agricultural/horticultural chemicals that may have been used across the site.
    - Potential copper chrome arsenate (CCA) treated timber posts.
- Soil sampling was conducted to assess contamination from agricultural/horticultural chemicals across the site, with attention also paid to the soil around the potential CCA treated timber posts. Samples were analysed for heavy metals and organochlorine and organophosphate pesticides.

- From the information collected, it is assessed that the potential contamination sources could pose a risk to future site users (through dermal contact, ingestion, or inhalation of potentially contaminated soils) but sampling returned chemical results that were below the criteria for residential land use (including childcare centres/preschools).
- The risk assessment undertaken suggests that contamination from agricultural/horticultural chemicals and CCA is not present at the site.
- In summary, the site is assessed to be suitable for the proposed development given the management strategies outlined in **Section 10.0** are implemented.

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.
- Undertake a risk assessment for health risk to future site users and the environment.
- Provide a statement of site suitability or recommendations for further investigation.
- 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 chemicals of potential concern.
- Conduct limited sampling across the site to assess the need for further investigation.
- Assess the potential contamination source-pathway-receptor linkages from the chemicals 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.

4.0 Site identification

The site identification and details are as follows.

- Address: 1-132 Maybal Lane Charles Sturt University NSW 2678.
- Real property description: Lot 153 DP 751407.
- Site centre co-ordinate: 533049E 6119666N MGA GDA z55.
- Site: 0.9ha (lease area).
- Owner: The State of New South Wales.
- Local Government Area: Wagga Wagga City Council.
- Current zoning: SP2 Infrastructure.
- Present use: Vacant.
- Proposed use: Preschool.
- 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

The site forms part of a larger lot once known as Portion 153 which was dedicated for the Wagga Wagga Agricultural School and Experimental Farm in October 1892. In January 1976, the Agricultural School and Experimental Farm merged with the Riverina College of Advanced Education (now known as Charles Sturt University).

Council records

There are no Council records available for the site.

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 March 2024.

Internet search

- www.about.csu.edu.au/ - During the 1970s, the Council of the RCAE (Riverina College of Advanced Education) decided to purchase a green field's site adjacent to the existing campus of the Wagga Wagga Agricultural College known locally as 'Boorooma' Campus. During the late 1970s and into the 1980s, a great deal of building development was undertaken at this new site in readiness for the transfer of staff, students, and amenities to the new Boorooma and Agricultural campuses north of the Murrumbidgee River, from the old Teachers College campus in the city proper.
- www.about.csu.edu.au/ - In 1989, the Charles Sturt University Act brought together the Riverina Murray Institute of Higher Education and the Mitchell College of Advanced Education to form Charles Sturt University.
- www.winery.csu.edu.au/our-story - In 1893, the university vineyard at Wagga Wagga was planted with grapes as part of the experimental farm established following the formation of the NSW Department of Agriculture in 1880. The wine science and viticulture teaching program was established at Wagga Wagga in 1976.
- Wagga Wagga Express (NSW) August 1898. An Experimental Vineyard. With a view of demonstration that high-class wine can be produced in the district, the Department of Mines and Agriculture are planting out a wine vineyard at the Wagga Experimental farm. About 30 acres of suitable land has been set apart for this purpose between the hills known as the Two Sisters. […] Apart from being an experiment, the vineyard is to be managed in such a way as will make it one of the branches contributing to the self-support of the farm.
- Weekly Times (Melbourne) January 1907. Vines & Wine. Wagga Experimental Vineyard. The Government experimental vineyard at Wagga (NSW) covers 26 acres, 13 of which are comparatively newly planted. A part of the new portion yielded its first

crop last season. About 150 varieties of grapes are cultivated, the vines in some instances being planted 20ft. between the rows and 10ft. between the plants, and in others 10ft. by 10ft.

- The Land (Sydney) February 1911. Netting over a Vineyard. Just now, at the experimental farm, Wagga […] about half an acre of vineyard is to be covered over with wire-netting of 1¼in. mesh, and high enough to permit horses working underneath it. To the trellis posts, which are about 10 feet apart, will be affixed uprights to support the wire netting.

Previous reports

Aitken Rowe Testing Laboratories (2024) *Geotechnical Investigation – Proposed St Marys Preschool, Lot 153 Farrer Road, Boorooma, Wagga Wagga, NSW.* Ref: S23-491.

- The purpose of the investigation is to assess the type and condition of the underlying soil strata and make recommendation [sic] in respect to geotechnical design parameters for the proposed St Marys Preschool development.
- The site for the proposed development is located at DP 751407, Lot 153 fronting Farrer Road, Boorooma, Wagg Wagga, NSW approximately 200m west of the Farrer Road and Boorooma Street roundabout. The site consists of vacant agricultural/grazing land with small to medium sized trees scattered across the site as noted at the time of the investigation. The subject site has a general downward slope from north-west to south-east at approximately 1V (Vertical): 40H (horizontal) and covered with thick grass/vegetation as noted at the time of the investigation. It should also be noted that the site has previously been used as a vineyard.
- The fieldwork for the investigation consisted of the logging and sampling of five solid flight auger boreholes to the borehole termination depth of 3.0m as requested by the client across the subject site […] with representative samples recovered from the boreholes for relevant laboratory testing.
- The borehole investigation revealed that the site (at the borehole locations) is generally underlain by topsoil to 0.1m to 0.2m overlying natural alluvial [sic] material comprising low plasticity sand silt and clayey silt, medium plasticity sandy clay and medium, medium to high and high plasticity clay, extending to the borehole termination depth at 3.0m in BH1 to BH5.
- It should be noted silt-based material was encountered to a depth of approximately 0.3m in BH1 and 0.4m in BH3 below the existing surface level at the location of boreholes drilled. The location and depth of the silt-based material may be varied across the subject site.
- It should be noted that silt-based material may become ‘unsuitable’ and difficult to compact once exposed and subjected to moisture ingress due to its silt and fine sand characteristics depending on the climatic condition at the time of the construction. Care shall therefore be exercised during the process of the site preparation.
- It should be noted that tile drainage may exist at the site from the previous vineyard. Care shall therefore be taken to identify any tile drainage. If tile drainage is encountered during site works, it is highly recommended to contact Aitken Rowe immediately.
- It should be noted that the proposed removal of the existing trees at the subject site will likely significantly modify the soil moisture conditions under the footprint of the

footing system of the proposed school buildings. Therefore, the site may have 'abnormal moisture conditions' immediately after the removal of the existing trees and the site shall therefore be classified as 'P-Problem site' in accordance with the Australian Standard AS 2870 -2011 "Residential Slab and Footings" as appropriate.

- [Aitken Rowe] recommend that all the footings shall be designed similar to those as recommend in the Standard for 'Class P' and the footing shall be designed by engineering principles. However, when the foundation material achieves equilibrium moisture condition throughout the soil profile after the removal of the existing trees and entire root system at the subject site, then the site may be deemed 'normal site' and 'Class 'M-D' - Moderately reactive deep drying' classification may be adopted in accordance with the Australian Standard AS 2870 - 2011 "Residential Slab and Footings", provided the subgrade is prepared as specified.

Aerial photographs and satellite images

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

1966 – The site forms part of a larger lot of vacant agricultural land. There are two trees on site. Surrounding land use is agricultural. Vines have been planted to the north as part of the Experimental Farm.

1971 – A farm track runs north south through the approximate centre of the site.

1980 – Vines have been planted across the site. University buildings can be seen to the west.

1990 – No change to the site from 1980.

1995 – No change to the site from 1980.

1997 – No change to the site from 1980.

1998 – No change to the site from 1980.

2007 – Some vines have been removed and have been stockpiled in the southeast corner. The telephone poles along the eastern boundary have been installed. The Riverina Anglican College high school has been built to the southeast of the site across Farrer Road.

2009 – Sheep can be seen grazing across the site. More vines have been removed and have been piled in the southeast corner.

2010 – There are no sheep on the site. Some trees have been planted in the west of the site.

2012 – No change to the site from 2010. Major residential development has occurred to the south, across Farrer Road.

2013 – No change to the site from 2010. Residential development continues to the south, across Farrer Road.

2014 – No change to the site from 2010.

2015 – No change to the site from 2010.

2016 – No change to the site from 2010.

2018 – No change to the site from 2010.

2019 – No change to the site from 2010. Farrer Road has been widened, bring the southern boundary of the site closer to the road.

2020 – No change to the site from 2010.

2021 – Some of the vines from the pile in the southeast corner have been removed.

2022 – No change to the site from 2021.

2023 – No change to the site from 2021.

2024 –No change to the site from 2021.

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.

- The site is located in the southeast of the Charles Sturt University (CSU) Wagga Wagga campus, approximately 6km north of the city centre of Wagga Wagga.
- The site fronts Farrer Road and the CSU campus lies to the north and west. Medium density residential lies to the south across Farrer Road, with the Riverina Anglican College primary school and high school to the southeast. Agricultural land lies to the east of the site.
- The site is no longer an operational vineyard although some vines do remain. Some willow wattle and olive trees have been planted in the east of the site, along the approximate path of the vineyard rows. The site is covered with various weeds and native grass (red grass).
- A small rubbish pile exists in the southeast corner and consists mostly of soil, branches, and a mix of old and new wire. A trampoline frame, an old pipe and some old timber vineyard posts can also be seen.
- Telephone poles line the eastern boundary of the site.
- Two concrete bases can be seen near the southern boundary.
- Some timber vineyard posts can still be seen installed across the site. The posts may have been treated with copper chrome arsenate (CCA).
- Sheep droppings and some sheep bones could be seen across the site although no sheep were grazing at the time of investigation. Kangaroos were observed at the time.
- Surface desiccation cracking was observed where the clay is near the surface.
- There was no evidence of intensive pesticide use by the means of races, dips, or chemical storage.

A map of the site features can be seen in **Attachment C**. Site photographs can be seen in **Attachment D**.

A summary of the site environmental setting is as follows.

Topography

The site is located on a south trending gently inclined waning mid slope at an elevation of approximately 209m to 215m AHD.

Vegetation

The site is covered with various weeds including khaki weed, caltrop, Pattersons curse, paddy melons, hairy panic, rye grass, stinging nettle, St. Barnaby's thistle and sorrel. Native red grass also exists across the site. Some willow wattle (Acacia salicina) has been planted in the east of the site.

Natural Resources Sensitivity

A search of the Wagga Wagga Local Environment Plan (2013) found the site is mapped as being in a natural resource sensitivity area for terrestrial biodiversity. The site is not mapped as being in a natural resource sensitivity area for vulnerable lands, riparian land and waterways or groundwater vulnerability.

Weather

The average rainfall for Wagga Wagga is approximately 580mm per annum, with the wettest months being July, August, and October. Wagga Wagga is characterised by cold wet winters and hot dry summers.

Hydrology

An unnamed drainage is located around 575m east of the site and runs south to Duke's Creek, located around 1.5km south of the site. Duke's Creek flows southwest into the Murrumbidgee River which is located approximately 2.8km south of the site. Run-on from rainfall has been altered by the CSU and Council stormwater system. The site is mapped as not being in a flood planning area.

Soil

Soils are dark brown clay topsoils overlying colluvial silt which is underlain by colluvial and residual clay with aeolian sand addition. Surface desiccation cracking was observed where the clay is near the surface.

Geology

Soils have formed on undulating rises and long lower slopes of Silurian granite, mainly Wantabadgery Granodiorite and Collingullie Granite. Thick (>2m) clay sequences with significant aeolian clay additions.

Hydrogeology

There is one groundwater bore located around 340m south of the site which forms part of the Council's urban salinity piezometer network. The groundwater bore was drilled to 18m below ground level, constructed into clay and sand. The bore has been consistently dry since the 2017/2018 reporting period. Low productivity groundwater is likely to be a muted reflection of the surface topography in the underlying geology with flow to the south towards the Murrumbidgee River. Groundwater is not a reliable resource in the locale.

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 gross contamination from previous agricultural/horticultural land use and CCA 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 contamination within the soil associated with the identified contamination sources.
- Determine if any contamination, should it be identified, poses a risk to current and/or 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 2024.

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/horticultural land use and CCA.

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 Pesticides	**Health Investigation Levels (HILs)** -Residential A NEPM (2013) -Table 1A(1) Heavy metals and pesticides -Soils within 3m of surface **Added Contaminants Limits (ACLs)** -Residential A NEPM (2013) -Table 1B(1-4) Heavy metals -Soils within 2m of surface -pH of 6.0 ($CaCl_2$) and CEC of 10 assumed from local knowledge.

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 sampling pattern has been chosen based on potential contamination sources, previous land use, and requirements to delineate potential contamination. 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:

- Six systematic 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 and 3: to assess the near surface soil contamination from potential persistent agricultural/horticultural chemicals diffuse application. Samples taken between vineyard rows.
- Samples 2 and 4: to assess the near surface soil contamination from potential persistent agricultural/horticultural chemicals diffuse application. Samples taken in the vineyard row.
- Sample 5 and 6: to assess the near surface soil contamination from potential persistent CCA next to the existing timber posts.

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 (Withdrawn).
- AS 4482.2:1999 - Guide to the sampling and investigation of potentially contaminated soil Part 2: Volatile substances (Withdrawn).

Although these guidelines have recently been withdrawn, they have been used in the absence of other relevant Australian publications.

8.0 Results

The site inspection and sampling for this PSI was conducted over one day on 9 April 2024. The weather was cool with light winds. A summary of the field observations and sample analytical results are as follows.

Soil and site surface

- Soils are dark brown clay topsoils overlying colluvial silt which is underlain by colluvial and residual clay with aeolian sand addition. Surface desiccation cracking was observed where the clay is near the surface.
- There were no visual or olfactory indicators of chemical contamination on site.

Soil analysis

- Heavy metals are below the Limits of Reporting (LORs) and/or the adopted criteria.
- Pesticides are below LORs and the adopted criteria.

Quality control and quality assurance results

- The duplicate sample (6) returned relative percent differences of <30% for all analytes.
- The rinsate sample returned results below the laboratory limit of reporting.
- There were matrix spike outliers for zinc and copper however as the results are well below the adopted criteria, this is considered 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 (CSM) 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

The site has been used for agriculture/horticulture as far as records can ascertain. Chemicals associated with agricultural/horticultural pesticide use across the site may have accumulated in the soil. Timber posts were present throughout the site and may have been treated with copper chrome arsenate (CCA). A small rubbish pile exists in the southeast corner of the site. Pathways are primarily from soil disturbance during development and occupation. Short to medium-term soil contact is likely for future construction workers, and long-term soil contact is possible for future occupants.

Potential and known sources of contamination

- Persistent agricultural chemicals.
- Potential CCA.

List of chemicals of potential concern

From the potential contamination sources, the Chemicals of Potential Concern (COPCs) most likely to impact the site are as follows:

- Pesticides.
- Heavy metals.

Mechanism of contamination

The mechanism of contamination is predominantly top-down vertical and lateral migration into soil.

Potentially affected environmental media

- Soil.
- Surface water but is unlikely to be impacted owing to the distance to it.
- Groundwater but 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 of contamination is likely owing to the persistence of pesticides in the soil.

Actual or potential exposure pathways

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

Human and ecological receptors

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

Source pathway receptor linkage assessment

- There is low risk of gross pesticide and heavy metal contamination across the site as the sampling returned low results.
- There is low risk of contamination from CCA as the sampling returned low results for heavy metals in the soil around the timber posts.
- There is low risk of contamination from the small rubbish pile in the southeast corner. The rubbish is an aesthetic issue which can be managed during development.
- There is low risk of surface water contact as exposure pathways are limited. No surface water bodies exist on site and surface run off will be directed to the Council's stormwater system.
- There is low risk of contamination from the groundwater as exposure pathways are limited. Groundwater is likely to be at deep depths and domestic groundwater bores do not exist on the site or in the area. The site is connected to town water making groundwater ingestion unlikely.
- There is low risk from any off-site sources of potential contamination as there are no known nearby gross contaminating activities.

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 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 an appropriate risk assessment framework for the management of the site during development.

The results of the investigation conclude that contamination from agricultural chemicals is not present at the site, and it is suitable for the proposed development given the following management strategies are adopted:

- The timber posts are recommended to be removed and disposed of at an appropriately licenced landfill.
- The small rubbish pile in the southeast corner is recommended to be removed and disposed of at an appropriately licenced landfill.

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 evaluate 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 Colliers, ADCG, 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, 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 maps and proposed site plan*

1-132 Maybal Lane Charles Sturt University NSW 2678

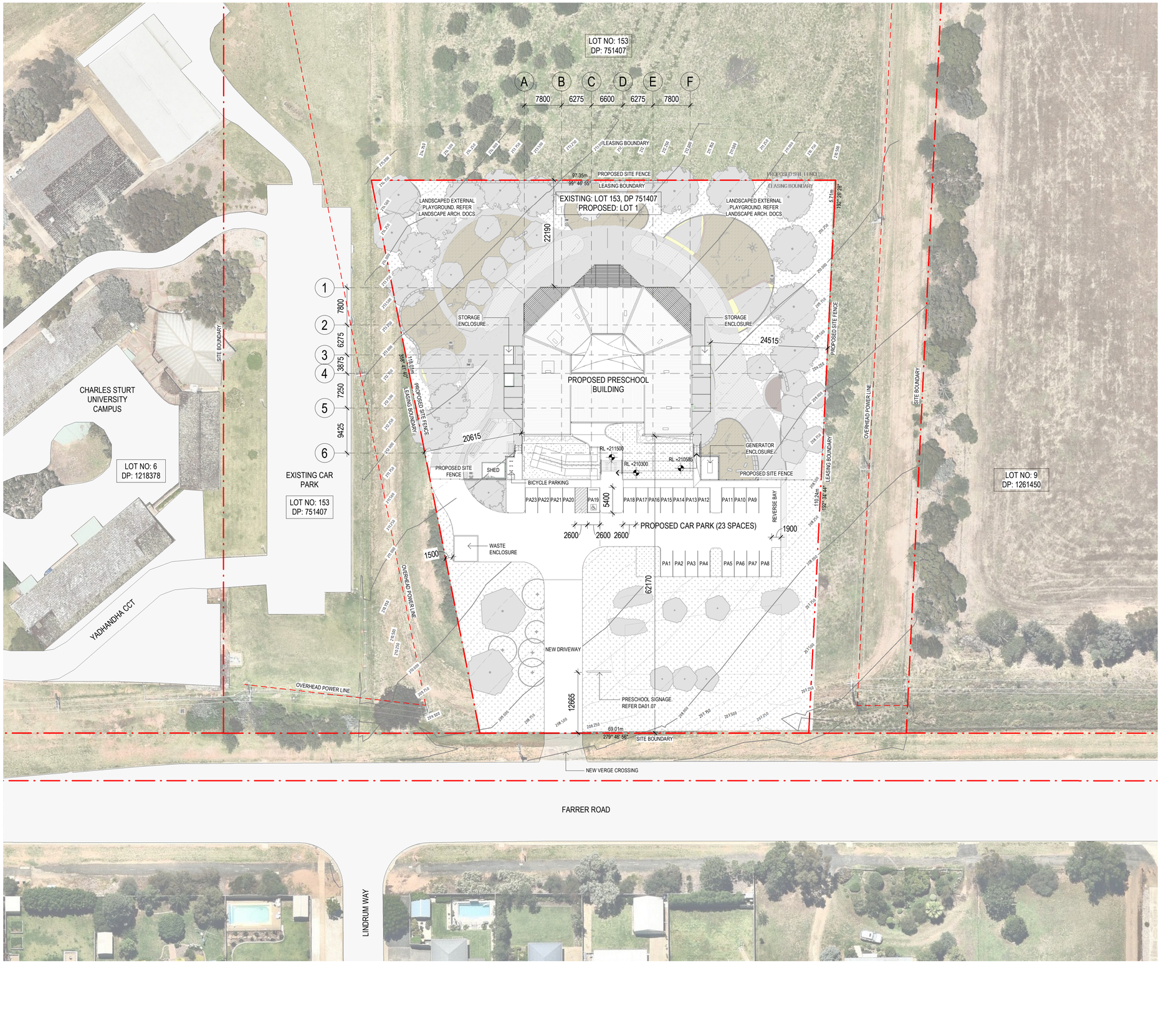
Preliminary Site Investigation
Report No. 9956
Google Earth image 2023

Legend
Boundary

Charles Sturt University
Coolamon Rd
Gobbagombalin
Estella
Boorooma
Cartwrights Hill
Hampden Ave
A41
A41
Narrandera Rd
N
1 km
Google Earth
Image © 2024 Airbus

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2024



PLOT RATIO CALCULATIONS

SITE AREA:	9,634m²
BUILDING AREA:	808m²
EXTERNAL ENCLOSURES:	62m²
TOTAL BUILT AREA:	870m²
PLOT RATIO:	9.03%

COVERED OUTDOOR AREAS

SITE AREA:	9,634m²
COVERED LOUVRED AREAS:	125m²
SHADE SAILS:	166m²
TOTAL:	291m²
RATIO:	3.02%

BUILDING CONSTRUCTION

EXTERNAL WALLS
CONSTRUCTION: BRICK VENEER w/ STEEL STUD FRAMING
MIN. INSULATION: R1.7

INTERNAL WALLS
CONSTRUCTION: STEEL STUD FRAMING
MIN. INSULATION: R2.0 BETWEEN CONDITIONED + UNCONDITIONED SPACES

FLOOR
CONSTRUCTION: CONCRETE SLAB ON GROUND
MIN. INSULATION: R2.0

ROOF
CONSTRUCTION: STEEL RAFTERS + PURLINS
MIN. INSULATION: R3.7

EXTERNAL GLAZING
U-VALUE: < 6.70
SHGC: < 0.63 - 0.81

GRAY PUKSAND

Contractors to use Architectural drawings for set out.
Contractors to check & verify all Dimensions on Site prior to Construction/Fabrication.
Figured Dimensions take precedence over Scaled Dimensions.
Any Discrepancies should be immediately referred to the Architect.
All work to comply with N.C.C. Statutory Authorities & Relevant Australian Standards.

NSW Nominated Architects Scott Moylan 7147 Craig Saltmarsh 6569

REV	DESCRIPTION	DATE
1	FOR INFORMATION	28.03.2024
2	FOR INFORMATION	22.04.2024
3	FOR INFORMATION	01.05.2024
4	FOR COORDINATION	17.06.2024
5	FOR INFORMATION	21.06.2024
6	FOR INFORMATION	25.06.2024
7	FOR INFORMATION	02.07.2024
8	FOR INFORMATION	25.07.2024
9	FOR INFORMATION	26.07.2024

PROJECT NO	**423039**
DRAWN	**AP**
CHECKED	**AB**
APPROVED	**IH**

St Mary's Rainbow Preschool
Farrer Road, Wagga Wagga

SITE PLAN

DWG # **DA01.02** REV **9**

SCALE @ A1 As indicated

RSN://xxx-rvt-01/x2xxx/ St Mary's Rainbow Preschool_C20

Attachment B : *Aerial photographs and satellite images*

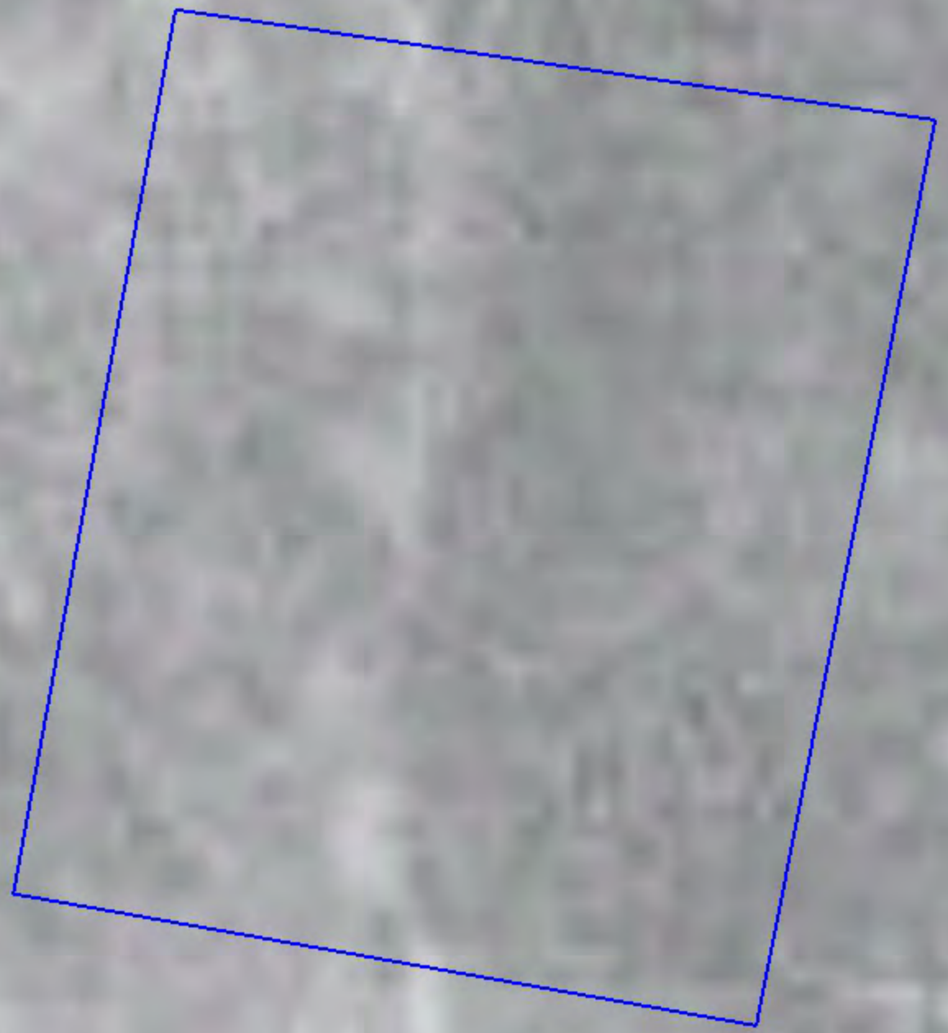
1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1966

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1971

Legend
Boundary



Yadhanadina Cct

Farrer Rd

Farrer Rd

Google Earth

N

70 m

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1980

Legend
Boundary

Yachandina Cct

Farrer Rd

Farrer Rd

Google Earth

N

70 m

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1990

Legend
Boundary

Yadhandha Cct

Farrer Rd

Farrer Rd

Google Earth

N

70 m

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1995

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1997

Legend
Boundary

Yadhandha Cct

Farrer Rd

Farrer Rd

Google Earth

N

70 m

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
NSW Spatial Services image 1998

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Google Earth image 2007

Legend
Boundary

Yadhandha Cct

Farrer Rd

Farrer Rd

Google Earth

Image © 2024 Maxar Technologies

N

70 m

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Google Earth image 2009

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2010

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2012

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2013

Legend
Boundary

Yadhandha Cct
Farrer Rd
Farrer Rd
Farrer Rd
Google Earth
70 m
N

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2014

Legend
Boundary

Yadhandha Cct

Farrer Rd

Farrer Rd

Farrer Rd

Google Earth

70 m

N


1-132 Maybal Lane Charles Sturt University NSW 2678
Preliminary Site Investigation
Report No. 9956
Nearmap image 2015
Legend
Boundary
Yathendha Crt
Farrer Rd
Farrer Rd
N
70 m
Google Earth

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2016

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2018

Legend
Boundary

Yadhandha Cct
Farrer Rd
Farrer Rd
Farrer Rd
Google Earth
70 m
N

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2019

1-132 Maybal Lane Charles Sturt University NSW 2678

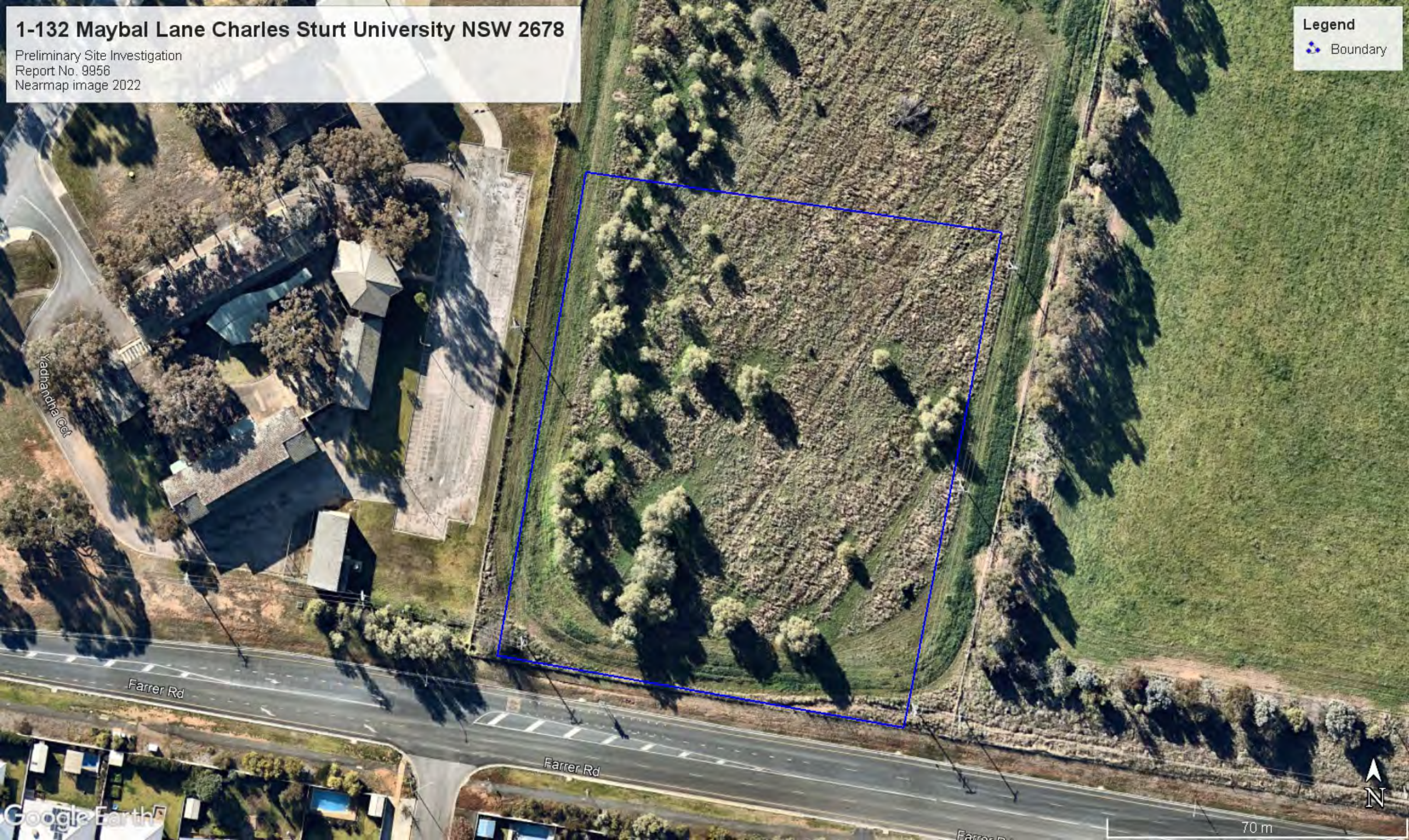
Preliminary Site Investigation
Report No. 9956
Nearmap image 2020

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2021

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2022



1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2023

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2024

Legend
Boundary

Yadhandha Cct

Farrer Rd

Farrer Rd

Google Earth

70 m

N

Attachment C : *Site features*

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2024

Legend
Boundary

Yadhandha Cct

Small rubbish pile

Farrer Rd

Farrer Rd

Google Earth

70 m

N

Attachment D : *Site photographs*

Photograph 1: The site. Photograph taken facing north, from Farrer Road.

Photograph 2: The site. Photograph taken facing south toward Farrer Road.

Photograph 3: Willow wattle and olive trees. Photograph taken facing north.

Photograph 4: Small rubbish pile in south east corner. Photograph taken facing east.

Photograph 5: Concrete bases near the southern boundary. Photograph taken facing north.

Photograph 6: Timber vineyard post seen in the mid ground. Photograph taken facing south east.

Photograph 7: Sheep bones. Photograph taken facing north west.

Photograph 8: Surface desiccation cracking. Key for scale.

Photograph 9: Soil profile.

Attachment E : *Sampling map*

1-132 Maybal Lane Charles Sturt University NSW 2678

Preliminary Site Investigation
Report No. 9956
Nearmap image 2024

Legend

- Boundary
- Sampling locations

BH01
BH02
BH05
BH06
BH03
BH04

Yadhandha Cct

Farrer Rd

Google Earth

80 m

N

Attachment F : *Tabulated results*

Page: 1 of 1
Job number: 9956
Project: 1-132 Maybal Lane Charles Sturt University NSW 2678

		Sample date	9/4/24	9/4/24	9/4/24	9/4/24	9/4/24	9/4/24	-	-	-	-	-	-				
		Sample location	BH1	BH2	BH3	BH4	BH5	BH6	-	-	-	-	-	-		**Residential A Criteria**		
		Sample ID	1	2	3	4	5	6	-	-	-	-	-	-				
		Sample depth (m)	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	-	-	-	-	-	-				
Compound	**LOR**	**Unit**	Result	Result	Result	Result	Result	Result	-	-	-	-	-	-	**HILs**	**HSLs**	**ACLs**	**EILs**
Arsenic	5	mg/L	6	<5	<5	<5	12	10	-	-	-	-	-	-	100	-	-	100
Cadmium	1	mg/L	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	20	-	-	-
Chromium	2	mg/L	19	17	21	19	23	26	-	-	-	-	-	-	-	-	400	-
Copper	5	mg/L	20	8	11	13	16	20	-	-	-	-	-	-	6000	-	190	-
Lead	5	mg/L	7	6	7	8	7	8	-	-	-	-	-	-	300	-	1100	-
Nickel	2	mg/L	6	5	5	8	8	7	-	-	-	-	-	-	400	-	170	-
Zinc	5	mg/L	15	15	11	15	16	14	-	-	-	-	-	-	7400	-	400	-
Mercury	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	40	-	-	-
Chromium (VI)	0.5	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
PCBs	0.1	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
HCB	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	10	-	-	-
Heptachlor	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	6	-	-	-
Chlordane	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	50	-	-	-
Endrin	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	10	-	-	-
Endosulfan	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	270	-	-	-
Mirex	0.05	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Aldrin+dieldrin	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	6	-	-	-
DDT+DDE+DDD	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	240	-	-	-
Chlorpyrifos	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	160	-	-	-
Atrazine	0.05	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Bifenthrin	0.05	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Phenols	0.5	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
PAHs	0.5	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Benzo(a)pyrene TEQ (half LOR)	0.5	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
TRH C6-C10 minux BTEX (F1)	0.02	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
TRH C10-C16 minus napthalene (F2)	0.1	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
TRH C16-C34 (F3)	0.1	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
TRH C34-C40 (F4)	0.1	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Benzene	0.001	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Toluene	0.002	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Ethylbenzene	0.002	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Xylenes	0.002	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Napthalene	0.005	mg/L	-	-	-	-	-	-	-	-	-	-	-	-				
Asbestos detected	0.1	g/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Attachment G : *Laboratory reports*

Chain of Custody

McMahon EARTH SCIENCE

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:	9/04/2024
Signature:	
Received by:	
Date:	Fax:
Signature:	10/4/24 12pm
Relinquished by:	
Date:	
Signature:	
Received by:	
Date:	
Signature:	

Analysing Laboratory:	ALS Environmental - Sydney
Project:	Farrer Road
Order No.:	9956
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.: EN/111/23

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 (OCP/OPP)	W-2 (metals)							
1-6	1 to 6	9/04/2024	S	Jar	6	✓	✓								
7	Duplicate	9/04/2024	S	Jar	1	✓									
8	Rinsate	9/04/2024	W	NP	1			✓							
				TOTAL	8										

Environmental Division
Sydney
Work Order Reference
ES2411604

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 : **ES2411604**

Client	: **DM MCMAHON PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: ADMIN	Contact	: Danae Hambly
Address	: 6 JONES ST Wagga Wagga NSW, AUSTRALIA 2650	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: admin@dmmcmahon.com.au	E-mail	: danae.hambly@alsglobal.com
Telephone	: +61 02 6931 0510	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 9956 Farrer Road	Page	: 1 of 3
Order number	: ----	Quote number	: EN2023DMMCMA0002 (EN/111)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DAVID MCMAHON		

Dates

Date Samples Received	: 10-Apr-2024 12:00	Issue Date	: 11-Apr-2024
Client Requested Due Date	: 17-Apr-2024	Scheduled Reporting Date	: **17-Apr-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 10.6, 11.3'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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
ES2411604-001	09-Apr-2024 00:00	1	✓	✓	✓
ES2411604-002	09-Apr-2024 00:00	2	✓	✓	✓
ES2411604-003	09-Apr-2024 00:00	3	✓	✓	✓
ES2411604-004	09-Apr-2024 00:00	4	✓	✓	✓
ES2411604-005	09-Apr-2024 00:00	5	✓	✓	✓
ES2411604-006	09-Apr-2024 00:00	6	✓	✓	✓
ES2411604-007	09-Apr-2024 00:00	Duplicate	✓	✓	

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-02T 8 metals (Total)
ES2411604-008	09-Apr-2024 00:00	Rinsate	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@dmmcmahon.com.au

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

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2411604**	Page	: 1 of 5
Client	: **DM MCMAHON PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: ADMIN	Telephone	: +61-2-8784 8555
Project	: 9956 Farrer Road	Date Samples Received	: 10-Apr-2024
Site	: ----	Issue Date	: 16-Apr-2024
Sampler	: DAVID MCMAHON	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 8

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 Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **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.**

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, 3, 4, 5, 6, Duplicate	**09-Apr-2024**	**----**	----	----	**12-Apr-2024**	23-Apr-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
1, 2, 3, 4, 5, 6, Duplicate	**09-Apr-2024**	**12-Apr-2024**	06-Oct-2024	✓	**15-Apr-2024**	06-Oct-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
1, 2, 3, 4, 5, 6, Duplicate	**09-Apr-2024**	**12-Apr-2024**	07-May-2024	✓	**16-Apr-2024**	07-May-2024	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
1, 2, 3, 4, 5	**09-Apr-2024**	**12-Apr-2024**	23-Apr-2024	✓	**15-Apr-2024**	22-May-2024	✓
Soil Glass Jar - Unpreserved (EP068)							
6	**09-Apr-2024**	**12-Apr-2024**	23-Apr-2024	✓	**16-Apr-2024**	22-May-2024	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
1, 2, 3, 4, 5	**09-Apr-2024**	**12-Apr-2024**	23-Apr-2024	✓	**15-Apr-2024**	22-May-2024	✓
Soil Glass Jar - Unpreserved (EP068)							
6	**09-Apr-2024**	**12-Apr-2024**	23-Apr-2024	✓	**16-Apr-2024**	22-May-2024	✓

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)							
Rinsate	**09-Apr-2024**	**13-Apr-2024**	06-Oct-2024	✓	**13-Apr-2024**	06-Oct-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
Rinsate	**09-Apr-2024**	**----**	----	----	**15-Apr-2024**	07-May-2024	✓

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	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**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	18	**11.11**	**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	18	**5.56**	**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	18	**5.56**	**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	18	**5.56**	**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)

CERTIFICATE OF ANALYSIS

Work Order	: **ES2411604**	Page	: 1 of 10
Client	: **DM MCMAHON PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: ADMIN	Contact	: Danae Hambly
Address	: 6 JONES ST 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	: 9956 Farrer Road	Date Samples Received	: 10-Apr-2024 12:00
Order number	: ----	Date Analysis Commenced	: 12-Apr-2024
C-O-C number	: ----	Issue Date	: 16-Apr-2024 12:18
Sampler	: DAVID MCMAHON		
Site	: ----		
Quote number	: EN/111		
No. of samples received	: 8		
No. of samples analysed	: 8		

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 Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	1	2	3	4	5
				Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2411604-001	ES2411604-002	ES2411604-003	ES2411604-004	ES2411604-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**10.8**	**11.3**	**10.4**	**11.7**	**10.0**
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**6**	<5	<5	<5	**12**
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**19**	**17**	**21**	**19**	**23**
Copper	7440-50-8	5	mg/kg		**20**	**8**	**11**	**13**	**16**
Lead	7439-92-1	5	mg/kg		**7**	**6**	**7**	**8**	**7**
Nickel	7440-02-0	2	mg/kg		**6**	**5**	**5**	**8**	**8**
Zinc	7440-66-6	5	mg/kg		**15**	**15**	**11**	**15**	**16**
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	1	2	3	4	5
				Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00
Compound	CAS Number	LOR	Unit		ES2411604-001	ES2411604-002	ES2411604-003	ES2411604-004	ES2411604-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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
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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	1	2	3	4	5
			Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00	09-Apr-2024 00:00
Compound	CAS Number	LOR	Unit	ES2411604-001	ES2411604-002	ES2411604-003	ES2411604-004	ES2411604-005
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
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**	**99.2**	**99.9**	**92.3**	**97.6**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**120**	**114**	**113**	**106**	**115**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	6	Duplicate	----	----	----
			Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2411604-006	ES2411604-007	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**11.2**	**10.9**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**10**	**10**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**26**	**23**	----	----	----
Copper	7440-50-8	5	mg/kg	**20**	**20**	----	----	----
Lead	7439-92-1	5	mg/kg	**8**	**7**	----	----	----
Nickel	7440-02-0	2	mg/kg	**7**	**6**	----	----	----
Zinc	7440-66-6	5	mg/kg	**14**	**13**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	6	Duplicate	----	----	----
				Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2411604-006	ES2411604-007	--------	--------	--------
					Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	6	Duplicate	----	----	----
				Sampling date / time	09-Apr-2024 00:00	09-Apr-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2411604-006	ES2411604-007	--------	--------	--------
					Result	Result	----	----	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**99.3**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**122**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Rinsate	----	----	----	----
				Sampling date / time	09-Apr-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2411604-008	--------	--------	--------	--------
					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