Darfield Solar and Energy Storage Project

# Detailed Site Investigation

for: New Zealand Clean Energy Ltd

Job No: 67231

Version: Rev0

eTrack No: 200049159

Date of Issue: 21/01/2025

# EXECUTIVE SUMMARY

Babbage Consultants Limited (Babbage) has been engaged by New Zealand Clean Energy Ltd (NZCE) to undertake a Detailed Site Investigation (DSI) at 1352 Homebush Road, Darfield, Selwyn District (the site). The findings of this investigation are summarised as follows:

1. The site has been used as production land (combination of agricultural, pastoral and forestry) for at least 83 years. Forestry activity ceased around 2010.
2. The site is underlain by a gravelly silt unit of unknown thickness.
3. Soil sample analyses reported metals and organochlorine pesticides (OCPs) at concentrations below rural residential land use National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS)[1] Soil Contaminant Standard (SCS) and/or soil guideline values for protection of ecological receptors (Eco-SGVs)[2] at sample locations on the site. Asbestos in soil was not detected above the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (NZGAMAS)[3] human health soil guideline values.
4. Surface soils from the site that require off-site removal, will need to be disposed of to an appropriately consented disposal facility that can accept the levels of contamination identified (combination of clean fill and managed fill).
5. Review of historical aerial photographs, Environment Canterbury (ECAN) Listed Land Use Register (LLUR)[4], landowner interviews and subsequent site walkover indicates the site has been subjected to an activity on the Hazardous Activities and Industry List (HAIL); Item A10 – Persistent pesticide use or storage. However, pursuant to regulation 5(8)(b) of the NESCS, as the piece of land is to remain as production land (pastoral/grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, the NESCS does not apply.
6. A Remedial Action Plan (RAP) is not required as the NESCS does not apply. However, a Site Management Plan (SMP) is recommended which sets out health, environmental and safety controls the redevelopment earthwork contractor must employ during the redevelopment earthwork phase. The SMP will also provide mitigation controls to manage unexpected discovery

[1] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

[2] Landcare Research 2019. Updated User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs) – Consultation draft, June 2019.

[3] Building Research Association of New Zealand (BRANZ) 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil

[4] Environment Canterbury Regional Council 26 March 2024. Retrieved from https://llur.ecan.govt.nz/home

of contaminants, including asbestos containing materials (ACM). The earthwork contractor will need to ensure that site staff are trained in asbestos awareness and how to recognise ACM during earthwork. The SMP will also assist the earthwork contractor with waste classification and disposal requirements for impacted materials generated from the site including asbestos waste.

7. This assessment should be revisited if the final development proposal changes the current land use from production (pastoral/grazing) land.

# ACKNOWLEDGEMENT OF SUBMISSION

This report was prepared by John Timpany and reviewed by Hiram Garcia.

Respectfully submitted

Babbage Consultants Limited

John Timpany
Environmental Consultant

Hiram Garcia
Principal Environmental Consultant

I have assessed the site in accordance with current New Zealand Regulations and guidance documents and reported in accordance with the current edition of Contaminated Land Management Guidelines No 1: Reporting of Contaminated Sites in New Zealand.
I am considered by Babbage Consultants Limited as a suitably qualified and experienced practitioner (SQEP) pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.
Name: Hiram Garcia

Signed:  Date: 21 January 2025

**Babbage Consultants Limited: SQEP Definition**

Babbage Consultants Limited requires that a SQEP has the following Qualifications/Experience:

- Tertiary education in environmental science, engineering, or other relevant field;
- Ten years of relevant post graduate environmental experience;
- A commitment to continuing professional development; and
- Full membership of an appropriate professional body requiring a commitment to operating in accordance with a professional code of ethics.

| Date | Version | eTrack No. | Author(s) | Reviewer(s) |
|---|---|---|---|---|
| 21/01/2024 | Rev0 | 200049159 | John Timpany | Hiram Garcia |
| | | | | |
| | | | | |

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# 1 INTRODUCTION AND BACKGROUND

Babbage has been engaged by NZCE to undertake a DSI at 1352 Homebush Road, Darfield, Selwyn District (the site) to support NZCE's site redevelopment.

The scope of work for the DSI was set out in our proposal dated 14 November 2024. The key aims of the DSI were to determine:

- Whether historic use is likely to have resulted in ground contamination and verify whether activities detailed on the HAIL, issued by the Ministry for the Environment (MfE)[5], apply to the site.
- Concentrations of contaminants of concern in the soils investigated on the site.
- Whether resource consents may be required to address ground contamination issues as part of the proposed redevelopment work with respect to the NESCS SCS criteria.
- Whether contamination at the site requires remedial work, poses material handling issues and/or off-site disposal/landfill constraints as part of the redevelopment programme.

The site identification details are presented in Table 1.

***Table 1. Site identification.***

| Address | Legal description | Area in square metres ($m^2$) |
|---|---|---|
| 1352 Homebush Road | Lot 2 DP 60325 (Lot 2) | 1,073,406 |
| | Lot 1 DP 434071 (Lot 1) | 469,240 |

**Note:** Source – Land Information New Zealand (LINZ) data service website[6].

It is understood that NZCE plans to develop the site as a solar power generation facility. Babbage understands that this will involve the construction of maintenance access roads to access solar panels and a substation. The proposed development plan is included as Appendix A. Solar panel footings will be pile driven in place which will not generate spoils.

The contamination investigation work performed follows the general reporting and investigation methodology presented in the MfE Contaminated Land Management Guidelines (CLMG) No. 1[7] and

[5] MfE 24 March 2021. Land – Guidance and guidelines on contaminated land. Retrieved from https://www.mfe.govt.nz/land/hazardous-activities-and-industries-list-hail

[6] LINZ data service 25 November 2024. Retrieved from https://data.linz.govt.nz/layer/50772-nz-primary-parcels

[7] MfE 2021. Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021)

CLMG No. 5[8]. In addition, the requirements outlined in the NZGAMAS have also been followed where appropriate.

[8] MfE 2021. Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils (Revised 2021)

# 2 SITE DESCRIPTION

The site is located north of Homebush Road, in the township of Darfield, within the Selwyn District of Canterbury. The site is currently used as pastoral and agricultural land.

The current surrounding property use is presented in Table 2.

***Table 2. Surrounding property use.***

| Direction | Observation |
|---|---|
| North | To the north of the site is Auchenflower Road with agricultural and pastoral properties beyond. |
| South | To the south of the site is Homebush Road and McHughs Plantation Reserve with pastoral and residential properties beyond. |
| East | To the east of the site are pastoral and agricultural properties with scattered residential dwellings. |
| West | To the west of the site is Fonterra Darfield facility with agricultural properties and West Coast Road beyond. |

**Note:** Source – Based on information from LINZ Database website and Canterbury Map Viewer[9].

The Canterbury Maps Viewer website shows the site is sloping from northwest to southeast with a fall of approximately 20 meters (m). Stormwater surface runoff generated at the site appears to discharge straight to soakage onsite.

Published geological information[10] shows the site to be underlain by the Pakihi Supergroup consisting of un-weathered, brownish-grey, variable mix of gravels, sand, silt, and clay in low river terraces; locally up to 2m silt cap.

Babbage performed a site inspection on 12 December 2024. A summary of observed conditions is presented in Table 3. A photographic log of the site is presented as Appendix B.

***Table 3. Site condition.***

| Direction | Observation |
|---|---|
| Surface water | Low flow rate watercourses observed running along the perimeter of some paddocks for irrigation. |

[9] Environment Canterbury Regional Council. 10 December 2024. Canterbury Map Viewer. Retrieved from https://mapviewer.canterburymaps.govt.nz

[10] Institute of Geological and Nuclear Sciences (GNS). 10 December 2024.Geology 2.0.0 Webmap NZ 1:250k Geological unit. Retrieved from *https://data.gns.cri.nz/geology/index.html?map=NZ%20Geology* .

| | |
|---|---|
| Local sensitive environments | Low flow rate watercourses observed running along the perimeter of some paddocks for irrigation. |
| Visible signs of plant stress | Grass and other plant life (weeds, old crops) were observed to be in dying state, likely due to low rainfall and hot conditions. |
| Visible signs of potential contamination sources | No signs of visible potential contamination sources were observed on site. |

# 3 HISTORICAL SITE USE

Babbage has reviewed historic aerial photographs dating back to 1941 held on the Retrolens website[11] and LINZ Database A summary of selected historic aerial photography is presented in Table 4, and the historical aerial photographs are shown in Appendix C.

***Table 4. Summary of historical aerial photographs.***

| Year | Site | Surrounding land use |
|---|---|---|
| 1941 | The site appears to be used for agricultural and pastoral (Lot 2) activities with forestry (Lot 1). | The site is surrounded by mostly pastoral and agricultural land use. Some residential properties are scattered to the south, east and west. West Coast Road and Homebush Road are established. |
| 1985 | No significant changes to site. | Site surrounds still predominantly pastoral and agricultural. |
| 2004-2010 | No significant changes to site. | A dwelling has been established within 1352 Homebush Road along the southern boundary but is not part of the site. |
| 2012 | The forestry activity on Lot 1 is no longer visible and appears to be used for pastoral land use. | Directly west of the site appears to be an industrial facility under development. |
| 2019 | No significant changes to site. | The industrial facility to the west has been completed. No further significant changes to site surrounds. |

## 3.1 List Land Use Register Enquiry

A property statement was obtained from ECAN LLUR on 26th March 2024. The response is included in Appendix D (previous Babbage PSI) and the web entry summarised below:

*'The Listed Land Use Register does not currently have any information about a Hazardous Activities and Industries List on your selected site.'*

[11] Local Government Geospatial Alliance 10 December 2024. Retrolens Historic Image Resource. Retrieved from http://retrolens.nz/

## 3.2 Previous Investigations

***Table 5 Summary of other investigations.***

| Investigation | Summary |
|---|---|
| Preliminary Site Investigation prepared by Babbage[12] | The site has potential contaminants of concern from OCPs, organophosphate pesticides (OPPs), and metals from historic agricultural activities. As the piece of land is to remain production land (grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, the NESCS does not apply to the site. |

## 3.3 Summary

Based on review of historical aerial photographs, ECAN LLUR, landowner interviews, and site observations, it is concluded that the site been subjected to an activity on the HAIL; Item A10 Persistent pesticide bulk storage or use from agricultural land use.

[12] Babbage 2024. Preliminary Site Investigation, 1352 Homebush Road, Darfield. Preliminary Site Investigation prepared for Darfield Solar and Energy Storage Ltd, 28 August 2024, Job No.: 67231#CIM.

# 4 SAMPLING ANALYSIS PLAN

Soil sampling has been undertaken to determine if there are contaminants of concern from historical agricultural activities, in particular metals, OCPs and OPPs.

The soil sampling and analysis plan for the site is provided in Table 6. A total of 22 soil samples locations were proposed as presented in Table 6 based on the areas of proposed earthworks. Samples were taken in general accordance with CLMG No 5 and the NZGAMAS.

***Table 6. Sampling and analysis plan.***

| Sample number | Matrix | Sample design | Depths (m below ground level (bgl) | Sample analysis* |
|---|---|---|---|---|
| S01 through S10, S12 through S20 | Soil | Targeted. Samples placed along area of proposed maintenance road layout. | Surface to 0.1, 0.3, and 0.5 unless refusal encountered. | Metals (7) screen.<br>OCPs screen (even numbered samples).<br>OPPs screen (odd numbered samples). |
| S11 | Soil | Targeted. Sample targeted for area of possible historical structure. | Surface to 0.1, 0.3, and 0.5 unless refusal encountered. | Metals (7) screen.<br>OCPs screen.<br>OPPs screen.<br>Asbestos presence/absence.<br>Asbestos semi-quantitative**. |
| S21 and S22 | Soil | Targeted. Samples placed within area of proposed substation. | Surface to 0.1, 0.3, and 0.5 unless refusal encountered. | Metals (7) screen.<br>OCPs screen.<br>OPPs screen. |
| S23 | Soil | Duplicate of S22. | Surface to 0.1+. | Metals screen (7). |

**Note:** * Analysis was performed on deeper sample(s) (0.3 and 0.5 m bgl) where shallow sample(s) result(s) (surface to 0.1 m bgl) reported elevated contaminant concentrations. ** Semi Quant asbestos analysis was performed on 500 ml samples where asbestos presence/absence samples returned positive test results.

The soil investigation was performed by Babbage on 12 December 2024 in accordance with the sampling analysis plan above with no deviations.

Soil analyses were carried out by an International Accreditation New Zealand (IANZ) accredited laboratories using industry standard methods.

## 4.1 Field Observations

The following field observations were recorded as part of these investigations:

- Groundwater was not encountered to the maximum depth of this investigation.

- No visual or olfactory evidence of potential contamination sources was noted in the paddocks during the site walkover.
- The soils encountered during the excavation of investigation holes were logged (see Appendix E). In general, the site was underlain by a gravelly silt unit from approximately 0.0 to up to 0.3 m bgl.

## 4.2 Data Quality

A quality assurance and quality control (QA/QC) programme was implemented as part of field procedures to confirm data was fit for purpose and included:

- Experienced staff used to undertake the field investigation work.
- Decontamination of sampling equipment between sampling locations.
- Preservation of samples with ice during transport from the field to the laboratory.
- Transportation of samples with accompanying chain of custody documentation.
- Compliance with sample holding times.

Standard laboratory QA/QC reports were not examined as part of this project but are available from the laboratory on request.

In addition to routine quality control procedures (sample handling, chain of custody etc.), a field duplicate sample was collected and submitted for analysis for metals. The duplicate sample (S23) was collected from sample location S22. The duplicate sample results and calculated relative percentage differences (RPDs) are presented in Appendix F, these ranged from approximately 8 to 15 % indicating that variability in sample collection, handling and analysis is acceptable.

## 4.3 Analytical Results

The soil sample results are presented in Table 7, Table 8 and Table 9 below and sample locations are presented in Figure 1 below. The laboratory reports are given in Appendix G.

Soil sample results were compared against criteria for the assessment of regulatory requirements, the proposed redevelopment land use and acceptance criteria for local soil disposal sites to meet the objectives of the investigation. The adopted assessment acceptance criteria included:

- Soil trace element background concentrations for Yellow-brown shallow and stony soil (YBST) soils (Level 1-Level 2)[13].

[13] Canterbury Maps Open Data, 2025. Soil Trace Elements Level 2. Retrieved from https://opendata.canterbury-maps.govt.nz/datasets/ecan::soil-trace-elements-level-2/explore?location=-43.619659%2C171.921084%2C9.77

- Although the NESCS does not apply to the site, Babbage has chosen to compare the results to the following land use criteria presented in the NESCS Users' Guide and MfE methodology[14].
    - Rural residential (25% produce consumption) (most conservative) and commercial/industrial (most applicable for earthworks workers) land use criteria.
- Soil guideline values for the protection of ecological receptors (Eco-SGVs)[15].
- Human health soil guideline values presented in the NZGAMAS.
- Acceptance criteria for example cleanfill, managed fill and landfill sites.

The findings are summarised below:

1 Soil samples collected and analysed reported metals concentrations below the NESCS rural residential and commercial/industrial land use SCSs and Eco-SGVs criteria on the site.

2 Metal concentrations were reported above the background concentrations at six locations (S12, S13, S14, S16, S18 and S21) on the site. The source of the metal impacted soil is likely to be anthropogenic, from approximately 83 years of agricultural use.

3 Asbestos was not detected in the soil sampled at the site.

4 OCP concentrations were reported below the NESCS rural residential and commercial/industrial land use SCSs criteria from sample locations on the site.

5 OPPs were not detected above the laboratory limits of reporting (less than 0.03 milligrams per kilogram (mg/kg)) from sample locations on the site.

Based on the soil sample results, it is highly unlikely that there will be a risk to human health if the redevelopment activity is done to the piece of land.

## 4.4 Disposal Requirements

Site investigation results show that surface soils from the proposed site earthworks do not require off-site disposal from a contamination perspective as they are below the adopted NESCS SCS and Eco-SGV criteria and can remain on-site. Babbage understands that soil from earthworks is planned to be redistributed on-site and as such off-site disposal is not expected/required.

[14] MfE, 2011, Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (June 2011)

[15] Landcare Research 2016. User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs)- Consultation draft, June 2016.


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CLIENT / PROJECT

**NZ CLEAN ENERGY LIMITED**

**1352 HOMEBUSH ROAD, DARFIELD, SELWYN DISTRICT**

MAP TITLE

# ENVIRONMENTAL SAMPLE LOCATION PLAN

MAP REVISIONS

10/12/2024 Initial version by JT.
16/01/2025 Revised version by JT.

Legend

- Site Boundary
- Sampling points
- Proposed maintanence road locations
- Proposed substation area

NOTES
Aerial Images: LINZ Basemap

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

1:14,209 **@ A3**

MAP NO.

**Figure 1**

**Table 7: Soil analytical results - metal and asbestos**

| | | | | | Asbestos[1] | Metals - Screen | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asbestos Containing Material (ACM) (Presence / absence and type) | Arsenic | Cadmium | Chromium | Copper | Lead | Nickel | Zinc |
| | | | | | - | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **NESCS SCS - Commercial / Industrial[2]** | | | | | **0.05% ACM/0.001% fines** | **70** | **1,300** | **>10,000** | **>10,000** | **3,300** | **6,000 [5]** | **400,000 [5]** |
| **NESCS SCS - Rural Residential (25% produce)[2]** | | | | | **0.01% ACM/0.001% fines** | **17** | **0.8** | **>10,000** | **>10,000** | **160** | **-** | **-** |
| **Agricultural Land Eco-SGVs (Environmental Protection)[3]** | | | | | **NA** | **20** | **3.1** | **300** | **-** | **530** | **-** | **-** |
| **Soil trace element background concentration for YBST (Level 1- Level 2)[4]** | | | | | **NA** | **6.35** | **0.14** | **19.89** | **11.68** | **19.75** | **13.91** | **69.58** |
| **Waste Acceptance criteria-Burwood[6]** | | | | | **NA** | **80** | **400** | **2,700** | **>10,000** | **880** | **600** | **14,000** |
| **Property Address** | **Sample ID** | **Sample depth (m bgl)** | **Material Type** | **Sampled Date** | | | | | | | | |
| **1352 Homebush Road, Darfield** | S01 | 0.0 | Natural | 12/12/2024 | - | 0.33 | <0.01 | 0.9 | 0.4 | 1.5 | 0.9 | 5 |
| | S02 | 0.0 | Natural | 12/12/2024 | - | 0.23 | <0.01 | 0.7 | <0.3 | 1.2 | 0.6 | 3 |
| | S03 | 0.0 | Natural | 12/12/2024 | - | 0.24 | <0.01 | 0.7 | 0.3 | 1 | 0.6 | 4 |
| | S04 | 0.0 | Natural | 12/12/2024 | - | 0.24 | <0.01 | 0.7 | <0.3 | 1.1 | 0.6 | 3 |
| | S05 | 0.0 | Natural | 12/12/2024 | - | 0.24 | <0.01 | 0.7 | 0.3 | 1 | 0.7 | 3 |
| | S06 | 0.0 | Natural | 12/12/2024 | - | 0.26 | 0.01 | 0.8 | 0.3 | 1.2 | 0.6 | 4 |
| | S07 | 0.0 | Natural | 12/12/2024 | - | 0.24 | 0.03 | 0.8 | 0.3 | 1.1 | 0.6 | 4 |
| | S08 | 0.0 | Natural | 12/12/2024 | - | 0.3 | 0.01 | 0.9 | 0.4 | 1.3 | 0.7 | 4 |
| | S09 | 0.0 | Natural | 12/12/2024 | - | 0.27 | <0.01 | 0.8 | <0.3 | 1.1 | 0.6 | 4 |
| | S10 | 0.0 | Natural | 12/12/2024 | - | 0.27 | <0.01 | 0.8 | 0.3 | 1.2 | 0.7 | 4 |
| | S11 | 0.0 | Natural | 12/12/2024 | No asbestos detected. | 0.33 | 0.01 | 0.9 | 0.4 | 1.3 | 0.7 | 4 |
| | S12 | 0.0 | Natural | 12/12/2024 | - | 2.75 | 0.15 | 9 | 3.1 | 23.6 | 5.9 | 34 |
| | S13 | 0.0 | Natural | 12/12/2024 | - | 2.54 | 0.17 | 9.4 | 3.8 | 16 | 6.6 | 34 |
| | S14 | 0.0 | Natural | 12/12/2024 | - | 2.42 | 0.17 | 9.5 | 3.3 | 15.8 | 7 | 32 |
| | S15 | 0.0 | Natural | 12/12/2024 | - | 2.45 | 0.09 | 9.7 | 3.6 | 15.2 | 6.8 | 33 |
| | S16 | 0.0 | Natural | 12/12/2024 | - | 2.4 | 0.13 | 8.8 | 3.2 | 20.5 | 5.8 | 33 |
| | S17 | 0.0 | Natural | 12/12/2024 | - | 2.11 | 0.04 | 13 | 2.5 | 14.1 | 5.2 | 29 |
| | S18 | 0.0 | Natural | 12/12/2024 | - | 2.47 | 0.16 | 12.1 | 3.8 | 16 | 6.1 | 37 |
| | S19 | 0.0 | Natural | 12/12/2024 | - | 1.98 | 0.07 | 11.5 | 2.8 | 12.6 | 4.9 | 30 |
| | S20 | 0.0 | Natural | 12/12/2024 | - | 2.66 | 0.09 | 18.2 | 3.6 | 19.1 | 7.6 | 37 |
| | S21 | 0.0 | Natural | 12/12/2024 | - | 3.93 | 0.22 | 17.8 | 5.2 | 22.3 | 9.5 | 60 |
| | | 0.3 | Natural | 12/12/2024 | - | 3.14 | 0.11 | 13.2 | 3.9 | 13.5 | 8.8 | 60 |
| | S22 | 0.0 | Natural | 12/12/2024 | - | 2.16 | 0.11 | 12.2 | 2.5 | 14.1 | 5 | 29 |
| | | 0.3 | Natural | 12/12/2024 | - | 2.94 | 0.08 | 13.1 | 2.8 | 13 | 8.6 | 48 |
| | S23 (S22 Dup) | 0.0 | Natural | 12/12/2024 | - | 2.36 | 0.12 | 11.7 | 2.9 | 15.2 | 5.7 | 32 |

**Comments**

**Results are in milligrams per kilogram (mg/kg) unless specified.**

**1 = BRANZ, 2017. New Zealand Guidelines for Assessing and Managing Asbestos in Soil.**

**2 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.**

**3 = User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs)- Consultation draft, Envirolink Tools Grant: C09X1402, June 2016**

**4= Canterbury Maps Open Data. Soil Trace Elements Level 2. https://opendata.canterburymaps.govt.nz/datasets/ecan::soil-trace-elements-level-2/explore?location=-43.619659%2C171.921084%2C9.77**

**5 = in the absence of available NESCS SCS Soil criterion for nickel and zinc, the criterion has been adopted from Assessment of Site Contamination National Environment Protection Measures (ASC NEPM) Toolbox – http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox.**

**6 = Disposal facility criteria may vary. Verify with disposal facility prior to disposal.**

**NA = Not Applicable.**

<LoR - below laboratory reporting limits.

| | |
|---|---|
| **BOLD :** | exceeds applicable NES:CS SCS criteria |
| **BOLD :** | exceeded Eco-SGVs |
| **BOLD:** | exceeded adopted NES:CS SCS land use criteria and Eco-SGVs |
| | above background concentrations |
| | exceeded Disposal Facility Criteria |
| - : | not tested for |
| m bgl: | metre below ground level |

**Table 8: Soil analytical results - OCPs**

| | | | | | OCP - Screen | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2,3-Diuron | 2,4'-DDT | 2,4'-DDD | 2,4'-DDE | a-BHC | a-chlordane | Aldrin | b-BHC | Chlordane (total) | cis-Permethrin | Dieldrin | Endosulfan I | Endosulfan II | Endosulfan Sulfate | Endrin | Endrin Aldehyde | Endrin ketone | Gamma-Chlordane | HCH delta- | Heptachlor | Heptachlor Epoxide | Hexachlorobenzene | Lindane ( g-BHC) | Methoxychlor | p,p'-DDD | p,p'DDE | p,p'- DDT | Procymidone | Propanil | Sum of DDT and isomers | Toxaphene |
| | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **NESCS SCS Soil - Commercial / Industrial[1]** | | | | | NA | NA | NA | NA | NA | NA | **160** | NA | NA | NA | **160** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **14,180** | NA | NA | NA | NA | NA | NA | **1,000** | NA |
| **NESCS SCS Soil - Rural Residential (25% produce)[1]** | | | | | NA | NA | NA | NA | NA | NA | **1.1** | NA | NA | NA | **1.1** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **33** | NA | NA | NA | NA | NA | NA | **45** | NA |
| **Soil trace element background concentration for YBST (Level 1- Level 2)[2]** | | | | | NA | NA | NA | NA | NA | NA | <LoR | NA | NA | NA | <LoR | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <LoR | NA |
| **Waste Acceptance criteria-Burwood[3]** | | | | | NA | NA | NA | NA | NA | NA | **70** | NA | NA | NA | **70** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **400** | NA |
| **Property Address** | **Sample ID** | **Sample depth (m bgl)** | **Material Type** | **Sampled Date** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **12352 Homebush Road, Darfield** | S02 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S04 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S06 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.09 | <0.05 | <0.02 | <0.02 | 0.095 | <0.05 |
| | S08 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.04 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S10 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.21 | <0.05 | <0.02 | <0.02 | 0.21 | <0.05 |
| | S12 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S14 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.03 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S16 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.17 | <0.05 | <0.02 | <0.02 | 0.17 | <0.05 |
| | S18 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.18 | <0.05 | <0.02 | <0.02 | 0.18 | <0.05 |
| | S20 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.05 | <0.05 | <0.02 | <0.02 | 0.052 | <0.05 |
| | S21 | 0.3 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |
| | S22 | 0.0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | 0.05 | <0.05 |
| | | 0.3 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.02 | <0.02 | <0.05 | <0.05 |

**Comments**

**Results are in milligrams per kilogram (mg/kg) unless specified.**

**1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.**

**2 = Canterbury Maps Open Data. Soil Trace Elements Level 2. https://opendata.canterburymaps.govt.nz/datasets/ecan::soil-trace-elements-level-2/explore?location=-**

**3= Disposal facility criteria may vary. Verify with disposal facility prior to disposal.**

**NA = Not Applicable.**

<LoR - below laboratory reporting limits

**BOLD :** exceeds applicable NES:CS SCS criteria

above background concentrations

exceeded Disposal Facility Criteria

- : not tested for

m bgl: metre below ground level

**Table 9: Soil analytical results - OPPs**

| | | | | | OPP - Screen | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Azinphos-methyl | Chlorfenvinphos | Chlorpyrifos | Chlorpyrifos-methyl | Coumaphos | Demeton-O | Demeton-S | Diazinon | Dichlorvos | Dimethoate | Disulfoton | EPN | Ethion | Ethoprop (Ethoprophos) | Ethyl parathion | Fenamiphos | Fenitrothion | Fensulfothion | Fenthion | Malathion | Merphos | Methyl Parathion | Mevinphos | Monocrotophos | Naled | Omethoate | Phorate | Pirimiphos-methyl | Profenofos | Prothiofos | Pyrazophos | Ronnel | Sulprofos (Bolstar) | Temephos | Terbufos | Tetrachlorvinphos | Trichloronat |
| | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **NESCS SCS Soil - Commercial / Industrial[1]** | | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | N/A | N/A | N/A | N/A | N/A | N/A |
| **NESCS SCS Soil - Rural Residential (25% produce)[1]** | | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | N/A | N/A | N/A | N/A | N/A | N/A |
| **Soil trace element background concentration for YBST (Level 1- Level 2)[2]** | | | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Waste Acceptance criteria-Burwood[3]** | | | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Property Address** | **Sample ID** | **Sample depth (m bgl)** | **Material Type** | **Sampled Date** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **1232 Homebush Road, Darfield** | S01 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S03 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.03 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S05 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.03 | <0.02 | <0.03 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S07 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.03 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S09 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.03 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S11 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S13 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | 0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S15 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S17 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S19 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.03 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S21 | 0 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | | 0.3 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| | S22 | 0.3 | Natural | 12/12/2024 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |

**Comments**

**Results are in milligrams per kilogram (mg/kg) unless specified.**

**1 = MfE, June 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.**

**2 = Canterbury Maps Open Data. Soil Trace Elements Level 2. https://opendata.canterburymaps.govt.nz/datasets/ecan::soil-trace-elements-level-2/e**

**3 = Disposal facility criteria may vary. Verify with disposal facility prior to disposal.**

**NA = Not Applicable.**

<LoR - below laboratory reporting limits

**BOLD :** exceeds applicable NES:CS SCS criteria

above background concentrations

exceeded Disposal Facility Criteria

- : not tested for

m bgl: metre below ground level

# 5 REGULATORY REQUIREMENTS

Based on the results from the contaminated site assessment work described above, and given the anticipated redevelopment plans, a summary of the contaminated land regulatory requirements is presented below:

- Review of historical aerial photographs, ECAN LLUR, contamination investigation results, and site observation indicates the site has been subjected to an activity on the HAIL. However, pursuant to regulation 5(8)(b) of the NESCS, as the piece of land is to remain as production land (pastoral/grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, the NESCS does not apply.
- The site falls under the permitted activity standards as defined in Rule 5.185 (1) and (2) of the Canterbury Land and Water Regional Plan, as site investigation work and reporting were undertaken in general accordance with CLMG No 1 and CLMG No 5. The permitted activity rule requires a DSI to be provided to Canterbury Regional Council (CRC) within two months of the completion of the investigation by the person or organisation initiating the site investigation.
- As the site does not meet the definition of contaminated land as defined under section 2.9 of the Canterbury Land and Water Regional Plan, Babbage does not consider Rule 5.187 to be applicable to the site.

# 6 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) for the site has been developed to assess risk. For a contaminant to present a risk to human health or the environment, the following components are required to be present and connected:

- Sources/Contaminants – the known and potential sources of contamination and contaminants of concern.
- Pathways – likely and complete exposure pathways by which the identified receptors could be exposed to the contaminants, under current or known proposed future land use.
- Receptors – human and ecological receptors.

Based on the data for the site, the potential source, pathway and receptor linkages are presented in Table 10.

***Table 10. Conceptual site model.***

| Source | Exposure pathway | Potential receptor | Risk to current/future land users |
|---|---|---|---|
| Asbestos in soil from former structure. | Inhalation of asbestos fines. | Site re-development workers.<br>Current site users.<br>Future site users.<br>Surrounding residents.<br>Receiving environment (in surrounds and at disposal facility). | **Unlikely**.<br>Asbestos not detected in soil. |
| Metal concentrations in soil from anthropogenic activity. | Direct contact.<br>Ingestion of soil.<br>Inhalation of airborne dust.<br>Off-site discharge. | Site re-development workers.<br>Current site users.<br>Future site users.<br>Surrounding residents.<br>Receiving environment (in surrounds and at disposal facility). | **Unlikely**.<br>Metals below adopted NESCS SCS and Eco-SGV criteria. |
| Pesticide concentrations in soil from historical spraying activity. | Direct contact.<br>Ingestion of soil.<br>Inhalation of airborne dust.<br>Off-site discharge. | Site re-development workers.<br>Current site users.<br>Future site users.<br>Surrounding residents. | **Unlikely**.<br>OCPs below adopted NESCS SCS criteria. |

| | | | |
|---|---|---|---|
| | | Receiving environment (in surrounds and at disposal facility). | |

Based on the source, pathway and receptor linkage, the potential to pose a risk to the health of future land users and/or the environment appear to be less than minor.

# 7 CONCLUSIONS

Based on the DSI, Babbage concludes the following:

1. The concentrations of metals and OCPs in soil samples taken from the site do not exceed the applicable NESCS SCS and Eco-SGV criteria. Soil from the site does not need to be removed from a contamination perspective, however if it is removed, it may need to be disposed of at a facility consented to accept that level of contamination.
2. Pursuant to regulation 5(8)(b) of the NESCS, as the piece of land is to remain as production land (pastoral/grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, the NESCS does not apply.
3. Prepare a SMP outlining health, environmental and safety controls, mitigation controls to manage unexpected discovery of contaminants, including ACM (underground services are common).
4. Site earthwork contractors should adopt measures to prevent adverse effects to human health and the environment from the excavation work, including health and safety plans, mitigation measures and erosion and sediment controls meeting the Erosion & Sediment Control Toolbox for Canterbury guide website[16].

[16] Environment Canterbury Regional Council 2025. Erosion & Sediment Control Toolbox website, Retrieved from https://www.esccanterbury.co.nz/.

# APPLICABILITY AND LIMITATIONS

## Restrictions of Intended Purpose

This report has been prepared solely for the benefit of New Zealand Clean Energy Ltd as our client with respect to the brief. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such party's sole risk.

## Legal Interpretation

Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on they should be independently verified with appropriate legal advice.

## Maps and Images

All maps, plans, and figures included in this report are indicative only and are not to be used or interpreted as engineering drafts. Do not scale any of the maps, plans or figures in this report. Any information shown here on maps, plans and figures should be independently verified on site before taking any action. Sources for map and plan compositions include LINZ Data and Map Services and local council GIS services. For further details regarding any maps, plans or figures in this report, please contact Babbage Consultants Limited.

## Reliability of Investigation

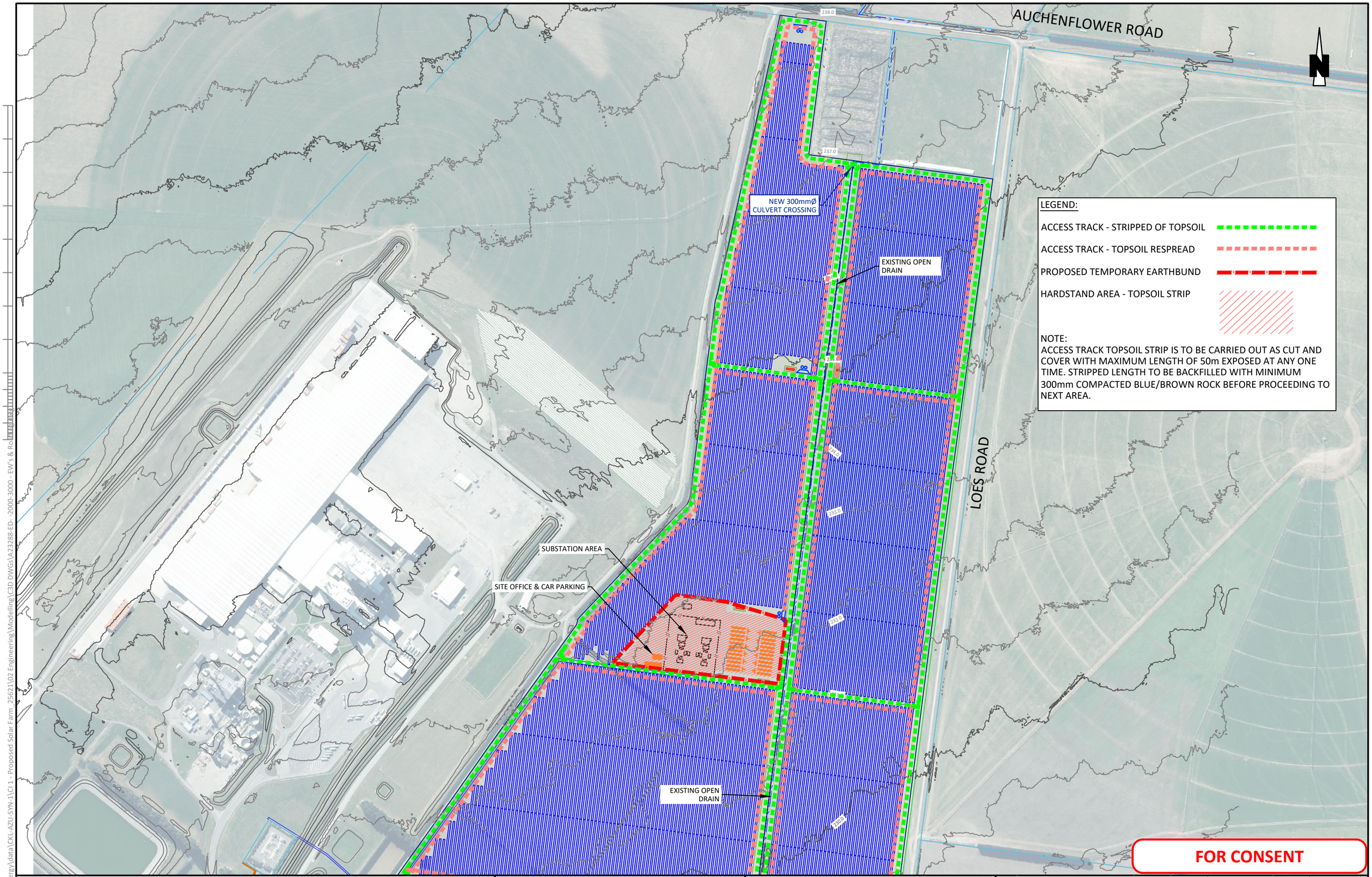
Babbage has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of matrix sampled away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

There is no investigation that is thorough enough to preclude the presence of materials at the site that presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may in the future become subject to different regulatory standards, which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

# Appendix A

## Proposed Development Plan

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E: Auckland@ckl.co.nz

# AGRIVOLTAIC FACILITY
## DARFIELD SOLAR AND ENERGY LTD
## 1352 HOMEBUSH ROAD, DARFIELD

## EARTHWORKS TOPSOIL STRIP & RESPREAD

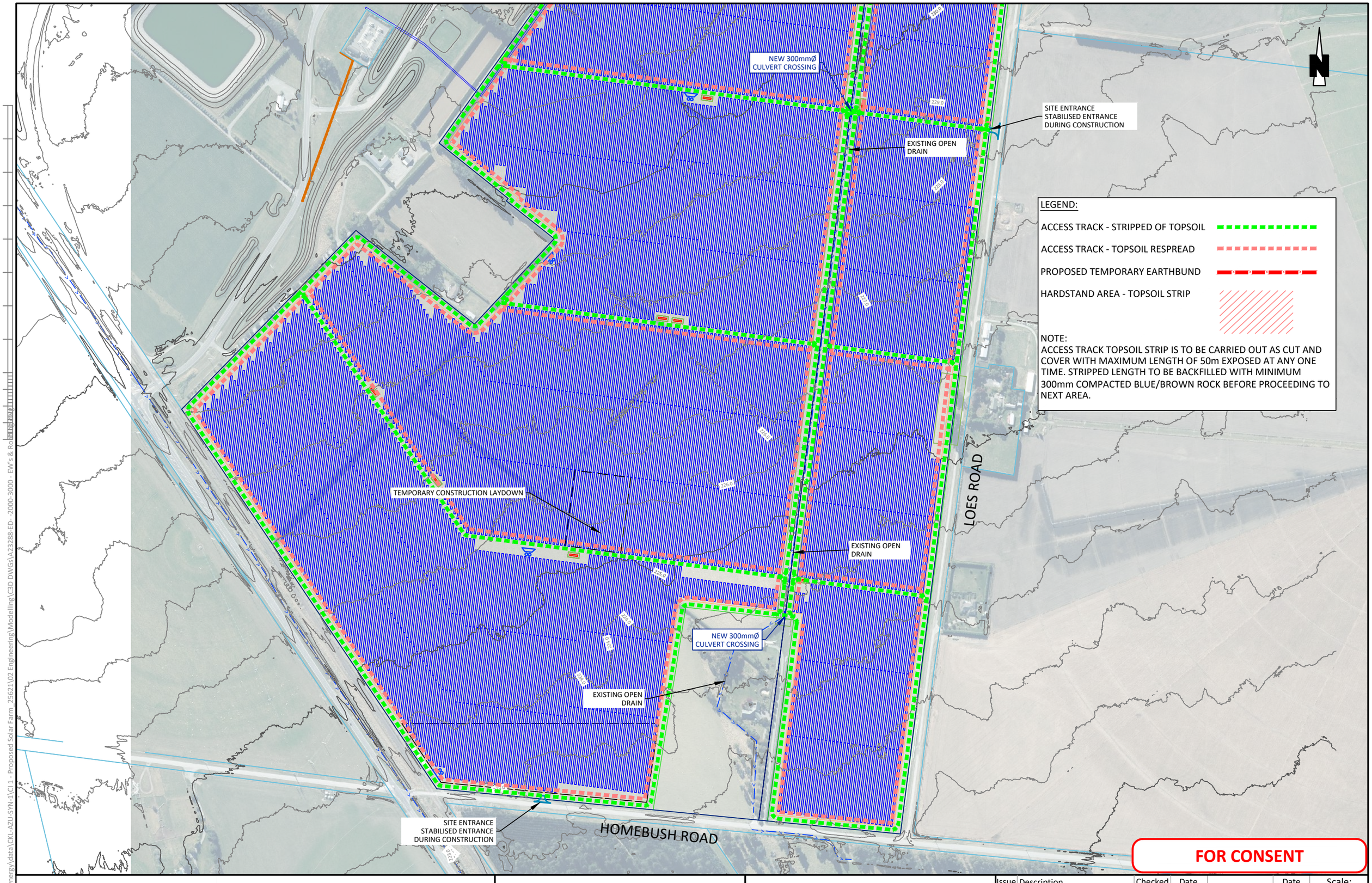
| Issue | Description | Checked | Date |
|---|---|---|---|
| 0 | | | 11.06.24 |

| | | Date |
|---|---|---|
| Designed: | GCW | 11.06.24 |
| Drawn: | GCW | 11.06.24 |
| Checked: | | 11.06.24 |

Scale: 1:5000 (A3 Original)

Job No: A23288 | Dwg No: 2001 | Rev: 0

C:\ProgramData\12DSynergy\data\CKL-AZU-SYN-1\CI 1 - Proposed Solar Farm 25621\02 Engineering\Modelling\C3D DWGs\A23288-ED - 2000-3000 - EW's & Ro




FOR CONSENT

C:\ProgramData\12Dsynergy\data\CKL-AZU-SYN-1\Cl 1 - Proposed Solar Farm_25621\02 Engineering\Modelling\C3D DWGs\A23288-ED - 2000-3000 - EW's & Ro

CKL
Planning | Surveying | Engineering | Environmental
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# AGRIVOLTAIC FACILITY
## DARFIELD SOLAR AND ENERGY LTD
## 1352 HOMEBUSH ROAD, DARFIELD

# EARTHWORKS TOPSOIL STRIP & RESPREAD

| Issue | Description | Checked | Date |
|---|---|---|---|
| 1 | Construction Laydown updated | | 30.07.24 |
| 0 | | | 11.06.24 |

| | | | Date |
|---|---|---|---|
| Designed: | GCW | | 11.06.24 |
| Drawn: | GCW | | 11.06.24 |
| Checked: | | | 11.06.24 |

Scale: 1:5000 (A3 Original)

Job No: A23288 | Dwg No: 2000 | Rev: 1

# Appendix B

## Site Photographs

| Client name: | Site location: | Photo dates: |
|---|---|---|
| New Zealand Clean Energy Ltd | 1352 Homebush Road, Darfield | 12 December 2024 |

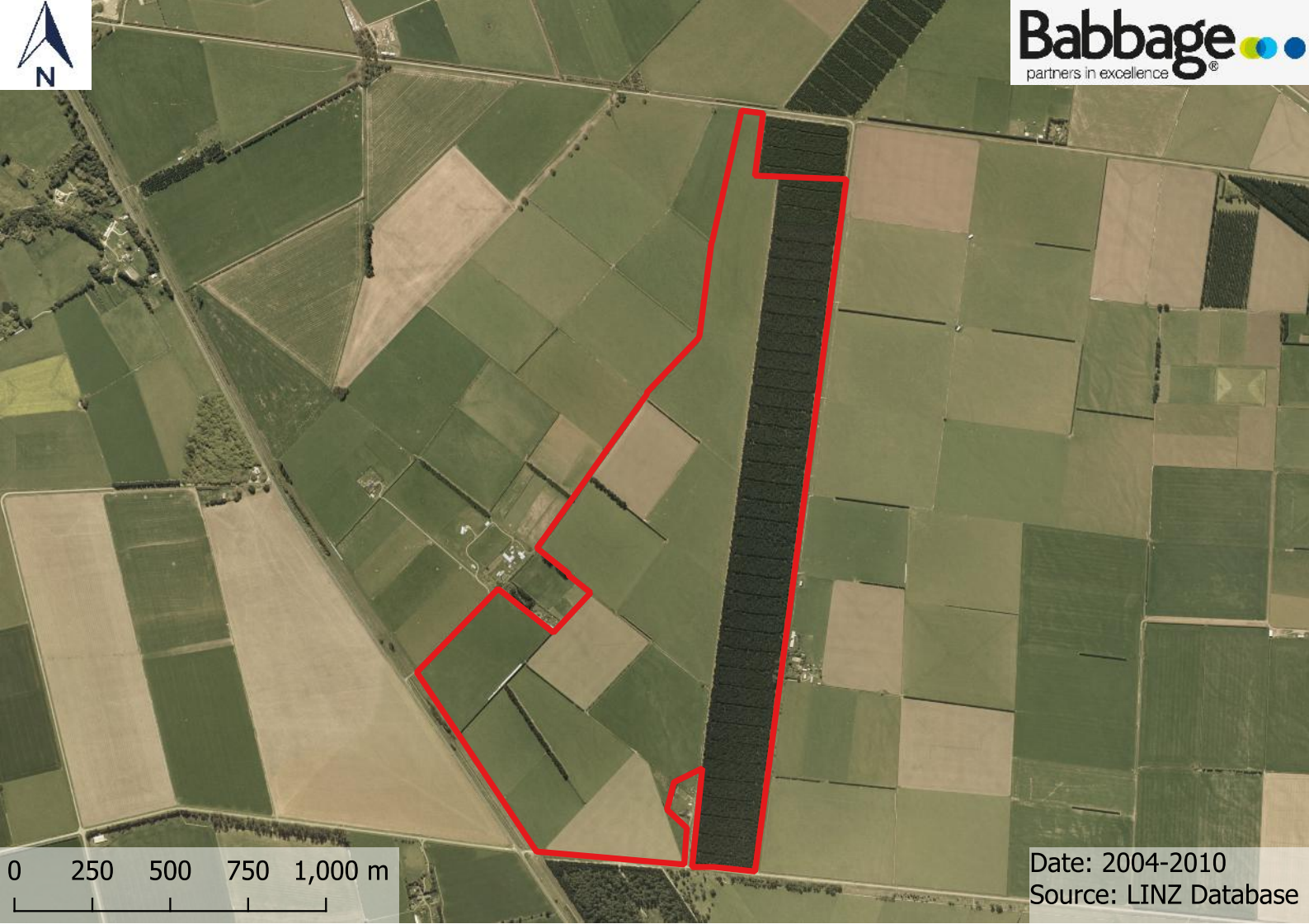
| | |
|---|---|
| ***Photo No.*** ***1.*** |  |
| Direction Photo Taken: Facing north. | |
| Description: General site conditions. | |
| ***Photo No.*** ***2.*** |  |
| Direction Photo Taken: N/A | |
| Description: General ground conditions. | |

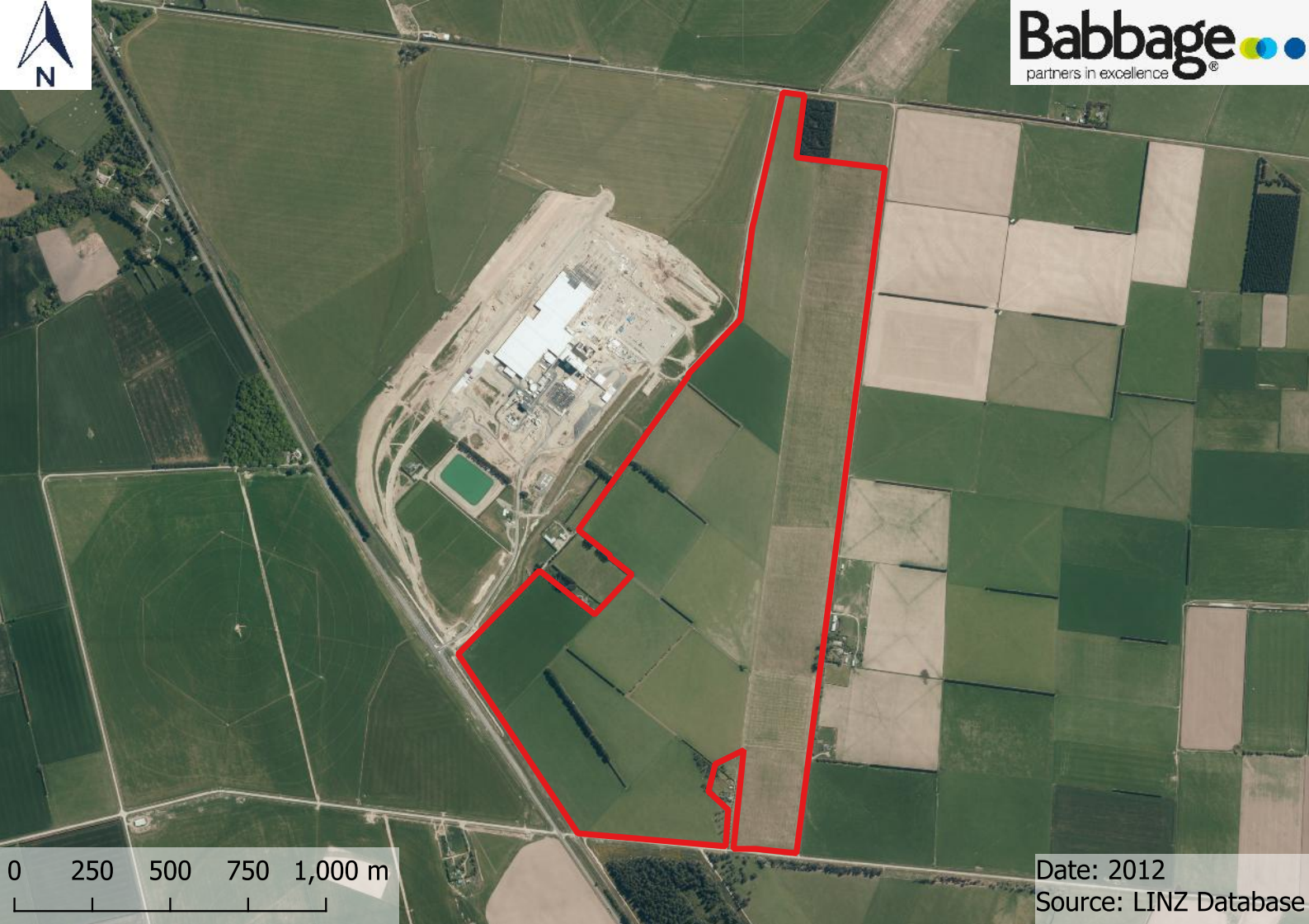
# Appendix C

## Selected Historical Aerials


N
Babbage
partners in excellence
126/8
0
250
500
750
1,000 m
Date: 1941
Source: Retrolens


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 1985 Aerial
Source: Retrolens


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2004-2010
Source: LINZ Database


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2012
Source: LINZ Database


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2019
Source: LINZ Database

# Appendix D

## Previous Babbage PSI

Darfield Solar and Energy Storage Project

# Preliminary Site Investigation

for: Darfield Solar and Energy Storage Ltd

Job No: 67231#CIM

Version: Rev3

eTrack No: 200048456

Date of Issue: 28/08/2024

# EXECUTIVE SUMMARY

Babbage Consultants Limited (Babbage) has been engaged by Darfield Solar and Energy Storage Ltd (DSES) to undertake a Preliminary Site Investigation (PSI) at 1352 Homebush Road, Darfield, Selwyn District (the site). The findings of this investigation are summarised as follows:

1 The site has been used for as production land (combination of agricultural, pastoral, and forestry purposes) for at least 69 years. Forestry activity ceased around 2010.

2 Site history review indicates that the site has been subjected to an activity on the Hazardous Activities and Industry List (HAIL) Item A10.

3 The site has potential contaminants in particular organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), and metals from historical agricultural activities.

4 The conceptual site model indicates that there is a potential source and pathway link to human/ecological receptors. The level of risk to human health or the environment is considered minor for Lot 2 and less than minor for Lot 1.

5 Pursuant to regulation 5(8)(b) of the NESCS[1], the piece of land is to remain as production land (grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, therefore the NESCS does not apply.

6 Notwithstanding the minor and less than minor risk assessment, an environmental soil assessment is recommended prior to soil disturbance works on site to assess the level of contamination and required controls during earthworks, if any.

[1] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

# ACKNOWLEDGEMENT OF SUBMISSION

This report was prepared by Charlotte Lucas and reviewed by Hiram Garcia.

Respectfully submitted

Babbage Consultants Limited

Charlotte Lucas
Environmental Consultant

Hiram Garcia
Principal Environmental Consultant

I have assessed the site in accordance with current New Zealand Regulations and guidance documents and reported in accordance with the current edition of Contaminated Land Management Guidelines No 1: Reporting of Contaminated Sites in New Zealand.
I am considered by Babbage Consultants Limited as a suitably qualified and experienced practitioner (SQEP) pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.

Name: Hiram Garcia

Signed:  Date: 28/08/2024

**Babbage Consultants Limited: SQEP Definition**

Babbage Consultants Limited requires that a SQEP has the following Qualifications/Experience:

- Tertiary education in environmental science, engineering, or other relevant field;
- Ten years of relevant post graduate environmental experience;
- A commitment to continuing professional development; and
- Full membership of an appropriate professional body requiring a commitment to operating in accordance with a professional code of ethics.

| Date | Version | eTrack No. | Author(s) | Reviewer(s) |
|---|---|---|---|---|
| 22/05/2024 | Rev0 | 200047967 | Charlotte Lucas | Hiram Garcia |
| 05/07/2024 | Rev1 | 200048181 | Charlotte Lucas | Hiram Garcia |
| 07/08/2024 | Rev2 | 200048181 | Charlotte Lucas | Hiram Garcia |
| 28/08/2024 | Rev3 | 200048456 | Charlotte Lucas | Hiram Garcia |

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## List of Tables



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## List of Appendices

# 1 INTRODUCTION AND BACKGROUND

Babbage has been engaged by DSES to undertake a PSI at 1352 Homebush Road, Darfield, Selwyn District (the site) to support DSES's site development (See Figure 1).

The scope of work for the PSI was set out in our proposal dated 8 March 2024 which does not include a site visit. The key aims of the PSI were to determine:

- The site history based on historical aerials, Environment Canterbury Regional Council Listed Land Use Register (ECAN LLUR) and a landowner interview, whether historic use is likely to have resulted in ground contamination and verify whether activities detailed on the HAIL, issued by the Ministry for the Environment (MfE)[2], apply to the site.
- Nature and source of potential contaminants if applicable.
- Known or potential human and ecological receptors that could be exposed to contaminants if applicable.
- Known or potential pathways by which identified receptors could be exposed to potential contaminants under current or known proposed future land use if applicable.

The site identification details are presented in Table 1.

***Table 1. Site identification.***

| Address | Legal description | Area ($m^2$) |
|---|---|---|
| 1352 Homebush Road | Lot 2 DP 60325 (Lot 2) | 1,073,406 |
| | Lot 1 DP 434071 (Lot 1) | 469,240 |

**Note:** Source – Land Information New Zealand (LINZ) data service website[3].

It is understood that DSES plans to develop the site as a solar power generation facility.

The PSI performed follows the general reporting and investigation methodology presented in the MfE Contaminated Land Management Guidelines (CLMG) No. 1[4].

[2] MfE 24 March 2021. Land – Guidance and guidelines on contaminated land. Retrieved from https://www.mfe.govt.nz/land/hazardous-activities-and-industries-list-hail

[3] LINZ data service 22 March 2024. Retrieved from https://data.linz.govt.nz/layer/50772-nz-primary-parcels

[4] MfE 2021. Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand (Revised 2021)


Babbage

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CLIENT / PROJECT

**DARFIELD SOLAR AND ENERGY STORAGE LIMITED**

**1352 HOMEBUSH ROAD, DARFIELD, SELWYN DISTRICT**

MAP TITLE

**SITE LOCATION PLAN**

MAP REVISIONS

17/04/2024 Initial version by CL.
08/08/2024 Revised version by CL

## Legend

- Site Boundary
- Lot Boundary

NOTES
Aerial Images: LINZ Basemap

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

**1:1** **@ A3**

MAP NO.

**Figure 1**

# 2 SITE DESCRIPTION

The site is located north of Homebush Road, in the suburb of Darfield, within the Selwyn District of Canterbury. The site is currently used as pastoral and agricultural land.

The Canterbury Maps Viewer website[5] shows the site is sloping from northwest to southeast with a fall of approximately 20 meters (m). Stormwater surface runoff generated at the site appears to discharge straight to soakage onsite.

Published geological information[6] shows the site to be underlain by the Pakihi Supergroup consisting of un-weathered, brownish-grey, variable mix of gravels, sand, silt, and clay in low river terraces; locally up to 2m silt cap.

The current surrounding property use is presented in Table 2.

***Table 2. Surrounding property use.***

| Direction | Observation |
|---|---|
| North | To the north of the site is Auchenflower Road with agricultural and pastoral properties beyond. |
| South | To the south of the site is Homebush Road and McHughs Plantation Reserve with pastoral and residential properties beyond. |
| East | To the east of the site are pastoral and agricultural properties with scattered residential dwellings. |
| West | To the west of the site is Fonterra Darfield facility with agricultural properties and West Coast Road beyond. |

**Note:** Source – Based on information from LINZ Database website and Canterbury Map Viewer.

[5] Environment Canterbury Regional Council. 17 April 2024. Canterbury Map Viewer. Retrieved from https://mapviewer.canterburymaps.govt.nz

[6] Institute of Geological and Nuclear Sciences (GNS). 26 March 2024.Geology 2.0.0 Webmap NZ 1:250k Geological unit. Retrieved from https://data.gns.cri.nz/geology/index.html?map=NZ%20Geology .

# 3 HISTORICAL SITE USE

Babbage has reviewed historic aerial photographs dating back to 1941 held on the Retrolens website[7] and LINZ Database. A summary of selected historic aerial photography is presented in Table 3 and the historical aerial photographs are shown in Appendix A.

***Table 3. Summary of historical aerial photographs.***

| Year | Site | Surrounding land use |
|---|---|---|
| 1941 | The site appears to be used for agricultural and pastoral (Lot 2) activities with forestry (Lot 1). | The site is surrounded by mostly pastoral and agricultural land use. Some residential properties are scattered to the south, east and west. West Coast Road and Homebush Road are established. |
| 1985 | No significant changes to site. | Site surrounds still predominantly pastoral and agricultural. |
| 2004-2010 | No significant changes to site. | A dwelling has been established within 1352 Homebush Road along the southern boundary but is not part of the site. |
| 2012 | The forestry activity on Lot 1 is no longer visible and appears to be used for pastoral land use. | Directly west of the site appears to be an industrial facility under development. |
| 2019 | No significant changes to site use. | The industrial property is now established to the west of the site. |

## 3.1 List Land Use Register Enquiry

A property statement was obtained from ECAN LLUR[8] on 26th March 2024. The response is provided in Appendix B and the web entry summarised below:

*'The Listed Land Use Register does not currently have any information about a Hazardous Activities and Industries List on your selected site.'*

[7] Local Government Geospatial Alliance 26 March 2024. Retrolens Historic Image Resource. Retrieved from http://retrolens.nz/

[8] Environment Canterbury Regional Council 26 March 2024. Retrieved from https://llur.ecan.govt.nz/home

### 3.2 Landowner Interview

Babbage received a response from the landowner at the time of this report on 4 April 2024 about the site. The response is summarised below and can be found in Appendix C:

- Prior to the current landowner 104 hectare (ha) (Lot 2) was used for pastoral farming and 46ha (Lot 1) for forestry.
- On the site 20ha of kale has been planted for the last 20 years and rotated annually for winter greenfeed for sheep. Each paddock is in kale for 10 months every 7-8 years. Herbicides and pesticides are used on the kale however they are mixed and stored offsite. The following chemicals are presently used; Glyphosate, versatill, pyrinex (chlorpyrifos), carfentrazone, 2-methyl-4-chlorophenoxyacetic (MCPA) and 4-(2-methyl-4-chlorophenoxy)butyric acid (MCPB).
- Prior to 2017, the land was ploughed to a depth of 150-200 millimetres (mm). Post 2017 the land was directly drilled.
- It's noted at on Lot 1 there was a 15x15m hole. This hole has previously been excavated and contained old tree stumps. This was filled and covered with onsite topsoil.
- There is no dwellings or structures on the site.

# 4 POTENTIAL FOR CONTAMINATION

Based on review of historical aerial photographs, ECAN LLUR enquiry, and land landowner interview it is concluded that the site is likely to have an has been subjected to an activity on the HAIL. Activities and locations can be found in Table 4 and mapped on Figure 2.

***Table 4. HAIL Activities.***

| HAIL Item | Description | Location |
|---|---|---|
| HAIL Item (A10) | Persistent pesticide bulk storage or use. | Lot 2, associated with agricultural activities since 1985. |


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CLIENT / PROJECT

**DARFIELD SOLAR AND ENERGY STORAGE LIMITED**

**1352 HOMEBUSH ROAD, DARFIELD, SELWYN DISTRICT**

MAP TITLE

# HAIL ACTIVITY LOCATION PLAN

MAP REVISIONS

17/04/2024 Initial version by CL.
08/08/2024 Revised version by CL

## Legend

- Site Boundary
- Lot Boundary
- HAIL ITEM (A10)

NOTES
Aerial Images: LINZ Basemap

DISCLAIMER:
This map/plan is not an engineering draft.
This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE

**1:1 @ A3**

MAP NO.

**Figure 2**

# 5 RISK ASSESSMENT

A conceptual site model (CSM) for the site has been developed to assess risk. For a contaminant to present a risk to human health or the environment, the following components are required to be present and connected:

- Sources/Contaminants – the known and potential sources of contamination and contaminants of concern.
- Pathways – likely and complete exposure pathways by which the identified receptors could be exposed to the contaminants, under current or known proposed future land use.
- Receptors – human and ecological receptors.

Based on the data for the site, the potential source, pathway and receptor linkages are presented in Table 5.

***Table 5. Conceptual site model.***

| Source | Exposure pathway | Potential receptor | Acceptable risk? |
|---|---|---|---|
| Organochlorine pesticides (OCPs), Organophosphate pesticides (OPPs) and metals for agricultural land use. | Direct contact.<br>Ingestion of soil.<br>Inhalation of airborne dust.<br>Off-site discharge. | Site re-development workers.<br>Current site users.<br>Future site users.<br>Surrounding residents.<br>Receiving environment (in surrounds and at disposal facility). | **Lot 2:**<br>**Minor**<br>Due to the area of application and the duration of the activity on the western portion of the site there may be a potential risk to human health or the environment. Soil sampling is recommended to determine actual risk. |
| | | | **Lot 1:**<br>**Less than minor**<br>Due to the short application time since the removal of the forest area there is unlikely to be a risk to human health or the environment. |

Based on the source, pathway and receptor linkage, OCPs, OPPs, and metals are likely to have the potential to pose a risk to the health of future land users and/or the environment.

Pursuant to regulation 5(8)(b) of the NESCS, the piece of land is to remain as production land (grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, therefore the NESCS does not apply.

# 6 CONCLUSIONS

Based on the PSI, Babbage concludes the following:

1 The site history review indicates that the site has been subjected to an activity on the HAIL.
   - HAIL Item (A10)- Persistent pesticide bulk storage or use.

2 The site has potential contaminants in particular OCPs, OPPs, and metals from historical agricultural activities.

3 The conceptual site model indicates that there is a potential source and pathway link to human/ecological receptors. The level of risk to human health or the environment is considered minor for Lot 2 and less than minor for Lot 1.

4 Pursuant to regulation 5(8)(b) of the NESCS, the piece of land is to remain as production land (grazing) and the proposed soil disturbance activity is not related to residential or farmhouse activities, therefore the NESCS does not apply.

5 Notwithstanding the minor and less than minor risk assessment, an environmental soil assessment is recommended prior to soil disturbance works on site to assess the level of contamination and required controls during earthworks, if any.

# APPLICABILITY AND LIMITATIONS

## Restrictions of Intended Purpose

This report has been prepared solely for the benefit of Darfield Solar and Energy Storage Ltd as our client with respect to the brief. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such party's sole risk.

## Legal Interpretation

Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on, they should be independently verified with appropriate legal advice.

## Maps and Images

All maps, plans, and figures included in this report are indicative only and are not to be used or interpreted as engineering drafts. Do not scale any of the maps, plans or figures in this report. Any information shown here on maps, plans and figures should be independently verified on site before taking any action. Sources for map and plan compositions include LINZ Data and Map Services and local council GIS services. For further details regarding any maps, plans or figures in this report, please contact Babbage Consultants Limited.

## Reliability of Investigation

Babbage has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of matrix sampled away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

There is no investigation that is thorough enough to preclude the presence of materials at the site that presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may in the future become subject to different regulatory standards, which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

# Appendix A

# Selected Historical Aerials


N
Babbage
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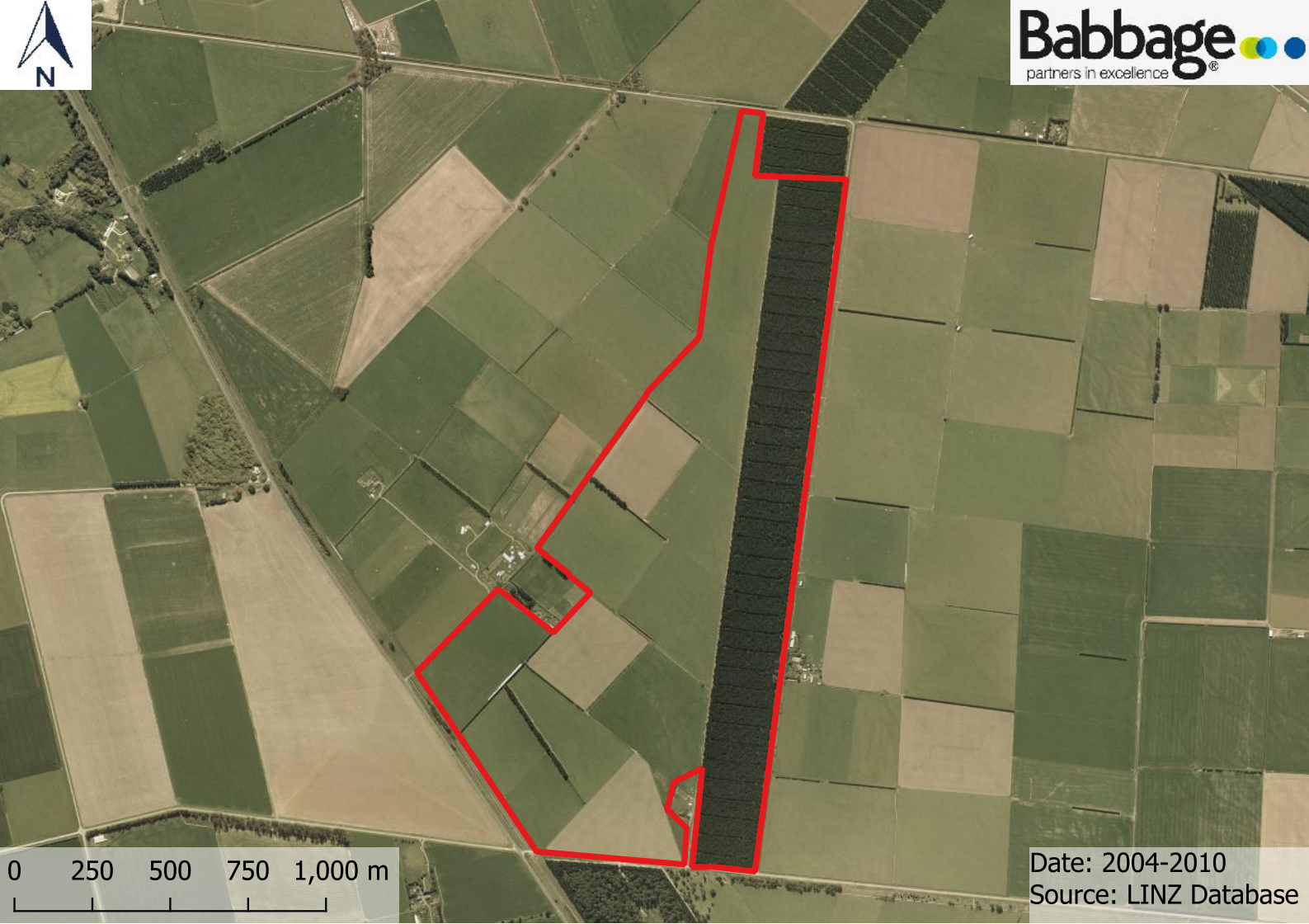
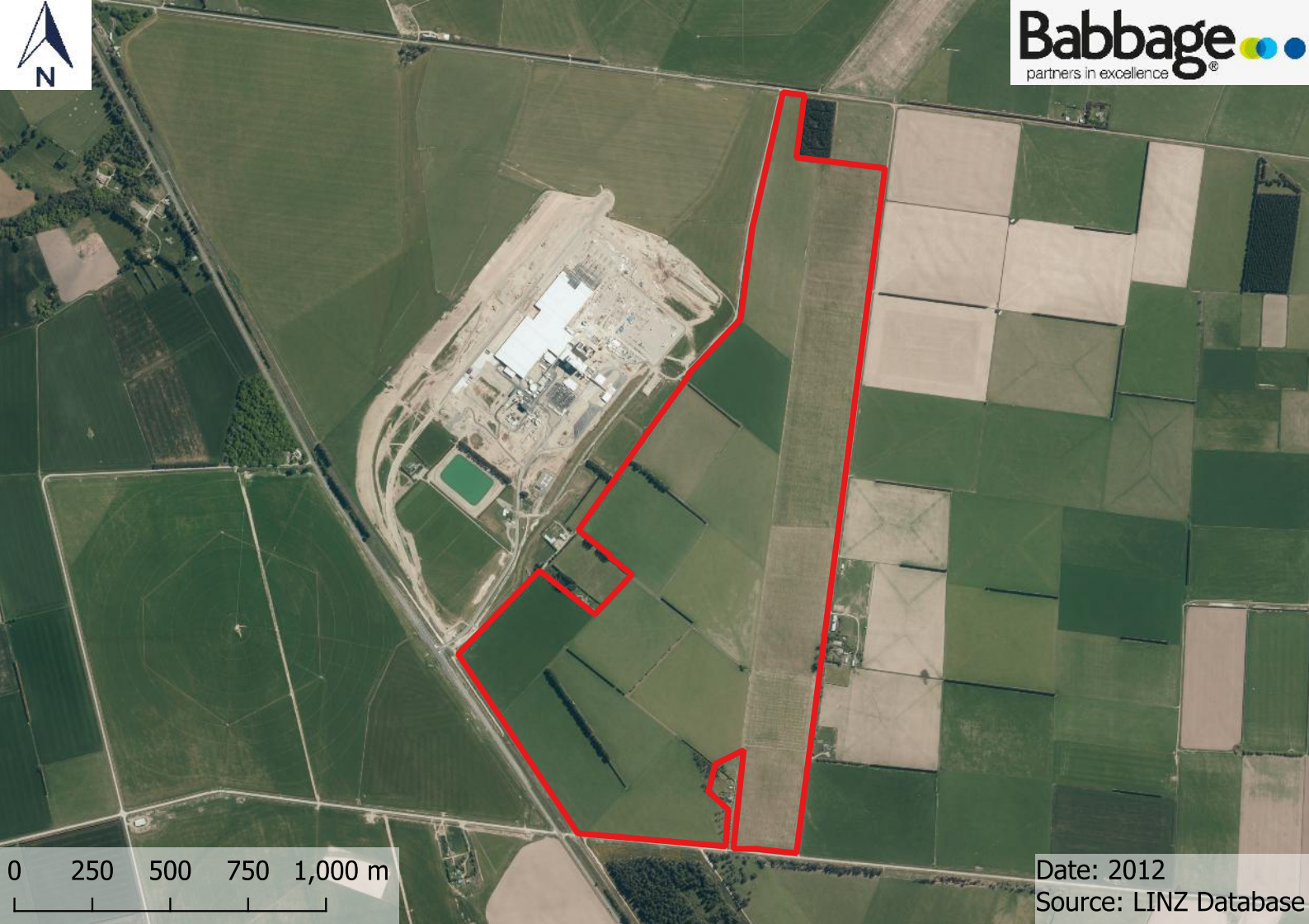
126/8
0
250
500
750
1,000 m
Date: 1941
Source: Retrolens


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 1985 Aerial
Source: Retrolens


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2004-2010
Source: LINZ Database


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2012
Source: LINZ Database


N
Babbage
partners in excellence
0 250 500 750 1,000 m
Date: 2019
Source: LINZ Database

# Appendix B

# Listed Land Use Register

Environment Canterbury
Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear Sir/Madam

Thank you for submitting your property enquiry from our Listed Land Use Register (LLUR). The LLUR holds information about sites that have been used or are currently used for activities which have the potential to cause contamination.

The LLUR statement shows the land parcel(s) you enquired about and provides information regarding any potential LLUR sites within a specified radius.

Please note that if a property is not currently registered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR database is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; additional relevant information may be held in other files (for example consent and enforcement files).

Please contact Environment Canterbury if you wish to discuss the contents of this property statement.

Yours sincerely

**Contaminated Sites Team**

# Property Statement
# from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ373252

**Date generated:** 25 March 2024
**Land parcels:** Lot 2 DP 60325


The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

## Sites at a glance

**Sites within enquiry area**

There are no sites associated with the area of enquiry.

## More detail about the sites

There are no sites associated with the area of enquiry.

## Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the

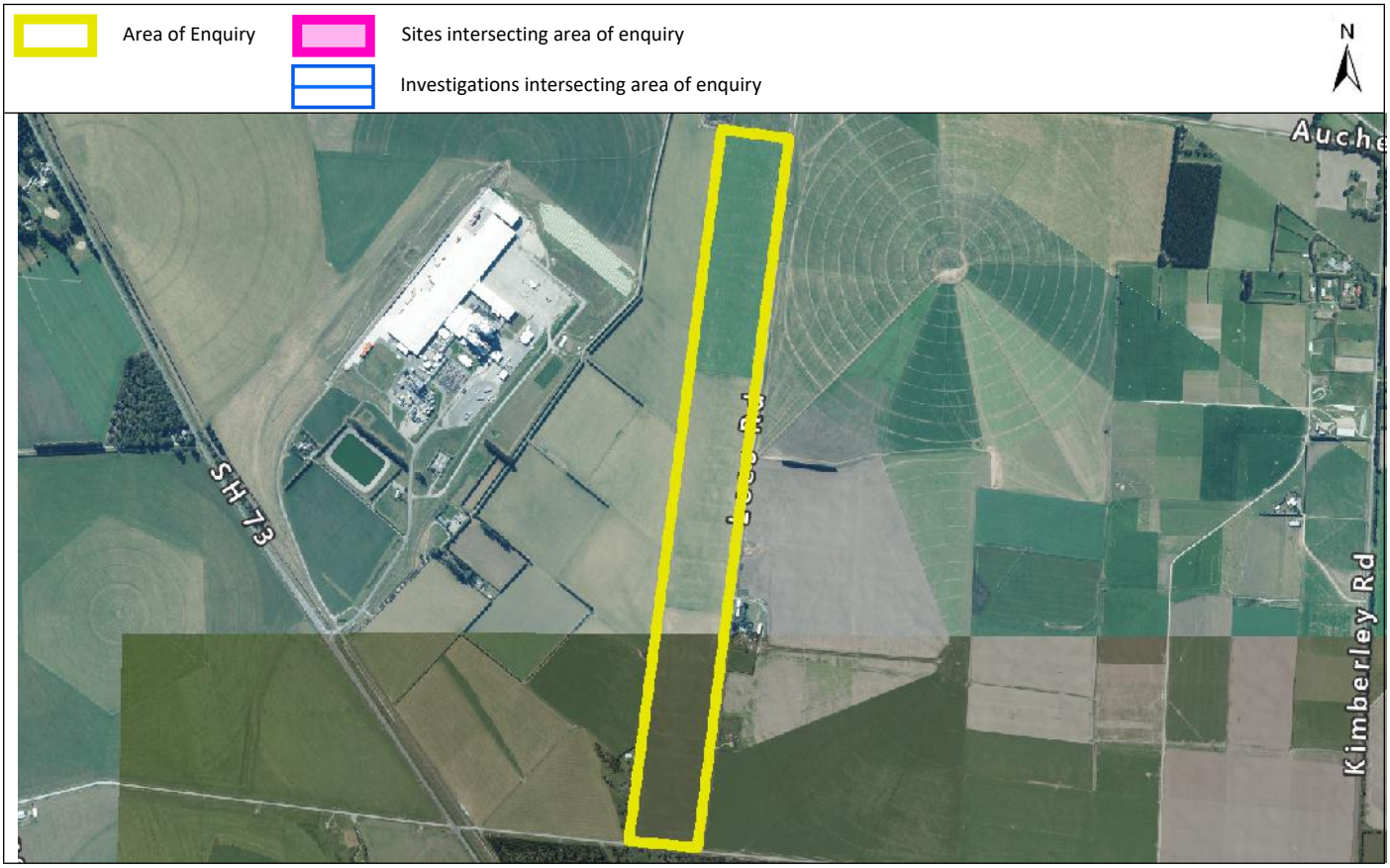
accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

# Property Statement
# from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ373253

**Date generated:** 25 March 2024
**Land parcels:** Lot 1 DP 434071




The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

## Sites at a glance

**Sites within enquiry area**

There are no sites associated with the area of enquiry.

## More detail about the sites

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Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

# Appendix C

# Landowner Interview

104 ha + 46 ha.

**General Questions for PSI/DSI**

Current Owner

What was the land used for before you bought it? 104 ha pastural farming
46 ha Forestry, converted to pasture

Do you know the contact details of the previous owner? 104 ha, deceased
46 ha, Selwyn Plantation Board now Selwyn D.C.

Were there any buildings on the land when you bought it? **(If have buildings, go to Q4; otherwise, go to Q7)** No

If so, are these still present? Or have they been demolished? **(If demolished, go to Q5; otherwise, go to Q6)** —

If demolished, where were the demolition materials taken? —

Did those buildings contain any asbestos? —

During the Current Owner's Ownership

What are the types of buildings on the site? **(If buildings already present; go to Q8; otherwise, go to Q9)** No buildings on site

When were they built? —

What has been the main use of the land? **(If used for agriculture; go to Q10; otherwise, go to Q11)** 104 ha pastural farming
46 ha ex forestry

Were there any cattle, sheep dips or footrot troughs? No

Were there any crops grown e.g. vegetables, fruits or others e.g. maize? **(If crops grown, go to Q12; otherwise, go to Q13)** Winter greenfeed for sheep

Where were the crops planted and how long have they been there e.g. 19xx – 19xx? And were they the same crops grown i.e. year after year?

20 ha kale, rotated annually

Were there any greenhouses/shadehouses? **(If there are greenhouses/shadehouses, go to Q14; otherwise go to Q15)** No

What was grown in these and for how long? Are these still present? **(If demolished, go to Q15; otherwise go to Q16)** —

Where were the demolition materials taken? —

Any excavations or fill *(fill = material brought onto site from elsewhere)* that he knows of? A small area on the 46 ha (approx 15 m x 15 m) was filled with on site material when land was converted from forestry to pasture.

Were there any fuels e.g. diesel and petrol stored on site (past/present)? **(If have fuels stored, go to Q18; otherwise, go to Q19)** No

Where were the fuels stored i.e. Above-ground Storage Tank (AST) and Under-ground Storage Tank (UST)? When were they removed? —

Were any chemicals used on site? E.g. DDT and copper spray. **(If chemicals have been used, go to Q20; otherwise, go to Q24)** Common Herbicides and pesticides, for weeds in young grass and pests in Kale. 20 ha annually.

What are the names of the chemicals? Where are they stored and for how long? How were they applied? Glysophate, Versatill, Pyrinex, Carfentrazone, MCPA MCPB. Stored off site. Applied by registered chemical applicator.

Have there been any chemical spills/leaks. **(If there was spill/leak, go to Q22; otherwise, go to Q23)** No

Where and when was the spill/leak? What chemicals were they? —

Where were any mixing places? E.g. tanks or containers or taps where sprays were mixed. off site.

Has the property been ploughed or cultivated? **(If the property has been ploughed/cultivated go to Q25; otherwise, go to Q26)** All land plouged (20 ha per year) prior to 2017, to a depth of 150 - 200 mm. Direct drilled there after.

If the property has been ploughed/cultivated. Where was this? When was it ploughed/cultivated and to what depth?

Any ideas of where there might be "hotspots" of land contamination? No

Have any forestry activities occurred on the land or near by? yes 46 ha block.

**Auckland**

**Address |** Level 4, 68 Beach Road, Auckland 1010

**Post |** PO Box 2027, Shortland Street, Auckland 1140, New Zealand

**Ph |** 64 9 379 9980

**Fax |** +64 9 377 1170

**Email |** contact-us@babbage.co.nz

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# Appendix E

## Soil Logging

**Soil Logging: 1352 Homebush Road, Darfield.**

| Sample Location | Depth (m bgl) | Soil type |
|---|---|---|
| S01 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S02 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S03 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S04 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S05 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S06 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S07 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S08 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S09 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S10 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S11 0.0 m<br>S11 0.3 m | 0.0-0.3 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.3 m.** |
| S12 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |

| | | |
|---|---|---|
| S13 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S14 0.0 m<br>S14 0.3 m | 0.0-0.3 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.3 m.** |
| S15 0.0 m<br>S15 0.3 m | 0.0-0.3 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.3 m.** |
| S16 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S17 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S18 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S19 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S20 0.0 m | 0.0-0.15 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.15 m.** |
| S21 0.0 m<br>S21 0.3 m | 0.0-0.3 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.3 m.** |
| S22 0.0 m<br>S22 0.3 m | 0.0-0.3 | **NATURAL:** Gravelly SILT, brown. Dry.<br>**Refusal on gravels at 0.3 m.** |

# Appendix F

## Quality Assurance and Quality Control

**Appendix F: Quality Assurance and Quality Control (duplicate) sample results comparison**

| Property address | Sample ID | Arsenic | Cadmium | Chromium | Copper | Lead | Nickel | Zinc |
|---|---|---|---|---|---|---|---|---|
| 1352 Homebush Road, Darfield | S22 | 2.16 | 0.11 | 12.2 | 2.5 | 14.1 | 5 | 29 |
| | S23 | 2.36 | 0.12 | 11.7 | 2.9 | 15.2 | 5.7 | 32 |
| | RPD % | 9 | 9 | 4 | 15 | 8 | 13 | 10 |

Note: Where both results were below the laboratory limit of reporting the RPD has been reported as 0%

# Appendix G

## Laboratory Reports

Environment Testing NZ

# ANALYTICAL REPORT

REPORT CODE **AR-24-NU-108040-01** REPORT DATE **23/12/2024**

**Attention** Babbage Consultants Limited
John Timpany
Level 4, 68 Beach Road
1010 Auckland
NEW ZEALAND
**Phone**
**Email** John.Timpany@babbage.co.nz

**Contact for your orders:** Frances Gilvray **Order code:** EUNZAU-00749573
**Reception Date & Time:** 13/12/2024 11:30:30
**Submission Reference:** NZCE CLEAN ENERGY, 67231

| | | | | | |
|---|---|---|---|---|---|
| **SAMPLE CODE:** | | **816-2024-00314941** | **816-2024-00314942** | **816-2024-00314943** | **816-2024-00314944** |
| **Sample Name:** | | S01 0.0 m | S02 0.0 m | S03 0.0 m | S04 0.0 m |
| **Product Type:** | | Soil | Soil | Soil | Soil |
| **Analysis Started on:** | | 13/12/2024 | 13/12/2024 | 13/12/2024 | 13/12/2024 |
| **Analysis Ending Date:** | | 20/12/2024 | 18/12/2024 | 20/12/2024 | 18/12/2024 |
| **Sampled By** | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY |
| **Attempt to Chill was evident** | | No | No | No | No |
| **Sample correctly preserved** | | Yes | Yes | Yes | Yes |
| **Appropriate sample containers used** | | Yes | Yes | Yes | Yes |
| | **LOQ** | **Unit** | | | |
| ORGANICS | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | <0.02 |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |

| SAMPLE CODE: | | | 816-2024-00314941 | 816-2024-00314942 | 816-2024-00314943 | 816-2024-00314944 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S01 0.0 m | S02 0.0 m | S03 0.0 m | S04 0.0 m |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'DDE | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Sum of DDT and isomers | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | <0.05 |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 0.33 | 0.23 | 0.24 | 0.24 |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | <0.01 | <0.01 | <0.01 | <0.01 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 0.9 | 0.7 | 0.7 | 0.7 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 0.4 | <0.3 | 0.3 | <0.3 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 1.5 | 1.2 | 1.0 | 1.1 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 0.9 | 0.6 | 0.6 | 0.6 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| EPN | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |

| SAMPLE CODE: | | | 816-2024-00314941 | 816-2024-00314942 | 816-2024-00314943 | 816-2024-00314944 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S01 0.0 m | S02 0.0 m | S03 0.0 m | S04 0.0 m |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Naled | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 5 | 3 | 4 | 3 |

| SAMPLE CODE: | | | 816-2024-00314945 | 816-2024-00314946 | 816-2024-00314947 | 816-2024-00314948 |
|---|---|---|---|---|---|---|
| Sample Name: | | | S05 0.0 m | S06 0.0 m | S07 0.0 m | S08 0.0 m |
| Product Type: | | | Soil | Soil | Soil | Soil |
| Analysis Started on: | | | 13/12/2024 | 13/12/2024 | 13/12/2024 | 13/12/2024 |
| Analysis Ending Date: | | | 20/12/2024 | 18/12/2024 | 20/12/2024 | 18/12/2024 |
| Sampled By | | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY |
| Attempt to Chill was evident | | | No | No | No | No |
| Sample correctly preserved | | | Yes | Yes | Yes | Yes |
| Appropriate sample containers used | | | Yes | Yes | Yes | Yes |
| | **LOQ** | **Unit** | | | | |
| ORGANICS | | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | <0.02 |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'DDE | 0.0001 | mg/kg | - | 0.09 | - | 0.04 |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Sum of DDT and isomers | 0.001 | mg/kg | - | 0.095 | - | <0.05 |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | <0.05 |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 0.24 | 0.26 | 0.24 | 0.30 |

| SAMPLE CODE: | | | 816-2024-00314945 | 816-2024-00314946 | 816-2024-00314947 | 816-2024-00314948 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S05 0.0 m | S06 0.0 m | S07 0.0 m | S08 0.0 m |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | <0.01 | 0.01 | 0.03 | 0.01 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 0.7 | 0.8 | 0.8 | 0.9 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 0.3 | 0.3 | 0.3 | 0.4 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 1.0 | 1.2 | 1.1 | 1.3 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 0.7 | 0.6 | 0.6 | 0.7 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| EPN | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Naled | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |

| SAMPLE CODE: | | | 816-2024-00314945 | 816-2024-00314946 | 816-2024-00314947 | 816-2024-00314948 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S05 0.0 m | S06 0.0 m | S07 0.0 m | S08 0.0 m |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 3 | 4 | 4 | 4 |

| SAMPLE CODE: | | | 816-2024-00314949 | 816-2024-00314950 | 816-2024-00314951 | 816-2024-00314952 |
|---|---|---|---|---|---|---|
| Sample Name: | | | S09 0.0 m | S10 0.0 m | S11 0.0 m | S12 0.0 m |
| Product Type: | | | Soil | Soil | Soil | Soil |
| Analysis Started on: | | | 13/12/2024 | 13/12/2024 | 13/12/2024 | 13/12/2024 |
| Analysis Ending Date: | | | 20/12/2024 | 18/12/2024 | 20/12/2024 | 20/12/2024 |
| Sampled By | | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY |
| Attempt to Chill was evident | | | No | No | No | No |
| Sample correctly preserved | | | Yes | Yes | Yes | Yes |
| Appropriate sample containers used | | | Yes | Yes | Yes | Yes |
| | LOQ | Unit | | | | |
| ORGANICS | | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | <0.02 |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'DDE | 0.0001 | mg/kg | - | 0.21 | - | <0.02 |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Sum of DDT and isomers | 0.001 | mg/kg | - | 0.21 | - | <0.05 |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | <0.05 |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 0.27 | 0.27 | 0.33 | 2.75 |

| SAMPLE CODE: | | | 816-2024-00314949 | 816-2024-00314950 | 816-2024-00314951 | 816-2024-00314952 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S09 0.0 m | S10 0.0 m | S11 0.0 m | S12 0.0 m |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | <0.01 | <0.01 | 0.01 | 0.15 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 0.8 | 0.8 | 0.9 | 9.0 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | <0.3 | 0.3 | 0.4 | 3.1 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 1.1 | 1.2 | 1.3 | 23.6 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 0.6 | 0.7 | 0.7 | 5.9 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| EPN | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Naled | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |

| SAMPLE CODE: | | | 816-2024-00314949 | 816-2024-00314950 | 816-2024-00314951 | 816-2024-00314952 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S09 0.0 m | S10 0.0 m | S11 0.0 m | S12 0.0 m |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 4 | 4 | 4 | 34 |

| | LOQ | Unit | 816-2024-00314953 | 816-2024-00314954 | 816-2024-00314955 | 816-2024-00314956 |
|---|---|---|---|---|---|---|
| **SAMPLE CODE:** | | | | | | |
| **Sample Name:** | | | S13 0.0 m | S14 0.0 m | S15 0.0 m | S16 0.0 m |
| **Product Type:** | | | Soil | Soil | Soil | Soil |
| **Analysis Started on:** | | | 13/12/2024 | 13/12/2024 | 13/12/2024 | 13/12/2024 |
| **Analysis Ending Date:** | | | 20/12/2024 | 20/12/2024 | 20/12/2024 | 20/12/2024 |
| **Sampled By** | | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY |
| **Attempt to Chill was evident** | | | No | No | No | No |
| **Sample correctly preserved** | | | Yes | Yes | Yes | Yes |
| **Appropriate sample containers used** | | | Yes | Yes | Yes | Yes |
| ORGANICS | | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | <0.02 |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'DDE | 0.0001 | mg/kg | - | 0.03 | - | 0.17 |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Sum of DDT and isomers | 0.001 | mg/kg | - | <0.05 | - | 0.17 |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | <0.05 |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 2.54 | 2.42 | 2.45 | 2.40 |

| SAMPLE CODE: | | | 816-2024-00314953 | 816-2024-00314954 | 816-2024-00314955 | 816-2024-00314956 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S13 0.0 m | S14 0.0 m | S15 0.0 m | S16 0.0 m |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | 0.17 | 0.17 | 0.09 | 0.13 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 9.4 | 9.5 | 9.7 | 8.8 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 3.8 | 3.3 | 3.6 | 3.2 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 16.0 | 15.8 | 15.2 | 20.5 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 6.6 | 7.0 | 6.8 | 5.8 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| EPN | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Naled | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |

| SAMPLE CODE: | | | 816-2024-00314953 | 816-2024-00314954 | 816-2024-00314955 | 816-2024-00314956 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S13 0.0 m | S14 0.0 m | S15 0.0 m | S16 0.0 m |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 34 | 32 | 33 | 33 |

| | | | 816-2024-00314957 | 816-2024-00314958 | 816-2024-00314959 | 816-2024-00314960 |
|---|---|---|---|---|---|---|
| **SAMPLE CODE:** | | | | | | |
| **Sample Name:** | | | S17 0.0 m | S18 0.0 m | S19 0.0 m | S20 0.0 m |
| **Product Type:** | | | Soil | Soil | Soil | Soil |
| **Analysis Started on:** | | | 13/12/2024 | 13/12/2024 | 13/12/2024 | 13/12/2024 |
| **Analysis Ending Date:** | | | 20/12/2024 | 20/12/2024 | 20/12/2024 | 20/12/2024 |
| **Sampled By** | | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY |
| **Attempt to Chill was evident** | | | No | No | No | No |
| **Sample correctly preserved** | | | Yes | Yes | Yes | Yes |
| **Appropriate sample containers used** | | | Yes | Yes | Yes | Yes |
| | **LOQ** | **Unit** | | | | |
| ORGANICS | | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | <0.02 |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | <0.02 |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | <0.02 |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| p,p'DDE | 0.0001 | mg/kg | - | 0.18 | - | 0.05 |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | <0.05 |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | <0.02 |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | <0.02 |
| Sum of DDT and isomers | 0.001 | mg/kg | - | 0.18 | - | 0.052 |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | <0.05 |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 2.11 | 2.47 | 1.98 | 2.66 |

| SAMPLE CODE: | | | 816-2024-00314957 | 816-2024-00314958 | 816-2024-00314959 | 816-2024-00314960 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S17 0.0 m | S18 0.0 m | S19 0.0 m | S20 0.0 m |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | 0.04 | 0.16 | 0.07 | 0.09 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 13.0 | 12.1 | 11.5 | 18.2 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 2.5 | 3.8 | 2.8 | 3.6 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 14.1 | 16.0 | 12.6 | 19.1 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 5.2 | 6.1 | 4.9 | 7.6 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| EPN | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Naled | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |

| SAMPLE CODE: | | | 816-2024-00314957 | 816-2024-00314958 | 816-2024-00314959 | 816-2024-00314960 |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S17 0.0 m | S18 0.0 m | S19 0.0 m | S20 0.0 m |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | <0.02 | - |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 29 | 37 | 30 | 37 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **SAMPLE CODE:** | | | **816-2024-00314961** | **816-2024-00314962** | **816-2024-00314963** | |
| **Sample Name:** | | | S21 0.0 m | S22 0.0 m | S23 0.0 m | |
| **Product Type:** | | | Soil | Soil | Soil | |
| **Analysis Started on:** | | | 13/12/2024 | 13/12/2024 | 13/12/2024 | |
| **Analysis Ending Date:** | | | 20/12/2024 | 20/12/2024 | 20/12/2024 | |
| **Sampled By** | | | JOHN TIMPANY | JOHN TIMPANY | JOHN TIMPANY | |
| **Attempt to Chill was evident** | | | No | No | No | |
| **Sample correctly preserved** | | | Yes | Yes | Yes | |
| **Appropriate sample containers used** | | | Yes | Yes | Yes | |
| | **LOQ** | **Unit** | | | | |
| ORGANICS | | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | - | <0.02 | - | |
| 2,4´-DDT | 0.001 | mg/kg | - | <0.02 | - | |
| 2,4'-DDD | 0.001 | mg/kg | - | <0.02 | - | |
| 2,4'-DDE | 0.001 | mg/kg | - | <0.02 | - | |
| a-BHC | 0.0001 | mg/kg | - | <0.02 | - | |
| a-chlordane | 0.0001 | mg/kg | - | <0.02 | - | |
| Aldrin | 0.001 | mg/kg | - | <0.02 | - | |
| b-BHC | 0.0001 | mg/kg | - | <0.02 | - | |
| Chlordane (total) | 0.002 | mg/kg | - | <0.02 | - | |
| cis-Permethrin | 0.0001 | mg/kg | - | <0.02 | - | |
| Dieldrin | 0.0001 | mg/kg | - | <0.02 | - | |
| Endosulfan I | 0.001 | mg/kg | - | <0.02 | - | |
| Endosulfan II | 0.005 | mg/kg | - | <0.02 | - | |
| Endosulfan Sulfate | 0.0001 | mg/kg | - | <0.02 | - | |
| Endrin | 0.001 | mg/kg | - | <0.02 | - | |
| Endrin Aldehyde | 0.01 | mg/kg | - | <0.02 | - | |
| Endrin ketone | 0.0001 | mg/kg | - | <0.02 | - | |
| Gamma-Chlordane | 0.001 | mg/kg | - | <0.02 | - | |
| HCH, delta- | 0.001 | mg/kg | - | <0.02 | - | |
| Heptachlor | 0.0001 | mg/kg | - | <0.02 | - | |
| Heptachlor Epoxide | 0.0001 | mg/kg | - | <0.02 | - | |
| Hexachlorobenzene | 0.0001 | mg/kg | - | <0.02 | - | |
| Lindane ( g-BHC) | 0.0001 | mg/kg | - | <0.02 | - | |
| Methoxychlor | 0.0001 | mg/kg | - | <0.02 | - | |
| p,p'-DDD | 0.0001 | mg/kg | - | <0.02 | - | |
| p,p'DDE | 0.0001 | mg/kg | - | <0.02 | - | |
| p,p'-DDT | 0.001 | mg/kg | - | <0.05 | - | |
| Procymidone | 0.0001 | mg/kg | - | <0.02 | - | |
| Propanil | 0.001 | mg/kg | - | <0.02 | - | |
| Sum of DDT and isomers | 0.001 | mg/kg | - | <0.05 | - | |
| Toxaphene | 0.005 | mg/kg | - | <0.05 | - | |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 3.93 | 2.16 | 2.36 | |

| SAMPLE CODE: | | | 816-2024-00314961 | 816-2024-00314962 | 816-2024-00314963 |
|---|---|---|---|---|---|
| **Sample Name:** | | | S21 0.0 m | S22 0.0 m | S23 0.0 m |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | 0.22 | 0.11 | 0.12 |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 17.8 | 12.2 | 11.7 |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 5.2 | 2.5 | 2.9 |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 22.3 | 14.1 | 15.2 |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 9.5 | 5.0 | 5.7 |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | - | - |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | - | - |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | - | - |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | - | - |
| Coumaphos | 0.02 | mg/kg | <0.02 | - | - |
| Demeton-O | 0.02 | mg/kg | <0.02 | - | - |
| Demeton-S | 0.02 | mg/kg | <0.02 | - | - |
| Diazinon | 0.02 | mg/kg | <0.02 | - | - |
| Dichlorvos | 0.02 | mg/kg | <0.02 | - | - |
| Dimethoate | 0.02 | mg/kg | <0.02 | - | - |
| Disulfoton | 0.02 | mg/kg | <0.02 | - | - |
| EPN | 0.02 | mg/kg | <0.02 | - | - |
| Ethion | 0.02 | mg/kg | <0.02 | - | - |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | - | - |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | - | - |
| Fenamiphos | 0.02 | mg/kg | <0.02 | - | - |
| Fenitrothion | 0.02 | mg/kg | <0.02 | - | - |
| Fensulfothion | 0.02 | mg/kg | <0.02 | - | - |
| Fenthion | 0.02 | mg/kg | <0.02 | - | - |
| Malathion | 0.02 | mg/kg | <0.02 | - | - |
| Merphos | 0.02 | mg/kg | <0.02 | - | - |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | - | - |
| Mevinphos | 0.02 | mg/kg | <0.02 | - | - |
| Monocrotophos | 0.02 | mg/kg | <0.02 | - | - |
| Naled | 0.02 | mg/kg | <0.02 | - | - |
| Omethoate | 0.02 | mg/kg | <0.02 | - | - |
| Phorate | 0.02 | mg/kg | <0.02 | - | - |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | - | - |
| Profenofos | 0.02 | mg/kg | <0.02 | - | - |
| Prothiofos | 0.02 | mg/kg | <0.02 | - | - |
| Pyrazophos | 0.02 | mg/kg | <0.02 | - | - |
| Ronnel | 0.02 | mg/kg | <0.02 | - | - |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | - | - |
| Temephos | 0.02 | mg/kg | <0.02 | - | - |
| Terbufos | 0.02 | mg/kg | <0.02 | - | - |

| SAMPLE CODE: | | | 816-2024-00314961 | 816-2024-00314962 | 816-2024-00314963 | |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S21 0.0 m | S22 0.0 m | S23 0.0 m | |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | - | - | |
| Trichloronat | 0.02 | mg/kg | <0.02 | - | - | |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 60 | 29 | 32 | |

## HOLDING TIMES

**816-2024-00314941** S01 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314942** S02 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314943** S03 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314944** S04 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314945** S05 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314946** S06 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314947** S07 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314948** S08 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314949** S09 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314950** S10 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314951** S11 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314952** S12 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314953** S13 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314954** S14 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314955** S15 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314956** S16 0.0 m

| Test | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314957** S17 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314958** S18 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314959** S19 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314960** S20 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314961** S21 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314962** S22 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW04T | Organochlorine Pesticides | Not supplied | N/A | N/A | 14 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

**816-2024-00314963** S23 0.0 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW504 | Cadmium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW507 | Chromium - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW509 | Copper - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW511 | Lead - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW517 | Nickel - Total | Not supplied | N/A | N/A | 180 | N/A |
| NW528 | Zinc - Total | Not supplied | N/A | N/A | 180 | N/A |

*If the date and time of sampling are not provided the laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.*

## LIST OF METHODS

NW04T **Organochlorine Pesticides:** Internal Method, GC-MS/MS

NW0YU **Organophosphorus Pesticides (OPP):** Internal Method, GC-MS/MS

NW499 **Arsenic - Total:** APHA Online Edition 3125 B mod.

NW504 **Cadmium - Total:** APHA Online Edition 3125 B mod.

NW507 **Chromium - Total:** APHA Online Edition 3125 B mod.

NW509 **Copper - Total:** APHA Online Edition 3125 B mod.

NW511 **Lead - Total:** APHA Online Edition 3125 B mod.

NW517 **Nickel - Total:** APHA Online Edition 3125 B mod.

NW528 **Zinc - Total:** APHA Online Edition 3125 B mod.

**Signature**

**Gabriela Carvalhaes** Business Unit Manager

## EXPLANATORY NOTE

① Test is not accredited
② Test is subcontracted within Eurofins group and is accredited
③ Test is subcontracted within Eurofins group and is not accredited
④ Test is subcontracted outside Eurofins group and is accredited
⑤ Test is subcontracted outside Eurofins group and is not accredited
⑥ Test result is provided by the customer and is not accredited
⑦ Tested at the sampling point by Eurofins and is not accredited
⑧ Tested at the sampling point by Eurofins and is accredited
⑨ Test is RLP accredited
⑩ Test is subcontracted within Eurofins group and is RLP accredited

**N/A** means Not Applicable
**Not Detected** means not detected at or above the Limit of Quantification (LOQ)
**LOQ** means Limit of Quantification and the unit of LOQ is the same as the result unit
**Symbol -** in result column means not tested

### General

1. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
2. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
3. Actual LOQs are matrix dependent. Quoted LOQs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
5. Analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
6. Samples were analysed on an 'as received' basis.

### Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.
Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.
For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.
Holding times are expressed in days.

### Units

**mg/kg**: milligrams per kilogram
**µg/L**: micrograms per litre
**org/100 mL**: Organisms per 100 millilitres
**CFU**: Colony Forming Unit
**mg/L**: milligrams per litre
**ppb**: parts per billion
**NTU**: Nephelometric Turbidity Units
**Colour**: Pt-Co Units (CU)
**ppm**: parts per million
**%**: Percentage
**MPN/100 mL**: Most Probable Number of organisms per 100 millilitres

### Terms

| | |
|---|---|
| APHA | American Public Health Association |
| TCLP | Toxicity Characteristic Leaching Procedure |
| US EPA | United States Environmental Protection Agency |

### Quality Controls

All test method Quality Controls including method blanks, reference samples, spikes, surrogates and duplicate sample testing have passed and are within the control limits.

The Customer acknowledges and accepts that: (a) where Eurofins is not responsible for sampling, the test result(s) in this report apply only to the sample as received. Customer is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the product.
This document can only be reproduced in full.
The tests are identified by a five-digit code, their description is available on request.
Accreditation does not apply to comments or graphical representations.
Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 35 O'Rorke Road, Penrose, Auckland, NEW ZEALAND.
The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.
Eurofins may subcontract the performance of part or all of the Services to a third party and the Customer authorises the release of all information necessary to the third party for the provision of the Services.
All samples become the property of Eurofins to the extent necessary for the performance of the Services.
Eurofins will not be required to store samples and may destroy or otherwise dispose of the samples or return the samples to the Customer (at the Customer's cost in all respects) immediately following analysis of the samples.
If the Customer pays for storage of the samples Eurofins will take commercially reasonable steps to store the samples for the agreed period in terms of industry practice.
The Eurofins water sampling service follows methodology based on AS/NZS 5667 and / or best practice to collect and transport samples that are fit for the purpose of analytical testing. The laboratory is not responsible for sampling activities unless explicitly indicated by the statement "Sampled by Eurofins" on the report for water samples.
The Customer acknowledges that the Services are provided using the current state of technology and methods developed and generally applied by Eurofins and involve analysis, interpretations, consulting work and conclusions. Eurofins shall use commercially reasonable degree of care in providing the Services.
This report is produced and issued on the basis of information, documents and/or samples provided by, or on behalf of, the Customer and solely for the benefit of the Customer who is responsible for acting as it sees fit on the basis of this report. Neither Eurofins nor any of its officers, employees, agents or subcontractors shall be liable to the Customer nor any third party for any actions taken or not taken on the basis of this report nor for any incorrect results arising from unclear, erroneous, incomplete, misleading or false information provided to Eurofins.
Eurofins shall have no liability for any indirect or consequential loss including, without limitation, loss of production, loss of contracts, loss of profits, loss of business or costs incurred from business interruption, loss of opportunity, loss of goodwill or damage to reputation and cost of product recall (including any losses suffered as a result of distribution of the Customer's products subject of the Services prior to the report being released by Eurofins). It shall further have no liability for any loss, damage or expenses arising from the claims of any third party (including, without limitation, product liability claims) that may be incurred by the Customer.
Eurofins General Terms and Conditions apply.

**END OF REPORT**

Environment Testing NZ

# ANALYTICAL REPORT

REPORT CODE **AR-25-NU-000594-01** REPORT DATE **06/01/2025**

**Attention** Babbage Consultants Limited
John Timpany
Level 4, 68 Beach Road
1010 Auckland
NEW ZEALAND
**Phone**
**Email** John.Timpany@babbage.co.nz

**Contact for your orders:** Frances Gilvray **Order code:** EUNZAU-00752873
**Reception Date & Time:** 24/12/2024 1:36:00PM
**Submission Reference:** NZCE Clean Energy, 67231

| | | | | | |
|---|---|---|---|---|---|
| **SAMPLE CODE:** | | | **816-2024-00315146** | **816-2024-00315147** | |
| **Sample Name:** | | | S21 0.3 m | S22 0.3 m | |
| **Product Type:** | | | Soil | Soil | |
| **Analysis Started on:** | | | 24/12/2024 | 24/12/2024 | |
| **Analysis Ending Date:** | | | 06/01/2025 | 06/01/2025 | |
| **Sampled Date & Time** | | | 13/12/2024 11:30 | 13/12/2024 11:30 | |
| **Sampled By** | | | JOHN TIMPANY | JOHN TIMPANY | |
| **Attempt to Chill was evident** | | | No | No | |
| **Sample correctly preserved** | | | Yes | Yes | |
| **Appropriate sample containers used** | | | Yes | Yes | |
| | **LOQ** | **Unit** | | | |
| ORGANICS | | | | | |
| ②**NW04T Organochlorine Pesticides** | | | | | |
| 2,3-Diuron | 0.001 | mg/kg | <0.02 | <0.02 | |
| 2,4´-DDT | 0.001 | mg/kg | <0.02 | <0.02 | |
| 2,4'-DDD | 0.001 | mg/kg | <0.02 | <0.02 | |
| 2,4'-DDE | 0.001 | mg/kg | <0.02 | <0.02 | |
| a-BHC | 0.0001 | mg/kg | <0.02 | <0.02 | |
| a-chlordane | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Aldrin | 0.001 | mg/kg | <0.02 | <0.02 | |
| b-BHC | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Chlordane (total) | 0.002 | mg/kg | <0.02 | <0.02 | |
| cis-Permethrin | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Dieldrin | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Endosulfan I | 0.001 | mg/kg | <0.02 | <0.02 | |
| Endosulfan II | 0.005 | mg/kg | <0.02 | <0.02 | |
| Endosulfan Sulfate | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Endrin | 0.001 | mg/kg | <0.02 | <0.02 | |
| Endrin Aldehyde | 0.01 | mg/kg | <0.02 | <0.02 | |
| Endrin ketone | 0.0001 | mg/kg | <0.02 | <0.02 | |
| Gamma-Chlordane | 0.001 | mg/kg | <0.02 | <0.02 | |
| HCH, delta- | 0.001 | mg/kg | <0.02 | <0.02 | |
| Heptachlor | 0.0001 | mg/kg | <0.02 | <0.02 | |

| SAMPLE CODE: | | | 816-2024-00315146 | 816-2024-00315147 | | |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S21 0.3 m | S22 0.3 m | | |
| Heptachlor Epoxide | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| Hexachlorobenzene | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| Lindane ( g-BHC) | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| Methoxychlor | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| p,p'-DDD | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| p,p'DDE | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| p,p'-DDT | 0.001 | mg/kg | <0.05 | <0.05 | | |
| Procymidone | 0.0001 | mg/kg | <0.02 | <0.02 | | |
| Propanil | 0.001 | mg/kg | <0.02 | <0.02 | | |
| Sum of DDT and isomers | 0.001 | mg/kg | <0.05 | <0.05 | | |
| Toxaphene | 0.005 | mg/kg | <0.05 | <0.05 | | |
| ② **NW499 Arsenic - Total** | 0.05 | mg/kg | 3.14 | 2.94 | | |
| ② **NW504 Cadmium - Total** | 0.01 | mg/kg | 0.11 | 0.08 | | |
| ② **NW507 Chromium - Total** | 0.2 | mg/kg | 13.2 | 13.1 | | |
| ② **NW509 Copper - Total** | 0.3 | mg/kg | 3.9 | 2.8 | | |
| ② **NW511 Lead - Total** | 0.1 | mg/kg | 13.5 | 13.0 | | |
| ② **NW517 Nickel - Total** | 0.2 | mg/kg | 8.8 | 8.6 | | |
| ②**NW0YU Organophosphorus Pesticides (OPP)** | | | | | | |
| Azinphos-methyl | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Chlorfenvinphos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| chlorpyrifos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Chlorpyrifos-methyl | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Coumaphos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Demeton-O | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Demeton-S | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Diazinon | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Dichlorvos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Dimethoate | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Disulfoton | 0.02 | mg/kg | <0.02 | <0.02 | | |
| EPN | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Ethion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Ethoprop (Ethoprophos) | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Ethyl parathion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Fenamiphos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Fenitrothion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Fensulfothion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Fenthion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Malathion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Merphos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Methyl Parathion | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Mevinphos | 0.02 | mg/kg | <0.02 | <0.02 | | |

| SAMPLE CODE: | | | 816-2024-00315146 | 816-2024-00315147 | | |
|---|---|---|---|---|---|---|
| **Sample Name:** | | | S21 0.3 m | S22 0.3 m | | |
| Monocrotophos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Naled | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Omethoate | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Phorate | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Pirimiphos-methyl | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Profenofos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Prothiofos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Pyrazophos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Ronnel | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Sulprofos (Bolstar) | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Temephos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Terbufos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Tetrachlorvinphos | 0.02 | mg/kg | <0.02 | <0.02 | | |
| Trichloronat | 0.02 | mg/kg | <0.02 | <0.02 | | |
| ② **NW528 Zinc - Total** | 1 | mg/kg | 60 | 48 | | |

## HOLDING TIMES

**816-2024-00315146** S21 0.3 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW504 | Cadmium - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW507 | Chromium - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW509 | Copper - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW511 | Lead - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW517 | Nickel - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW04T | Organochlorine Pesticides | 13/12/2024 | 03/01/2025 | 21 | 14 | No |
| NW528 | Zinc - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |

**816-2024-00315147** S22 0.3 m

| Test | | Sampling Date | Holding End | Effective Holding (days) | Requirement (days) | Compliance |
|---|---|---|---|---|---|---|
| NW499 | Arsenic - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW504 | Cadmium - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW507 | Chromium - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW509 | Copper - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW511 | Lead - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW517 | Nickel - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |
| NW04T | Organochlorine Pesticides | 13/12/2024 | 03/01/2025 | 21 | 14 | No |
| NW528 | Zinc - Total | 13/12/2024 | 06/01/2025 | 24 | 180 | Yes |

## LIST OF METHODS

NW04T **Organochlorine Pesticides:** Internal Method, GC-MS/MS

NW0YU **Organophosphorus Pesticides (OPP):** Internal Method, GC-MS/MS

NW499 **Arsenic - Total:** APHA Online Edition 3125 B mod.

NW504 **Cadmium - Total:** APHA Online Edition 3125 B mod.

NW507 **Chromium - Total:** APHA Online Edition 3125 B mod.

NW509 **Copper - Total:** APHA Online Edition 3125 B mod.

NW511 **Lead - Total:** APHA Online Edition 3125 B mod.

NW517 **Nickel - Total:** APHA Online Edition 3125 B mod.

NW528 **Zinc - Total:** APHA Online Edition 3125 B mod.

# Environment Testing NZ

**Signature**

**Gabriela Carvalhaes** Business Unit Manager

**EXPLANATORY NOTE**

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**LOQ** means Limit of Quantification and the unit of LOQ is the same as the result unit
**Symbol -** in result column means not tested

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| | |
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## Environment Testing NZ

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Eurofins shall have no liability for any indirect or consequential loss including, without limitation, loss of production, loss of contracts, loss of profits, loss of business or costs incurred from business interruption, loss of opportunity, loss of goodwill or damage to reputation and cost of product recall (including any losses suffered as a result of distribution of the Customer's products subject of the Services prior to the report being released by Eurofins). It shall further have no liability for any loss, damage or expenses arising from the claims of any third party (including, without limitation, product liability claims) that may be incurred by the Customer.
Eurofins General Terms and Conditions apply.

**END OF REPORT**

# Certificate of Analysis


**Client** Babbage Consultants
**Client Contact** Alistair Brown
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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

IANZ# 1290

| | | | |
|---|---|---|---|
| Certificate ID | R-00111 | Date Sampled[2] | 12/12/2024 |
| Samples Taken By[2] | John T. | Date Sample(s) Received | 13/12/2024 |
| Project Reference[2] | 67231 | Date Sample(s) Analysed & Issued | 13/12/2024 |
| **Site Address**[2] | NZCE Clean Energy | | |
| **Location Sample Analysed** | Eurofins \| Focus 43 Detroit Drive, Rolleston, Christchurch 7675 | | |

| Lab ID | Sample ID[2] | Sample Details[2] | Sample type | Sample size[2] (g) | Fibres Identified |
|---|---|---|---|---|---|
| 1 | 511 | 0.0m | Soil | 130 | ORF, NAD |

**Opinions and interpretations expressed herein are outside the scope of Eurofins | Focus IANZ accreditation**

| | |
|---|---|
| **Analytical Notes** | - |

| **Fibre Identification Key:** | | | |
|---|---|---|---|
| * | See Analytical Notes | **ORF** | Organic Fibre |
| **CHR** | Chrysotile (White Asbestos) | **SMF** | Synthetic Mineral Fibre |
| **AMO** | Amosite (Brown / Grey Asbestos) | **NFD** | No Fibres Detected |
| **CRO** | Crocidolite – (Blue Asbestos) | **NAD** | No Asbestos Detected |
| **UMF** | Unknown Mineral Fibre | | |

| **Sample Size Guide:** | |
|---|---|
| **Sufficient** | Sample weight >1 g |
| **Limited** | Sample weight between 0.5 g -1 g |
| **Insufficient** | Sample weight <0.5 g; small size could misrepresent what is in sampled material. Suggest the client obtain a larger sample. |

**Analysis Methods:**

1. Samples submitted have been analysed to determine the presence of asbestos using stereo microscopy followed by polarised light microscopy (PLM) and dispersion staining (DS) techniques as documented in AS 4964–2004 and in-house method LTM-ASB-8020-R12 for Qualitative Identification of Asbestos in Bulk Samples.
2. Eurofins | Focus did not carry out any sampling, and the data presented are based on the samples submitted. Data supplied by the client is indicated with superscript [2] and may impact the results.
3. This certificate should be read in its entirety and shall not be reproduced except in full without written approval of the laboratory.

**Methodology**

| | |
|---|---|
| Asbestos Fibre Identification | Conducted in accordance with the Australian Standard AS 4964 – 2004: *Method for the Qualitative Identification of Asbestos in Bulk Samples* and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.<br>NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres. |
| Unknown Mineral Fibres | Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.<br>NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS 4964 – 2004 requires that these are reported as UMF unless confirmed by an independent technique. |
| Subsampling Soil Samples | The whole sample submitted is first dried and then passed through a 10 mm sieve followed by a 2 mm sieve. All fibrous matter greater than 10 mm greater than 2 mm and the material passing through the 2 mm sieve are retained and analysed for the presence of asbestos. If the sub 2 mm fraction is greater than approximately 30 g to 60g, then a subsampling routine based on ISO 3082:2009(E) is employed.<br>NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be subsampled for trace analysis in accordance with AS 4964 - 2004. |
| Bonded asbestos containing material (ACM) | The material is first examined, and any fibres are isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly combined. The resultant material is then further examined in accordance with AS 4964 - 2004.<br>NOTE: Even after disintegration, it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse. |
| Limit of Reporting | The performance limitation of the AS 4964 - 2004 method for non-homogeneous samples is 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered at the nominal reporting limit of 0.01% (w/w). The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM) screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g., 500 mL) may improve the likelihood of detecting asbestos, particularly Asbestos Fines (AF), to aid assessment against the NEPM criteria. |

**Sample History**

Where samples are submitted/analysed over several days, the last extraction date is reported. If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time. Client samples are disposed of 3 months after analysis.

| Description | Testing Site | Extracted | Holding Time |
|---|---|---|---|
| AS4964-2004 and in-house Method LTM-ASB-8020-R12 | Christchurch | 13/12/2024 | Indefinite |



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# Certificate of Analysis

**Comments**

**Asbestos Counter/Identifier:**

Holly Nordstrom Senior Analyst-Asbestos

**Vikram Pathania**

**Senior Analyst-Asbestos (Key Technical Personnel)**

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

Measurement uncertainty of test data is available on request or please click here.

The Customer acknowledges and accepts that: (a) where Eurofins is not responsible for sampling, the test result(s) in this report apply only to the sample as received. Customer is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the homogeneity of the product.
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