ENGAGE ENVIRONMENTAL SERVICES
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QUARTERLY GROUNDWATER MONITORING

SCONE WASTE FACILITY
NOBLET ROAD
SCONE NSW

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ABBREVIATIONS

The following is a list of common abbreviations used in the Contamination Sector within environmental reports.

B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
CLM	Contaminated Land Management
CSM	Conceptual Site Model
DA	Development Application
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
EIL	Ecological Investigation Level
EPA	Environment Protection Authority (NSW)
EPL	Environmental Protection License
ESL	Ecological Screening Level
LOR	Limit of Reporting
LOT	Allotment
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environmental and Heritage
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCOC	Potential Contaminant of Concern
PCB	Polychlorinated Biphenyls
QA/QC	Quality Assurance and Quality Control
SAC	Site Acceptance Criteria
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TRH	Total Recoverable Hydrocarbons
UHSC	Upper Hunter Shire Council
VOC	Volatile Organic Compounds
WHS	Work Health Safety

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1.0 INTRODUCTION

General

Under the requirements of the NSW EPA Environmental Protection Licence (EPL) 5863, Upper Hunter Shire Council (UHSC) is required to conduct quarterly and annual groundwater monitoring of the Scone Waste Facility located on Noblet Road, Scone NSW 2337.

The Quarterly Groundwater Monitoring Report provides a snapshot of the groundwater conditions at the Site in relation to the current Site Criteria and satisfies the groundwater monitoring requirements of the EPL.

The Scone Waste Facility is an active landfill, it has the potential to be a polluting activity or to adversely impact the groundwater within the immediate vicinity and down hydraulic gradient of the site if there was a leak within the landfill.

Engage Environmental Services (Engage) was commissioned by UHSC to undertake this quarterly round of groundwater monitoring at the site. The quarterly groundwater monitoring was carried out on 18th December 2024.

This report has been prepared utilising information supplied by the client, publicly accessible information, information obtained as part of the onsite fieldwork and analysis, information from Government bodies and from experience, knowledge, and current industry practice.

Briefing

The briefing provided by Upper Hunter Shire Council and contained within EPL 5863 indicates that quarterly groundwater monitoring is required at five locations on the site, monitoring wells A to E (MWA-MWE). Monitoring Well D is located within the landfill and the monitoring well accesses the perched water table (leachate) within the landfill. Comparisons against established criteria and historical data allow for trending of data. Trending of data can highlight seasonal variations, increases in analyte concentrations, decreases in analyte concentrations and fluctuations within the dataset. Over a time period the dataset can reveal increasing/decreasing trends highlighting potential site issues.

Refer to **Figure 1:** *Site Layout with Sample Locations*

2.0 SITE CRITERIA AND SAMPLING FREQUENCY

The groundwater analytical suite and sampling frequency were provided by UHSC and the EPL. Each of the wells have the same sampling regime and analytical suite for sample analysis. The site criterion are sourced from the Australian and New Zealand guidelines for fresh and marine water quality (ANZW 2018) 95% trigger values and National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 2013, unless otherwise stated.

Table 1: Analytes, Site Criteria and Sampling Frequency for Groundwater Monitoring Wells - Quarterly.

	Analytes/Pollutant	Units	Site Criteria NEPM 2013 and ANZW 2018 Fresh Water 95%	Sampling Frequency
IONS	**Calcium**	mg/L	NA	Quarterly
	Alkalinity (total)	mg/L	NA	Quarterly
	Chloride	mg/L	NA	Quarterly
	Fluoride	mg/L	NA	Quarterly
	Potassium[1]	mg/L	410	Quarterly
	Magnesium	mg/L	NA	Quarterly
	Sulphate	mg/L	NA	Quarterly
HEAVY METALS	**Iron**	mg/L	0.3	Quarterly
	Manganese	mg/L	1.9	Quarterly
PHENOLS	**Total phenolics**	mg/L	0.32	Quarterly
OCP	**Organochlorine Pesticide[3] (OCP)**	mg/L	0.00001	Quarterly
MISC. INORGANICS	**pH**	pH	6.5 – 8	Quarterly
	Sodium	mg/L	NA	Quarterly
	Ammonia[2]	mg/L	0.9	Quarterly
	Nitrate	mg/L	50	Quarterly
	Total organic	mg/L	4	Quarterly
	Electrical	µS/cm	NA	Quarterly

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.
2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.
3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

3.0 SAMPLING METHODOLOGY

Groundwater Sampling

The five well locations were identified on the site. The site map was cross-referenced to the markings on the monitoring wells to ensure the correct wells were being sampled. Purging and sampling of monitoring wells was conducted in accordance with the NEPM (NEPC, 2013) and the *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DECC, 2007).

Purging is the process of removing stagnant water from a well, immediately prior to sampling, causing its replacement by groundwater from the adjacent formation that is representative of actual aquifer conditions. In order to determine when a well has been adequately purged, the physical parameters (pH ± 0.1 unit, electrical conductivity ± 5%, temperature ± 0.20, reduction-oxidation (redox) ± 10%; and dissolved oxygen ± 10%.) are monitored while the groundwater is removed during purging.

The physical parameters were measured at regular intervals using a YSI Quatro Pro Plus Water Quality Meter. Stable conditions were indicated by monitoring for three consecutive readings of the physical parameters.

Collection of samples were direct into laboratory issued sampling containers for specific analytes. Samples were obtained using a disposable bailer. Care was taken so the bailer did not contact the sample container. All samples were collected and filled into the correct sample containers, a meniscus was formed on each sampling container prior to sealing to reduce or eliminate head space. The samples were placed immediately into a portable cooler to prevent the loss of potential volatile components.

Decontamination procedures between sampling events and sampling locations was undertaken. Sampling equipment was cleaned before and after sampling to prevent cross contamination. The cleaning procedure included:

- New nitrile disposable gloves for each well;
- Washing and wipe down with phosphate free laboratory grade detergent;
- Rinsing of brush before using brush on equipment;
- Using a brush on equipment if necessary;
- Rinsing with deionised water and wipe down with new wipe if necessary; and,
- New disposable bailer used for each well.

Appropriate decontamination procedures were appropriate during groundwater sampling.

4.0 RESULTS

The five groundwater monitoring wells were sampled during the December 2024 sampling event, results are detailed in **Tables 2** to **6**. Comparisons have been made to the previous rounds of monitoring (January 2024 – December 2024). Refer to **Attachment 1** – NATA Accredited Laboratory Results and **Attachment 3** – Data Log.

There were two exceedances of the site criteria for December in MWA, TOC at a concentration of <5mg/L and Iron at a concentration of 0.37mg/L.

Table 2 – Quarterly Groundwater Results and Comparison March 2024 – December 2024 (MWA).

	Analytes	Units	Site Criteria (mg/L)	MWA Mar 2024	MWA June 2024	MWA Sept 2024	MWA Dec 2024
IONS	**Calcium**	mg/L	NA	570	540	570	650
	Alkalinity (total)	mg/L	NA	530	490	550	540
	Chloride	mg/L	NA	6500	7300	6500	7700
	Fluoride	mg/L	NA	0.2	0.2	0.1	<0.5
	Potassium[1]	mg/L	410	3	3	4	5.2
	Magnesium	mg/L	NA	1100	1000	1100	1300
	Sulphate	mg/L	NA	62	53	63	64
HEAVY METALS	**Iron**	mg/L	0.3	<LOR	<LOR	0.03	0.37
	Manganese	mg/L	1.9	0.006	0.028	0.045	0.058
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.3	6.9	7.0	7.1
	Sodium	mg/L	NA	2200	1800	2100	2300
	Ammonia[2]	mg/L	0.9	0.26	0.16	0.051	0.18
	Nitrate	mg/L	0.7	0.55	0.54	0.55	0.57
	Total Organic Carbon	mg/L	4	**5**	4	4	<LOR
	EC	µS/cm	NA	19000	19000	20000	19000

Highlighted results exceed site criteria
<LOR = No Detection. Analyte is below the Laboratory Limit of reporting.
1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.
2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.
3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

There was one exceedance of the site criteria for December in MWB, TOC at a concentration of <5mg/L.

Table 3 – Quarterly Groundwater Results and Comparison March 2024 – December 2024 (MWB).

	Analytes	Units	Site Criteria (mg/L)	MWB Mar 2024	MWB June 2024	MWB Sept 2024	MWB Dec 2024
IONS	**Calcium**	mg/L	NA	470	410	480	510
	Alkalinity (total)	mg/L	NA	450	460	490	510
	Chloride	mg/L	NA	4300	4600	4200	4900
	Fluoride	mg/L	NA	0.3	0.3	0.3	<0.5
	Potassium[1]	mg/L	410	2	3	4	<5
	Magnesium	mg/L	NA	620	520	640	680
	Sulphate	mg/L	NA	93	91	97	97
HEAVY METALS	**Iron**	mg/L	0.3	<LOR	<LOR	0.03	<LOR
	Manganese	mg/L	1.9	0.014	0.008	0.007	0.011
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.5	7.1	7.0	7.9
	Sodium	mg/L	NA	1600	1300	1500	1600
	Ammonia[2]	mg/L	0.9	0.033	<LOR	0.034	0.01
	Nitrate	mg/L	0.7	0.19	0.19	0.24	0.27
	Total Organic Carbon	mg/L	4	7	7	7	<LOR
	EC	µS/cm	NA	13000	13000	14000	13000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory Limit of reporting.

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

There were two exceedances of the site criteria for December in MWC, TOC at a concentration of <5mg/L and Iron at a concentration of 0.62mg/L.

Table 4 – Quarterly Groundwater Results and Comparison March 2024 – December 2024 (MWC).

	Analytes	Units	Site Criteria (mg/L)	MWC Mar 2024	MWC June 2024	MWC Sept 2024	MWC Dec 2024
IONS	**Calcium**	mg/L	NA	420	390	420	440
	Alkalinity (total)	mg/L	NA	840	860	910	840
	Chloride	mg/L	NA	4600	4500	4600	5100
	Fluoride	mg/L	NA	0.2	0.2	0.2	<0.5
	Potassium[1]	mg/L	410	2	2	3	<5
	Magnesium	mg/L	NA	600	510	600	620
	Sulphate	mg/L	NA	83	71	90	85
HEAVY METALS	**Iron**	mg/L	0.3	0.04	0.18	0.03	**0.62**
	Manganese	mg/L	1.9	1.8	1.8	1.4	1.2
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.4	6.9	6.8	7.8
	Sodium	mg/L	NA	2300	1700	2100	2200
	Ammonia[2]	mg/L	0.9	0.021	<LOR	0.02	0.21
	Nitrate	mg/L	0.7	0.03	0.02	0.2	0.08
	Total Organic Carbon	mg/L	4	**10**	**18**	**6**	<LOR
	EC	µS/c	NA	15000	15000	15000	14000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory Limit of reporting.

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

MWD is a leachate monitoring well which provides access to the perched landfill leachate water table. The Site Criteria for this particular well is only used as a general indicator of the leachate water quality.

Table 5 – Quarterly Groundwater Results and Comparison March 2024 – December 2024 (MWD) Leachate Well

	Analytes	Units	Site Criteria (mg/L)	MWD Mar 2024	MWD June 2024	MWD Sept 2024	MWD Dec 2024
IONS	**Calcium**	mg/L	NA	150	170	170	170
	Alkalinity (total)	mg/L	NA	1200	1300	1700	2400
	Chloride	mg/L	NA	1100	940	1600	3600
	Fluoride	mg/L	NA	0.3	0.3	0.3	<10
	Potassium[1]	mg/L	410	76	67	93	180
	Magnesium	mg/L	NA	130	110	190	340
	Sulphate	mg/L	NA	100	100	76	24
HEAVY METALS	**Iron**	mg/L	0.3	**0.4**	0.28	**1.0**	**1.7**
	Manganese	mg/L	1.9	0.62	0.66	0.58	1.7
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.000011	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.8	7.4	7.5	**8.1**
	Sodium	mg/L	NA	750	590	1000	2100
	Ammonia[2]	mg/L	0.9	**130**	**100**	**200**	**2.1**
	Nitrate	mg/L	0.7	<LOR	<LOR	0.03	<LOR
	Total Organic Carbon	mg/L	4	**89**	**100**	**110**	**270**
	EC	µS/cm	NA	5600	5600	8600	13000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory Limit of reporting.

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs.

There were three exceedances of the site criteria for December in MWE, TOC at a concentration of 5mg/L and Iron at a concentration of 0.33mg/L and pH 8.1.

Table 6 –Quarterly Groundwater Results and Comparison March 2024 – December 2024 (MWE)

	Analytes	Units	Threshold Criteria (mg/L)	MWE Mar 2024	MWE June 2024	MWE Sept 2024	MWE Dec 2024
IONS	**Calcium**	mg/L	NA	82	39	100	130
	Alkalinity (total)	mg/L	NA	1400	980	1100	1200
	Chloride	mg/L	NA	440	240	780	1100
	Fluoride	mg/L	NA	0.5	0.4	0.4	<0.5
	Potassium[1]	mg/L	410	<LOR	0.8	2	<5
	Magnesium	mg/L	NA	91	46	100	160
	Sulphate	mg/L	NA	120	60	180	220
HEAVY METALS	**Iron**	mg/L	0.3	0.010	0.09	**1.4**	**0.33**
	Manganese	mg/L	1.9	0.65	0.71	1	1.4
PHENOLS	**Total phenolics**	mg/L	0.32	<LOR	<LOR	<LOR	<LOR
OCP	**OCP[3]**	mg/L	0.00001	<LOR	<LOR	<LOR	<LOR
MISC. INORGANICS	**pH**	pH	6.5 – 8	7.7	7.1	7.2	8.1
	Sodium	mg/L	NA	720	440	590	910
	Ammonia[2]	mg/L	0.9	<LOR	0.081	0.093	0.12
	Nitrate	mg/L	0.7	<LOR	0.008	0.066	<0.02
	Total Organic Carbon	mg/L	4	**9**	**44**	**7**	<LOR
	EC	µS/cm	NA	3700	2400	4400	5000

Highlighted results exceed site criteria

<LOR = No Detection. Analyte is below the Laboratory Limit of reporting.

1 - World Health Organisation Guidelines for Drinking-water Quality 2009, Poor (acceptable) drinking water criteria.

2 - Criteria value may not protect key species from chronic toxicity, refer to ANZW 2018 for further guidance.

3 - A Trigger value for DDT is used in the absence of a criteria value for Total OCP. DDT has the lowest criteria of OCPs

5.0 DISCUSSION

The inferred hydraulic gradient for the site is a down gradient towards Parsons Gully to the west. The location of the four monitoring wells surrounding the landfill place wells MWA, MWB and MWC down-hydraulic gradient and well MWE up-hydraulic gradient of the landfill. Well MWD is located within the perched landfill water table, this enables access to the leachate within the landfill.

The following is a summary of the significant results for December 2024 in relation to the Site Criteria. Key increasing trends, decreasing trends and exceedances of the threshold criteria are indicated.

MWA

MWA is located in the northwest section of the site and is considered to be a down-hydraulic gradient monitoring well. There is farmland adjoining to the north and west of this location. There are two exceedances of the site criteria;

- Iron concentration increased from 0.03mg/L to 0.037 mg/L, above the site Criteria of 0.3mg/L.

The following changes have occurred in the water quality of MWA since the previous monitoring period in September 2024:

- Ammonia concentration increased from 0.051 mg/L to 0.18mg/L;
- Chloride concentration increased from 6500 mg/L to 7700 mg/L;

All other analytes reported concentrations consistent with previous monitoring data.

MWB

MWB is located in the southwest section of the site and is considered to be a down-hydraulic gradient monitoring well. There is farmland to the south and west of this location. There is one exceedance of the site criteria:

- The TOC concentration decreased from 7 mg/L in September 2024 to below limit of reporting in December 2024.

The following changes have occurred in the water quality of MWA since the previous monitoring period in September 2024:

- pH levels increased from 7.0 in September 2024 to 7.9 in December 2024.

All other analytes reported concentrations consistent with previous monitoring data.

MWC

MWC is located on the southern boundary of the site, down hydraulic gradient of the landfill and onsite dam. There is farmland to the south of well, along with a stand of vegetation immediately south of the well. There were two concentrations which exceeded the site criteria:

- Iron concentration increased from 0.03mg/L to 0.062 mg/L, above the site Criteria of 0.3mg/L.

The following changes have occurred in the water quality of MWC the previous monitoring period:

- Ammonia concentration has increased from 0.002 mg/L in September to 0.21 mg/L in December 2024;
- pH levels increased from 6.8 in September to 7.8 in December 2024.

All other analytes reported concentrations consistent with previous monitoring data.

MWD

The water collected and analysed from well MWD is landfill leachate and as such the Site Criteria is not used to compare the results against. The results of MWD are used as an indicator of current conditions within the landfill with trends and seasonal variations apparent. MWD is also to be used as a comparison to the external monitoring wells.

The following changes occurred in the water quality of the landfill leachate well MWD since the previous monitoring period:

- Alkalinity concentration increased from 1700mg/L to 2400 mg/L;
- Ammonia concentration decreased from 200mg/L to 2.1mg/L.
- Chloride concentration decreased from 1100 mg/L to 940 mg/L;
- Iron increased from 1.0 mg/L to 1.7 mg/L;
- pH increased from 7.5 to 8.1;
- Potassium increased from 93mg/L to 180 mg/L;
- Sodium concentration increased from 1000 mg/L to 2100 mg/L;
- The TOC concentration increased from 110mg/L to 270 mg/L.

MWE

MWE is located on the eastern boundary of the site and is considered to be an up-gradient groundwater monitoring well. There are a series of dams to the east of the well. There were three concentrations which exceeded the site criteria. The following changes have occurred in the water quality of MWE the previous monitoring period:

- Iron concentration decreased from 1.4mg/L to 0.33 mg/L, remaining above the site Criteria of 0.3mg/L; and
- pH increased from 7.2 to 8.1 above the criteria of between 6.5-8

The following changes have occurred in the water quality of MWE:

- Ammonia concentration increased from 0.093 to 0.12 mg/L;
- Calcium concentration increased from 100 mg/L to 130 mg/L;
- Chloride concentration increased from 780 mg/L to 1000 mg/L;
- Magnesium concentration increased from 100 mg/L to 160 mg/L;
- Sodium concentration increased from 590 mg/L to 910 mg/L.

All other analytes reported concentrations consistent with previous monitoring data.

The following analytes exceeded the Threshold Criteria during the December 2024 sampling event, excluding the Leachate Monitoring well (MWD); Iron in MWA, MWC and MWE; pH MWE. Refer to **Attachment 3** – Data Log.

The upgradient well MWE recorded a concentration of pH outside of the normal range, there were elevated pH readings in all of the wells. The up gradient well gives an indication of the groundwater conditions as they move into the site. Review of the pH will be undertaken across the site in the next round of monitoring.

Site Maintenance

The leachate well remains broken off at the ground level. No immediate maintenance is required on the other wells.

6.0 CONCLUSIONS

There are seasonal fluctuations and localised weather events which would have impacted the local and regional groundwater conditions. Trending of the analytes sampled over time may indicate a seasonal fluctuation, an anomaly or highlight an issue on the site (or surrounding area). The trending of analytes occurs in the annual groundwater monitoring report with a running comparison in the quarterly monitoring reports.

The results and discussion of the laboratory sample analysis from the Scone Waste Facility during the December 2024 quarterly sampling event displayed several ongoing exceedances of the Site Criteria from the previous monitoring period. There was an unexpected exceedance in MWE (up gradient monitoring well) of pH outside of the criteria range.

The following analytes exceeded the Site Criteria for the December 2024 sampling event; Iron in MWA, MWC and MWE; pH in MWE.

Continued sampling and data collection will allow robust trending and statistical analysis of data to occur.

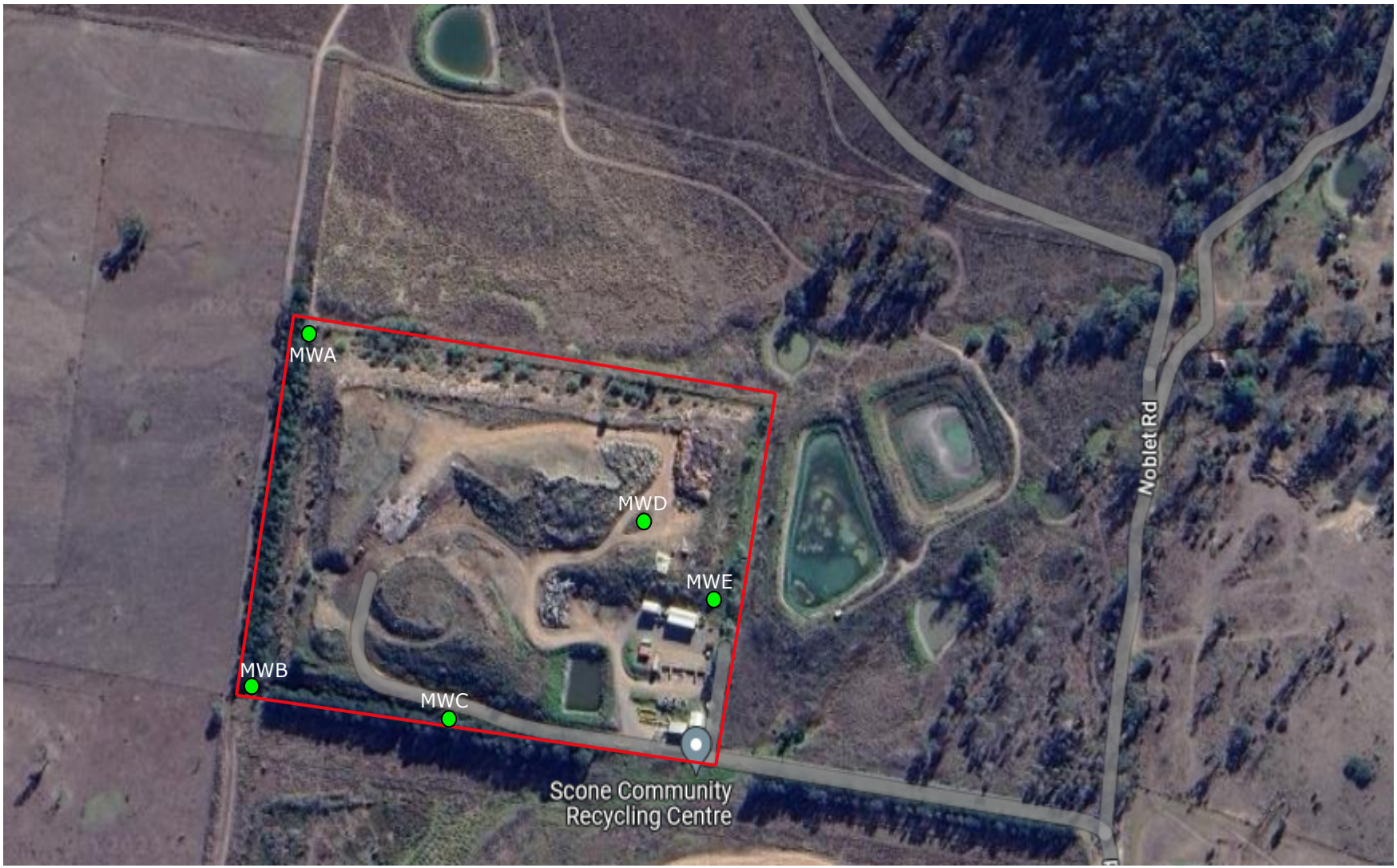
The next water sampling event will be a Quarterly monitoring event which will be undertaken in March 2025.

REFERENCES

- *Australian and New Zealand Guidelines for the Management of Contaminated Sites* (ANZECC/NHMRC 1992);
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZW, 2018);
- *Australian Drinking Water Guidelines, National Water Quality Management Strategy 6* 2011, updated Nov 2018;
- *Contaminated Land Management Act 1997* (NSW);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA 2011);
- *Contaminated Sites: Consultants reporting on Contaminated Lands (NSW EPA 2020)*
- *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contamination Land Management Act 1997* (NSW DECC, 2009);
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007);
- *Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* (NSW EPA 1999);
- *Contaminated land sampling design guidelines part 1 – application (NSW EPA 2022)*
- *Contaminated land sampling design guidelines part 2 – interpretation (NSW EPA 2022)*
- *Environmental Guidelines: Solid Waste Landfills* (NSW EPA, 1996);
- *Environmental Guidelines Solid Waste Landfills* Second edition, (NSW EPA 2016);
- *Health - Based Soil Investigation Levels,* Imray, P & Langley, A*, National Environmental Health Forum Monographs, Soil Series No. 2 (2nd Ed), South Australian Health Commission* (NEHF 1998);
- *National Environment Protection (Assessment of Site Contamination) Measure (No.1)* (NEPM, 2013) as amended;
- *State Environmental Planning Policy (Resilience and Hazards) 2021;*
- *Storage and Handling of Dangerous Goods Code of Practice 2005*;
- *Work Health and Safety Act 2011* (NSW) and associated regulations.

FIGURE

SITE LAYOUT



Legend

Sample Location

Site boundary

Image: SiX Maps NSW Gov.

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Title: Sampling Locations Noblet Road, Scone

Client	Project No.	Figure No	Date
UHSC	E2424	1	1/02/2024
	Scale	Compiled	Revision
	NA	DB	1

ATTACHMENT A

DATALOG

ENGAGE ENVIRONMENTAL SERVICES			Threshold Criteria	NA	NA	NA	NA	0.3	NA		0.00001	NA	6.5–8	NA	0.9	0.7	NA	4	0.32	NA
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm
			Analytes	Calcium	Alkalinity	Chloride	Fluoride	Iron	Magnesium	Manganese	Organochlorine pesticides (OCP)	Potassium	pH	Sodium	Ammonia	Nitrate	Sulfate	Total organic carbon	Total phenolics	Electrical conductivity (EC)
Well Id	Lab Report	Date	Monitoring frequency	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
MWA	1173951	18/12/2024	Quarterly	650	540	7700	< LOR	0.37	1300	0.058	< LOR	5.2	7.1	2300	0.18	0.57	64	< LOR	< LOR	19000
MWB	1173951	18/12/2024	Quarterly	510	510	4900	< LOR	< LOR	680	0.011	< LOR	< LOR	7.9	1600	0.01	0.27	97	< LOR	< LOR	13000
MWC	1173951	18/12/2024	Quarterly	440	840	5100	< LOR	0.62	620	1.2	< LOR	< LOR	7.8	2200	0.21	0.08	85	< LOR	< LOR	14000
MWD	1173951	18/12/2024	Quarterly	170	2400	3600	< LOR	1.7	340	1.7	< LOR	180	8.1	2100	2.1	< LOR	24	270	< LOR	13000
MWE	1173951	18/12/2024	Quarterly	130	1200	1100	< LOR	0.33	160	1.4	< LOR	< LOR	8.1	910	0.12	< LOR	220	< LOR	< LOR	5000

ATTACHMENT B

NATA ACCREDITED LABORATORY RESULTS

Engage Environmental Services
113 Reservoir Rd
Glendale
NSW 2285

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Stephen Challinor**

Report **1173051-W**
Project name UHSC
Project ID E2424-1224-UHSC
Received Date Dec 18, 2024

Client Sample ID			**MWA**	**MWB**	**MWC**	**MWD**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**N24-De0050037**	**N24-De0050038**	**N24-De0050039**	**N24-De0050040**
Date Sampled			**Dec 18, 2024**	**Dec 18, 2024**	**Dec 18, 2024**	**Dec 18, 2024**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Toxaphene	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dibutylchlorendate (surr.)	1	%	88	85	64	68
Tetrachloro-m-xylene (surr.)	1	%	97	63	94	58
Phenols (Halogenated)						
2-Chlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			MWA	MWB	MWC	MWD
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			N24-De0050037	N24-De0050038	N24-De0050039	N24-De0050040
Date Sampled			Dec 18, 2024	Dec 18, 2024	Dec 18, 2024	Dec 18, 2024
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
Total Halogenated Phenol*	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
2-Nitrophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.4-Dimethylphenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4-Dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	< 0.006	< 0.006	< 0.006
Total cresols*	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
4-Nitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
Dinoseb	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Phenol-d6 (surr.)	1	%	59	65	61	78
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (as N)	0.01	mg/L	0.18	0.01	0.21	2.1
Chloride	1	mg/L	7700	4900	5100	3600
Conductivity (at 25 °C)	10	uS/cm	19000	13000	14000	13000
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 10
Nitrate (as N)	0.02	mg/L	0.57	0.27	0.08	< 0.02
pH (at 25 °C)	0.1	pH Units	7.1	7.9	7.8	8.1
Sulphate (as SO4)	5	mg/L	64	97	85	24
Total Organic Carbon	5	mg/L	< 5	< 5	< 5	270
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	540	510	840	2400
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	540	510	840	2400
Heavy Metals						
Iron	0.05	mg/L	0.37	< 0.05	0.62	1.7
Manganese	0.005	mg/L	0.058	0.011	1.2	1.7
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	650	510	440	170
Magnesium	0.5	mg/L	1300	680	620	340
Potassium	0.5	mg/L	5.2	< 5	< 5	180
Sodium	0.5	mg/L	2300	1600	2200	2100

Client Sample ID			MWE
Sample Matrix			Water
Eurofins Sample No.			N24-De0050041
Date Sampled			Dec 18, 2024
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002
Endrin	0.0002	mg/L	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002
Toxaphene	0.005	mg/L	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	71
Tetrachloro-m-xylene (surr.)	1	%	114
Phenols (Halogenated)			
2-Chlorophenol	0.003	mg/L	< 0.003
2.4-Dichlorophenol	0.003	mg/L	< 0.003
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	< 0.03
Total Halogenated Phenol*	0.01	mg/L	< 0.01
Phenols (non-Halogenated)			
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03
2-Nitrophenol	0.01	mg/L	< 0.01
2.4-Dimethylphenol	0.003	mg/L	< 0.003
2.4-Dinitrophenol	0.03	mg/L	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006
Total cresols*	0.01	mg/L	< 0.01
4-Nitrophenol	0.03	mg/L	< 0.03
Dinoseb	0.1	mg/L	< 0.1
Phenol	0.003	mg/L	< 0.003

Client Sample ID			MWE
Sample Matrix			Water
Eurofins Sample No.			N24-De0050041
Date Sampled			Dec 18, 2024
Test/Reference	LOR	Unit	
Phenols (non-Halogenated)			
Phenol-d6 (surr.)	1	%	59
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1
Ammonia (as N)	0.01	mg/L	0.12
Chloride	1	mg/L	1100
Conductivity (at 25 °C)	10	uS/cm	5000
Fluoride	0.5	mg/L	< 0.5
Nitrate (as N)	0.02	mg/L	< 0.02
pH (at 25 °C)	0.1	pH Units	8.1
Sulphate (as SO4)	5	mg/L	220
Total Organic Carbon	5	mg/L	< 5
Alkalinity (speciated)			
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	1200
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20
Total Alkalinity (as CaCO3)	20	mg/L	1200
Heavy Metals			
Iron	0.05	mg/L	0.33
Manganese	0.005	mg/L	1.4
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	0.5	mg/L	130
Magnesium	0.5	mg/L	160
Potassium	0.5	mg/L	< 5
Sodium	0.5	mg/L	910

Sample History

Where samples are submitted/analysed over several days, the last date of extraction 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.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides	Melbourne	Dec 23, 2024	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Ammonia (as N)	Melbourne	Dec 23, 2024	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (at 25 °C)	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4030 Conductivity			
Nitrate (as N)	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
pH (at 25 °C)	Melbourne	Dec 23, 2024	6 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Total Organic Carbon	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Dec 23, 2024	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Phenols (Speciated)			
Phenols (Halogenated)	Melbourne	Dec 23, 2024	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Dec 23, 2024	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F			
Chloride	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Fluoride	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Sulphate (as SO4)	Melbourne	Dec 23, 2024	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Melbourne	Dec 23, 2024	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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ABN: 91 05 0159 898

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NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Engage Environmental Services
Address: 113 Reservoir Rd
Glendale
NSW 2285

Project Name: UHSC
Project ID: E2424-1224-UHSC

Order No.:
Report #: 1173051
Phone: 0478 362 005
Fax:

Received: Dec 18, 2024 3:42 PM
Due: Jan 6, 2025
Priority: 10 Day
Contact Name: Stephen Challinor

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Iron	Manganese	Nitrate (as N)	pH (at 25 °C)	Total Organic Carbon	Organochlorine Pesticides	Phenols (Speciated)	Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	Eurofins Suite B11C: Na/K/Ca/Mg
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	MWA	Dec 18, 2024		Water	N24-De0050037	X	X	X	X	X	X	X	X	X	X	X
2	MWB	Dec 18, 2024		Water	N24-De0050038	X	X	X	X	X	X	X	X	X	X	X
3	MWC	Dec 18, 2024		Water	N24-De0050039	X	X	X	X	X	X	X	X	X	X	X
4	MWD	Dec 18, 2024		Water	N24-De0050040	X	X	X	X	X	X	X	X	X	X	X
5	MWE	Dec 18, 2024		Water	N24-De0050041	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

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.

Units

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

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Chloride	mg/L	< 1			1	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Iron	mg/L	< 0.05			0.05	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Method Blank							
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Fluoride	mg/L	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	54			25-140	Pass	
LCS - % Recovery							
Ammonia (as N)	%	80			70-130	Pass	
Chloride	%	107			70-130	Pass	
Fluoride	%	106			70-130	Pass	
Sulphate (as SO4)	%	105			70-130	Pass	
Total Organic Carbon	%	77			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Carbonate Alkalinity (as CaCO3)	%	122			70-130	Pass	
Total Alkalinity (as CaCO3)	%	124			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Iron	%	97			80-120	Pass	
Manganese	%	100			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	110			80-120	Pass	
Magnesium	%	119			80-120	Pass	
Potassium	%	112			80-120	Pass	
Sodium	%	116			80-120	Pass	
LCS - % Recovery							
Ammonia (as N)	%	81			70-130	Pass	
Conductivity (at 25 °C)	%	95			70-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Methyl-4.6-dinitrophenol	%	38			25-140	Pass	
2.4-Dinitrophenol	%	38			25-140	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4-Nitrophenol	%	91			25-140	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	94			70-130	Pass	
4.4'-DDD	%	98			70-130	Pass	
4.4'-DDE	%	72			70-130	Pass	
4.4'-DDT	%	100			70-130	Pass	
a-HCH	%	71			70-130	Pass	
Aldrin	%	71			70-130	Pass	
b-HCH	%	80			70-130	Pass	
d-HCH	%	94			70-130	Pass	
Dieldrin	%	90			70-130	Pass	
Endosulfan I	%	107			70-130	Pass	
Endosulfan II	%	104			70-130	Pass	
Endosulfan sulphate	%	93			70-130	Pass	
Endrin	%	93			70-130	Pass	
Endrin aldehyde	%	84			70-130	Pass	
Endrin ketone	%	92			70-130	Pass	
g-HCH (Lindane)	%	103			70-130	Pass	
Heptachlor	%	96			70-130	Pass	
Heptachlor epoxide	%	90			70-130	Pass	
Hexachlorobenzene	%	88			70-130	Pass	
Methoxychlor	%	97			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	42			25-140	Pass	
2.4-Dichlorophenol	%	31			25-140	Pass	
2.4.5-Trichlorophenol	%	37			25-140	Pass	
2.4.6-Trichlorophenol	%	39			25-140	Pass	
2.6-Dichlorophenol	%	37			25-140	Pass	
4-Chloro-3-methylphenol	%	47			25-140	Pass	
Pentachlorophenol	%	38			25-140	Pass	
Tetrachlorophenols - Total	%	39			25-140	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Nitrophenol	%	31			25-140	Pass	
2.4-Dimethylphenol	%	54			25-140	Pass	
2-Methylphenol (o-Cresol)	%	44			25-140	Pass	
3&4-Methylphenol (m&p-Cresol)	%	39			25-140	Pass	
Dinoseb	%	40			25-140	Pass	
Phenol	%	82			25-140	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	M24-De0050311	NCP	%	35			30-130	Pass	
2.4-Dinitrophenol	M24-De0050311	NCP	%	43			30-130	Pass	
Spike - % Recovery									
				Result 1					
Chloride	M24-De0055526	NCP	%	97			70-130	Pass	
Fluoride	M24-De0049093	NCP	%	101			70-130	Pass	
Sulphate (as SO4)	M24-De0054937	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	M24-De0055640	NCP	%	94			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Manganese	M24-De0055640	NCP	%	95			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	M24-De0054802	NCP	%	111			75-125	Pass	
Magnesium	M24-De0054802	NCP	%	118			75-125	Pass	
Potassium	M24-De0054802	NCP	%	114			75-125	Pass	
Sodium	M24-De0054936	NCP	%	112			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	N24-De0050038	CP	%	91			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M24-De0049092	NCP	%	54			30-130	Pass	
4-Nitrophenol	M24-De0049092	NCP	%	59			30-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	N24-De0050041	CP	%	108			70-130	Pass	
4.4'-DDD	N24-De0050041	CP	%	102			70-130	Pass	
4.4'-DDE	N24-De0050041	CP	%	109			70-130	Pass	
4.4'-DDT	N24-De0050041	CP	%	91			70-130	Pass	
a-HCH	N24-De0050041	CP	%	88			70-130	Pass	
Aldrin	N24-De0050041	CP	%	97			70-130	Pass	
b-HCH	N24-De0050041	CP	%	110			70-130	Pass	
d-HCH	N24-De0050041	CP	%	102			70-130	Pass	
Dieldrin	N24-De0050041	CP	%	115			70-130	Pass	
Endosulfan I	N24-De0050041	CP	%	115			70-130	Pass	
Endosulfan II	N24-De0050041	CP	%	93			70-130	Pass	
Endosulfan sulphate	N24-De0050041	CP	%	93			70-130	Pass	
Endrin	N24-De0050041	CP	%	115			70-130	Pass	
Endrin aldehyde	N24-De0050041	CP	%	115			70-130	Pass	
Endrin ketone	N24-De0050041	CP	%	115			70-130	Pass	
g-HCH (Lindane)	N24-De0050041	CP	%	115			70-130	Pass	
Heptachlor	N24-De0050041	CP	%	91			70-130	Pass	
Heptachlor epoxide	N24-De0050041	CP	%	94			70-130	Pass	
Hexachlorobenzene	N24-De0050041	CP	%	70			70-130	Pass	
Methoxychlor	N24-De0050041	CP	%	90			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	N24-De0050041	CP	%	56			30-130	Pass	
2.4-Dichlorophenol	N24-De0050041	CP	%	41			30-130	Pass	
2.4.5-Trichlorophenol	N24-De0050041	CP	%	47			30-130	Pass	
2.4.6-Trichlorophenol	N24-De0050041	CP	%	52			30-130	Pass	
2.6-Dichlorophenol	N24-De0050041	CP	%	47			30-130	Pass	
4-Chloro-3-methylphenol	N24-De0050041	CP	%	66			30-130	Pass	
Pentachlorophenol	N24-De0050041	CP	%	30			30-130	Pass	
Tetrachlorophenols - Total	N24-De0050041	CP	%	43			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Nitrophenol	N24-De0050041	CP	%	38			30-130	Pass	
2.4-Dimethylphenol	N24-De0050041	CP	%	62			30-130	Pass	
2-Methylphenol (o-Cresol)	N24-De0050041	CP	%	52			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	N24-De0050041	CP	%	50			30-130	Pass	
Dinoseb	N24-De0050041	CP	%	31			30-130	Pass	
Phenol	N24-De0050041	CP	%	32			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25 °C)	M24-De0048876	NCP	uS/cm	1800	1700	1.2	30%	Pass	
pH (at 25 °C)	M24-De0048874	NCP	pH Units	8.2	8.3	pass	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	M24-De0048876	NCP	mg/L	230	270	16	30%	Pass	
Carbonate Alkalinity (as CaCO3)	M24-De0048876	NCP	mg/L	24	< 10	200	30%	Fail	Q15
Hydroxide Alkalinity (as CaCO3)	M24-De0048876	NCP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	M24-De0048876	NCP	mg/L	250	270	5.7	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	M24-De0055640	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Manganese	M24-De0055640	NCP	mg/L	0.033	0.033	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	M24-De0054802	NCP	mg/L	42	41	3.0	30%	Pass	
Magnesium	M24-De0054802	NCP	mg/L	92	89	3.0	30%	Pass	
Potassium	M24-De0054802	NCP	mg/L	11	10	5.0	30%	Pass	
Sodium	M24-De0054802	NCP	mg/L	360	350	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	N24-De0050038	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Total Organic Carbon	N24-De0050038	CP	mg/L	< 5	< 5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	N24-De0050039	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor epoxide	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	N24-De0050039	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Toxaphene	N24-De0050039	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	N24-De0050039	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	N24-De0050039	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
4-Chloro-3-methylphenol	N24-De0050039	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	N24-De0050039	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	N24-De0050039	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	N24-De0050039	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	N24-De0050039	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Nitrophenol	N24-De0050039	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	N24-De0050039	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	N24-De0050039	CP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	N24-De0050039	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	N24-De0050039	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	N24-De0050039	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	N24-De0050041	CP	mg/L	0.12	0.15	24	30%	Pass	
Chloride	N24-De0050041	CP	mg/L	1100	1100	1.0	30%	Pass	
Sulphate (as SO4)	N24-De0050041	CP	mg/L	220	220	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Andrew Black	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Caitlin Breeze	Senior Analyst-Metal
Edward Lee	Senior Analyst-Organic
Emily Rosenberg	Senior Analyst-Metal
Luke Holt	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Inorganic

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

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

ATTACHMENT C
CALIBRATION CERTIFICATE

Hanna Instruments Pty Ltd
18 Fiveways Boulevard
Keysborough VIC 3173

Ph: (03) 9769 0666

Certificate #: HC00492/2024

CALIBRATION CERTIFICATE

Meter part #: HI98194
pH probe part #: HI7698194-1
EC probe # HI7698194-3
DO probe # HI7698494-5

Meter S/N: M04200028111
pH probe S/N: J79355
EC probe S/N: J88036
DO probe S/N: 03110092

Customer: Engage Environmental
Contact #: Stephen Challinor

Calibration Date: 11/09/2024
Calibration Time: 11:30

pH BUFFERS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Buffer description	Buffer Lot Number & Expiry	Original pH value	Calibrated pH value
HI7004	pH Buffer 4.01	Lot 9535 Expiry 11/2028	pH 3.95	pH 4.01
HI7007	pH Buffer 7.01	Lot 9507 Expiry 11/2028	pH 7.06	pH 7.01
HI7010	pH Buffer 10.01	Lot 9751 Expiry 01/2026	pH 9.95	pH 10.01

EC STANDARDS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Standard description	Standard Lot Number & Expiry	Original EC value	Calibrated EC value
HI7039	5000 uS/cm	Lot 7204 Expiry 11/2026	5490 uS/cm	5000 uS/cm

DO STANDARDS USED FOR CALIBRATION			CALIBRATION DATA	
Item Code	Standard description	Standard Lot Number & Expiry	Original DO value	Calibrated DO value
N/A	100% DO	N/A	96.90%	100.00%

pH CALIBRATION RESULTS	
Offset	-14.8
Slope A (%)	98%
Slope B (%)	95%

DO CALIBRATION RESULTS	
Point 1	100%

EC CALIBRATION RESULTS	
EC Point	5000 uS/cm
Cell	4.295 / cm

Comments or Remarks :

ATC (Automatic Temperature Compensation) to 25°C was applied during calibration
HANNA buffers and standards were used for calibration of the meter. HANNA buffers and standards are standardised with high precision meters calibrated to NIST references.

Attila
Service Personnel

ATTACHMENT D
FIELD DATA SHEETS

GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-1224 Scone	**Sample ID: MWA**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 18.12.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / **NO** / N/A	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged:	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.77.....	m agl	**Weather Conditions**:	
Standing water level: ..... 6.582.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 15.66	m bgl	20-25 ☐ 25-30 X	
Initial well volume: .....9.078.....	L		
Water level after purging: .....8.182.....	m bgl	Clear ☐ Partly cloudy ☐	Overcast X
Volume of water purged: .....1.6.....	L		
Water level at time of sampling: .....8.394.....	m bgl	Calm ☐ Slight breeze X	Moderate breeze ☐
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐	Rain ☐

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
10:42am	4.66	18.46	6.55	34.6	20.65	9214	Water clear no odour or sheen
10:44am	3.09	18.56	6.58	35.6	20.46	9267	
10:46am	2.93	18.56	6.58	35.5	20.47	9276	

Water Quality and General Comments:

Water was clear, no odour or sheen or hydrocarbons. Vegetation was found around monument. No standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-1224 Scone	**Sample ID: MWB**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 18.12.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.8.....	m agl	**Weather Conditions**:	
Standing water level: ..... 6.401.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 14.04	m bgl	20-25 ☐ 25-30 X	
Initial well volume: .....7.639.....	L		
Water level after purging: .....6.942.....	m bgl	Clear ☐ Partly cloudy☐	Overcast X
Volume of water purged: .....0.697.....	L		
Water level at time of sampling: .....7.124.....	m bgl	Calm ☐ Slight breeze X	Moderate breeze ☐
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐	Rain ☐

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
11:22am	3.20	12.7	6.92	40.1	20.05	6352	Clear water, no sheen
11:24am	3.02	12.7	6.84	32.7	19.87	6348	
11:26am	2.61	12.67	6.81	28.9	19.87	6333	

Water Quality and General Comments:

Water was clear, no odour or sheen or hydrocarbons. Vegetation was found around monument. No standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-1224 Scone	**Sample ID: MWC**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 18.12.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged:	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.75.....	m agl	**Weather Conditions**:	
Standing water level: ..... 5.282.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 12.6	m bgl	20-25 ☐ 25-30 ☐ >30 X	
Initial well volume: .....7.318.....	L		
Water level after purging: .....5.691.....	m bgl	Clear ☐ Partly cloudy ☐ Overcast X	
Volume of water purged: .....1.886.....	L		
Water level at time of sampling: .....5.432.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
11:54am	2.80	13.93	6.77	28.3	19.45	6955	Clear water
11:56am	2.92	13.94	6.73	28.4	19.45	6995	
11:58am	2.81	13.91	6.71	27.9	19.52	6959	

Water Quality and General Comments:

Water was clear top of column, brown tinge after purging. No odour or sheen or hydrocarbons. Vegetation was found around monument. No standing water around monument.

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GROUNDWATER MONITORING FIELD DATA SHEET

Project: E2424-1224 Scone	**Sample ID: MWD Leachate well**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 18.12.24

Well Information

Monument damaged:	YES / NO / **N/A**	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / NO / **N/A**	Cap on PVC casing:	YES / NO / **N/A**
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	**YES** / NO / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / NO / **N/A**	Odours from groundwater:	**YES** / NO / N/A
Casing above ground: .....N/A.....	m agl	**Weather Conditions**:	
Standing water level: ..... 10.068.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 12.96	m bgl	20-25 ☐ 25-30 ☐ >30 X	
Initial well volume: .....2.892.....	L		
Water level after purging: .....11.132.....	m bgl	Clear ☐ Partly cloudy ☐ Overcast X	
Volume of water purged: .....1.064.....	L		
Water level at time of sampling: .....10.331.....	m bgl	Calm ☐ Slight breeze X Moderate breeze ☐	
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐ Rain ☐	

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
1:05pm	2.5	12.5	7.49	-41.1	25.38	6250	
1:07pm	0.86	12.82	7.30	-24.2	25.91	6409	
1.09pm	1.21	12.83	7.26	-30.1	26.18	6419	

Water Quality and General Comments:

Water was green tinged with methane odour and minor sediment. No sheen or hydrocarbons. Vegetation was found around monument. No standing water around monument. Monitoring well was cut to ground level. Well, was surrounded by tyres.

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GROUND WATER MONITORING FIELD DATA SHEET

Project: E2424-1224 Scone	**Sample ID: MWE**
Client: UHSC	**Sampler:** DB
Site Address: Noblet Road Scone	**Date:** 18.12.24

Well Information

Monument damaged: Rusty	YES / **NO** / N/A	Well ID visible:	YES / **NO** / N/A
Locked well casing:	YES / **NO** / N/A	Cap on PVC casing:	**YES** / NO / N/A
Cement footing damaged:	YES / NO / **N/A**	Water in monument casing:	YES / **NO** / N/A
Standing water, vegetation around monument:	YES / **NO** / N/A	Internal obstruction in casing:	YES / **NO** / N/A
Well Damaged: Rusty	YES / **NO** / N/A	Odours from groundwater:	YES / **NO** / N/A
Casing above ground: .....0.68.....	m agl	**Weather Conditions**:	
Standing water level: ..... 4.365.....	m bgl	Temperature >15 ☐ 15-20 ☐	
Total well depth: 9.46	m bgl	20-25 ☐ 25-30 ☐ >30 X	
Initial well volume: .....5.095.....	L		
Water level after purging: .....4.714.....	m bgl	Clear ☐ Partly cloudy ☐	Overcast X
Volume of water purged: .....0.381.....	L		
Water level at time of sampling: .....4.845.....	m bgl	Calm ☐ Slight breeze X	Moderate breeze ☐
Well purged dry:	YES / **NO**	Windy ☐	
Purging equipment:	Bailer		
Sample equipment:	Bailer	Fine X Showers ☐	Rain ☐

Note: 50mm internal diameter pipe = 1.96 L/m.

Water Quality Details:

Time am / pm	DO (mg/L^{-1})	EC (µS cm^{-1})	pH	Redox (mV)	Temp (°C)	Salinity	Comments
12:30pm	2.31	4059	7.12	-4.5	19.11	2031	Clear water, small amount of sediment
12:32pm	1.75	3997	7.05	-5.9	19.09	1998	
12:35pm	.1.49	4483	7.07	-5.0	19.09	2012	

Water Quality and General Comments:

Water was clear with minor white sediment, no sheen or hydrocarbons. Vegetation was found around monument. No standing water around monument.

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