



QUARTERLY GROUNDWATER MONITORING THE SCONE WASTE LANDFILL

THE SCONE WASTE LANDFILL

Noblet Road
Scone
NSW 2337

Upper Hunter Shire Council

DLH1186_H01197

July 2017

PROJECT NAME	Scone Waste Landfill Groundwater Monitoring
PROJECT ID	DLH1186
DOCUMENT CONTROL NUMBER	H01197
PREPARED FOR	Upper Hunter Shire Council
APPROVED FOR RELEASE BY	Stephen Challinor
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DOCUMENT CONTROL				
VERSION	DATE	COMMENT	PREPARED BY	REVIEWED BY
H01197	28.07.2017	Final Copy	Tobias Scheid/ Megan Priestley	Stephen Challinor

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ABBREVIATIONS

ACM	Asbestos Containing Material
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Above-ground Storage Tank
ASS	Acid Sulfate Soil
B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
COC	Chain of Custody documentation
CLM	Contaminated Land Management
DA	Development Application
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DLA	DLA Environmental Services
DP	Deposited Plan
DQO	Data Quality Objective
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW)
ESL	Ecological Screening Level
HIL	Health-Based Investigation Level
LOR	Limit of Reporting
MW	Monitoring Well
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environmental and Heritage
OPP	Organophosphorus Pesticides
OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photo-Ionisation Detector
PQL	Practical Quantification Limit
QA/QC	Quality Assurance and Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAC	Site Acceptance Criteria
SAQP	Sampling Analysis and Quality Plan
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WHS	Work Health Safety

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1.0 INTRODUCTION

1.1 General

DLA Environmental Services (DLA) was engaged by Upper Hunter Shire Council (the Client) to conduct annual and quarterly surface and groundwater monitoring of the following area:

Scone Waste Facility Area
Noblet Road, Scone NSW 2337 (the Site).

The Groundwater Monitoring Report provides an overview of the current condition of groundwater at the Site in relation to the Site Criteria and satisfies the groundwater monitoring requirements of the EPA Environmental Protection Licence 5863.

The report has been prepared utilising information obtained as part of the investigation process, from previous monitoring reports and from experience, knowledge, and current industry practice in the monitoring of similar sites. It is anticipated that quarterly monitoring will be undertaken in April, July and October with annual reporting undertaken in the January reporting period.

Quarterly groundwater monitoring was undertaken on Thursday 6th July 2017 by staff of DLA.

1.2 Scope of Works

The scope of work provided by Upper Hunter Shire Council indicates that annual and quarterly groundwater monitoring is required at the following groundwater sampling locations:

- MWA
- MWB
- MWC
- MWD (landfill leachate monitoring well): and,
- MWE

Refer to **Figure 3: Site Layout with Sample Locations**

2.0 MONITORING PARAMETERS

The following sample analysis parameters and monitoring frequency were provided by Upper Hunter Shire Council for the Groundwater Wells. Threshold Criteria are primarily sourced from Australian and New Zealand guidelines for fresh and marine water quality (ANZECC) 2000 95% trigger values and National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 2013.

Table 2a: Analytes, Threshold Criteria and Monitoring Frequency for Groundwater Monitoring Wells

Analytes	Units	Threshold Criteria NEPM	
		2013 and ANZECC 2000 Fresh Water 95%	Monitoring Frequency
Calcium	mg/L	NA	Quarterly
Alkalinity (total)	mg/L	NA	Quarterly
Chloride	mg/L	NA	Quarterly
Fluoride	mg/L	NA	Quarterly
Iron	mg/L	0.3 ^E	Quarterly
Magnesium	mg/L	NA	Quarterly
Manganese	mg/L	1.9 ^D	Quarterly
Organochlorine pesticides (OCP)	mg/L	0.00001 ^F	Quarterly
Potassium	mg/L	410 ^Q	Quarterly
pH	pH	6.5 – 8	Quarterly
Sodium	mg/L	NA	Quarterly
Ammonia	mg/L	0.9 ^D	Quarterly
Nitrate	mg/L	0.7	Quarterly
Sulfate	mg/L	NA	Quarterly
Total organic carbon	mg/L	4	Quarterly
Total phenolics	mg/L	0.32	Quarterly
Electrical conductivity (EC)	µS/cm	NA	Quarterly
Total dissolved solids	mg/L	NA	Yearly
Biochemical Oxygen Demand	mg/L	NA	Yearly
Phosphate	mg/L	0.015 ^G	Yearly
Arsenic III & V	mg/L	0.024 (III), 0.013 (V)	Yearly
Aluminium	mg/L	0.055 (pH > 6.5)	Yearly
Barium	mg/L	NA	Yearly
Cadmium	mg/L	0.0002	Yearly
Cobalt	mg/L	0.09 ^M	Yearly
Copper	mg/L	0.0014	Yearly
Chromium VI	mg/L	0.001 ^D	Yearly

Table 2a: Analytes, Threshold Criteria and Monitoring Frequency for Groundwater Monitoring Wells (continued)

Sampling Parameter	Units	Threshold Criteria NEPM	Monitoring Frequency
		2013 and ANZECC 2000 Fresh Water	
Chromium (total)	mg/L	0.001	Yearly
Lead	mg/L	0.0034	Yearly
Mercury	mg/L	0.0006	Yearly
Zinc	mg/L	0.008 ^D	Yearly
TPH	mg/L	0.6 ^I	Yearly
Benzene	mg/L	0.95	Yearly
Toluene	mg/L	0.18 ^L	Yearly
Ethylbenzene	mg/L	0.08 ^L	Yearly
CVCs/VOCCs:			
- Total	mg/L	NA	Yearly
- Tetrachlorethene (TCE)	mg/L	NA	Yearly
- 1,1,1-Trichloroethane (TCA)	mg/L	6500 (1,1,2 TCA)	Yearly
- Tetrachloroethene (PCE)	mg/L	0.05 ^N	Yearly
- 1,2-Dichloroethene	mg/L	0.03 ^P	Yearly
Vinyl Chloride	mg/L	0.0003 ^N	Yearly
PCBs	mg/L	0.00003 ^A	Yearly
PAHs	mg/L	0.016 ^B	Yearly
OPPs	mg/L	0.00002 ^C	Yearly

A - Trigger value for Aroclor 1254 used in absence of trigger value for total PCBs

B - Trigger value for Naphthalene used in absence of reliable trigger value for total PAHs

C - Trigger value of Azinphos methyl used in absence of reliable trigger value for total OPP

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

G - Filterable Reactive Phosphate

I - Dutch Intervention (2000) Mineral Oil Criteria

L – ANZECC 2000 Low reliability trigger value

M – ANZECC 2000 Moderate reliability trigger value

N - NEPM 2013 drinking water criteria

P - Australian Drinking Water Guidelines 2011

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

3.0 SAMPLING METHODOLOGY

3.1 Groundwater Sampling

Groundwater samples were collected from five well locations including MWA, MWB, MWC, MWD and MWE. Purging and sampling of monitoring wells was conducted in accordance with the NEPM (NEPC, 2013), the *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007) and the *Murray-Darling Basin Groundwater Quality Sampling Guidelines*.

Wells were purged with a low flow peristaltic pump or disposable bailer whilst being measured for physiochemical stability to indicate the flow of formation water. Physiochemical properties were measured at regular intervals following the purging of each equipment volume using a YSI Quatro Pro Plus Water Quality Meter and a flow through cell. Stable conditions were indicated by monitoring the following parameters for three consecutive readings of:

- PH \pm 0.1 unit;
- EC \pm 5%;
- Temp \pm 0.20;
- Redox \pm 10%; and,
- Dissolved Oxygen \pm 10%.

Samples were obtained using a low-flow peristaltic pump with disposable Low Density Polyethylene Tubing (LDPE) tubing / samples were obtained using a disposable bailer.

Groundwater samples were collected into laboratory prepared sample containers for specific analytes, i.e. into a combination of plastic unpreserved, plastic preserved, glass amber unpreserved and preserved glass vials. All samples were collected and filled into the respective sample containers so no head space remained in the sample container, with no loss of any preservation agents, where present. Groundwater samples for metals were lab filtered prior to testing. All samples were then placed immediately into a chilled esky to prevent the loss of potential volatile components.

Decontamination procedures between sampling events and sampling locations are outlined below.

Sampling equipment was cleaned prior to sampling and between sample locations to prevent cross contamination. The cleaning procedure included:

- Washing and brush scrub with phosphate free laboratory grade detergent;
- Rinsing with water of a potable quality;
- Rinsing with deionised water; and

- Disposable Teflon tubing was used with the low flow pump and was replaced between sample locations (Groundwater Sampling Only).

It is opinion of DLA that decontamination procedures were appropriate during groundwater sampling and that no cross contamination can be inferred.

4.0 RESULTS

All wells were sampled during the July 2017 sampling event, results are detailed below.

Refer to **Table 4a – Table 4e** for results. Refer to **Figure 3** for sampling locations.

Table 4a – Groundwater Results Comparison July 2017

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWA Oct 2016	MWA Jan 2017	MWA Apr 2017	MWA July 2017
Calcium	mg/L	NA	580	600	570	640
Alkalinity (total)	mg/L	NA		460	450	470
Chloride	mg/L	NA	7400	8200	7700	7900
Fluoride	mg/L	NA	0.15	ND	0.14	0.12
Iron	mg/L	0.3 ^E	ND	ND	ND	ND
Magnesium	mg/L	NA	1100	1200	1100	1200
Manganese	mg/L	1.9 ^D	0.02	0.004	0.006	0.007
OCP	mg/L	0.00001 ^F	ND	ND	ND	ND
Potassium	mg/L	410 ^Q	4.4	5.6	3.1	4.3
pH	pH	6.5 – 8	6.8	7.3	6.8	7.0
Sodium	mg/L	NA	2100	2100	2200	2200
Ammonia	mg/L	0.9 ^D	0.14	0.13	0.14	0.07
Nitrate	mg/L	0.7	0.50	0.13	0.24	0.24
Sulfate	mg/L	NA	37	38	39	42
Total Organic Carbon (TOC)	mg/L	4	6.2	3.9	6.4	8.0
Total phenolics	mg/L	0.32	0.22	0.02	0.16	ND
EC	µS/cm	NA	21000	19000	21000	21000

Samples highlighted in **Bold** exceed threshold criteria

ND = No Detection above Laboratory LOR

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

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

NA – Not Applicable

Table 4b – Groundwater Results Comparison July 2017

Sampling Parameter	Units	Threshold	MWB	MWB	MWB	MWB
		Criteria (mg/L)	Oct 2016	Jan 2017	Apr 2017	July 2017
Calcium	mg/L	NA	600	590	580	640
Alkalinity (total)	mg/L	NA	360	380	360	390
Chloride	mg/L	NA	6000	6300	6000	6000
Fluoride	mg/L	NA	0.22	ND	0.27	0.26
Iron	mg/L	0.3 ^E	0.006	ND	ND	ND
Magnesium	mg/L	NA	830	850	760	820
Manganese	mg/L	1.9 ^D	0.008	ND	0.009	0.01
OCP	mg/L	0.00001 ^F	ND	ND	ND	ND
Potassium	mg/L	410 ^Q	3.6	5	2.8	4.0
pH	pH	6.5 – 8	6.9	7.2	6.6	7.0
Sodium	mg/L	NA	1800	1700	1700	1800
Ammonia	mg/L	0.9 ^D	0.09	0.10	0.09	0.21
Nitrate	mg/L	0.7	1.1	0.59	0.71	0.83
Sulfate	mg/L	NA	69	70	77	75
Total Organic Carbon (TOC)	mg/L	4	6.6	5	6.8	8.2
Total phenolics	mg/L	0.32	0.14	0.04	0.02	ND
EC	µS/c	NA	17000	16000	17000	16000

Samples highlighted in **Bold** exceed threshold criteria

ND = No Detection above Laboratory LOR

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

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

NA – Not Applicable

Table 4c – Groundwater Results Comparison July 2017

Sampling Parameter	Units	Threshold	MWC	MWC	MWC	MWC
		Criteria (mg/L)	Oct 2016	Jan 2017	April 2017	July 2017
Calcium	mg/L	NA	67	44	34	26
Alkalinity (total)	mg/L	NA	630	830	670	640
Chloride	mg/L	NA	770	880	520	370
Fluoride	mg/L	NA	0.34	0.13	0.44	0.46
Iron	mg/L	0.3 ^E	ND	ND	ND	0.008
Magnesium	mg/L	NA	120	89	68	52
Manganese	mg/L	1.9 ^D	5.6	7.8	7.3	4.600
OCP	mg/L	0.00001 ^F	ND	ND	ND	ND
Potassium	mg/L	410 ^Q	1.1	2	0.9	0.8
pH	pH	6.5 – 8	7.1	7.6	7.1	7.2
Sodium	mg/L	NA	620	510	540	430
Ammonia	mg/L	0.9 ^D	0.04	0.12	0.06	0.33
Nitrate	mg/L	0.7	ND	ND	ND	0.005
Sulfate	mg/L	NA	180	200	120	90
Total Organic Carbon (TOC)	mg/L	4	24	21	23	23
Total phenolics	mg/L	0.32	ND	ND	ND	ND
EC	µS/c	NA	3900	4200	2900	2400

Samples highlighted in **Bold** exceed threshold criteria

ND = No Detection above Laboratory LOR

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

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

NA – Not Applicable

Table 4d – Groundwater Results Comparison July 2017

Sampling Parameter	Units	Threshold	MWD	MWD	MWD	MWD
		Criteria (mg/L)	(leachate) Oct 2016	(leachate) Jan 2017	(leachate) April 2017	(leachate) July 2017
Calcium	mg/L	NA	210	260	260	150
Alkalinity (total)	mg/L	NA	1600	2300	1500	2500
Chloride	mg/L	NA	1600	2800	2200	2800
Fluoride	mg/L	NA	0.27	ND	0.28	0.35
Iron	mg/L	0.3 ^E	1.2	1.1	0.920	1.6
Magnesium	mg/L	NA	150	230	190	230
Manganese	mg/L	1.9 ^D	0.6	0.850	0.780	0.42
OCP	mg/L	0.00001 ^F	ND	ND	ND	ND
Potassium	mg/L	410 ^Q	140	210	130	180
pH	pH	6.5 – 8	7.3	7.5	7.3	7.5
Sodium	mg/L	NA	1000	1400	1200	1700
Ammonia	mg/L	0.9 ^D	150	250	210	310
Nitrate	mg/L	0.7	ND	ND	ND	ND
Sulfate	mg/L	NA	110	330	310	100
Total Organic Carbon (TOC)	mg/L	4	200	270	150	320
Total phenolics	mg/L	0.32	0.07	0.04	0.19	0.05
EC	µS/c	NA	7800	11000	9400	12000

Samples highlighted in **Bold** exceed threshold criteria

ND = No Detection above Laboratory LOR

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

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

NA – Not Applicable

As MWD is within the perched landfill leachate water table, the Threshold Criteria are only applicable as indicators of general water quality for comparison to the wells surrounding the landfill. Exceedances of the Threshold Criteria for MWD are expected and do not indicate contamination is leaving the site.

Table 4e – Groundwater Results Comparison July 2017

Sampling Parameter	Units	Threshold Criteria (mg/L)	MWE	MWE	MWE	MWE
			Oct 2016	Jan 2017	April 2017	July 2017
Calcium	mg/L	NA	61	70	34	60
Alkalinity (total)	mg/L	NA	900	1100	1100	1200
Chloride	mg/L	NA	560	580	360	340
Fluoride	mg/L	NA	0.41	0.18	0.52	0.5
Iron	mg/L	0.3 ^E	0.012	0.021	0.006	0.077
Magnesium	mg/L	NA	67	76	67	65
Manganese	mg/L	1.9 ^D	0.110	0.27	7.3	0.14
OCP	mg/L	0.00001 ^F	ND	ND	ND	ND
Potassium	mg/L	410 ^Q	1.3	1.8	0.9	1.5
pH	pH	6.5 – 8	7.3	7.8	7.3	7.5
Sodium	mg/L	NA	650	610	530	570
Ammonia	mg/L	0.9 ^D	0.04	0.04	0.07	0.1
Nitrate	mg/L	0.7	ND	ND	ND	ND
Sulfate	mg/L	NA	120	130	110	99
Total Organic Carbon (TOC)	mg/L	4	16	13	20	26
Total phenolics	mg/L	0.32	0.01	ND	ND	ND
EC	µS/c	NA	3600	3500	3200	3100

Samples highlighted in **Bold** exceed threshold criteria

ND = No Detection above Laboratory LOR

D – Trigger value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance

E - Interim working level, in absence of reliable trigger value

F - Trigger value for DDT used in absence of trigger value for total OCP

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

NA – Not Applicable

5.0 DISCUSSION

Due to the sites topography, the inferred hydraulic gradient is generally to the west. Wells MWA, MWB and MWC are located down-hydraulic gradient of the landfill. Well MWE is considered to be up-hydraulic gradient of the landfill. Well MWD is located within the perched landfill water table, being the leachate within the landfill.

The water sampled from well MWD is landfill leachate and as such the Threshold Criteria is not used as a comparison, only as an indicator of current conditions. MWD is to be used as a general indicator of water quality within the landfill for comparison to the external monitoring wells.

The following is a summary of the results of the July 2017 sampling event in relation to the Threshold Criteria. The following exceedances of the Threshold Criteria occurred.

- Nitrate in MWB exceeded the Threshold Criteria (0.7 mg/L) with a concentration of 0.83 mg/L. This is the lowest exceedance observed in this well over the past 12 months. Exceedances of nitrate have been consistent in MWB since October 2016. There was no detection for Nitrate in MWD the leachate well, giving no indication that the Nitrate in the affected wells is sourced from the landfill. The Nitrate may be migrating onto the site from the farmland to the north through the local ground water;
- Iron in MWD exceeded the Threshold Criteria (0.3mg/L) with a concentration of 1.6mg/L. This is the highest concentration reported since July 2016. Exceedances of iron have been reported in this monitoring well for the past four sampling events;
- Ammonia in MWD exceeded the Threshold Criteria (0.9mg/L) with a concentration of 310mg/L. This concentration had increased in comparison to the past three sampling events, April 2017 (210 mg/L), January 2017 (250 mg/L) and October 2016 (150 mg/L). Exceedances of ammonia are common for MWD and have been reported in all past sampling events; and
- Exceedances of the Threshold Criteria (4 mg/L) for TOC occurred in all wells MWA, MWB, MWC, MWD and MWE. MWA exceeded the Threshold Criteria with a TOC reading of 8.0 mg/L, increasing from the April 2017 reading of 6.4 mg/L. MWB increased to 0.83 mg/L from the April 2017 sampling event of 0.71 mg/L. MWC has exceeded the Threshold criteria (4 mg/L) consistently since October 2015 with the reading being 23 mg/L. MWE has exceeded the Threshold criteria consistently since October 2015 and has increased slightly from 20 mg/L in the April sample event to 26 mg/L in the July 2017 sampling event. The Threshold Criteria used for TOC is intended for drinking water, not groundwater. Due to the magnitude

of the exceedances and the intention of the Threshold Criteria used, these exceedances are regarded as minor. The TOC concentration in MWE indicates that TOC is likely to be elevated in the local groundwater.

The following changes and detections occurred in the landfill leachate well MWD;

- Ammonia concentration has increased to 310 mg/L from the April 2017 concentration of 210 mg/L. Concentrations of ammonia in MWD have consistently been substantially higher than in the surrounding wells;
- Iron concentration has increased to 1.6 mg/L in July 2017 from 0.92 in April 2017; and
- TOC concentration has increased to 320 mg/L from the April 2017 sampling event (150 mg/L).

All other analytes in all other wells reported detections which were within the Threshold Criteria.

Refer to **Attachment 3** – Data Log.

The data will be viewed on a trending basis as more results become available.

6.0 CONCLUSIONS

The results of laboratory analysis of the samples collected from the Scone Waste Landfill during the July 2017 quarterly sampling event confirmed several exceedances of the Threshold Criteria in the wells external to the landfill. The Threshold Criteria are sourced from the ANZECC 2000 Guidelines for Fresh Water 95% level of protection, NEPM 2013 and Australian Drinking Water Guidelines 2011.

The following analytes exceeded the Threshold Criteria during the July 2017 sampling event; nitrate in MWB, iron in MWD, ammonia in MWD and TOC in MWA, MWB, MWC and MWE. There were no other exceedances of the Threshold Criteria in the wells surrounding the landfill.

Some exceedances have been explained by local conditions or regarded as minor due to the criteria being Australian Drinking Water Guidelines. Trending of these analytes over time may indicate a seasonal fluctuation of regional groundwater conditions. All remaining exceedances are in MWD which is the leachate monitoring well. Exceeding concentrations in MWD are substantially higher than other wells, this indicates that it is unlikely that releases of landfill leachate into the local groundwater are occurring.

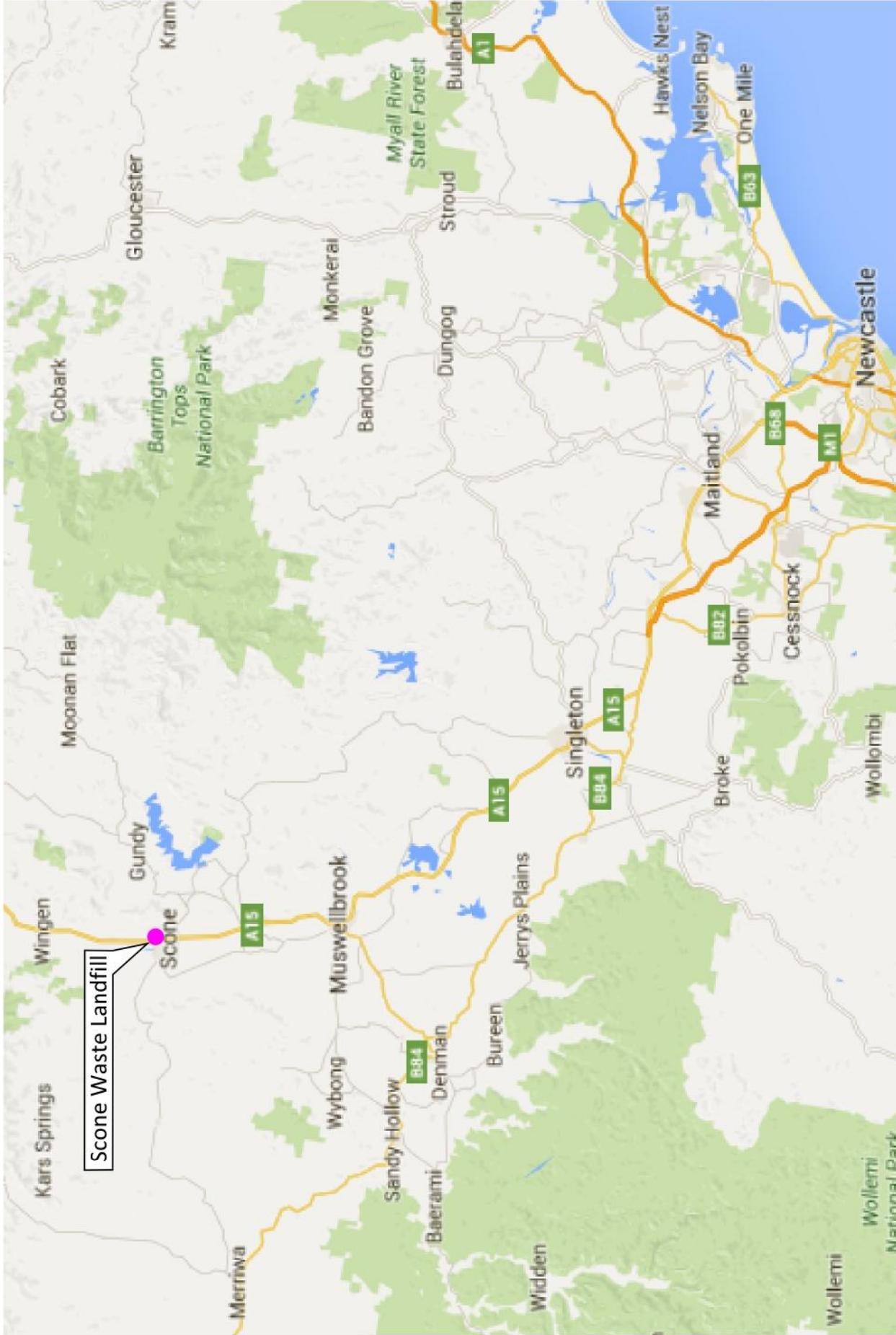
The elevated concentrations of nitrate, iron, ammonia and TOC in the monitoring wells external to the landfill do not necessarily indicate the concentrations are due to the landfill leachate, future testing and trending of data will allow for appropriate comparisons. Further monitoring may reveal the source and extent of elevated concentrations of particular analytes. As more data becomes available, it will become clearer which analytes are consistently elevated and may allow for determining the source of contamination.

The next water sampling event will be the annual monitoring which will be undertaken in October 2017.

7.0 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* (ANZECC, 2000);
- *Australian Drinking Water Guidelines, National Water Quality Management Strategy 2011*;
- Chapman, G A, Murphy, C L, Tille, P J, Atkinson, G and Morse, R J, *Sydney Soil Landscapes Map, Series 9130* (1989);
- *Contaminated Land Management Act 1997* (NSW);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA 2011);
- *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 Sites: Sampling Design Guidelines* (NSW EPA 1995);
- *Environmental Guidelines: Solid Waste Landfills* (NSW EPA, 1996);
- *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 1998b);
- *National Environment Protection (Assessment of Site Contamination) Measure (No.1)* (NEPC, 2013);
- *Storage and Handling of Dangerous Goods Code of Practice 2005*;
- Pacific Southwest, Region 9 Regional Screening Levels (US EPA, 2014);
- *Work Health and Safety Act 2011* (NSW) and associated regulations.
- R.W. Young *and others*, Ferruginous weathering under cool temperate climates during the Late Pleistocene in southeastern Australia, *Zeitschrift fur Geomorphologie*, 38(1), 1994,
- *Quality Criteria for Water*, U.S. Environmental Protection Agency, July 1976.
- *Potassium in Drinking-water Background document for development of WHO Guidelines for Drinking-water Quality*, World Health Organization, 2009
- *Ambient Water Quality Guidelines for Organic Carbon*, Ministry of Environment, Lands and Parks, British Columbia, Canada 2001

FIGURE 1 – SITE LOCATION REGIONAL



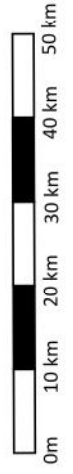
Scone Waste Landfill

Legend

● Site location - Noblet Rd, Scone



Approximate Scale



Title
Site location regional

Client
Upper Hunter Shire Council

Project No.
DLH1186

Scale
As Shown

Figure No.
1

Compiled
BF

Date
3/11/2015

Revision
R01



Sydney Office
Phone (02) 9476 1765
Fax (02) 9476 1557

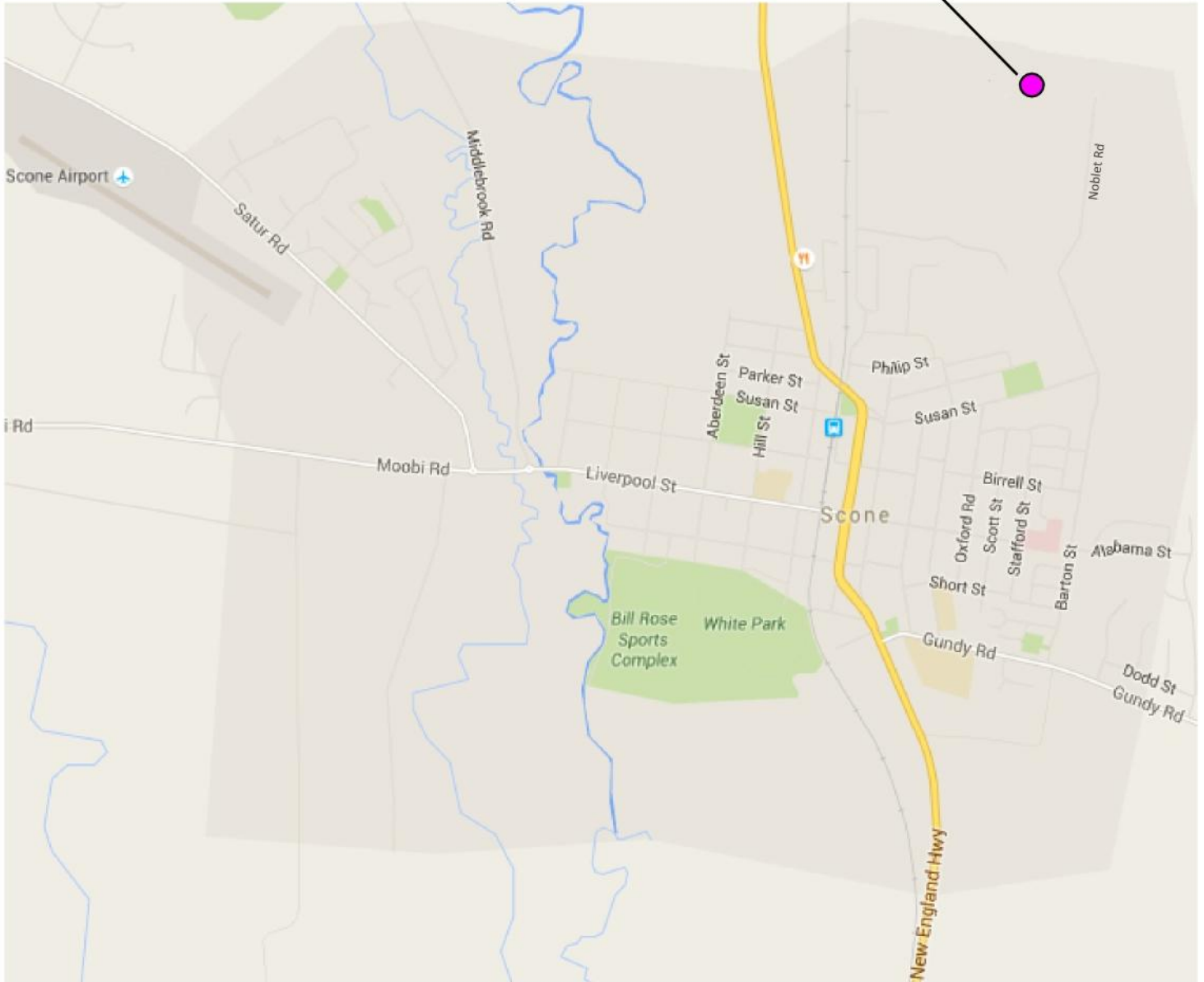
Maitland Office
Phone (02) 4933 0001

FIGURE 2 – SITE LOCATION LOCAL

N



Scone Waste Landfill



Legend

● Site Location - Noblet Rd, Scone

Approximate Scale



Sydney Office Phone (02) 9476 1765 Fax (02) 9476 1557
Maitland Office Phone (02) 4933 0001

Title Site location local

Client Upper Hunter Shire Council	Figure No 2	Date 3/11/2015
Project No. DLH1186	Scale As Shown	Compiled BF
		Revision R01

FIGURE 3 - SITE LAYOUT WITH SAMPLE LOCATIONS



Legend

● Groundwater well location



Approximate Scale
 0m 50m 100m



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 Maitland Office Phone (02) 4933 0001

Title Site layout with sample locations			
Client Upper Hunter Shire Council	Project No. DLH1186	Figure No 3	Date 16/10/2015
	Scale As Shown	Compiled BF	Revision R01

ATTACHMENT 1 – NATA CERTIFIED ANALYTICAL RESULTS



CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499


Email: au.samplereceipt.sydney@sgs.com

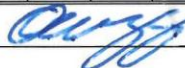

Company Name: DLA Environmental Services
Address: 42B Church Street Maitland NSW 2320

Contact Name: Stephen Challinor

Project Name/No: DLH1186
Purchase Order No: _____
Results Required By: _____
Telephone: 0422055544
Facsimile: _____

Email Results: hunter@dlaenvironmental.com.au & Stephen.challinor@dlaenvironmental.com.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	WQ3	fluoride	Chloride	Iron	manganese	organochlorine pesticides	ammonia	nitrate	TOC	total phenolics	Comments
MWA	6/7/17	1	X			5	X	X	X	X	X	X	X	X	X	X	<div style="text-align: left;"> <p>SGS EHS Alexandria Laboratory</p>  <p>SE167897 COC</p> <p>Received: 12-Jul-2017</p> </div> <p style="text-align: right; margin-top: 20px;">Leachate</p>
MWB	6/7/17	2	X			5	X	X	X	X	X	X	X	X	X	X	
MWC	6/7/17	3	X			5	X	X	X	X	X	X	X	X	X	X	
MWD	6/7/17	4	X			5	X	X	X	X	X	X	X	X	X	X	
MWE	6/7/17	5	X			5	X	X	X	X	X	X	X	X	X	X	

Relinquished By: Kath Skeen	Date/Time: 7/7/17	Received By: 	Date/Time: 12/7/17 @ 11:10
Relinquished By: Thomas Seneno 	Date/Time: 11/07/2017 2PM	Received By:	Date/Time:
Samples Intact: <u>Yes</u> / No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes / No	Laboratory Quotation No:
Comments: metals not field filtered			

CLIENT DETAILS

LABORATORY DETAILS

Contact Stephen Challinor
 Client DLA ENVIRONMENTAL SERVICES PTY LTD
 Address 42b Church St
 Maitland
 NSW 2320

Telephone 61 2 4933 0001
 Facsimile 61 2 98700999
 Email stephen.challinor@dlaenvironmental.com.au

Project **DLH1186**
 Order Number (Not specified)
 Samples 5

Manager Huong Crawford
 Laboratory SGS Alexandria Environmental
 Address Unit 16, 33 Maddox St
 Alexandria NSW 2015

Telephone +61 2 8594 0400
 Facsimile +61 2 8594 0499
 Email au.environmental.sydney@sgs.com

SGS Reference **SE167897 R0**
 Date Received 12/7/2017
 Date Reported 18/7/2017

COMMENTS

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

Ion Chromatography - The Limit of Reporting (LOR) has been raised for Nitrate-Nitrogen due to high conductivity of the sample requiring dilution.

SIGNATORIES



Bennet Lo
 Senior Organic Chemist/Metals Chemist



Dong Liang
 Metals/Inorganics Team Leader



Kamrul Ahsan
 Senior Chemist



Ly Kim Ha
 Organic Section Head

OC Pesticides in Water [AN420] Tested: 13/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER	WATER	WATER	WATER	WATER
			6/7/2017 SE167897.001	6/7/2017 SE167897.002	6/7/2017 SE167897.003	6/7/2017 SE167897.004	6/7/2017 SE167897.005
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Total Phenolics in Water [AN289] Tested: 13/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Total Phenols	mg/L	0.01	<0.01	<0.01	<0.01	0.05	<0.01

Forms of Carbon [AN190] Tested: 13/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Total Organic Carbon as NPOC	mg/L	0.2	8.0	8.2	23	320	26

Ammonia Nitrogen by Discrete Analyser (Aquakem) [AN291] Tested: 13/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Ammonia Nitrogen, NH ₃ as N	mg/L	0.01	0.07	0.21	0.33	310	0.10

Anions by Ion Chromatography in Water [AN245] Tested: 13/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Fluoride	mg/L	0.1	0.12	0.26	0.46	0.35	0.50
Chloride	mg/L	1	7900	6000	370	2800	340
Nitrate Nitrogen, NO3-N	mg/L	0.005	0.24	0.83	0.005	<0.050 †	<0.025 †
Sulfate, SO4	mg/L	1	42	75	90	100	99

pH in water [AN101/MA1490(Melb)] Tested: 12/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
pH**	No unit	-	7.0	7.0	7.2	7.5	7.5

Conductivity and TDS by Calculation - Water [AN106/MA1489(Melb)] Tested: 12/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Conductivity @ 25 C	µS/cm	2	21000	16000	2400	12000	3100
Total Dissolved Solids (by calculation)	mg/L	2	13000	9500	1400	7300	1900

Alkalinity [AN135/MA1127(Melb)] Tested: 12/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	470	390	640	2500	1200
Carbonate Alkalinity as CaCO ₃	mg/L	1	<1	<1	<1	<1	<1
Hydroxide Alkalinity as CaCO ₃	mg/L	5	<5	<5	<5	<5	<5
Phenolphthalein Alkalinity as CaCO ₃ *	mg/L	5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	5	470	390	640	2500	1200

Acidity and Free CO2 [AN140] Tested: 17/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Acidity to pH 8.3	mg CaCO3/L	5	200	160	88	380	91

Metals in Water (Dissolved) by ICPOES [AN320/AN321] Tested: 17/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER	WATER	WATER	WATER	WATER
			6/7/2017 SE167897.001	6/7/2017 SE167897.002	6/7/2017 SE167897.003	6/7/2017 SE167897.004	6/7/2017 SE167897.005
Calcium, Ca	mg/L	0.1	640	640	26	150	60
Magnesium, Mg	mg/L	0.1	1200	820	52	230	65
Sodium, Na	mg/L	0.1	2200	1800	430	1700	570
Potassium, K	mg/L	0.2	4.3	4.0	0.8	180	1.5

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 17/7/2017

PARAMETER	UOM	LOR	MWA	MWB	MWC	MWD	MWE
			WATER - 6/7/2017 SE167897.001	WATER - 6/7/2017 SE167897.002	WATER - 6/7/2017 SE167897.003	WATER - 6/7/2017 SE167897.004	WATER - 6/7/2017 SE167897.005
Iron, Fe	µg/L	5	<5	<5	8	1600	77
Manganese, Mn	µg/L	1	7	10	4600	420	140

METHOD

METHODOLOGY SUMMARY

- AN020** Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
- AN101/MA1490(Melb)** pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
- AN106/MA1489(Melb)** Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
- AN135/MA1127(Melb)** Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
- AN140** Acidity by Titration: The water sample is titrated with sodium hydroxide to designated pH end point. In a sample containing only carbon dioxide, bicarbonates and carbonates, titration to pH 8.3 at 25°C corresponds to stoichiometric neutralisation of carbonic acid to bicarbonate. Method reference APHA 2310 B.
- AN190** TOC and DOC in Water: A homogenised micro portion of sample is injected into a heated reaction chamber packed with an oxidative catalyst that converts organic carbon to carbon dioxide. The CO₂ is measured using a non-dispersive infrared detector. The process is fully automated in a commercially available analyser. If required a sugar value can be calculated from the TOC result. Reference APHA 5310 B.
- AN190** Chemical oxygen demand can be calculated/estimated based on the O₂/C relation as 2.67*NPOC (TOC). This is an estimate only and the factor will vary with sample matrix so results should be interpreted with caution.
- AN245** Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO₂, NO₃ and SO₄ are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
- AN289** Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
- AN291** Ammonia in solution reacts with hypochlorite ions from Sodium Dichloroisocyanate, and salicylate in the presence of Sodium Nitroprusside to form indophenol blue and measured at 670 nm by Discrete Analyser.
- AN318** Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
- AN320/AN321** Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
- AN320/AN321** Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
- AN420** SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
- Calculation** Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported . APHA4500CO₂ D.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
		IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

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

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : <http://www.sgs.com.au/~media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

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ATTACHMENT 2 – YSI WATER QUALITY METER CALIBRATION CERTIFICATE

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 12C101137



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
	Display		
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		293215	pH 10.01
1. pH 7.00		pH 7.00		290453	pH 6.97
2. pH 4.00		pH 4.00		288994	pH 3.88
3. mV		229.6mV		OB1388/OB1390	230.0mV
4. EC		2.76mS		292380	2.76mS
5. D.O		0.00ppm		4347	0.00ppm
6. Temp		22.0°C		MultiTherm	21.9°C

Calibrated by:

Sophie Boler

Calibration date:

4/07/2017

Next calibration due:

3/08/2017

ATTACHMENT 3 – DATA LOG



Monitoring Well	Chemical Report	Date Sampled	Comment	Calcium	Alkalinity	Chloride	Fluoride	Iron	Magnesium	Manganese	Organochlorine pesticides [OCP]	Potassium	pH	Sodium	Ammonia	Nitrate	Sulfate	Total organic carbon	Total phenolics	Electrical conductivity [EC]	Total dissolved solids	Biochemical oxygen demand	Phosphate	Arsenic III & V	Aluminium	Barium	Cadmium	Cobalt	Copper	Chromium VI	Chromium (total)	Lead	Mercury	Zinc	TPH	Benzene	Toluene	Ethylbenzene	total	Tetrachlorethene [TCE]	1,1,1-Trichloroethane [TCA]	Tetrachloroethene [PCE]	1,2-Dichloroethene	Vinyl Chloride	PCBs	PAHs	OPPs			
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
				Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly				
MWC	135493	6/10/2015		62	730	690	0.4	ND	130	2.2	ND	0.6	7.1	670	ND	0.17	350	18	ND	3900	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	
MWC	SE148082	14/01/2016		56	750	630	0.34	ND	110	4.9	ND	0.9	7.2	590	0.12	ND	300	21	ND	4300	2400	ND	0.19	0.003	ND	0.047	ND	0.011	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWC	144481	7/04/2016		290	660	3700	0.3	0.038	420	3.1	ND	1.4	7.2	1900	ND	4.9	220	9	ND	9600	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	
MWC	SE154534	6/07/2016		55	730	610	0.24	0.006	93	5.4	ND	1.0	7.4	580	0.05	0.15	220	24	ND	3300	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	
MWC	SE157865	6/10/2016		67	630	770	0.34	ND	120	5.6	ND	1.1	7.1	620	0.04	ND	180	24	ND	3900	2400	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	
MWC	SE160904	12/01/2017		44	830	880	0.13	ND	89	7.8	ND	2	7.6	510	0.12	ND	200	21	ND	4200	2400	ND	0.017	NA	0.006	0.05	ND	0.013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWC	SE164082	6/4/2017		34	670	520	0.44	ND	68	7.3	ND	0.9	7.1	540	0.06	ND	120	23	ND	2900	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	
MWC	SE167897	6/7/2017		26	640	370	0.46	0.008	52	4.6	ND	0.8	7.2	430	0.33	0.01	90	23	ND	2400	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		

CVCs/VOCCs



Monitoring Well	Chemical Report	Date Sampled	Comment	Monitoring frequency	Analytes	Units	Threshold Criteria
MWD 135493	6/10/2015	leachate	150	Quarterly	Calcium	mg/L	-
MWD SE148082	14/01/2016	leachate	170	Quarterly	Alkalinity	mg/L	-
MWD 144481	7/04/2016	leachate	160	Quarterly	Chloride	mg/L	-
MWD SE154534	6/07/2016	leachate	250	Quarterly	Fluoride	mg/L	-
MWD SE157866	6/10/2016	leachate	210	Quarterly	Iron	mg/L	0.3
MWD SE160904	12/03/2017	leachate	260	Quarterly	Magnesium	mg/L	-
MWD SE164082	6/4/2017	leachate	260	Quarterly	Manganese	mg/L	1.9
MWD SE167897	6/7/2017	leachate	150	Quarterly	Organochlorine pesticides (OCP)	mg/L	0.00001
			170	Quarterly	Potassium	mg/L	-
			7.6	Quarterly	pH	pH	6.5-8
			1700	Quarterly	Sodium	mg/L	-
			310	Quarterly	Ammonia	mg/L	0.9
			ND	Quarterly	Nitrate	mg/L	0.7
			66	Quarterly	Sulfate	mg/L	-
			330	Quarterly	Total organic carbon	mg/L	4
			ND	Quarterly	Total phenolics	mg/L	0.32
			11000	Quarterly	Electrical conductivity (EC)	µS/cm	-
			N/A	Yearly	Total dissolved solids	mg/L	-
			N/A	Yearly	Biochemical oxygen demand	mg/L	-
			N/A	Yearly	Phosphate	mg/L	0.015
			N/A	Yearly	Arsenic III & V	mg/L	0.024 (III) 0.013 (V)
			N/A	Yearly	Aluminium	mg/L	0.055 (pH> 6.5)
			N/A	Yearly	Barium	mg/L	-
			N/A	Yearly	Cadmium	mg/L	0.0002
			N/A	Yearly	Cobalt	mg/L	0.09
			N/A	Yearly	Copper	mg/L	0.0014
			N/A	Yearly	Chromium VI	mg/L	0.001
			N/A	Yearly	Chromium (total)	mg/L	-
			N/A	Yearly	Lead	mg/L	0.0034
			N/A	Yearly	Mercury	mg/L	0.0006
			N/A	Yearly	Zinc	mg/L	0.008
			N/A	Yearly	TPH	mg/L	0.26
			N/A	Yearly	Benzene	mg/L	0.95
			N/A	Yearly	Toluene	mg/L	0.18
			N/A	Yearly	Ethylbenzene	mg/L	0.08
			N/A	Yearly	total	mg/L	-
			N/A	Yearly	Tetrachloroethene (TCE)	mg/L	-
			N/A	Yearly	1,1,1-Trichloroethane (TCA)	mg/L	6500
			N/A	Yearly	Tetrachloroethene (PCE)	mg/L	0.05
			N/A	Yearly	1,2-Dichloroethane	mg/L	0.03
			N/A	Yearly	Vinyl Chloride	mg/L	0.0003
			N/A	Yearly	PCBs	mg/L	0.00003
			N/A	Yearly	PAHs	mg/L	0.016
			N/A	Yearly	OPPs	mg/L	0.00002

CVCs/VOCCs

*As MWD is within the perched landfill leachate water table, the Threshold Criteria are only applicable as indicators of general water quality for comparison to the wells surrounding the landfill. Exceedances of the Threshold Criteria for MWD are expected and do not indicate contamination is leaving the site.



Monitoring Well	Chemical Report	Date Sampled	Comment	Monitoring frequency	Analytes	Units	Threshold Criteria
MWE 135493	6/10/2015			Quarterly	Calcium	mg/L	-
MWE SE148082	14/01/2016			Quarterly	Alkalinity	mg/L	-
MWE 144481	7/04/2016			Quarterly	Chloride	mg/L	-
MWE SE154534	6/07/2016			Quarterly	Fluoride	mg/L	0.3
MWE SE157867	6/10/2016			Quarterly	Iron	mg/L	-
MWE SE160904	12/01/2017			Quarterly	Magnesium	mg/L	1.9
MWE SE164082	6/4/2017			Quarterly	Manganese	mg/L	0.00001
MWE SE167897	6/7/2017			Quarterly	Organochlorine pesticides (OCP)	mg/L	-
				Quarterly	Potassium	mg/L	6.5-8
				Quarterly	pH	pH	-
				Quarterly	Sodium	mg/L	0.9
				Quarterly	Ammonia	mg/L	0.7
				Quarterly	Nitrate	mg/L	-
				Quarterly	Sulfate	mg/L	4
				Quarterly	Total organic carbon	mg/L	0.32
				Quarterly	Total phenolics	mg/L	-
				Quarterly	Electrical conductivity	µS/cm	-
				Yearly	Total dissolved solids	mg/L	-
				Yearly	Biochemical oxygen demand	mg/L	0.015
				Yearly	Phosphate	mg/L	-
				Yearly	Arsenic III & V	mg/L	0.024 (III) 0.013 (V)
				Yearly	Aluminium	mg/L	0.055 (pH>6.5)
				Yearly	Barium	mg/L	-
				Yearly	Cadmium	mg/L	0.0002
				Yearly	Cobalt	mg/L	0.09
				Yearly	Copper	mg/L	0.0014
				Yearly	Chromium VI	mg/L	0.001
				Yearly	Chromium (total)	mg/L	-
				Yearly	Lead	mg/L	0.0034
				Yearly	Mercury	mg/L	0.0006
				Yearly	Zinc	mg/L	0.008
				Yearly	TPH	mg/L	0.26
				Yearly	Benzene	mg/L	0.95
				Yearly	Toluene	mg/L	0.18
				Yearly	Ethylbenzene	mg/L	0.08
				Yearly	total	mg/L	-
				Yearly	Tetrachloroethene (PCE)	mg/L	-
				Yearly	1,1,1-Trichloroethane (TCA)	mg/L	6500
				Yearly	Tetrachloroethene (PCE)	mg/L	0.05
				Yearly	1,2-Dichloroethene	mg/L	0.03
				Yearly	Vinyl Chloride	mg/L	0.0003
				Yearly	PCBs	mg/L	0.00003
				Yearly	PAHs	mg/L	0.016
				Yearly	OPPs	mg/L	0.00002

CVCs/VOCCs

ATTACHMENT 4 – GROUNDWATER FIELD DATA SHEETS

GROUNDWATER FIELD DATA SHEET

DLA Project Code: DLH1187 1186 <i>waste</i>	Sample ID: MWA
Project: M.t Vincent rd Waste Facility <i>SCOPIE</i>	Well Collar RL:
Client: CSR Maitland City Council <i>UHSC</i>	Sampler(s): <i>KS</i>
Address: M.t Vincent rd, East Maitland <i>Noblet rd</i>	Signature: <i>[Signature]</i>
BH ID: <i>Stone</i>	Date: <i>6/7/17</i>

Well Status

Monument damaged: YES <input checked="" type="radio"/> NO <input checked="" type="radio"/> N/A	Well ID visible: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A
Locked well casing: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A	Cap on PVC casing: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A
Cement footing damaged: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A	Water in monument casing: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A
Standing water, vegetation around monument: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A	Internal obstruction in casing: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A
Well Damaged: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A	Odours from groundwater: YES <input checked="" type="radio"/> NO <input type="radio"/> N/A
Nearby works:	
Comments: <i>rusting of monument</i>	
Casing above ground: <i>1</i> m agl	Weather Conditions:
Standing water level: <i>5.95</i> m bgl	Temperature 15-20 <input type="checkbox"/> 20-25 <input checked="" type="checkbox"/>
Total well depth: <i>15.7</i> m bgl	25-30 <input type="checkbox"/> >30 <input type="checkbox"/>
Initial well volume: <i>30.77</i> L	Clear <input checked="" type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/>
Water level after purging: <i>14.17</i> m bgl	Calm <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Moderate breeze <input type="checkbox"/>
Volume of water purged: <i>3</i> L	Windy <input type="checkbox"/>
Water level at time of sampling: <i>14.17</i> m bgl	Fine <input checked="" type="checkbox"/> Showers <input type="checkbox"/> Rain <input type="checkbox"/>
Well purged dry: YES <input checked="" type="radio"/> NO <input type="radio"/>	
Purging equipment: <i>Bailer</i>	
Sample equipment: <i>"</i>	

Note: 50mm internal diameter pipe = 1.96 L/m. All measurements below well collar

Water Quality Details:

Time am / pm	DO (mg/L ⁻³)	EC (µS cm ⁻²)	pH	Redox (mV)	Temp (°C)	Salinity (% Refract)	Comments
17:57	<i>1.76 ppm</i> <i>21.4 %</i>	<i>12057</i>	<i>6.89</i>	<i>105.4</i>	<i>22.2</i>	<i>7.91</i>	
1:00	<i>1.33</i> <i>16.1 %</i>	<i>14270</i>	<i>6.60</i>	<i>106.0</i>	<i>20.9</i>	<i>7.07</i>	
1:53	-	<i>14877</i>	<i>6.56</i>	<i>105.4</i>	<i>20.2</i>	<i>9.45</i>	

Additional Comments:

clear, no odour

GROUNDWATER FIELD DATA SHEET

DLA Project Code: DLH1257 1186	Sample ID: MWB
Project: M.t.Vincent rd Waste Facility Scone Council	Well Collar RL:
Client: CSR Maitland City Council WABC	Sampler(s): K.S
Address: M.t.Vincent rd, East Maitland North rd	Signature: <i>[Signature]</i>
BH ID: Scone	Date: 6/7/17

Well Status

Monument damaged:	YES / <input checked="" type="radio"/> NO / N/A	Well ID visible:	<input checked="" type="radio"/> YES / NO / N/A
Locked well casing:	YES / <input checked="" type="radio"/> NO / N/A	Cap on PVC casing:	<input checked="" type="radio"/> YES / NO / N/A
Cement footing damaged:	<input checked="" type="radio"/> YES / <input checked="" type="radio"/> NO / N/A	Water in monument casing:	YES / NO / N/A
Standing water, vegetation around monument:	YES / <input checked="" type="radio"/> NO / N/A	Internal obstruction in casing:	YES / NO / N/A
Well Damaged:	YES / <input checked="" type="radio"/> NO / N/A	Odours from groundwater:	YES / NO / N/A
Nearby works:		
Comments:	Monument rusted, top found on ground Cement cracked		
Casing above ground: 15m	m agl	Weather Conditions:	
Standing water level: 6.22	m bgl	Temperature 15-20 <input type="checkbox"/> 20-25 <input checked="" type="checkbox"/>	
Total well depth: 16.00	m bgl	25-30 <input type="checkbox"/> >30 <input type="checkbox"/>	
Initial well volume: 31.36	L	Clear <input checked="" type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/>	
Water level after purging: 14.47	m bgl	Calm <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Moderate breeze <input type="checkbox"/>	
Volume of water purged: 3	L	Windy <input type="checkbox"/>	
Water level at time of sampling: 14.47	m bgl	Fine <input checked="" type="checkbox"/> Showers <input type="checkbox"/> Rain <input type="checkbox"/>	
Well purged dry:	YES / <input checked="" type="radio"/> NO		
Purging equipment: bailer			
Sample equipment: bailer			

Note: 50mm internal diameter pipe = 1.96 L/m. All measurements below well collar

Water Quality Details:

Time am / pm	DO (mg/L ⁻³)	EC (µS cm ⁻¹)	pH	Redox (mV)	Temp (°C)	Salinity (% Refract)	Comments
12.26	2.55 30.3%	12516	7.08	95.5	20.0	8.02	
12.29	1.57 18.10	12285	6.82	78.4	19.4	7.98	
1.32	1.51 17.2%	12207	6.74	99.9	19.2	7.96	

Additional Comments:

clear, no odour, no sediment

GROUNDWATER FIELD DATA SHEET

DLA Project Code: DLH1557 1186	Sample ID: MWC
Project: Mt Vincent rd Waste Facility <i>wash fill</i>	Well Collar RL:
Client: CSR Maitland City Council UHS C	Sampler(s): K.S
Address: Mt Vincent rd, East Maitland <i>Noble Rd</i>	Signature: <i>K.S</i>
BH ID: <i>Score</i>	Date: 6/7/13

Well Status

Monument damaged:	YES / <input checked="" type="radio"/> NO / N/A	Well ID visible:	YES / NO / <input checked="" type="radio"/> N/A
Locked well casing:	YES / <input checked="" type="radio"/> NO / N/A	Cap on PVC casing:	<input checked="" type="radio"/> YES / NO / N/A
Cement footing damaged:	YES / <input checked="" type="radio"/> NO / N/A	Water in monument casing:	YES / <input checked="" type="radio"/> NO / N/A
Standing water, vegetation around monument:	YES / <input checked="" type="radio"/> NO / N/A	Internal obstruction in casing:	YES / <input checked="" type="radio"/> NO / N/A
Well Damaged:	YES / <input checked="" type="radio"/> NO / N/A	Odours from groundwater:	YES / <input checked="" type="radio"/> NO / N/A
Nearby works:			
Comments:			
Casing above ground: <i>1</i>	m agl	Weather Conditions:	
Standing water level: <i>4.45</i>	m bgl	Temperature	15-20 <input type="checkbox"/> 20-25 <input checked="" type="checkbox"/>
Total well depth: <i>17.66</i>	m bgl		25-30 <input type="checkbox"/> >30 <input type="checkbox"/>
Initial well volume: <i>34.61</i>	L	Clear <input checked="" type="checkbox"/>	Partly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/>
Water level after purging: <i>15.47</i>	m bgl	Calm <input type="checkbox"/>	Slight breeze <input checked="" type="checkbox"/> Moderate breeze <input type="checkbox"/>
Volume of water purged: <i>3</i>	L	Windy <input type="checkbox"/>	
Water level at time of sampling: <i>15.42</i>	m bgl	Fine <input checked="" type="checkbox"/>	Showers <input type="checkbox"/> Rain <input type="checkbox"/>
Well purged dry:	YES / <input checked="" type="radio"/> NO		
Purging equipment: <i>Bail</i>			
Sample equipment: <i>Bail</i>			

Note: 50mm internal diameter pipe = 3.96 l/m. All measurements below well collar

Water Quality Details:

Time am / pm	DO (mg/L ³)	EC (µS cm ⁻²)	pH	Redox (mV)	Temp (°C)	Salinity (% Refract)	Comments
1.53	<i>1.58 PPM</i> 21.6	2094	7.70	-76.0	20.4	1.18	
1.57	<i>1.37</i> 15.4	2043	7.41	-105.5	20.0	1.16	
1.59	<i>1.28</i> 14.2	2000	7.18	-101.3	19.9	1.14	

Additional Comments:

clear, no odour; v. slight sediments

GROUNDWATER FIELD DATA SHEET

DLA Project Code: D11111 1186	Sample ID: MWD
Project: Mt Vincent rd Waste Facility SCONE	Well Collar RL:
Client: CSR Maitland City Council UHSC	Sampler(s): KS
Address: Mt Vincent rd, East Maitland SCONE	Signature: <i>[Signature]</i>
BH ID: Nadur Rd	Date: 6/7/17

Well Status

Monument damaged: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> N/A	Well ID visible: YES / NO / <input checked="" type="checkbox"/> N/A
Locked well casing: YES / <input checked="" type="checkbox"/> NO / <input type="checkbox"/> N/A	Cap on PVC casing: YES / NO / <input checked="" type="checkbox"/> N/A
Cement footing damaged: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> N/A	Water in monument casing: YES / <input checked="" type="checkbox"/> NO / <input type="checkbox"/> N/A
Standing water, vegetation around monument: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> N/A	Internal obstruction in casing: YES / <input checked="" type="checkbox"/> NO / <input type="checkbox"/> N/A
Well Damaged: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> N/A	Odours from groundwater: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> N/A
Nearby works:	
Comments: <u>Previously run over</u>	
Casing above ground: m agl	Weather Conditions:
Standing water level: <u>9.82</u> m bgl	Temperature 15-20 <input type="checkbox"/> 20-25 <input checked="" type="checkbox"/>
Total well depth: <u>10.100</u> m bgl	25-30 <input type="checkbox"/> >30 <input type="checkbox"/>
Initial well volume: <u>19.80</u> L	Clear <input checked="" type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/>
Water level after purging: <u>8.57</u> m bgl	Calm <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Moderate breeze <input type="checkbox"/>
Volume of water purged: <u>3</u> L	Windy <input type="checkbox"/>
Water level at time of sampling: <u>8.57</u> m bgl	Fine <input checked="" type="checkbox"/> Showers <input type="checkbox"/> Rain <input type="checkbox"/>
Well purged dry: YES / <input checked="" type="checkbox"/> NO	
Purging equipment: <u>Bailer</u>	
Sample equipment: <u>Bailer</u>	

Note: 50mm internal diameter pipe = 1.96 l/m. All measurements below well collar

Water Quality Details:

Time am / pm	DO (mg/L ⁻¹)	EC (µS cm ⁻¹)	pH	Redox (mV)	Temp (°C)	Salinity (% Refract)	Comments
2.54	<u>0.8 ppm</u> <u>7.4</u>	10297	7.21	-121.3	26.2	5.82	
2.56	<u>1.09</u> <u>13.4</u>	10268	7.21	-122.0	25.6	5.82	

Additional Comments:

lots of dark sediments (black)
greenish/grey colour, very odourous.

GROUNDWATER FIELD DATA SHEET

DLA Project Code: DLH107 1186	Sample ID: <u>MNE</u>
Project: <u>Mt Vincent rd Waste Facility</u> <u>SCONE</u>	Well Collar RL:
Client: <u>CSR Maitland City Council</u> <u>UHSC</u>	Sampler(s): <u>E.S</u>
Address: <u>Mt Vincent rd, East Maitland</u> <u>Noble Rd</u>	Signature: <u>[Signature]</u>
BH ID:	Date: <u>6/7/17</u>

Well Status

Monument damaged:	YES <input type="radio"/> NO <input checked="" type="radio"/> N/A	Well ID visible:	YES / NO / N/A
Locked well casing:	YES / NO / N/A	Cap on PVC casing:	<input checked="" type="radio"/> YES / NO / N/A
Cement footing damaged:	YES / NO / N/A	Water in monument casing:	YES / <input checked="" type="radio"/> NO / N/A
Standing water, vegetation around monument:	YES / NO / N/A	Internal obstruction in casing:	YES / <input checked="" type="radio"/> NO / N/A
Well Damaged:	YES / NO / N/A	Odours from groundwater:->	YES / <input checked="" type="radio"/> NO / N/A
Nearby works:		
Comments:		

Casing above ground: <u>5</u> m agl	Weather Conditions:
Standing water level: <u>2.90</u> m bgl	Temperature 15-20 <input type="checkbox"/> 20-25 <input checked="" type="checkbox"/>
Total well depth: <u>9.50</u> m bgl	25-30 <input type="checkbox"/> >30 <input type="checkbox"/>
Initial well volume: <u>18.62</u> L	Clear <input checked="" type="checkbox"/> Partly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/>
Water level after purging: <u>3.97</u> m bgl	Calm <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Moderate breeze <input type="checkbox"/>
Volume of water purged: <u>3</u> L	Windy <input type="checkbox"/>
Water level at time of sampling: <u>3.97</u> m bgl	Fine <input checked="" type="checkbox"/> Showers <input type="checkbox"/> Rain <input type="checkbox"/>
Well purged dry: YES / <input checked="" type="radio"/> NO	
Purging equipment: <u>Bur</u>	
Sample equipment: <u>✓</u>	

Note: 50mm internal diameter pipe = 1.96 l/m. All measurements below well collar

Water Quality Details:

Time am / pm	DO (mg/L ⁻³)	EC (µS cm ⁻³)	pH	Redox (mV)	Temp (°C)	Salinity (% sea water)	Comments
2.21	<u>1.37</u> <u>14.7%</u>	<u>2375</u>	<u>7.44</u>	<u>-86.2</u>	<u>18.8</u>	<u>1.40</u>	
2.25	<u>1.62</u> <u>10.8</u>	<u>2335</u>	<u>7.22</u>	<u>-121.5</u>	<u>17.8</u>	<u>1.41</u>	
2.28	<u>1.94</u> <u>16.0</u>	<u>2324</u>	<u>7.18</u>	<u>-119.0</u>	<u>17.8</u>	<u>1.40</u>	

Additional Comments:

slightly cloudy / minute sediments
no odour, no colour

