

Environmental Division

## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>EW1301874</b>	<b>Page</b>	: 1 of 5
<b>Client</b>	: <b>SHOALHAVEN CITY COUNCIL</b>	<b>Laboratory</b>	: Environmental Division NSW South Coast
<b>Contact</b>	: Mr David Hojem	<b>Contact</b>	: Aneta Prosaroski
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<b>Project</b>	: Huskisson Landfill	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: 1543516780	<b>Date Samples Received</b>	: 26-JUN-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 12-JUL-2013
<b>Sampler</b>	: ----	<b>No. of samples received</b>	: 15
<b>Site</b>	: ----	<b>No. of samples analysed</b>	: 15
<b>Quote number</b>	: ----		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics

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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Compound	CAS Number	LOR	Unit	S1	S2	GA 1	GA 2	GA 4
				1050	1020	1000	1045	1205
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301874-001	EW1301874-002	EW1301874-003	EW1301874-004	EW1301874-005
<b>EA015: Total Dissolved Solids</b>								
Total Dissolved Solids @180°C	----	1	mg/L	454	242	----	1060	1160
<b>ED037P: Alkalinity by PC Titrator</b>								
Total Alkalinity as CaCO3	----	1	mg/L	----	----	----	84	49
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	142	103
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	----	----	----	457	503
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	----	----	----	19	22
Magnesium	7439-95-4	1	mg/L	----	----	----	42	47
Sodium	7440-23-5	1	mg/L	----	----	----	302	280
Potassium	7440-09-7	1	mg/L	16	3	----	5	7
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	4.68	<0.01	----	0.08	0.03
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	----	----	----	17.5	17.3
Total Cations	----	0.01	meq/L	----	----	----	17.7	17.3
Ionic Balance	----	0.01	%	----	----	----	0.38	0.02
<b>EN67 PK: Field Tests</b>								
pH	----	0.1	pH Unit	7.4	6.2	----	6.7	6.1
Electrical Conductivity (Non Compensated)	----	1	µS/cm	639	284	----	----	----
Dissolved Oxygen	----	0.01	mg/L	6.30	7.91	----	----	----
Field Observations	----	0.01	--	----	----	Dry	----	----
Standing Water Level	----	0.01	m AHD	----	----	----	2.52	7.60
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	26	27	----	18	2
<b>EP030: Biochemical Oxygen Demand (BOD)</b>								
Biochemical Oxygen Demand	----	2	mg/L	<2	<2	----	----	----



## Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

				GA 5 1145	GA 6 1155	GA 7a 1150	GA 8 0945	GA 9 1005
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301874-006	EW1301874-007	EW1301874-008	EW1301874-009	EW1301874-010
<b>EA015: Total Dissolved Solids</b>								
Total Dissolved Solids @180°C	----	1	mg/L	3770	502	160	159	196
<b>ED037P: Alkalinity by PC Titrator</b>								
Total Alkalinity as CaCO3	----	1	mg/L	155	<1	14	2	6
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	230	136	36	15	9
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	1430	167	21	27	24
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	53	2	6	1	<1
Magnesium	7439-95-4	1	mg/L	158	14	4	2	1
Sodium	7440-23-5	1	mg/L	833	138	18	14	20
Potassium	7440-09-7	1	mg/L	13	1	4	3	2
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.26	0.02	0.01	<0.01	0.02
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	48.2	7.54	1.62	1.11	0.98
Total Cations	----	0.01	meq/L	52.2	7.28	1.51	0.90	1.00
Ionic Balance	----	0.01	%	3.96	1.80	----	----	----
<b>EN67 PK: Field Tests</b>								
pH	----	0.1	pH Unit	6.2	4.1	6.2	6.1	5.8
Standing Water Level	----	0.01	m AHD	3.72	9.29	8.81	13.2	19.9
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	9	6	8	13	19



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				GA 10 1115	GA 11 1135	GA 12 1120	DUP 1045	BLANK 0940
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301874-011	EW1301874-012	EW1301874-013	EW1301874-014	EW1301874-015
<b>EA015: Total Dissolved Solids</b>								
Total Dissolved Solids @180°C	----	1	mg/L	536	544	1160	1120	----
Total Dissolved Solids @180°C	----	1	mg/L	----	----	----	----	<1
<b>ED037P: Alkalinity by PC Titrator</b>								
Total Alkalinity as CaCO3	----	1	mg/L	91	4	<1	85	<1
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	118	34	356	142	<1
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	129	30	423	459	<1
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	29	<1	<1	19	<1
Magnesium	7439-95-4	1	mg/L	15	2	36	42	<1
Sodium	7440-23-5	1	mg/L	114	31	341	302	<1
Potassium	7440-09-7	1	mg/L	6	<1	<1	5	<1
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	<0.01	0.11	<0.01
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	7.91	1.63	19.3	17.6	<0.01
Total Cations	----	0.01	meq/L	7.79	1.51	17.8	17.7	<0.01
Ionic Balance	----	0.01	%	0.78	----	4.20	0.17	----
<b>EN67 PK: Field Tests</b>								
pH	----	0.1	pH Unit	6.4	5.0	4.5	6.7	6.6
Standing Water Level	----	0.01	m AHD	9.95	9.21	11.2	2.52	----
<b>EP005: Total Organic Carbon (TOC)</b>								
Total Organic Carbon	----	1	mg/L	16	6	11	17	<1