

# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204031	Page	: 1 of 4
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	: Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone	:	Telephone	: +61 2 4225 3125
Project	: Dunmore Quarterly Surface Water	Date Samples Received	: 05-Sep-2022 13:18
Order number	: 147649	Date Analysis Commenced	: 05-Sep-2022
C-O-C number	:	Issue Date	12-Sep-2022 19:26
Sampler	: Robert DaLio		HALA NALA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER SURFACE WATER		Approdiction No. 926
No. of samples received	: 3		Accredited for compliance with
No. of samples analysed	: 3		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

## Signatories

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

Signatories	Position	Accreditation Category
Aneta Prosaroski	Client Liaison Officer	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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

LOR = Limit of reporting

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

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analytical work for this work order will be conducted at ALS Sydney.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.6 Rivers and Streams.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.4 Lakes and Reservoirs
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.</li>



Sub-Matrix: WATER			Sample ID	SWP2	SWP4 -	SWP5		
(Matrix: WATER)					Sand Mine Dam			
		Sampli	ng date / time	05-Sep-2022 09:20	05-Sep-2022 10:15	05-Sep-2022 09:15		
Compound	CAS Number	LOR	Unit	EW2204031-001	EW2204031-002	EW2204031-003		
				Result	Result	Result		
EA005FD: Field pH								
рН		0.1	pH Unit	8.5	8.1	8.0		
EA025: Total Suspended Solids dried a	t 104 ± 2°C							
Suspended Solids (SS)		5	mg/L	54	7	29		
EA045: Turbidity								
Turbidity		0.1	NTU	59.3	8.6	62.8		
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1		
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1		
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	307	605	184		
Total Alkalinity as CaCO3		1	mg/L	307	605	184		
ED041G: Sulfate (Turbidimetric) as SO4	2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	63	121	49		
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	172	298	114		
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	70	85	42		
Magnesium	7439-95-4	1	mg/L	32	51	16		
Sodium	7440-23-5	1	mg/L	147	260	79		
Potassium	7440-09-7	1	mg/L	22	25	47		
EG020F: Dissolved Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	<0.05	0.05	0.11		
EG020T: Total Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	1.07	0.34	1.84		
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1				
EK055G: Ammonia as N by Discrete An	alyser							
Ammonia as N	7664-41-7	0.01	mg/L	4.39				
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	14798-03-9_ N	0.01	mg/L	4.12				
EK057G: Nitrite as N by Discrete Analy	ser							
Nitrite as N	14797-65-0	0.01	mg/L	0.97				
EK058G: Nitrate as N by Discrete Analy	vser							
Nitrate as N	14797-55-8	0.01	mg/L	11.7				
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Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SWP2	SWP4 - Sand Mine Dam	SWP5	 
		Sampli	ng date / time	05-Sep-2022 09:20	05-Sep-2022 10:15	05-Sep-2022 09:15	 
Compound	CAS Number	LOR	Unit	EW2204031-001	EW2204031-002	EW2204031-003	 
				Result	Result	Result	 
EK059G: Nitrite plus Nitrate as N (NOx) t	oy Discrete Ana	lyser					
Nitrite + Nitrate as N		0.01	mg/L	12.7			 
EN055: Ionic Balance							
Ø Total Anions		0.01	meq/L	12.3	23.0	7.91	 
Ø Total Cations		0.01	meq/L	13.1	20.4	8.05	 
ø lonic Balance		0.01	%	3.10	6.05	0.87	 
EP005: Total Organic Carbon (TOC)							
Total Organic Carbon		1	mg/L		43	30	 
EP030: Biochemical Oxygen Demand (BO	D)						
Biochemical Oxygen Demand		2	mg/L		4	3	 

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EA045: Turbidity

(WATER) EG020F: Dissolved Metals by ICP-MS

(WATER) EG020T: Total Metals by ICP-MS

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) EA025: Total Suspended Solids dried at 104 ± 2°C

(WATER) EK055G-NH4: Ammonium as N by DA

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EN055: Ionic Balance

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) ED093F: Dissolved Major Cations

(WATER) EP005: Total Organic Carbon (TOC)

(WATER) EP030: Biochemical Oxygen Demand (BOD)



# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204032	Page	: 1 of 7
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone	:	Telephone	: +61 2 4225 3125
Project	: Dunmore Quarterly Surface Water EPL	Date Samples Received	: 05-Sep-2022 13:20
Order number	: 147649	Date Analysis Commenced	: 05-Sep-2022
C-O-C number	:	Issue Date	: 12-Sep-2022 19:41
Sampler	: Robert DaLio		Hac-MRA NATA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER SURFACE WATER		Accreditation No. 925
No. of samples received	: 6		Accredited for compliance with
No. of samples analysed	: 6		ISO/IEC 17025 - Testing

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Aneta Prosaroski	Client Liaison Officer	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



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- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analytical work for this work order will be conducted at ALS Sydney.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.6 Rivers and Streams.
- Temperature performed by ALS Wollongong via in-house method EA116 and EN67 PK.
- Dissolved oxygen (DO) performed by ALS Wollongong via in-house method EA025FD and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.4 Lakes and Reservoirs
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.</li>



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SWP1 Point 1	SWC_2 Point 19	SWC_UP Point 20	SWC_Down Point 21	SWC_DOWN_2 Point 22
		Sampli	ng date / time	05-Sep-2022 10:05	05-Sep-2022 08:50	05-Sep-2022 08:00	05-Sep-2022 08:20	05-Sep-2022 08:15
Compound	CAS Number	LOR	Unit	EW2204032-001	EW2204032-002	EW2204032-003	EW2204032-004	EW2204032-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
рН		0.1	pH Unit	7.6	7.4	7.4	7.4	7.4
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)		1	µS/cm	585	1740	1370	1690	1990
EA015: Total Dissolved Solids dried at 1	80 ± 5 °C							
Total Dissolved Solids @180°C		10	mg/L		1270	990	1260	1410
EA025: Total Suspended Solids dried at	104 ± 2°C							
Suspended Solids (SS)		5	mg/L	9	8	8	6	9
EA045: Turbidity								
Turbidity		0.1	NTU	17.9	27.2	27.4	26.6	25.9
EA116: Temperature								
Temperature		0.5	°C	12.1	12.7	11.8	12.5	12.5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	225	106	107	105	103
Total Alkalinity as CaCO3		1	mg/L	225	106	107	105	103
ED041G: Sulfate (Turbidimetric) as SO4	2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	44	95	74	88	104
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	93	671	469	614	754
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	52	43	38	41	43
Magnesium	7439-95-4	1	mg/L	19	47	37	44	52
Sodium	7440-23-5	1	mg/L	77	338	252	312	381
Potassium	7440-09-7	1	mg/L	10	15	11	14	16
EG020F: Dissolved Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	0.05	0.05	0.05	<0.05	<0.05
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.067	0.060	0.068	0.058	0.050
Iron	7439-89-6	0.05	mg/L	0.96	1.71	2.01	1.84	1.24
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.2	0.2	0.2	0.2



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SWP1 Point 1	SWC_2 Point 19	SWC_UP Point 20	SWC_Down Point 21	SWC_DOWN_2 Point 22
		Sampli	ing date / time	05-Sep-2022 10:05	05-Sep-2022 08:50	05-Sep-2022 08:00	05-Sep-2022 08:20	05-Sep-2022 08:15
Compound	CAS Number	LOR	Unit	EW2204032-001	EW2204032-002	EW2204032-003	EW2204032-004	EW2204032-005
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Anal	yser							
Ammonia as N	7664-41-7	0.01	mg/L	1.82	0.46	0.15	0.35	0.19
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	14798-03-9_N	0.01	mg/L	1.80	0.46	0.15	0.35	0.19
EK057G: Nitrite as N by Discrete Analyse	ər							
Nitrite as N	14797-65-0	0.01	mg/L	0.40	0.01	0.01	0.01	0.01
EK058G: Nitrate as N by Discrete Analys	er							
Nitrate as N	14797-55-8	0.01	mg/L	2.06	0.85	0.88	0.86	0.84
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser						
Nitrite + Nitrate as N		0.01	mg/L	2.46	0.86	0.89	0.87	0.85
EN055: Ionic Balance								
Ø Total Anions		0.01	meq/L	8.04	23.0	16.9	21.2	25.5
Ø Total Cations		0.01	meq/L	7.76	21.1	16.2	19.6	23.4
ø Ionic Balance		0.01	%	1.72	4.36	2.19	4.05	4.26
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		1	mg/L	19	8	8	8	8
EP025FD: Field Dissolved Oxygen								
Dissolved Oxygen		0.01	mg/L	8.70	9.01	9.60	9.37	9.54



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Duplicate				
		Sampli	ng date / time	05-Sep-2022 08:00				
Compound	CAS Number	LOR	Unit	EW2204032-006				
				Result				
EA005FD: Field pH								
рН		0.1	pH Unit	7.4				
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)		1	μS/cm	1370				
EA015: Total Dissolved Solids dried at 1	80 ± 5 °C							
Total Dissolved Solids @180°C		10	mg/L	1280				
EA025: Total Suspended Solids dried at	104 ± 2°C							
Suspended Solids (SS)		5	mg/L	9				
EA045: Turbidity								
Turbidity		0.1	NTU	26.3				
EA116: Temperature								
Temperature		0.5	°C	11.8				
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1				
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1				
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	112				
Total Alkalinity as CaCO3		1	mg/L	112				
ED041G: Sulfate (Turbidimetric) as SO4	2- by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	93				
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	637				
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	43				
Magnesium	7439-95-4	1	mg/L	47				
Sodium	7440-23-5	1	mg/L	337				
Potassium	7440-09-7	1	mg/L	15				
EG020F: Dissolved Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	0.06				
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.058				
Iron	7439-89-6	0.05	mg/L	1.65				
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2				



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Duplicate	 	 
		Sampli	ng date / time	05-Sep-2022 08:00	 	 
Compound	CAS Number	LOR	Unit	EW2204032-006	 	 
				Result	 	 
EK055G: Ammonia as N by Discrete Anal	yser					
Ammonia as N	7664-41-7	0.01	mg/L	0.46	 	 
EK055G-NH4: Ammonium as N by DA						
Ammonium as N	14798-03-9_N	0.01	mg/L	0.46	 	 
EK057G: Nitrite as N by Discrete Analyse	ər					
Nitrite as N	14797-65-0	0.01	mg/L	0.01	 	 
EK058G: Nitrate as N by Discrete Analys	er					
Nitrate as N	14797-55-8	0.01	mg/L	0.86	 	 
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser				
Nitrite + Nitrate as N		0.01	mg/L	0.87	 	 
EN055: Ionic Balance						
Ø Total Anions		0.01	meq/L	22.1	 	 
Ø Total Cations		0.01	meq/L	21.0	 	 
Ø Ionic Balance		0.01	%	2.52	 	 
EP005: Total Organic Carbon (TOC)						
Total Organic Carbon		1	mg/L	8	 	 
EP025FD: Field Dissolved Oxygen						
Dissolved Oxygen		0.01	mg/L	9.60	 	 



### Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EA045: Turbidity (WATER) EP005: Total Organic Carbon (TOC) (WATER) EG020F: Dissolved Metals by ICP-MS (WATER) EG020T: Total Metals by ICP-MS (WATER) EK057G: Nitrite as N by Discrete Analyser (WATER) EK058G: Nitrate as N by Discrete Analyser (WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (WATER) EA025: Total Suspended Solids dried at 104 ± 2°C (WATER) EK055G-NH4: Ammonium as N by DA (WATER) EK055G: Ammonia as N by Discrete Analyser (WATER) EN055: Ionic Balance (WATER) ED045G: Chloride by Discrete Analyser (WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (WATER) EK040P: Fluoride by PC Titrator (WATER) ED037P: Alkalinity by PC Titrator (WATER) ED093F: Dissolved Major Cations (WATER) EA015: Total Dissolved Solids dried at 180 ± 5 °C



# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204033	Page	: 1 of 4
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone	:	Telephone	: +61 2 4225 3125
Project	: Dunmore Quarterly Leachate	Date Samples Received	: 05-Sep-2022 13:16
Order number	: 147649	Date Analysis Commenced	: 05-Sep-2022
C-O-C number	:	Issue Date	12-Sep-2022 19:42
Sampler	: Robert DaLio		HAC-MRA NATA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER LEACHATE		Approximation No. 825
No. of samples received	: 1		Accredited for compliance with
No. of samples analysed	: 1		ISO/IEC 17025 - Testing

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Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



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~ = Indicates an estimated value.

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- ED041G: LOR raised for Sulfate due to sample matrix
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Temperature performed by ALS Wollongong via in-house method EA116 and EN67 PK.
- Dissolved oxygen (DO) performed by ALS Wollongong via in-house method EA025FD and EN67 PK.
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- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.10 Wastewaters
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Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Leachate Sump	 	 
		Sampli	ng date / time	05-Sep-2022 09:35	 	 
Compound	CAS Number	LOR	Unit	EW2204033-001	 	 
				Result	 	 
EA005FD: Field pH						
рН		0.1	pH Unit	8.8	 	 
EA010FD: Field Conductivity						
Electrical Conductivity (Non Compensated)		1	µS/cm	8570	 	 
EA015: Total Dissolved Solids dried at 1	80 ± 5 °C					
Total Dissolved Solids @180°C		10	mg/L	5320	 	 
EA116: Temperature						
Temperature		0.5	°C	14.2	 	 
ED037P: Alkalinity by PC Titrator						
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	 	 
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	896	 	 
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2760	 	 
Total Alkalinity as CaCO3		1	mg/L	3660	 	 
ED041G: Sulfate (Turbidimetric) as SO4	2- by DA					
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	 	 
ED045G: Chloride by Discrete Analyser						
Chloride	16887-00-6	1	mg/L	1840	 	 
ED093F: Dissolved Major Cations						
Calcium	7440-70-2	1	mg/L	49	 	 
Potassium	7440-09-7	1	mg/L	369	 	 
EG020T: Total Metals by ICP-MS						
Manganese	7439-96-5	0.001	mg/L	0.127	 	 
Iron	7439-89-6	0.05	mg/L	1.33	 	 
EK040P: Fluoride by PC Titrator						
Fluoride	16984-48-8	0.1	mg/L	0.2	 	 
EK055G: Ammonia as N by Discrete Ana	alyser					
Ammonia as N	7664-41-7	0.01	mg/L	792	 	 
EK057G: Nitrite as N by Discrete Analys	ser					
Nitrite as N	14797-65-0	0.01	mg/L	<0.10	 	 
EK058G: Nitrate as N by Discrete Analy	ser					
Nitrate as N	14797-55-8	0.01	mg/L	124	 	 
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser				
Nitrite + Nitrate as N		0.01	mg/L	124	 	 



Sub-Matrix: WATER (Matrix: WATER)	Sample ID			Leachate Sump	 	 
	Sampling date / time		05-Sep-2022 09:35	 	 	
Compound	CAS Number	LOR	Unit	EW2204033-001	 	 
				Result	 	 
EP005: Total Organic Carbon (TOC)						
Total Organic Carbon		1	mg/L	467	 	 
EP025FD: Field Dissolved Oxygen						
Dissolved Oxygen		0.01	mg/L	2.00	 	 
Dissolved Oxygen - % Saturation		0.1	% saturation	19.7	 	 

### Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED093F: Dissolved Major Cations

(WATER) EP005: Total Organic Carbon (TOC)

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EG020T: Total Metals by ICP-MS

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) EA015: Total Dissolved Solids dried at 180  $\pm$  5 °C

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA



# **CERTIFICATE OF ANALYSIS**

Work Order	: EW2204034	Page	: 1 of 4
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	: Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone		Telephone	: +61 2 4225 3125
Project	: Dunmore Quarterly Leachate Tank EPL	Date Samples Received	: 05-Sep-2022 13:15
Order number	: 147649	Date Analysis Commenced	: 05-Sep-2022
C-O-C number	:	Issue Date	: 12-Sep-2022 19:42
Sampler	: Robert DaLio		Hac-MRA NATA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER LEACHATE		Accreditation No. 825
No. of samples received	: 1		Accredited for compliance with
No. of samples analysed	: 1		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

### Signatories

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

Signatories	Position	Accreditation Category
Aneta Prosaroski	Client Liaison Officer	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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

LOR = Limit of reporting

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

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analytical work for this work order will be conducted at ALS Sydney.
- EK059G: LOR raised for NOx on sample 1 due to sample matrix.
- ED041G: LOR raised for Sulfate due to sample matrix
- EK057G: LOR raised for Nitrite due to sample matrix.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Temperature performed by ALS Wollongong via in-house method EA116 and EN67 PK.
- Dissolved oxygen (DO) performed by ALS Wollongong via in-house method EA025FD and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.10 Wastewaters
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.</li>



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Leachate Storage Tank LP1	 	 
		Sampli	ng date / time	05-Sep-2022 09:40	 	 
Compound	CAS Number	LOR	Unit	EW2204034-001	 	 
				Result	 	 
EA005FD: Field pH						
рН		0.1	pH Unit	8.9	 	 
EA010FD: Field Conductivity						
Electrical Conductivity (Non Compensated)		1	µS/cm	8230	 	 
EA015: Total Dissolved Solids dried at 18	0 ± 5 °C					
Total Dissolved Solids @180°C		10	mg/L	5210	 	 
EA116: Temperature						
Temperature		0.5	°C	13.0	 	 
ED037P: Alkalinity by PC Titrator						
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	ma/L	<1	 	 
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	946	 	 
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2760	 	 
Total Alkalinity as CaCO3		1	mg/L	3700	 	 
ED041G: Sulfate (Turbidimetric) as SO4 2	by DA		U U			
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	 	 
ED045G: Chlorido by Discroto Analysor			U U			
Chloride	16887-00-6	1	ma/L	1840	 	 
ED092E: Dissolved Major Cations			3			
Calcium	7440-70-2	1	ma/l	44	 	 
Potassium	7440-09-7	1	mg/L	350	 	 
	1440 00 1					
Manganese	7430.06.5	0.001	ma/l	0 106	 	 
Iron	7439-80-6	0.05	mg/L	1 29	 	 
	7433-03-0	0.00		1120		
EK040P: Fluoride by PC Titrator	16094 49 9	0.1	ma/l	0.2		
	10904-40-0	0.1	mg/L	0.2	 	 
EK055G: Ammonia as N by Discrete Anal	yser	0.01		077		
	/664-41-7	0.01	mg/L	٥//	 	 
EK057G: Nitrite as N by Discrete Analyse	er			1.00		
Nitrite as N	14797-65-0	0.01	mg/L	<1.00	 	 
EK058G: Nitrate as N by Discrete Analys	er					
Nitrate as N	14797-55-8	0.01	mg/L	<1.00	 	 
EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser				



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Leachate Storage Tank LP1				
		Sampli	ng date / time	05-Sep-2022 09:40				
Compound	CAS Number	LOR	Unit	EW2204034-001				
				Result				
EK059G: Nitrite plus Nitrate as N (NOx) b	EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued							
Nitrite + Nitrate as N		0.01	mg/L	<1.00				
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		1	mg/L	401				
EP025FD: Field Dissolved Oxygen								
Dissolved Oxygen		0.01	mg/L	7.14				
Dissolved Oxygen - % Saturation		0.1	% saturation	68.8				

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED093F: Dissolved Major Cations

(WATER) EP005: Total Organic Carbon (TOC)

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EG020T: Total Metals by ICP-MS

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) EA015: Total Dissolved Solids dried at 180 ± 5 °C

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA



# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204038	Page	: 1 of 8
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	: Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone	:	Telephone	: +61 2 4225 3125
Project	: Dunmore Quarterly Groundwaters EPL	Date Samples Received	: 06-Sep-2022 15:47
Order number	: 147649	Date Analysis Commenced	: 06-Sep-2022
C-O-C number	:	Issue Date	: 23-Sep-2022 15:52
Sampler	: Robert DaLio		Hac-MRA NATA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER GROUNDWATERS		Accreditation No. 925
No. of samples received	: 14		Accredited for compliance with
No. of samples analysed	: 13		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

### Signatories

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

Signatories	Position	Accreditation Category
Aneta Prosaroski	Client Liaison Officer	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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

LOR = Limit of reporting

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

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analytical work for this work order will be conducted at ALS Sydney.
- ED041G: LOR raised for Sulfate on sample 1 & 10 due to sample matrix.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling and groundwater depth measurements completed by ALS Wollongong via inhouse sampling method EN/67.11 Groundwater Sampling Via High Flow & Bailer Method.
- Temperature performed by ALS Wollongong via in-house method EA116 and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sample collection of Ground Waters by in-house EN67 where the "surface layer of the aquifer was sampled".
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.</li>



company C	Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH1C	BH3	BH4	BH9	BH12R	
Congain Constraint Constraint PariableEven <td></td> <td></td> <td>Sampli</td> <td>ing date / time</td> <td>06-Sep-2022 08:30</td> <td>06-Sep-2022 12:50</td> <td>06-Sep-2022 13:05</td> <td>06-Sep-2022 08:00</td> <td>06-Sep-2022 11:25</td>			Sampli	ing date / time	06-Sep-2022 08:30	06-Sep-2022 12:50	06-Sep-2022 13:05	06-Sep-2022 08:00	06-Sep-2022 11:25	
RAMOPIC PROMICEResult	Compound	CAS Number	LOR	Unit	EW2204038-001	EW2204038-002	EW2204038-003	EW2204038-004	EW2204038-005	
EAd057: Field pH  0.0  0.1 Unit  0.8  7.4  7.3  7.2  6.8    EAD107: Field Conductivity    7.300  7.2  6.8330  7.4  5.330  7.2  7.2  7.3					Result	Result	Result	Result	Result	
phof.of.of.of.of.of.of.of.of.of.EADOFD: Field Conductivity (MonImageIm	EA005FD: Field pH									
EACH Conductivity (Non	рН		0.1	pH Unit	6.8	7.4	7.3	7.2	6.8	
Electral Conductivity (Non11µS/cm7380884100033301410EA116: TomperatureEA116: TomperatureEA116: TomperatureEA116: TomperatureComeania Sulf (Non	EA010FD: Field Conductivity									
Comparise  Image	Electrical Conductivity (Non		1	µS/cm	7360	984	1000	3330	1410	
EA116: omperatureTamperature0.50.C0.25.017.618.1015.919.7ED037P: Alkalinity as GaC03DMC-210-0011mgl,<1<	Compensated)									
Temporature  "C  25.2  27.6  17.6  18.1  19.5  19.7    BO3272, Alkalinity as CAC03  DMO-210-001  1  mgl  <1	EA116: Temperature									
Beba3:P2: Alkalinity by CP Tirtator    Hydravide Alkalinity as CaCO3  OMO - 2010001  Alkalinity as CaCO3  Alkalinity a	Temperature		0.5	°C	25.3	17.6	18.1	15.9	19.7	
Hydroxide Alkalinity as CaCO3  DIMO_210.01  1  Impl_	ED037P: Alkalinity by PC Titrator									
Carbonate Alkalinity as CaCO33812.22, B1mg/L <f< th=""><f< th=""><f< th=""><f< th=""><f< th=""><f< th=""><f< th="">Bicarbonate Alkalinity as CaCO371.62.31mg/L25403173611650554Total Alkalinity as CaCO31mg/L25403173611650554ED0415: Sulfate (Turbidimetric) as SO4 2: by DASulfate SO4-Turbidimetric) as SO4 2: by DA<td>Hydroxide Alkalinity as CaCO3</td><td>DMO-210-001</td><td>1</td><td>mg/L</td><td>&lt;1</td><td>&lt;1</td><td>&lt;1</td><td>&lt;1</td><td>&lt;1</td></f<></f<></f<></f<></f<></f<></f<>	Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3  71.6.2.3  1  mg/L  2540  317  361  1650  554    Total Alkalinity as CaCO3   1  mg/L  2540  317  361  1650  554    ED0416:: Sulfate (Turbidimetric) as S04 2: by DA  1  mg/L  <100	Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Total Akalinity as CaO3  ·  1  mg/L  2540  317  361  1650  5554    ED041G: Sulfate (Turbidimetric) as S04 2- by DA	Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2540	317	361	1650	554	
EDD41G: Sulfate (mubidimetric) as SQ4 2. by DA    Sulfate as SQ4 - Turbidimetric  148  69  12  92    Sulfate as SQ4 - Turbidimetric  1480-70-2  1  mg/L  940  78  109  381  123    Choride  16887-00-6  1  mg/L  940  78  109  381  123    ED035: Disolved Major Cations            Calcium  7440-70-2  1  mg/L  208  49  19  65  26    E0205r: Disolved Metals by ICP-MS      0.022  0.130  0.528  0.502    E020F: Disolved Metals by ICP-MS     0.02  0.130  0.528  0.502    Iron  7439-89-5  0.01  mg/L  0.4  0.2  0.1  0.2    EV040F: Fluoride by PC Titrato     0.1  mg/L  0.4  0.2  0.1  0.4  0.2	Total Alkalinity as CaCO3		1	mg/L	2540	317	361	1650	554	
Suifa as SQ4 - Turbidimetric14808-79-81mg/L<10118691292ED04SG: Chloride Dilscrete AnalyserED04SG: Chloride Dilscrete AnalyserED03SF: Dissolved Major CationsECalum7440-7021mg/L1251171131177149Potassium7440-7021mg/L126419196526EC020F: Dissolved Major Step Mathematica Strep Mathematica Step Mathem	ED041G: Sulfate (Turbidimetric) as SO4	2- by DA								
Bible Section Analyser    Chloride by Discrete Analyser    Chloride by Discrete Analyser    Bible Section Sections    Calcium  7440-70-2  1  Mng/L  1117  113  177  449    Potassium  7440-70-2  1  Mng/L  1117  113  177  449    Potassium  7440-70-2  1  Mng/L  1113  177  149    Potassium  7440-70-2  1  Mng/L  1112  1113  177  149    Potassium  7440-70-2  1  Mng/L  149    Marganeses  0.130  0.528  0.528  0.528  0.528  0.528  0.528  0.528  0.528  0.528	Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	118	69	12	92	
Choride16887-061mg/L94078109381123ED03F: Dissolved Major CationsCalclum7440-701mg/L1251117113177149Potassium7440-701mg/L20849196526E0020F: Dissolved Metals by CP-MSManganese7439-860.001mg/L0.0160.0220.1300.5280.502Iron7439-860.001mg/L0.1650.0220.1300.5280.502EK040P: Fluorde by CP TitratorFluorde hy Discrete Analysermg/L3760.020.130.40.2Ammonia as N by Discrete AnalyserKitrite as N by Discrete Analysermg/L3762.182.6130.04.01EK0550: Nitrite as N ty Discrete AnalyserNitrite as N 14797-5580.01mg/L4.016.530.050.02<0.01	ED045G: Chloride by Discrete Analyser									
Possolved Major Cations    Calcium  7440-70-2  1  mg/L  125  117  113  177  149    Potassium  7440-70-2  1  mg/L  208  49  19  65  26    Ed020F: Dissolved Metals by ICP-MS  U  U  208  49  19  65  26    Ed020F: Dissolved Metals by ICP-MS  U  U  200  0.105  0.002  0.130  0.528  0.502    Manganese  7439-86-5  0.001  mg/L  0.105  0.002  0.130  0.528  0.502    EK040F: Fluoride by PC Titrator  U  T/76  0.07  2.50  0.70  7.24    Fluoride by PC Titrator  0.10  mg/L  0.4  0.2  0.1  0.4  0.2    EK055G: Ammonia as N by Discrete Analyser  U  mod  0.21  0.1  0.4  0.2  130  <4.75    Kitrite as N by Discrete Analyser  U  0.01  0.13  0.01  0.05  0.02 <t< td=""><td>Chloride</td><td>16887-00-6</td><td>1</td><td>mg/L</td><td>940</td><td>78</td><td>109</td><td>381</td><td>123</td></t<>	Chloride	16887-00-6	1	mg/L	940	78	109	381	123	
Calcium  7440-70-2  1  mg/L  125  117  113  177  149    Potasium  7440-70-7  1  mg/L  208  49  19  65  26    Ecologer Ussolved Metals b(P-MS  U  U  208  49  9  10  65.28  26    Manganese  7439-65  0.001  0.015  0.022  0.130  0.528  0.502    Iron  7439-65  0.001  0.027  0.130  0.528  0.502    Iron  7439-65  0.015  mg/L  0.162  0.017  2.90  0.70  7.24    Iron  7439-65  0.01  mg/L  0.163  0.02  0.130  0.528  0.502    Iron  1698-448-8  0.1  mg/L  0.16  0.07  2.90  0.16  0.12  0.12    K1040  1698-458-1  0.10  0.10  0.10  0.10  0.47  0.12    K50557: Nitrite as No piscrete Analys:  Mirite as N	ED093F: Dissolved Major Cations									
Potassium  7440-07  1  mg/L  208  49  19  65  26    EG02F: Dissolved Metals by ICP-MS	Calcium	7440-70-2	1	mg/L	125	117	113	177	149	
Selected Metals by CP-MS    Manganese  7439-96-5  0.01  mg/L  0.105  0.022  0.130  0.528  0.502    Iron  7439-86-8  0.05  mg/L  7.76  0.07  2.90  0.70  7.24    EK042P: Fluoride by PC Titrator  u  u  0.22  0.130  0.70  7.24    Fluoride by PC Titrator  u  mode  0.2  0.1  0.4  0.2  0.1  0.4  0.2    EK055G: Ammonia as N by Discrete Analyser  u  mg/L  0.4  0.2  0.1  0.4  0.2    K057G: Nitrite as N by Discrete Analyser  u  mg/L  3.76  2.18  2.76  130  4.75    K058G: Nitrite as N by Discrete Analyser  u  mode  6.01  0.01  0.05  <0.01    K1trate as N by Discrete Analyser  u  mode  6.01  6.03  0.05  0.02  <0.01    K059G: Nitrite as N (NOX) by Discrete Analyser  u  mode  6.01  0.07  <0.01	Potassium	7440-09-7	1	mg/L	208	49	19	65	26	
ManganesYa39-690.001mg/u0.0150.0220.1300.5280.502IronYa39-690.05mg/u7.760.072.900.700.707.24EK040P: Fluoride by PC TitratorFluoride16984-880.1mg/u0.040.020.110.040.040.02Fluoride16984-880.1mg/u0.040.020.110.40.40.2Fluoride16984-880.1mg/u0.040.020.110.40.40.2Fluoride16984-880.1mg/u0.040.20.110.40.40.2Fluoride by EtrictorFluoride by EtrictorFluoride by EtrictorFluoride by EtrictorFluoride by EtrictorTitrite by Total State by EtrictorFluoride by EtrictorFluoride by EtrictorFluoride by EtrictorTitrite by Total State by EtrictorFluoride by EtrictorTitrite by Total State by EtrictorFluoride by EtrictorFluoride by EtrictorOther by EtrictorState by EtrictorState by EtrictorOther by EtrictorState by EtrictorState by EtrictorState by EtrictorState by Etrictor	EG020F: Dissolved Metals by ICP-MS									
Ion7439-890.05mg/L7.760.072.900.707.24EK040P: Fluoride DP CriterionFluoride16984-880.10.40.20.10.40.2FL055C: Amencia s N by Discrete Ausure10.10.40.20.10.40.2Amonia as N7664.470.010.760.182.760.1300.750.17FK05C: Nitritea SN by Discrete Ausure3762.182.761300.750.75Kitritea SN by Discrete AusureVisitive as N10.700.010.010.010.010.01EK055C: Nitritea SN Discrete AusureVisitive as N10.790.010.010.010.010.01EK055C: Nitritea SN 1000 Store SUBSCHKitritea SN 10.790.010.010.010.010.01EK056C: Nitritea SN 10.790.010.010.010.010.01Sintifie Distritea SN 10.790.010.010.010.010.01EK050C: Nitritea SN 10.790.100.020.010.010.01Distrite Nitritea SN 00.010.020.010.01Sintie Sintie Sinti	Manganese	7439-96-5	0.001	mg/L	0.105	0.022	0.130	0.528	0.502	
EK040P: Fluoride by PC TitratorFluoride16984-48-80.10.40.2Fluoride16984-48-80.10.40.2EK055G: Annonia as N by Discrete AnalyserAmmonia as N7664-170.01mg/L3762.182.761304.75K057G: Nitrite as N by Discrete AnalyserK056G: Nitrite as N by Discrete AnalyserNitrite as N by Discrete AnalyserNitrite as N by Discrete AnalyserK058G: Nitrate as N by Discrete AnalyserNitrite as N (NOC) by Discrete AnalyserNitrite as N (NOC) by Discrete AnalyserNitrite plus Nitrate as N (NOC) by Discrete AnalyserNote (Colspan="6">Note (Colspan="6") <td c<="" td=""><td>Iron</td><td>7439-89-6</td><td>0.05</td><td>mg/L</td><td>7.76</td><td>0.07</td><td>2.90</td><td>0.70</td><td>7.24</td></td>	<td>Iron</td> <td>7439-89-6</td> <td>0.05</td> <td>mg/L</td> <td>7.76</td> <td>0.07</td> <td>2.90</td> <td>0.70</td> <td>7.24</td>	Iron	7439-89-6	0.05	mg/L	7.76	0.07	2.90	0.70	7.24
Fluoride16984-480.10n/L0.20.10.40.2EK055G: Anmonia as N office AnalysisAmmonia as N7664.470.010m/L3762.182.761304.75Ktorser Nature Sector	EK040P: Fluoride by PC Titrator									
EK055G: Anmonia as N by Discrete AnalyserAmmonia as N7664.41.70.01mg/L3762.182.761304.75EK057G: Nitrite as N by Discrete AnalyserNitrite as N14797.65.00.01mg/L0.010.130.010.05<0.01	Fluoride	16984-48-8	0.1	mg/L	0.4	0.2	0.1	0.4	0.2	
Ammonia as N7664-4170.01mg/L3762.182.761304.75EK057G: Nitrite as N by Discrete AnalyseNitride as N14797-6500.010.0100.0130.010.05<0.01	EK055G: Ammonia as N by Discrete Ana	alyser								
EK057G: Nitrite as N by Discrete AnalyserNitrite as N14797-6500.01mg/L<0.01	Ammonia as N	7664-41-7	0.01	mg/L	376	2.18	2.76	130	4.75	
Nitrie as N14797-65-00.01mg/L<0.010.0130.010.05<0.01EK058G: Nitrate as N by Discrete AnalyseNitrate as N14797-55-80.01mg/L<0.01	EK057G: Nitrite as N by Discrete Analys	ser								
EK058G: Nitrate as N by Discrete AnalysesNitrate as N14797-55-80.01mg/L<0.01	Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.13	0.01	0.05	<0.01	
Nitrate as N  14797-55-8  0.01  mg/L  <0.01  6.37  0.05  0.02  <0.01    EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Au- Nitrite + Nitrate as N        Nitrite + Nitrate as N   0.01  Mg/L  <0.01  6.50  0.06  0.06  0.07  <0.01    EP005: Total Organic Carbon (TOC)       14  Mg/L  194  15  14  85  22	EK058G: Nitrate as N by Discrete Analy	ser								
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Anity    Nitrite + Nitrate as N  0.01  mg/L  <0.01  6.50  0.06  0.07  <0.01  <0.01    EP005: Total Organic Carbon (TOC)  Total Organic Carbon  1  Mg/L  194  15  14  85  22	Nitrate as N	14797-55-8	0.01	mg/L	<0.01	6.37	0.05	0.02	<0.01	
Nitrite + Nitrate as N   0.01  mg/L  <0.01  6.50  0.06  0.07  <0.01    EP005: Total Organic Carbon (TOC)  Total Organic Carbon   1  mg/L  194  15  14  85  22	EK059G: Nitrite plus Nitrate as N (NOx)	by Discrete Ana	lyser _							
EP005: Total Organic Carbon (TOC)    Total Organic Carbon  1  mg/L  194  15  14  85  22	Nitrite + Nitrate as N		0.01	mg/L	<0.01	6.50	0.06	0.07	<0.01	
Total Organic Carbon   1  mg/L  194  15  14  85  22	EP005: Total Organic Carbon (TOC)									
	Total Organic Carbon		1	mg/L	194	15	14	85	22	



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH1C	BH3	BH4	BH9	BH12R
		Sampli	ng date / time	06-Sep-2022 08:30	06-Sep-2022 12:50	06-Sep-2022 13:05	06-Sep-2022 08:00	06-Sep-2022 11:25
Compound	CAS Number	LOR	Unit	EW2204038-001	EW2204038-002	EW2204038-003	EW2204038-004	EW2204038-005
				Result	Result	Result	Result	Result
QWI-EN 67.11 Sampling of Groundwaters								
Standing Water Level		0.01	m AHD	2.91	3.07	4.25	2.85	4.14



Sampling date / time  06-Sep-2022 11:45  06-Sep-2022 12:30  06-Sep-2022 11:00  06-Sep-2022 13:25  0    Compound  CAS Number  LOR  Unit  EW2204038-006  EW2204038-007  EW2204038-008  EW2204038-009  EW220	6-Sep-2022 10:10 EW2204038-010 Result
Compound  CAS Number  LOR  Unit  EW2204038-006  EW2204038-007  EW2204038-008  EW2204038-009    Result  Result<	EW2204038-010 Result
Result Result Result Result Result	Result
EA005FD: Field pH	
pH 0.1 pH Unit 6.7 6.7 7.1 7.4	6.7
EA010FD: Field Conductivity	
Electrical Conductivity (Non  1  μS/cm  1740  970  2350  838    Compensated)   1  μS/cm  1740  970  2350  838	822
EA116: Temperature	
Temperature 0.5 °C 20.5 20.2 14.8 17.6	18.3
ED037P: Alkalinity by PC Titrator	
Hydroxide Alkalinity as CaCO3 DMO-210-001 1 mg/L <1 <1 <1 <1	<1
Carbonate Alkalinity as CaCO3  3812-32-6  1  mg/L  <1  <1  <1	<1
Bicarbonate Alkalinity as CaCO3  71-52-3  1  mg/L  754  409  420  308	412
Total Alkalinity as CaCO3  1  mg/L  754  409  420  308	412
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	
Sulfate as SO4 - Turbidimetric  14808-79-8  1  mg/L  47  52  473  51	<10
ED045G: Chloride by Discrete Analyser	
Chloride  16887-00-6  1  mg/L  199  58  442  101	65
ED093F: Dissolved Major Cations	
Calcium  7440-70-2  1  mg/L  176  100  104  88	88
Potassium 7440-09-7 1 mg/L 15 190 36	12
EG020F: Dissolved Metals by ICP-MS	
Manganese  7439-96-5  0.001  mg/L  0.288  0.094  0.290  0.082	0.087
Iron 7439-89-6 0.05 mg/L 3.26 <0.05 9.45 1.19	2.34
EK040P: Fluoride by PC Titrator	
Fluoride  16984-48-8  0.1  mg/L  0.2  0.5  0.2  0.2	0.2
EK055G: Ammonia as N by Discrete Analyser	
Ammonia as N  7664-41-7  0.01  mg/L  1.78  0.59  10.2  3.11	1.09
EK057G: Nitrite as N by Discrete Analyser	
Nitrite as N  14797-65-0  0.01  mg/L  0.02  0.02  0.01  0.02	<0.01
EK058G: Nitrate as N by Discrete Analyser	
Nitrate as N  14797-55-8  0.01  mg/L  0.01  1.91  <0.01  0.04	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser	
Nitrite + Nitrate as N  0.01  mg/L  0.03  1.93  0.01  0.06	<0.01
EP005: Total Organic Carbon (TOC)	
Total Organic Carbon  1  mg/L  31  25  42  21	19



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH13	BH14	BH15	BH19R	BH18
		Sampli	ng date / time	06-Sep-2022 11:45	06-Sep-2022 12:30	06-Sep-2022 11:00	06-Sep-2022 13:25	06-Sep-2022 10:10
Compound	CAS Number	LOR	Unit	EW2204038-006	EW2204038-007	EW2204038-008	EW2204038-009	EW2204038-010
				Result	Result	Result	Result	Result
QWI-EN 67.11 Sampling of Groundwaters								
Standing Water Level		0.01	m AHD	4.15	4.56	0.64	4.60	1.91



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH21	BH22	Duplicate					
		Samplii	ng date / time	06-Sep-2022 10:35	06-Sep-2022 09:00	06-Sep-2022 09:00					
Compound CA	S Number	LOR	Unit	EW2204038-011	EW2204038-012	EW2204038-013					
				Result	Result	Result					
EA005FD: Field pH											
рН		0.1	pH Unit	7.1	7.0	7.0					
EA010FD: Field Conductivity											
Electrical Conductivity (Non		1	µS/cm	2430	1810	1810					
Compensated)											
EA116: Temperature											
Temperature		0.5	°C	20.8	17.3	17.3					
ED037P: Alkalinity by PC Titrator											
Hydroxide Alkalinity as CaCO3 DM0	O-210-001	1	mg/L	<1	<1	<1					
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1					
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	667	646	652					
Total Alkalinity as CaCO3		1	mg/L	667	646	652					
ED041G: Sulfate (Turbidimetric) as SO4 2- by D	A										
Sulfate as SO4 - Turbidimetric 1	4808-79-8	1	mg/L	204	113	112					
ED045G: Chloride by Discrete Analyser											
Chloride 1	6887-00-6	1	mg/L	400	240	244					
ED093F: Dissolved Major Cations											
Calcium	7440-70-2	1	mg/L	135	117	127					
Potassium	7440-09-7	1	mg/L	20	30	32					
EG020F: Dissolved Metals by ICP-MS											
Manganese	7439-96-5	0.001	mg/L	0.597	0.108	0.119					
Iron	7439-89-6	0.05	mg/L	0.44	0.14	0.15					
EK040P: Fluoride by PC Titrator											
Fluoride 1	6984-48-8	0.1	mg/L	0.3	0.2	0.2					
EK055G: Ammonia as N by Discrete Analyser											
Ammonia as N	7664-41-7	0.01	mg/L	4.85	24.4	24.2					
EK057G: Nitrite as N by Discrete Analyser											
Nitrite as N 1	4797-65-0	0.01	mg/L	<0.01	<0.01	<0.01					
EK058G: Nitrate as N by Discrete Analyser											
Nitrate as N 1	4797-55-8	0.01	mg/L	<0.01	<0.01	<0.01					
EK059G: Nitrite plus Nitrate as N (NOx) by Dis	screte Ana	lyser									
Nitrite + Nitrate as N		0.01	mg/L	<0.01	<0.01	<0.01					
EP005: Total Organic Carbon (TOC)											
Total Organic Carbon		1	mg/L	37	50	51					



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH21	BH22	Duplicate	 
		Sampli	ng date / time	06-Sep-2022 10:35	06-Sep-2022 09:00	06-Sep-2022 09:00	 
Compound	CAS Number	LOR	Unit	EW2204038-011	EW2204038-012	EW2204038-013	 
				Result	Result	Result	 
QWI-EN 67.11 Sampling of Groundwaters							
Standing Water Level		0.01	m AHD	2.86	2.45	2.45	 

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED093F: Dissolved Major Cations

(WATER) EP005: Total Organic Carbon (TOC)

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EG020F: Dissolved Metals by ICP-MS

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA



# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204039	Page	: 1 of 6	
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	: Environmental Division NSV	N South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski	
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North	Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529			
Telephone	:	Telephone	: +61 2 4225 3125	
Project	: Dunmore Quarterly Groundwaters	Date Samples Received	: 07-Sep-2022 15:18	ANUTUR.
Order number	: 147649	Date Analysis Commenced	07-Sep-2022	
C-O-C number	:	Issue Date	14-Sep-2022 11:41	
Sampler	: Robert DaLio			Hac-MRA NAIA
Site	: DUNMORE LANDFILL TENDER			
Quote number	: WO/030/19 TENDER GROUNDWATERS			Approximation No. 935
No. of samples received	: 8			Accredited for compliance with
No. of samples analysed	: 8			ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

### Signatories

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

Signatories	Position	Accreditation Category
Aneta Prosaroski	Client Liaison Officer	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



#### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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

LOR = Limit of reporting

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

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analytical work for this work order will be conducted at ALS Sydney.
- ED041G: LOR raised for Sulfate due to sample matrix
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling and groundwater depth measurements completed by ALS Wollongong via inhouse sampling method EN/67.11 Groundwater Sampling High Flow & Bailer Method.
- Temperature performed by ALS Wollongong via in-house method EA116 and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BHA	BH2	BH10	BH16	BH17R
		Sampli	ng date / time	07-Sep-2022 10:15	07-Sep-2022 08:50	07-Sep-2022 11:00	07-Sep-2022 12:05	07-Sep-2022 09:15
Compound	CAS Number	LOR	Unit	EW2204039-001	EW2204039-002	EW2204039-003	EW2204039-004	EW2204039-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
рН		0.1	pH Unit	6.7	7.0	6.6	7.5	6.8
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)		1	µS/cm	717	2380	1820	1480	1150
EA116: Temperature								
Temperature		0.5	°C	19.0	21.1	16.0	13.6	17.2
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	264	681	325	749	354
Total Alkalinity as CaCO3		1	mg/L	264	681	325	749	354
ED041G: Sulfate (Turbidimetric) as SO4 2-	by DA							
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	126	114	16	97
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	45	361	428	200	156
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	87	131	28	156	135
Potassium	7440-09-7	1	mg/L	11	34	1	42	36
EG020F: Dissolved Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.060	0.257	0.106	0.270	0.206
Iron	7439-89-6	0.05	mg/L	7.48	4.34	0.59	0.06	10.5
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	0.6	0.2	0.1
EK055G: Ammonia as N by Discrete Analys	ser							
Ammonia as N	7664-41-7	0.01	mg/L	0.21	24.3	0.18	8.37	1.84
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyse	r							
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.01	<0.01	0.09	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by	/ Discrete Ana	lyser						
Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.01	<0.01	0.09	<0.01
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon		1	mg/L	22	47	7	33	20



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	ВНА	BH2	BH10	BH16	BH17R
		Sampli	ng date / time	07-Sep-2022 10:15	07-Sep-2022 08:50	07-Sep-2022 11:00	07-Sep-2022 12:05	07-Sep-2022 09:15
Compound	CAS Number	LOR	Unit	EW2204039-001	EW2204039-002	EW2204039-003	EW2204039-004	EW2204039-005
				Result	Result	Result	Result	Result
QWI-EN 67.11 Sampling of Groundwaters								
Standing Water Level		0.01	m AHD	2.65	3.65	0.25	0.55	3.10



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH18R	BH20	BH20s					
		Sampli	ng date / time	07-Sep-2022 11:40	07-Sep-2022 08:30	07-Sep-2022 08:15					
Compound	CAS Number	LOR	Unit	EW2204039-006	EW2204039-007	EW2204039-008					
				Result	Result	Result					
EA005FD: Field pH											
рН		0.1	pH Unit	7.7	7.3	7.2					
EA010FD: Field Conductivity											
Electrical Conductivity (Non		1	μS/cm	3120	1200	803					
FA116: Temperature											
Temperature		0.5	°C	16.4	17.6	15.8					
ED037P: Alkalinity by PC Titrator											
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1					
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1					
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	696	524	339					
Total Alkalinity as CaCO3		1	mg/L	696	524	339					
ED041G: Sulfate (Turbidimetric) as SO4 2	- by DA										
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	78	35					
ED045G: Chloride by Discrete Analyser											
Chloride	16887-00-6	1	mg/L	774	103	76					
ED093F: Dissolved Major Cations											
Calcium	7440-70-2	1	mg/L	131	134	102					
Potassium	7440-09-7	1	mg/L	31	47	52					
EG020F: Dissolved Metals by ICP-MS											
Manganese	7439-96-5	0.001	mg/L	0.597	0.062	0.078					
Iron	7439-89-6	0.05	mg/L	0.34	1.79	0.63					
EK040P: Fluoride by PC Titrator											
Fluoride	16984-48-8	0.1	mg/L	0.8	0.2	0.1					
EK055G: Ammonia as N by Discrete Analy	yser										
Ammonia as N	7664-41-7	0.01	mg/L	4.18	10.5	5.62					
EK057G: Nitrite as N by Discrete Analyse	er										
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01					
EK058G: Nitrate as N by Discrete Analyse	er										
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	2.16					
EK059G: Nitrite plus Nitrate as N (NOx) b	by Discrete Ana	lyser									
Nitrite + Nitrate as N		0.01	mg/L	0.01	<0.01	2.16					
EP005: Total Organic Carbon (TOC)											
Total Organic Carbon		1	mg/L	40	30	19					



Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH18R	BH20	BH20s	 
		Sampli	ng date / time	07-Sep-2022 11:40	07-Sep-2022 08:30	07-Sep-2022 08:15	 
Compound	CAS Number	LOR	Unit	EW2204039-006	EW2204039-007	EW2204039-008	 
				Result	Result	Result	 
QWI-EN 67.11 Sampling of Groundwaters							
Standing Water Level		0.01	m AHD	2.45	2.32	2.33	 

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) ED093F: Dissolved Major Cations

(WATER) EP005: Total Organic Carbon (TOC)

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EG020F: Dissolved Metals by ICP-MS

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA



# **CERTIFICATE OF ANALYSIS**

Work Order	EW2204040	Page	: 1 of 3
Client	SHELLHARBOUR CITY COUNCIL	Laboratory	: Environmental Division NSW South Coast
Contact	: Joel Coulton	Contact	: Aneta Prosaroski
Address	: LAMERTON HOUSE, LAMERTON CRESCENT	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
	SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529		
Telephone	:	Telephone	: +61 2 4225 3125
Project	: Dunmore Landfill Dust	Date Samples Received	: 07-Sep-2022 15:10
Order number	: 147649	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	:	Issue Date	: 16-Sep-2022 15:18
Sampler	: Robert DaLio		HALA NALA
Site	: DUNMORE LANDFILL TENDER		
Quote number	: WO/030/19 TENDER DUST		Accreditation No. 925
No. of samples received	: 4		Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

### Signatories

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

Signatories	Position	Accreditation Category
Zoran Grozdanovski	Laboratory Operator	Newcastle - Inorganics, Mayfield West, NSW



### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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

LOR = Limit of reporting

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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

• Analytical work for this work order will be conducted at ALS Newcastle.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m<sup>2</sup>.mth.
- Sample exposure period is 35 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.1.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/66.1 Sampling and Siting of Dust Depositon Gauges.
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.

Sub-Matrix: DEPOSITIONAL DUST (Matrix: AIR)			Sample ID	DDG1 03/08/2022 - 07/09/2022	DDG2 03/08/2022 - 07/09/2022	DDG3 03/08/2022 - 07/09/2022	DDG4 03/08/2022 - 07/09/2022	
		Sampli	ng date / time	07-Sep-2022 10:40	07-Sep-2022 10:50	07-Sep-2022 08:40	07-Sep-2022 08:00	
Compound	CAS Number	LOR	Unit	EW2204040-001	EW2204040-002	EW2204040-003	EW2204040-004	
				Result	Result	Result	Result	
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.5	0.3	0.4	1.1	
Ash Content (mg)		2	mg	10	6	8	23	
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.1	0.3	0.2	0.6	
Combustible Matter (mg)		2	mg	3	6	5	12	
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.6	0.6	0.6	1.7	
Total Insoluble Matter (mg)		2	mg	13	12	13	35	



## Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(AIR) EA125: Combustible Matter

(AIR) EA120: Ash Content

(AIR) EA141: Total Insoluble Matter