

Weekly Interim Report				
Client: Australian Dewatering Systems Pty Ltd		Week: 54		
Site Address: 45 Honeysuckle Dr, Newcastle, NSW		Sampling Date: 06.10.22		
Project Reference: ADG1272.21		Sampled By: Mitch Bath		
Receiving Waters: Newcastle Harbour		Receiving Ecosystem: Estuarine (moderately disturbed)		
Typical Discharge Criteria		Sampling Location		
Physico-chemical		Discharge		
pH (pH units)	6.5 – 8.5 <sup>1</sup>	7.22		
Electrical conductivity (mS/cm)	-	33.7		
Dissolved oxygen (% saturation)	>80 <sup>1</sup>	131.94		
Turbidity (NTU)	<50 <sup>1</sup>	11.1		
Suspended solids (mg/L)	<50 <sup>1</sup>	9		
Redox (mV)	-	-		
Receiving Water Quality Objectives (WQO)		Sampling Location		
Physico-chemical		Discharge	RW	BW
pH (pH units)	7.0 – 8.5 <sup>2</sup>	As above	7.52	7.81
Electrical conductivity (mS/cm)	-		35.8	18.1
Dissolved oxygen (%Sat)	80 – 110 <sup>2</sup>		134.13	133.04
Turbidity (NTU)	<10 <sup>2</sup>		11.2	13.7
Suspended solids (mg/L)	<50 <sup>2</sup>		10	16
Redox (mV)	-		-	-
Dissolved Metals (µg/L)				
Arsenic	24 <sup>2</sup>	nd	nd	1
Cadmium	0.7 <sup>2</sup>	nd	nd	nd
Chromium	27.4 <sup>2</sup>	nd	nd	nd
Copper	1.3 <sup>2</sup>	nd	nd	2
Lead	4.4 <sup>2</sup>	nd	nd	nd
Nickel	7 <sup>2</sup>	nd	nd	nd
Zinc	8 <sup>3</sup>	nd	nd	18
Iron	No relevant ANZG criterion available	nd	nd	nd
Mercury	0.1 <sup>2</sup>	nd	nd	nd
Total Metals (µg/L)				
Iron	No relevant ANZG criterion available	1,210	1,730	880
Nutrients (µg/L)				
Total Nitrogen	300 <sup>2</sup>	1,200	700	800
Nitrate	2,400 <sup>2</sup>	180	20	170

Total Phosphorus	30 <sup>2</sup>	<b>140</b>	<b>170</b>	<b>100</b>
Ammonia	910 (pH dependant) <sup>2</sup>	540	430	140
<b>Comments</b>				
<ul style="list-style-type: none"> <li>All physico-chemical parameters in the discharge waters were compliant with the discharge criteria, as per the site-based Dewatering Management Plan (DMP) (Reditus).</li> <li>In the receiving water (RW) mixing zone, both dissolve oxygen (DO) and turbidity were in exceedance of their respective water quality objectives (WQOs). DO 80 -110% saturation, reported at 134.13% saturation and turbidity 10 NTU, at 11.2 NTU. These exceedances in the RW mixing zone are consistent with elevated DO and turbidity in the background water (BW).</li> <li>All remaining physico-chemical parameters in the receiving water (RW) mixing zone were compliant with the relevant water quality objectives (WQOs), as per the site-based DMP (Reditus).</li> <li>The following dissolved metal was reported in exceedance within the BW. <ul style="list-style-type: none"> <li>copper at 2 µg/L; criterion 1.3 µg/L.</li> <li>zinc at 18 µg/L; criterion 8 µg/L.</li> </ul> <p>The exceedances of dissolved copper and zinc are unrelated to site discharge activities given there was no detectable concentrations reported in the discharge.</p> </li> <li>All remaining dissolved metal concentrations in the discharge and RW mixing zone were either below the laboratory limit of reporting (LOR) (reported as non-detectable) or below the relevant (available) site based WQOs.</li> <li>The following nutrients were reported in exceedance in the discharge, RW mixing zone and background water (BW): <ul style="list-style-type: none"> <li>Total nitrogen at 1,200 µg/L (discharge); 700 µg/L (RW); 800 µg/L (BW); criterion 300 µg/L.</li> <li>Total phosphorus at 140 µg/L (discharge); 170 µg/L (RW); and 100 µg/L (BW); criterion 30 µg/L.</li> </ul> <p>Concentrations of total nitrogen and total phosphorus in the discharge, RW and BW were reported in exceedance of the site based WQOs. In addition, since background concentrations of total nitrogen and total phosphorus are known to be elevated in the local RW of Newcastle Harbour, no significant impacts are anticipated. In addition, as stated in the Reditus Groundwater and Dewatering Management and Monitoring Plan. <i>"There is currently no proven and cost-effective method for the removal of nutrients with the available retention times and available space on construction sites. However, medium to high flow conditions and natural aquatic processes in Newcastle Harbour receiving waters are likely to mitigate possible impacts of nutrient loading. This will need to be monitored for physical and chemical stresses if trigger values are exceeded."</i> As such, monitoring of these nutrients in the RW and BW will occur over the subsequent monitoring rounds to assess if any significant impacts are occurring to the receiving environment.</p> </li> <li>All remaining nutrients were reported either below the laboratory LOR (reported as non-detectable) or below the relevant (available) site based WQOs.</li> <li>Based off the initial two consecutive weeks where discharge, RW and BW laboratory samples were reported in compliance with the WQOs (non-detectable concentrations) the sampling frequency of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), BTEX, organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCBs) and total recoverable hydrocarbons (TRHs) has been reduced as per the site-based Dewatering Management Plan (Reditus).</li> </ul>				
<b>Recommendations</b>				
<ul style="list-style-type: none"> <li>pH dosing of the extracted groundwater is not required. In the event that pH decreases below 7.0 commence pH dosing to achieve a discharge pH of approximately 8.0 - 8.2 pH units. This will assist in the precipitation and retention of heavy metals within the treatment system.</li> <li>Continue regular monitoring to confirm the suitability of water for discharge and to detect any potential impacts to the receiving environment.</li> </ul>				

Table notes:

1. Typical discharge criteria recognised throughout NSW.
  2. REDITUS (2019). Site specific *Dewatering and Groundwater Management and Monitoring Plan* - 45 Honeysuckle Drive, Newcastle, NSW. Table 8-1: Water Quality Objectives – DGVs.
  3. ANZG (2018) – Marine water trigger values for 95% species protection.
- \* = Insufficient data to derive a reliable trigger value. Low reliability value adopted (refer ANZECC/ARMCANZ (2000) Section 8.3.7.
- Bold** = Exceedance of adopted criteria.
- = No criteria available and / or no monitoring undertaken during this sampling event.
- nd = non detect.

## CERTIFICATE OF ANALYSIS

**Work Order** : **ES2235809**  
**Client** : **ADG CONSULTING P/L**  
**Contact** : **MR MICHAEL CAMPBELL**  
**Address** : **PO BOX 6405**  
                   **YATALA DC 4207**  
**Telephone** : **+61 07 5580 8063**  
**Project** : **ADG1272.21 45 Honeysuckle Road, Newcastle, NSW**  
**Order number** : **----**  
**C-O-C number** : **----**  
**Sampler** : **Lilli O'Sullivan**  
**Site** : **----**  
**Quote number** : **BNBQ/004**  
**No. of samples received** : **3**  
**No. of samples analysed** : **3**

**Page** : 1 of 4  
**Laboratory** : Environmental Division Sydney  
**Contact** : Customer Services ES  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
  
**Telephone** : +61-2-8784 8555  
**Date Samples Received** : 06-Oct-2022 14:17  
**Date Analysis Commenced** : 06-Oct-2022  
**Issue Date** : 13-Oct-2022 15:59



Accreditation No. 825  
 Accredited for compliance with  
 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle 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.

- EG020: LORs have been raised for some samples due to matrix interference (High sample salinity)
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Discharge	RW	BW	----	----
Sampling date / time				06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2235809-001	ES2235809-002	ES2235809-003	-----	-----	
				Result	Result	Result	----	----	
EA005: pH									
pH Value	----	0.01	pH Unit	7.22	7.52	7.81	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	33700	35800	18100	----	----	
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L	21900	23300	11800	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	9	10	16	----	----	
EA045: Turbidity									
Turbidity	----	0.1	NTU	11.1	11.2	13.7	----	----	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.001	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	<0.0001	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	<0.001	----	----	
Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.002	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	<0.001	----	----	
Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	<0.001	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.018	----	----	
Iron	7439-89-6	0.05	mg/L	<0.10	<0.10	<0.05	----	----	
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	1.21	1.73	0.88	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.54	0.43	0.14	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.18	0.02	0.17	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.18	0.02	0.17	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	0.7	0.6	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									



## Analytical Results

Sub-Matrix: <b>WATER</b> (Matrix: <b>WATER</b> )				Sample ID	Discharge	RW	BW	----	----
Sampling date / time					06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2235809-001	ES2235809-002	ES2235809-003	-----	-----
					Result	Result	Result	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser - Continued</b>									
^ Total Nitrogen as N		----	0.1	mg/L	1.2	0.7	0.8	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P		----	0.01	mg/L	0.14	0.17	0.10	----	----
<b>EP025: Oxygen - Dissolved (DO)</b>									
Dissolved Oxygen		----	0.1	mg/L	12.0	12.2	12.1	----	----

## Inter-Laboratory Testing

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

(WATER) EA005: pH