Pre-construction Water Quality Monitoring Report

Event 4 2022

October 2022

Project Number: 22-013

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1. Introduction

In 2020 Snowy Hydro Limited (Snowy Hydro) obtained approval (application number SSI 9208 and EPBC 2018/8322) to expand the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme), by linking the existing Tantangara and Talbingo reservoirs through a series of underground tunnels and constructing a new underground hydro-electric power station (referred to as 'Snowy 2.0').

To connect Snowy 2.0 to the National Energy Market (NEM), a new transmission connection is required. NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (known as TransGrid and the Proponent) will construct a substation and overhead transmission lines (the Project) to facilitate the connection of Snowy 2.0 to the existing electrical transmission network. The Project location is approximately 27 kilometres (km) east of Tumbarumba, New South Wales (NSW). UGL has been engaged on behalf of the Proponent to undertake the Project.

The purpose of the pre-construction water quality monitoring is to address the requirements of the Environmental Impact Statement (EIS) (Jacobs 2020) that was prepared by the Proponent under Part 5, Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* to assess the environmental impacts of the proposed Project. Subsequently, an Amendment Report (TransGrid 2021b) was submitted with the Response to Submissions (TransGrid 2021a) to the Department of Planning and Environment (DPE) with updated mitigation measures for the Project.

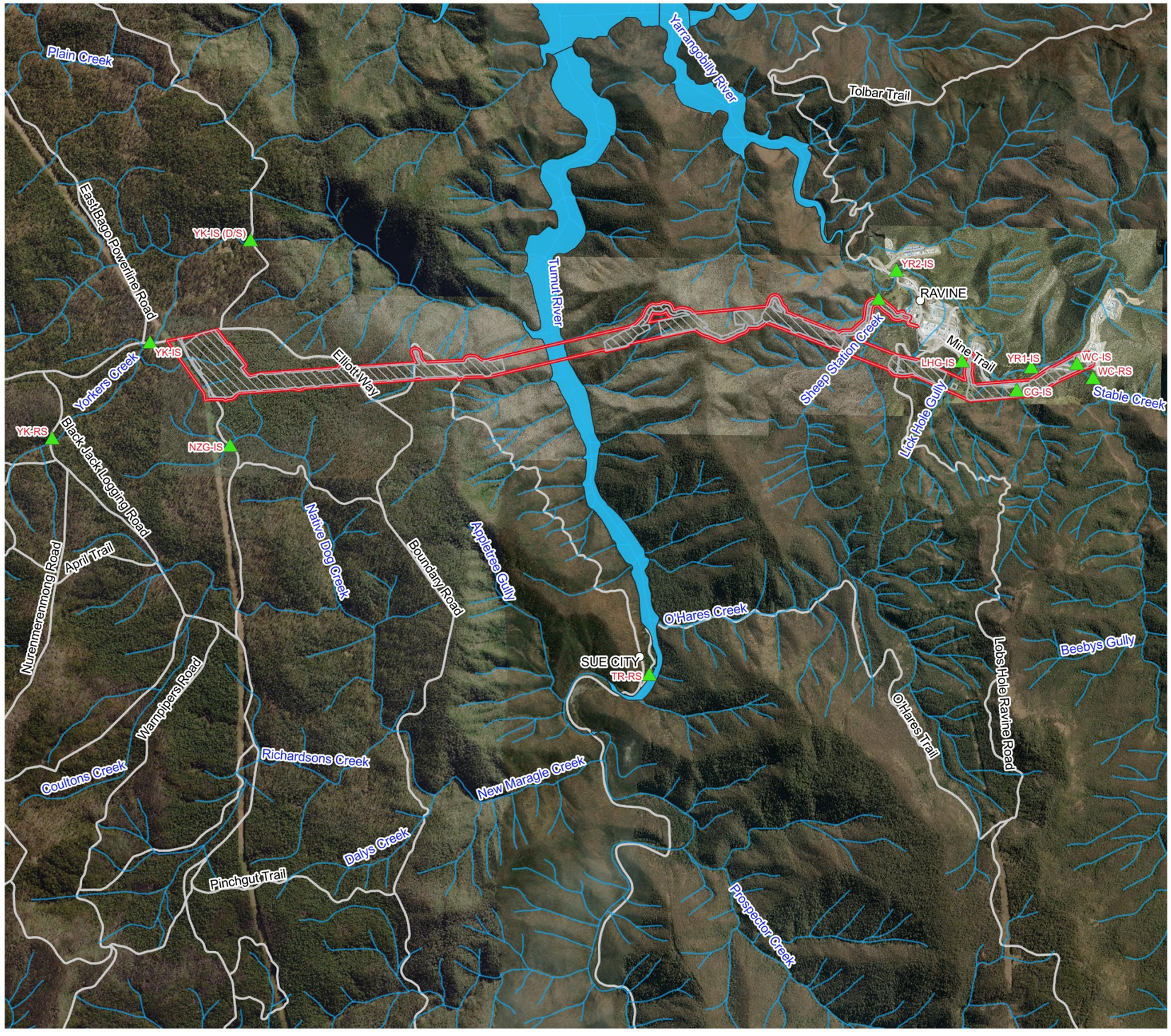
The objectives of the pre-construction surface water quality monitoring is to collect baseline data prior to Project construction works. Baseline data will be compared to ANZG (2018) guidelines to characterise the existing surface water quality. The data will be compared to the water quality objectives (WQO) for the Project area.

2. Program and methodology

The Pre-construction Water Quality Monitoring Program and Methodology (the Program) (NGH 2022) has been prepared to detail the WQOs for the Project, the location of the monitoring locations and the methodology for water sampling.

The Project area within Kosciuszko National Park is an area of high conservation value. Therefore, the water quality objectives for physical and chemical stressors includes **no change beyond natural variability** (ANZG 2018). The Default Guideline Values (DGV) for Upland Rivers has been provided for physical and chemical stressors and is detailed in the Program (NGH 2022).

The location of the sampling points in relation to the Project footprint is provided in Figure 2-1.



Legend
- Hydroareas
- Placepoint
- Roads
- Project Area
- Disturbance Footprint
- WQM Locations

0 1 2 km

Ref: 22-013 Snowy 2.0 Transmission Connection
WQM \ 22-013 WQM points 20220315
Author: N. Smith
Date created: 09.08.2022
Datum: 'EPSG:28355 GDA94 / MGA zone 55

NGH

Figure 2-1 WQM locations

3. Monitoring event observations and results

Water quality results for each site and are provided in Appendix A. Results are highlighted where they exceed the default guideline value (refer to the Program (NGH 2022)). Table 3-1 identifies exceedances of the DGVs for metals, cyanide and nutrients. Physico-chemical results have been provided in Figure 3-3 to Figure 3-10. Field data and observations are provided in Appendix B.

3.1. Event 4

NGH conducted the first, second and third rounds of sampling in March (Event 1), April (Event 2), and May and early June (Event 3) 2022. Reports for each event were prepared following receival of the laboratory results (NGH 2022a; 2022b; 2022c). The results of Event 1, Event 2 and Event 3 have been compared in this report to the results of Event 4.

NGH Environmental Scientist, Nicola Smith, conducted monitoring event UGL representative/s on 28 and 29 June 2022. The weather was mild with sun and a slight breeze. Data from the Cabramurra SMHEA automatic weather station on 28 June 2022 (Station ID 072161) indicates that it was a calm day with wind speed dropping from 6km/h in the morning to a calm afternoon. Temperatures on the day started with a low of -2.4°C and a high of 7.3°C. Data from the Tumbarumba weather station for 29 June 2022 (Station ID 072043) indicates that the day was calm with a low of -3.5°C and a high of 11.0°C.

Generally, water flow was observed to be slightly turbid with no hydrocarbon sheen, and no odours were present. The banks of each channel were well vegetated with the vegetation matrix weedier in some locations. Evidence of bank erosion from hooved animals was observed at the New Zealand Gully site, the Yorkers Creek impact site and Yorkers Creek reference site. Flow was observed to have increased in all channels as a result of the wet weather or snow melt compared to Event 1. However, turbidity was observed to have decreased compared to Event 3 (Figure 3-1 to Figure 3-2).

Figure 3-1 Lick Hole Gully (LHG-IS)

Figure 3-2 Sheep Station Creek (SSC-IS)

3.1.1. Results

The results indicate that the water quality in the locations where samples were taken generally meets the DGVs for Upland Rivers with a 99% species protection level for toxicants. Locations where a physical or chemical stressor was above the DGV are provided in Table 3-1. Both CG-IS and LHG-IS display elevated values for total dissolved solids compared to the other sampling locations. Total suspended solids at sites YK-IS and YK-RS were above the 0.2mg/L assigned DGV, refer to Appendix A.

Water temperatures ranged from 3.5 – 9.9 degrees Celsius with LHG-IS at 9.9 degrees Celsius and YK-RS at 3.5 degrees Celsius.

Many of the results are recorded as below (<) the limit of detection. To enable calculation of the statistics, the *Limit of Detection Divided by Two (LOD/2) Method* (Cohen and Ryan 1989) has been applied. This data is provided in Appendix A.

Any exceedances of the DGV for metals, nutrients and cyanide are presented in Table 3-1.

Table 3-1 Results above the DGV for Upland Rivers with 99% species protection level

Site identification	Analyte	DGV	Result	Comment
YK-IS (D/S)	Total Phosphorus (TP) mg/L	0.02	0.03mg/L	Located within Bago State Forest and adjacent to an unsealed track. Unknown activities within the State Forest upstream. Sample taken upstream of culvert. Sample only slightly elevated against the DGV by 0.01mg/L

The following time series, Figure 3-3 to Figure 3-10, display physico-chemical water quality through time for monitoring Event 1 (March), Event 2 (April), Event 3 (May/June) and Event 4 (June). Where a DGV is available, these values are shown on the graph and have been included for dissolved oxygen (%), conductivity, pH and turbidity.

Temperature is lowest at the Yorkers Creek sites YK-RS and YK-IS (D/S). The lower temperatures are a reflection of the cooler winter air temperatures and likelihood of snow melt (Figure 3-3).

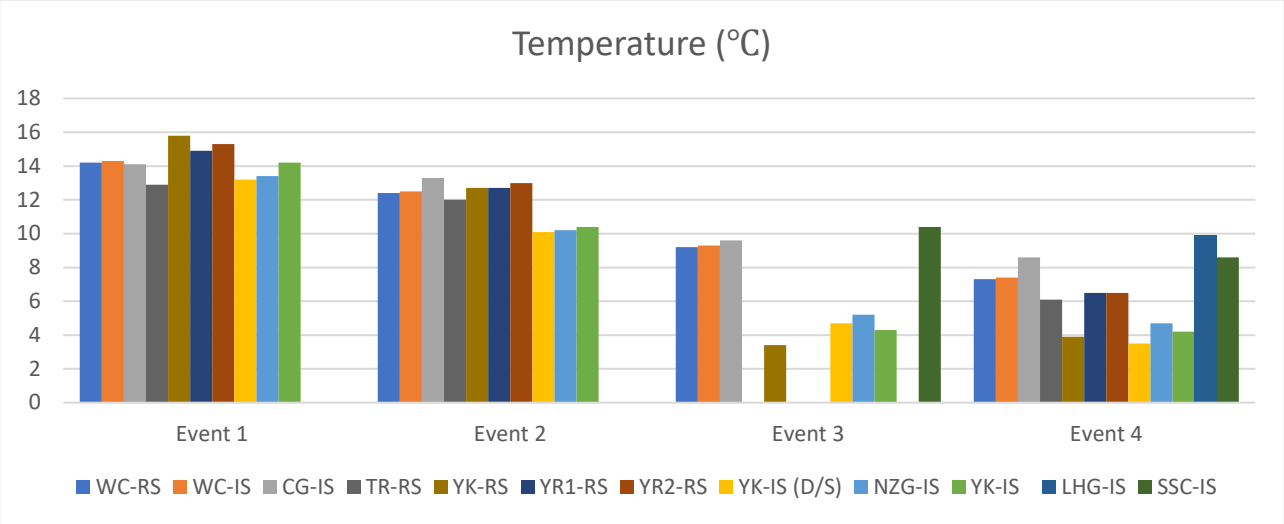


Figure 3-3 Temperature

DO (%) measurements at six sites are below the DGV minimum value with the lowest value of 24.6% at YR1-IS. This value is down from a high of 92.2% for Event 1, refer to Figure 3-4. DO (%) for YK-IS (D/S), NZG-IS, YK-RS and YK-IS are within the DGV range.

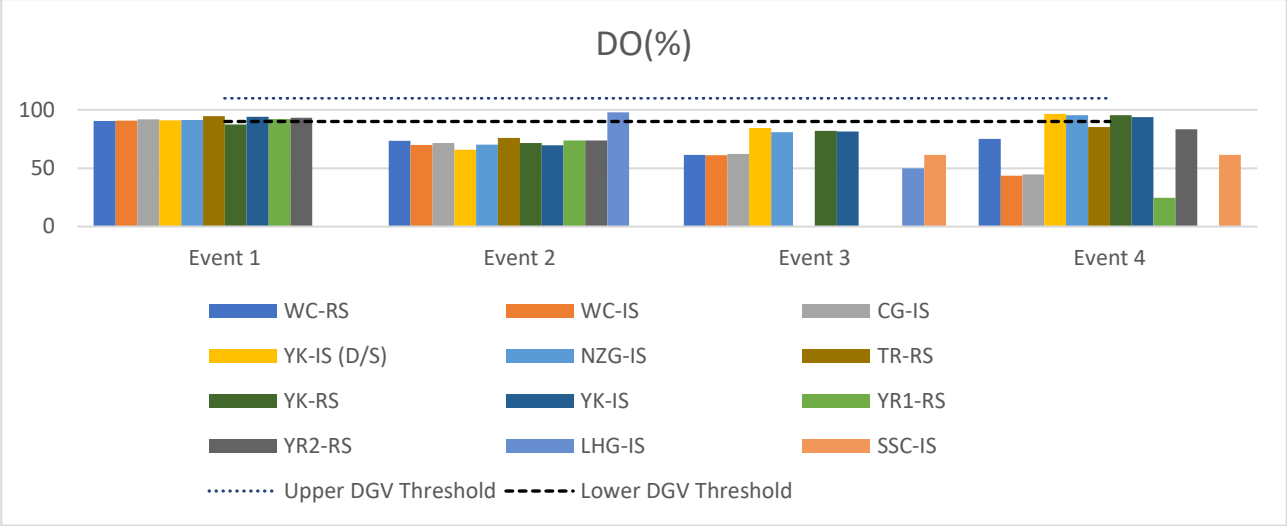


Figure 3-4 Dissolved oxygen (DO%)

The DO (ppm) for all sites exceeds the values of Event 1 to Event 3. The highest value recorded for Event 4 is YR2-IS with 19.18 ppm, refer to Figure 3-5.

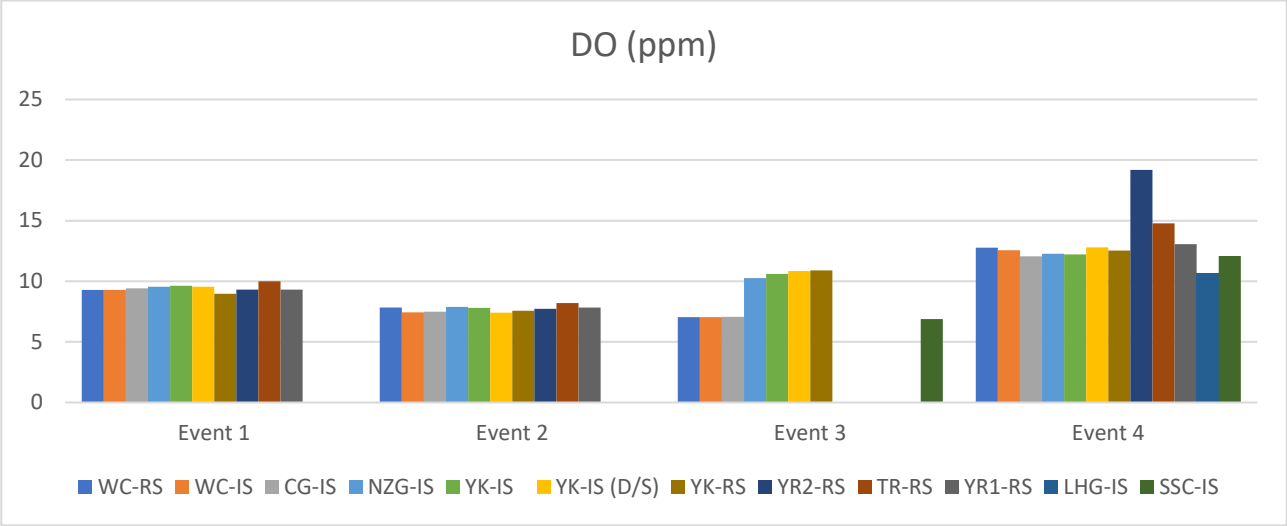


Figure 3-5 Dissolved Oxygen (ppm)

Specific conductance at most sites for Event 4 have decreased compared to previous events. The pattern of specific conductance between sites remains similar with CG-IS having the highest specific conductance, recorded as 321.3µS/cm for Event 4, refer to Figure 3-6.

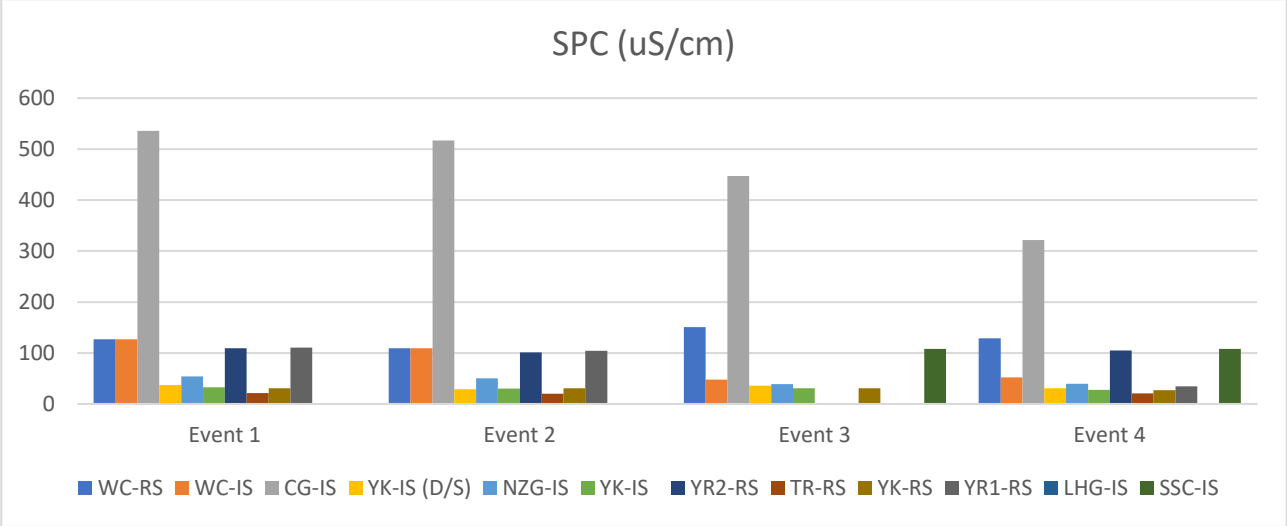


Figure 3-6 Specific Conductance (SPC µS/cm)

Conductivity at CG-IS for Event 4, compared to Event 3, has increased from 315µS/cm to 349µS/cm, refer to Figure 3-7. This is considered likely a result of the geology upstream. The pattern between sites is mostly reflective of the pattern for specific conductance. This was the first event where conductivity could be measured for Lick Hole Gully, which returned the highest value for Event 4 with 366.9µS/cm.

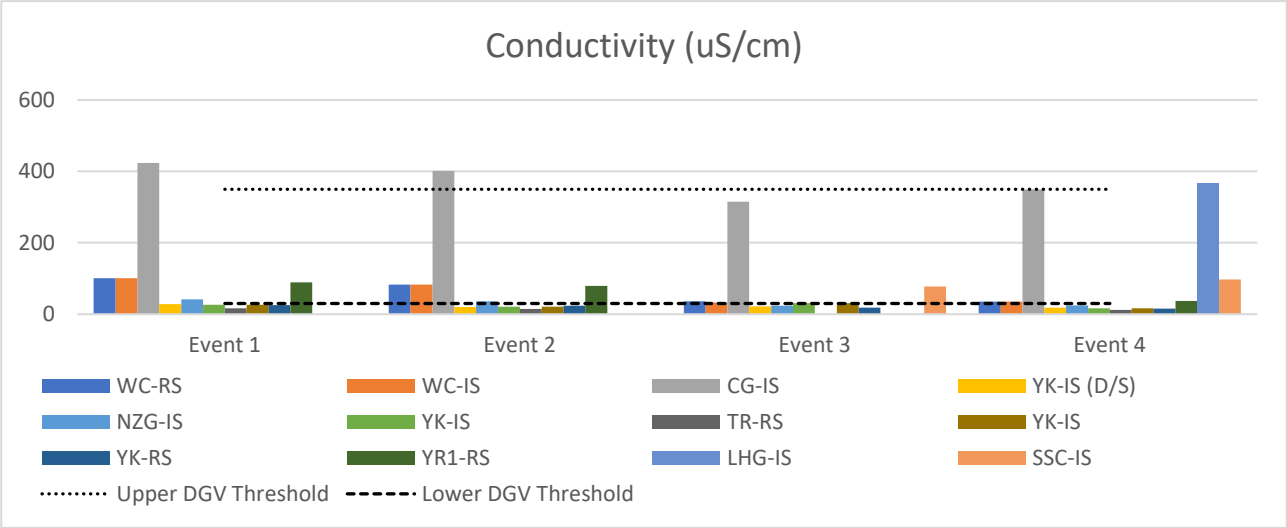


Figure 3-7 Conductivity (µS/cm)

Turbidity is missing from the suite of sampling results for Event 4. The equipment provided was missing the turbidity probe.

The results of monitoring for total suspended solids are some of the lowest of all events. The highest value for Event 4 was at YK-IS of 4mg/L compared to a value of 36mg/L during Event 3. For Event 3, the highest value was recorded at YK-IS (D/S) of 104mg/L, which returned a value of <0.2mg/L, refer to Figure 3-8.

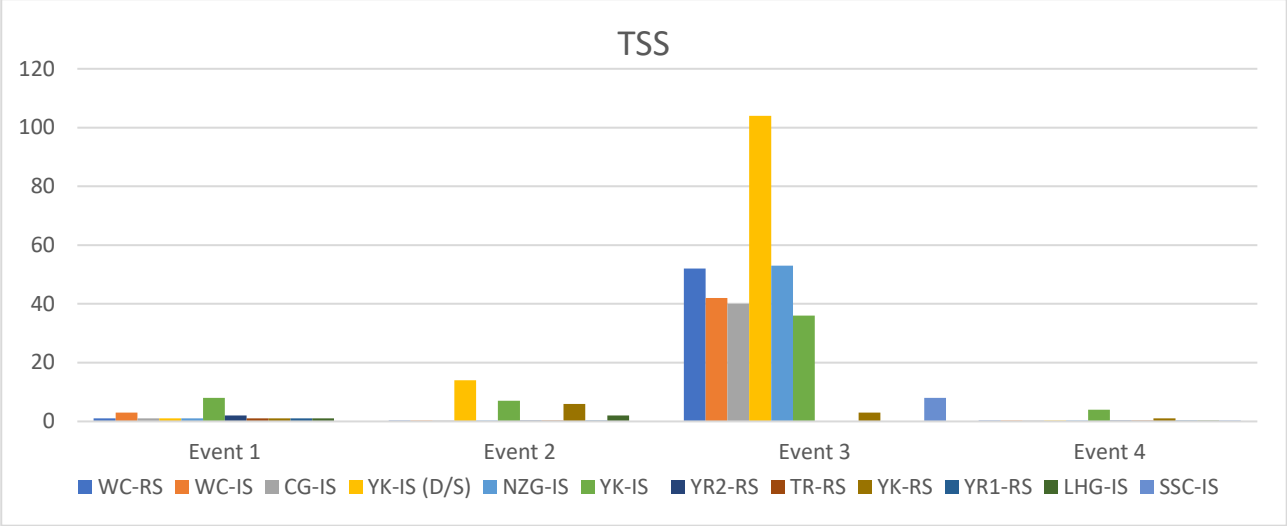


Figure 3-8 Total Suspended Solids

The pH for WC-RS and WC-IS have decreased from Event 3 to Event 4 from 7.64 to 5.8 pH units for WC-RS and 7.64 to 5.73 pH units for WC-IS. Overall, all sites showed reduced pH units for Event 4 than previous events, refer to Figure 3-9.

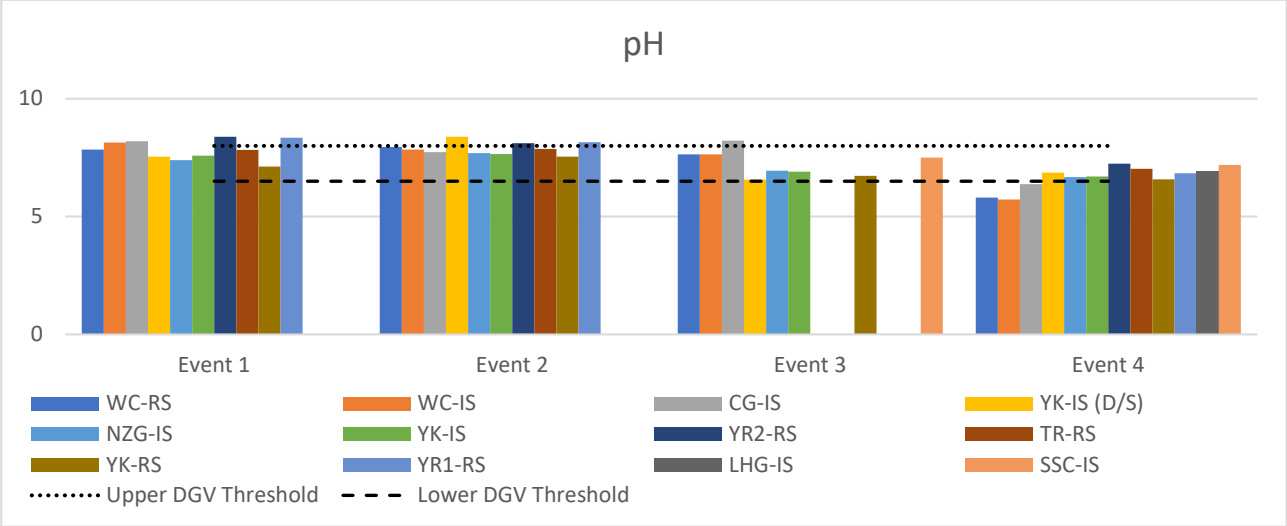


Figure 3-9 Potential of Hydrogen (pH)

The values for the oxygen redox potential during Event 4 have decreased from Event 3 except for WC-RS and WC-IS, which are displaying elevated values of 128.4mV and 115.9mV respectively. The values at all other sites are lower than the measured oxygen redox potential from any of the previous events, refer to Figure 3-10.

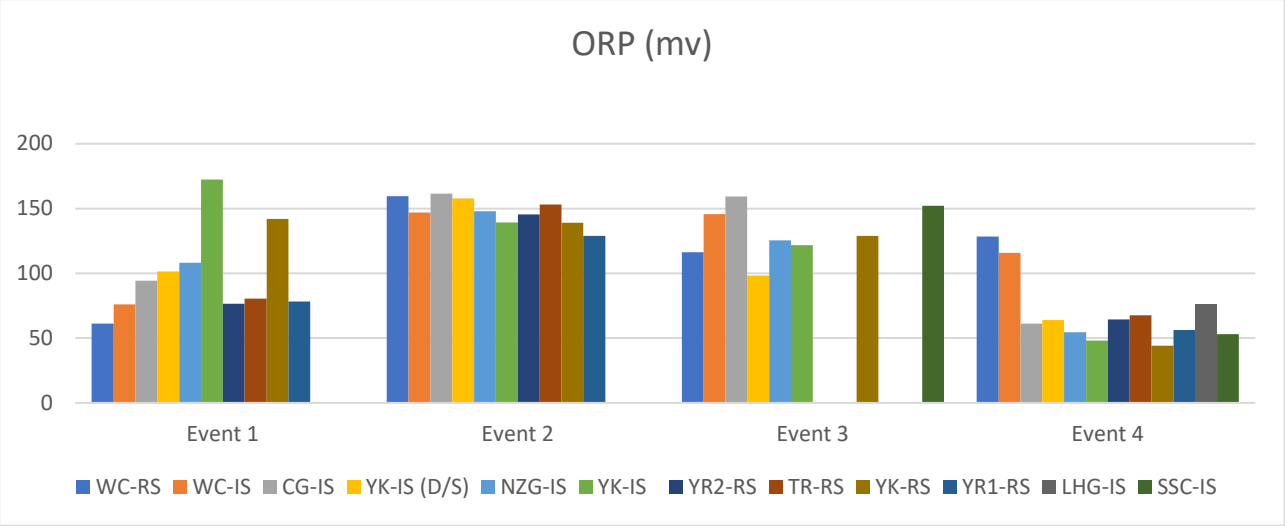


Figure 3-10 Oxygen Redox Potential (ORP)

3.1.2. Quality Assurance / Quality Control

A Quality Assurance and Quality Control (QA/QC) program was undertaken as part of this investigation including:

- A field duplicate sample, at a rate of one per 20 samples, was taken (DUP01) from the WQM site WC-RS on 28 June 2022. DUP01 was analysed for metals and metalloids. The duplicate sample has been compared against the WC-RS sample by Relative Percentage Difference (RPD) and has returned within an acceptable range or less than 30% for inorganic or less than 5 times the laboratory limit of reporting (LOR). The RPD was 0%.
- A water blank was supplied by the laboratory. The water blank sample was analysed for metals and metalloids. There were no exceedances of the sample results above the LORs.

NGH consider the QA/QC program to have been effective and the data reliable and representative to achieve the objectives of the investigation.

Refer to Appendix C for the laboratory analysis certificate, Appendix D for the RPD Table and Appendix E for the calibration certificates.

4. Conclusion

The results show a continuation of low water temperatures, especially for the channels at higher altitude (Bago State Forest – YK sites and NZG). Most results for Event 4 were lower with a similar pattern between sites as the previous three events except for dissolved oxygen. Dissolved oxygen showed an increase across sites except for WC-RS and WC-IS.

Laboratory results for Event 4 were generally consistent with the results of the previous monitoring events with the majority of analytes reported below the Limit of Reporting. The only exceedance in the laboratory results beyond total suspended solids was for total phosphorus at YK-IS (D/S) with a result of 0.03mg/L, which is above the DGV of 0.02mg/L. All results and statistics are provided in Appendix A.

5. References

Jacobs Pty Ltd. 2020. *Snowy 2.0 Transmission Connection Project EIS.*

NGH Pty Ltd. 2022. *Pre-construction Water Quality Monitoring Program and Methodology*.

NGH Pty Ltd. 2022a. *Pre-construction Water Quality Monitoring Report: Event 1 April 2022*.

NGH Pty Ltd. 2022b. *Pre-construction Water Quality Monitoring Report: Event 2 April 2022*.

NGH Pty Ltd. 2022c. *Pre-construction Water Quality Monitoring Report: Event 3 May and June 2022*.

TransGrid. 2021a. *Snowy 2.0 Transmission Connection Project Submissions Report.*

TransGrid. 2021b. *Snowy 2.0 Transmission Connection Project Amendment Report*.

APPENDIX A EVENT DATA TABLE

22-013 Pre-construction WQM		Sheen/ oil/ grease	Temp. ( )	Dissolved Oxygen (DO %)	DO (ppm)	Specific EC (SPC uS/cm)	EC (uS/cm)	pH	Redox (mV)	Turbidity (NTU)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Cyanide (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Ni (mg/L)	TN (mg/L)	TP (mg/L)	Ag (mg/L)	TDS mg/L	TSS (mg/L)	Zn (mg/L)
DGV (Default Guideline Value)		No	-	90-110	-	-	30-350	6.5-8	-	2-25	0.027	0.0008	0.00006	0.00001	0.001	0.004	0.3	0.001	1.2	0.00006	0.008	0.25	0.02	0.00002	-	-	0.0024
WC-RS	**Event 1**	No	14.2	90.5	9.28	126.8	100.7	7.85	61.2	0.37	*0.01*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.03	*0.0005*	0.011	*0.000015*	*0.0005*	3	*0.005*	*0.00001*	12	*1*	*0.001*
	Event 2	No but on sedime	12.4	73.5	7.84	109	83.1	7.95	159.4	1.49	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.001	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	*1*	*0.25*	*0.001*
	Event 3	No	9.2	61.3	7.05	151	36	7.64	116.3	36.96	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	50	52	*0.001*
	Event 4	No	7.3	75.1	12.78	128.9333333	35.3	5.8	128.4		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	19	*0.25*	*0.001*
	Min		7.30	61.30	7.05	109.00	35.30	5.80	61.20	0.37	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	1.00	0.25	0.00
	Max		14.20	90.50	12.78	151.00	100.70	7.95	159.40	36.96	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	3.00	0.01	0.00	50.00	52.00	0.00
	Mean		10.78	75.10	9.24	128.93	63.78	7.31	116.33	12.94	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.83	0.01	0.00	20.50	13.38	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		3.11	11.97	2.54	17.21	33.26	1.01	40.99	20.81	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	1.45	0.00	0.00	21.02	25.75	0.00
WC-IS	Event 1	No	14.3	90.6	9.28	126.7	100.8	8.14	76	0.32	*0.01*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.03	*0.0005*	0.011	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	80	3	*0.001*
	Event 2	No	12.5	69.9	7.44	109	83.3	7.84	146.8	1.39	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.002	*0.000015*	*0.0005*	0.8	*0.005*	*0.00001*	63	*0.25*	*0.001*
	Event 3	No	9.3	61.2	7.03	48	33	7.64	145.8	40.77	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.02	*0.00001*	41	42	*0.001*
	Event 4	No	7.4	43.7	12.55	52.3	35	5.73	115.9		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.02	*0.00001*	27	*0.25*	*0.001*
	Min		7.40	43.70	7.03	48.00	33.00	5.73	76.00	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	27.00	0.25	0.00
	Max		14.30	90.60	12.55	126.70	100.80	8.14	146.80	40.77	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.80	0.02	0.00	80.00	42.00	0.00
	Mean		10.88	66.35	9.08	84.00	63.03	7.34	121.13	14.16	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.28	0.01	0.00	52.75	11.38	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		3.11	19.50	2.51	39.79	34.28	1.09	33.32	23.05	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.35	0.01	0.00	23.44	20.46	0.00
CG-IS	Event 1	No	14.1	91.8	9.43	536	423.6	8.19	94.3	6.47	*0.01*	*0.00015*	*0.00001*	*0.000005*	0.005	*0.001*	*0.005*	*0.0005*	0.002	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	317	*1*	*0.001*
	Event 2	No	13.3	71.6	7.48	517	401.2	7.73	161.4	1.36	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.001	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	293	*0.25*	*0.001*
	Event 3	No	9.6	62.1	7.07	447	315	8.22	159.2	65.1	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	270	40	*0.001*
	Event 4	No	8.6	44.57	12.06	321.3	349	6.37	61.1		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.05	*0.00001*	266	*0.25*	*0.001*
	Min		8.60	44.57	7.07	321.30	315.00	6.37	61.10	1.36	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	266.00	0.25	0.00
	Max		14.10	91.80	12.06	536.00	423.60	8.22	161.40	65.10	0.02	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.05	0.00	317.00	40.00	0.00
	Mean		11.40	67.52	9.01	455.33	372.20	7.63	119.00	24.31	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.02	0.00	286.50	10.38	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		2.71	19.68	2.28	97.20	49.31	0.87	49.59	35.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	23.56	19.75	0.00
YR1-RS	Event 1	No	14.9	92.2	9.31	110.7	89.3	8.35	78.3	6.94	0.03	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.06	*0.0005*	0.003	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	69	*1*	*0.001*
	Event 2	No	12.7	73.8	7.83	104	79.2	8.15	128.8	1.85	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.001	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	50	*0.25*	*0.001*
	Event 3	No sample																									
	Event 4	No	6.5	24.6	13.05	34.7	36.9	6.84	56.3		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	33	*0.25*	*0.001*
	Min		6.50	24.60	7.83	34.70	36.90	6.84	56.30	1.85	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	33.00	0.25	0.00
	Max		14.90	92.20	13.05	110.70	89.30	8.35	128.80	6.94	0.03	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.10	0.01	0.00	69.00	1.00	0.00
	Mean		11.37	63.53	10.06	83.13	68.47	7.78	87.80	4.40	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.10	0.01	0.00	50.67	0.50	0.00
	Count		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	St. Dev		4.36	34.95	2.69	42.08	27.80	0.82	37.17	3.60	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.01	0.43	0.00
LHG-IS	Event 1	No									*0.01*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.02	*0.0005*	0.001	*0.000015*	*0.0005*	2	*0.005*	*0.00001*	348	*1*	*0.001*
	Event 2	No									*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.002	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	353	2	*0.001*
	Event 3	No sample																									
	Event 4	No	9.9	0	10.71	0	366.9	6.93	76.3		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.01	*0.00001*	295	*0.25*	*0.001*
	Min		9.90	0.00	10.71	0.00	366.90	6.93	76.30	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	295.00	0.25	0.00
	Max		9.90	0.00	10.71	0.00	366.90	6.93	76.30	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	2.00	0.01	0.00	353.00	2.00	0.00
	Mean		9.90	0.00	10.71	0.00	366.90	6.93	76.30	#DIV/0!	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.73	0.01	0.00	332.00	1.08	0.00
	Count		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	St. Dev		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.10	0.00	0.00	32.14	0.88	0.00
YR2-RS	Event 1	No	15.3	93.1	9.32	109.4	89.2	8.38	76.5	3.28	*0.01*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.06	*0.0005*	0.003	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	74	2	*0.001*
	Event 2	No	13	73.6	7.74	101	78.3	8.11	145.4	2.29	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.002	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	39	*0.25*	*0.001*
	Event 3	No sample																									
	Event 4	No	6.5	83.35	19.18	105.2	38.4	7.24	64.5		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	38	*0.25*	*0.001*
	Min		6.50	73.60	7.74	101.00	38.40	7.24	64.50	2.29	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	38.00	0.25	0.00
	Max		15.30	93.10	19.18	109.40	89.20	8.38	145.40	3.28	0.02	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.10	0.01	0.00	74.00	2.00	0.00
	Mean		11.60	83.35	12.08	105.20	68.63	7.91	95.47	2.79	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.10	0.01	0.00	50.33	0.83	0.00
	Count		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	St. Dev		4.56	9.75	6.20	4.20	26.74	0.60	43.66	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.50	1.01	0.00
SSC-IS	Event 1	No flow																									
	Event 2	No flow																									
	Event 3	No	10.4	61.4	6.87	108	78	7.5	152.2	42.72	*0.00015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	84	8	*0.001*
	Event 4	No	8.6	61.4	12.09	108	96.9	7.19	53.1		*0.00015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	69	*0.25*	*0.001*
	Min		8.60	61.40	6.87	108.00	78.00	7.19	53.10	42.72	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	69.00	0.25	0.00
	Max		10.40	61.40	12.09	108.00	96.90	7.50	152.20	42.72	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	84.00	8.00	0.00
	Mean		9.50	61.40	9.48	108.00	87.45	7.35	102.65	42.72	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	76.50	4.13	0.00
	Count		2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	St. Dev		1.27	0.00	3.69	0.00	13.36	0.22	70.07	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.61	5.48	0.00
TR-RS	Event 1	No	12.9	94.6	9.99	21.1	16.2	7.83	80.5	0.07	*0.01*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.03	*0.0005*	0.003	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	43	*1*	*0.001*
	Event 2	No	12	76	8.2	20	15	7.87	153	1.02	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.001	*0.000015*	*0.0005*	1.1	*0.005*	*0.00001*	12	*0.25*	*0.001*
	Event 3	No Sample																									
	Event 4	No	6.1	85.3	14.78	20.55	12.3	7.03	67.6		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.01	*0.00001*	7	*0.25*	*0.001*
	Min		6.10	76.00	8.20	20.00	12.30	7.03	67.60	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	7.00	0.25	0.00
	Max		12.90	94.60	14.78	21.10	16.20	7.87	153.00	1.02	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	1.10	0.01	0.00	43.00	1.00	0.00
	Mean		10.33	85.30	10.99	20.55	14.50	7.58	100.37	0.55	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.43	0.01	0.00	20.67	0.50	0.00
	Count		3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	St. Dev		3.69	9.30	3.40	0.55	2.00	0.47	46.04	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.58	0.00	0.00	19.50	0.43	0.00
YK-IS (D/S)	Event 1	No	13.2	91.1	9.56	36.9	28.6	7.55	101.4	6.42	0.26	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.39	*0.0005*	0.006	*0.000015*	*0.0005*	2	*0.005*	*0.00001*	22	*1*	*0.001*
	Event 2	No	10.1	65.9	7.42	29	20.5	8.39	157.8	9.1	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.15	*0.0005*	0.001	*0.000015*	*0.0005*	0.2	*0.005*	*0.00001*	*1*	14	*0.001*
	Event 3	No	4.7	84.4	10.85	36	22	6.56	98.2	59.63	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.17	*0.00001*	44	104	*0.001*
	Event 4	No	3.5	96.4	12.79	30.8	18.2	6.87	64		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.03	*0.00001*	18	*0.25*	*0.001*
	Min		3.50	65.90	7.42	29.00	18.20	6.56	64.00	6.42	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	1.00	0.25	0.00
	Max		13.20	96.40	12.79	36.90	28.60	8.39	157.80	59.63	0.26	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.01	0.00	0.00	2.00	0.17	0.00	44.00	104.00	0.00
	Mean		7.88	84.45	10.16	33.18	22.33	7.34	105.35	25.05	0.08	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.60	0.05	0.00	21.25	29.81	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		4.57	13.31	2.26	3.87	4.47	0.81	38.85	29.98	0.12	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.93	0.08	0.00	17.69	49.86	0.00
NZG-IS	Event 1	No	13.4	91.3	9.54	53.8	41.8	7.39	108.1	5.14	0.14	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.21	*0.0005*	0.005	*0.000015*	*0.0005*	3	*0.005*	*0.00001*	43	*1*	*0.001*
	Event 2	No	10.2	70.2	7.89	50	36	7.69	148	3.67	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	0.001	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	52	*0.25*	*0.001*
	Event 3	No	5.2	80.8	10.27	39	24	6.95	125.4	51.33	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	48	53	*0.001*
	Event 4	No	4.7	95.4	12.28	39.8	24.4	6.67	54.6		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	0.03	*0.00001*	22	*0.25*	*0.001*
	Min		4.70	70.20	7.89	39.00	24.00	6.67	54.60	3.67	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	22.00	0.25	0.00
	Max		13.40	95.40	12.28	53.80	41.80	7.69	148.00	51.33	0.14	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.01	0.00	0.00	3.00	0.03	0.00	52.00	53.00	0.00
	Mean		8.38	84.43	10.00	45.65	31.55	7.18	109.03	20.05	0.05	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.83	0.01	0.00	41.25	13.63	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		4.17	11.30	1.82	7.39	8.81	0.45	39.79	27.10	0.06	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	1.45	0.01	0.00	13.35	26.25	0.00
YK-IS	Event 1	No	14.2	94	9.63	32.9	26.1	7.58	172.4	10.66	0.41	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.49	*0.0005*	0.011	*0.000015*	*0.0005*	2	*0.005*	*0.00001*	20	8	*0.001*
	Event 2	No	10.4	69.7	7.8	30	21.4	7.65	139.3	9.44	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.2	*0.0005*	0.001	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	24	7	*0.001*
	Event 3	No	4.3	81.5	10.6	31	31	6.9	121.6	32.77	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	46	36	*0.001*
	Event 4	No	4.2	93.8	12.23	27.6	16.6	6.7	48.1		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	14	4	*0.001*
	Min		4.20	69.70	7.80	27.60	16.60	6.70	48.10	9.44	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	14.00	4.00	0.00
	Max		14.20	94.00	12.23	32.90	31.00	7.65	172.40	32.77	0.41	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.01	0.00	0.00	2.00	0.01	0.00	46.00	36.00	0.00
	Mean		8.28	84.75	10.07	30.38	23.78	7.21	120.35	17.62	0.11	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.58	0.01	0.00	26.00	13.75	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		4.90	11.61	1.85	2.21	6.18	0.48	52.57	13.13	0.20	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.01	0.00	0.00	0.95	0.00	0.00	13.95	14.93	0.00
YK-RS	Event 1	No	15.8	87.5	8.96	30.5	25.1	7.12	142	5.71	0.35	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.45	*0.0005*	0.005	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	20	*1*	*0.001*
	Event 2	No	12.7	71.4	7.58	31	24	7.54	138.9	9.77	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	0.19	*0.0005*	0.002	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	30	6	*0.001*
	Event 3	No	3.4	82	10.91	31	18	6.73	128.8	20.28	*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	40	3	*0.001*
	Event 4	No	3.9	95.3	12.53	26.9	16.1	6.58	44.2		*0.015*	*0.00015*	*0.00001*	*0.000005*	*0.0001*	*0.001*	*0.005*	*0.0005*	*0.0005*	*0.000015*	*0.0005*	*0.1*	*0.005*	*0.00001*	15	*1*	*0.001*
	Min		3.40	71.40	7.58	26.90	16.10	6.58	44.20	5.71	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	0.00	15.00	1.00	0.00
	Max		15.80	95.30	12.53	31.00	25.10	7.54	142.00	20.28	0.35	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.01	0.00	0.00	0.10	0.01	0.00	40.00	6.00	0.00
	Mean		8.95	84.05	10.00	29.85	20.80	6.99	113.48	11.92	0.10	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.10	0.01	0.00	26.25	2.75	0.00
	Count		4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	St. Dev		6.25	10.04	2.17	1.98	4.42	0.43	46.53	7.52	0.17	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.09	2.36	0.00

Values coloured blue and italicised are half the Limit of reporting for statistical use (LOR/2)

DO – Dissolved Oxygen; EC – Conductivity; Redox – Oxidation Reduction Potential; TSS – Total Suspended Solids; TDS – Total Dissolved Solids; TN – Total Nitrogen; TP – Total Phosphorus; Al – Aluminium; As – Arsenic; Cd – Cadmium; Cr – Chromium; Cu – Copper; Pb – Lead; Hg – Mercury; Ni – Nickel; Zn – Zinc; Fe – Iron; Ag – Silver; Mn – Manganese

APPENDIX B OBSERVATIONS AND FIELD DATA

28/6/22 - sunny, slight breeze

22-013 Pre-construction WQM		Grease/oil/ sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
WC-RS	Month	NO	7.3	—	12.78	—	35.3	5.8	128.4	—
	Comment	fast flowy, clear, no obvious turbidity nor oil sheen observed								
WC-IS	Month	NO	7.4	—	12.55	—	35.0	5.73	115.9	—
	Comment	Fast flowy, as above - slightly turbid								
CG-IS	Month	No	8.6	—	12.06	—	349.0	6.37	61.1	—
	Comment	fast flowy, clear, no obvious turbidity. Aquatic plants moss, cobble.								
YR1-IS	Month	NO	6.5	—	13.05	—	36.9	6.84	56.3	—
	Comment	Slightly more turbid visually than WC-RS, fast flowy.								

WB 7 Metals Cyanide YN

(mg/L) — check other readings have been mS/cm. — m

22-013 Pre-construction WQM		Grease/oil/ sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
LHG-IS	Month	No	9.9	—	10.71	~~366.9~~ →	366.9	6.93	76.3	—
	Comment	No odour, more water than usual able to take a more reading clear.								
YR2-IS	Month	NO	6.5	—	13.18	~~38.4~~ →	38.4	7.24	64.5	—
	Comment	Fast flowing, large rapids, no odour, not clear.								
SSC-IS	Month	No	8.6	—	12.09	~~96.9~~ →	96.9	7.19	53.1	—
	Comment	Flowing. Water level half of what it was in event 3. Milky-ness to water observed. No odour								
TR-RS	Month	No	6.1	~~—~~	~~12.79~~ 14.78	/	12.3	7.03	67.6	—
	Comment	Clear, cold no odour.								
YK-IS (D/S)	Month	No	3.5	~~4~~96.4	12.79	30.~~8~~	18.2	6.87	64.0	—
	Comment	Not as clear as previous event 1+2 fast flowing, no odour. TDS 20.10 mg/L								

no turbidity → doesn't read in probe

Also, need to check duplicate data collected B4 sample!

22-013 Pre-construction WQM		Grease/oil/ sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
NZG-IS	Month	NO	4.7	95.4	12.28	39.8	24.4	6.67	54.6	—
	Comment	Clear, sandy bed erosion on banks - deer, horses no odour, deeper than events 1 + 2.								TDS 26.00 mg/L
YK-IS	Month	NO	4.2	93.8	12.23	27.6	16.6	6.70	48.1	—
	Comment	Milky-ness to flow no odour Erosion on banks - horses - evidence = hoof marks + poo.								TDS 18.20 mg/L
YK-RS	Month	NO	3.9	95.3	12.53	26.9	16.1	6.58	44.2	—
	Comment	Evidence of horses Clear, fast flowing, deeper than events 1 + 2 No ~~?~~ odour.								TDS 17.5 mg/L

[*] Add metromaps to QGIS.

[*] Now have project area - determine which pts might need to be moved into impact zones.

APPENDIX C LABORATORY CERTIFICATES

2206-0100

Charles Sturt University

CLIENT:	NGH Pty Ltd
CONTACT:	Nicola Smith
ADDRESS:	35 Kincaid Street Wagga Wagga NSW 2650 ABN: 31 124 444 622
TELEPHONE:	0410 411 660
E-mail	nicola.s@nghconsulting.com.au

SAMPLE IDENTIFICATION	NATURE OF SAMPLE	DATE SAMPLED	TIME SAMPLED	CONTAINER TYPE	NUMBER OF CONTAINERS	Total Nitrogen	Total Phosphorus	Cyanide	Total Suspended Solids	Total Dissolved Solids	Dissolved Metals (Al, As, C
WC-RS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
WC-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
YR9-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
CG-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
LHG-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
YR2-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
SSC-IS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
TR-RS	Water	28.6.22		Bottle	3	X	X	X	X	X	X
YK-IS(DIS)	Water	29.6.22		Bottle	3	X	X	X	X	X	X
YK-IS	Water	29.6.22		Bottle	3	X	X	X	X	X	X
N2G-IS	Water	29.6.22		Bottle	3	X	X	X	X	X	X
YK-RS	Water	29.6.22		Bottle	3	X	X	X	X	X	X
DUP01	Water	28.6.22		Bottle	1						X
Water blank	Water	-		Bottle	3	X		X			X

ANALYTES REQUIRED *Complete & tick as required*

	NAME	SIGNATURE	ORGANISATION	DATE	TIME
RELINQUISHED BY:	Nicola Smith		NGH Pty Ltd	29.6.22	15:31
Mode of Transport Include Consignment Note # if applicable	Delivery				
RECEIVED BY:	M. GLAZIER		EM	29/6/22	3:33

Charles Sturt University

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Wagga Wagga NSW 2650
Attention: Nicole Isles

Wednesday, September 28, 2022

NATA Accredited Laboratory Number: 9597

Accredited for compliance with ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100
Page 1 of 15
For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0255	**WC-RS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.02**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**19**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0256	**WC-IS** 28.06.22					

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Attention: Nicole Isles

Wednesday, September 28, 2022

NATA Accredited Laboratory Number: 9597

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0256	**WC-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.04**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**27**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0257	**YR1-IS** 28.06.22					

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Attention: Nicole Isles

Wednesday, September 28, 2022

NATA Accredited Laboratory Number: 9597
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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:	Order #	Date Analysis Commenced
		29-June-2022
Sample Type	**Collected By**	**Date Received**
Water	N. Smith	29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0257	**YR1-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.02**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**33**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0258	**CG-IS** 28.06.22					

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Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0258	**CG-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.05**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**266**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0259	**LHG-IS** 28.06.22					

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This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100
Page 5 of 15
For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0259	**LHG-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.01**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**294**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0260	**YR2-IS** 28.06.22					

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Wagga Wagga NSW 2650
Attention: Nicole Isles

Wednesday, September 28, 2022

NATA Accredited Laboratory Number: 9597
Accredited for compliance with ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:	Order #	Date Analysis Commenced
		29-June-2022
Sample Type	**Collected By**	**Date Received**
Water	N. Smith	29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0260	**YR2-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.02**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**38**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0261	**SSC-IS** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:	Order #	Date Analysis Commenced
		29-June-2022
Sample Type	**Collected By**	**Date Received**
Water	N. Smith	29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0261	**SSC-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.01**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**69**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0262	**TR-RS** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:	Order #	Date Analysis Commenced
		29-June-2022
Sample Type	**Collected By**	**Date Received**
Water	N. Smith	29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0262	**TR-RS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.01**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**7**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0263	**YK-IS(DIS)** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0263	**YK-IS(DIS)** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.03**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**18**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0264	**YK-IS** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100
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For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0264	**YK-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.02**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**15**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0265	**NZG-IS** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100
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For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0265	**NZG-IS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.03**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**22**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**<0.2**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0266	**YK-RS** 28.06.22					

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REPLACEMENT LABORATORY ANALYSIS REPORT
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Report Number:2206-0100
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For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0266	**YK-RS** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Phosphorus, Total	**0.01**	mg/L	LTM-W-030	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	**14**	mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Total Suspended Solids	**4**	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0267	**DUP01** 28.06.22					

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Report Number:2206-0100
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For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0267	**DUP01** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002
22Jun-0268	**Water Blank** 28.06.22					
		Aluminium (dissolved)	**<0.03**	mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	**<0.0003**	mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	**<0.00002**	mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	**<0.00001**	mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	**<0.0002**	mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	**<0.002**	mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	**<0.01**	mg/L	APHA 3030 B/3120 B	0.01

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Report Number:2206-0100
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For all enquiries related to this report please quote document number: 2206-0100

Facility:

Order #

Date Analysis Commenced
29-June-2022

Sample Type
Water

Collected By
N. Smith

Date Received
29-June-2022

EAL ID	Client ID. / Date/Time sample taken	Test	Result (units)		Method Reference	Limit of Reporting
22Jun-0268	**Water Blank** 28.06.22					
		Lead (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.001
		Mercury	**<0.00003**	mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	**<0.001**	mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	**<0.2**	mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	**<0.1**	mg/L	LTM-W-014	0.1
		Silver (dissolved)	**<0.00002**	mg/L	* APHA 3030 E/3120 B	0.002
		Total Kjeldahl Nitrogen	**<0.2**	mg/L	LTM-W-034	2
		Zinc (dissolved)	**<0.002**	mg/L	APHA 3030 B/3120 B	0.002

Note:

**** NATA Accreditation does not cover the performance of this service.***

ENVIRONMENTAL AND ANALYTICAL LABORATORIES

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NGH Environmental

Suite 1/39 Fitzmaurice Strret

Wagga Wagga NSW 2650

Attention: Nicole Isles

Wednesday, September 28, 2022

NATA Accredited Laboratory Number: 9597

Accredited for compliance with ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 24/08/2022

Report Number:2206-0100

For all enquiries related to this report please quote document number: 2206-0100

Facility:	**Order #**	**Date Analysis Commenced**
		29-June-2022
Sample Type	**Collected By**	**Date Received**
Water	N. Smith	29-June-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting

Signed ..... Michael Glazier, Laboratory Manager.

All samples analysed as received.
All soil results are reported on a dry basis.
The EAL takes no responsibility for the end use of results within this report.
This report shall not be reproduced except in full.
This report replaces any previously issued report

APPENDIX D RPD TABLE

			Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Cyanide (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Ni (mg/L)	Ag (mg/L)	Zn (mg/L)
DUP01	Event 1	DUP01	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.003	0.000015	0.0005	0.00001	0.001
		YR1-IS	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.003	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 2	DUP01	<0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.001	0.000015	0.0005	0.00001	0.001
		WC-IS	<0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.002	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range except Mn**	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%
	Event 3	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		Yk-IS (D/S	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 4	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 5	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 6	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - **Acceptable Range**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 7														
	Event 8														

Water Blan	Event 1	**Nothing above LOR**	<0.02	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 2	**Nothing above LOR**	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 3	**Nothing above LOR**	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 4	**Nothing above LOR**	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 5														
	Event 6														

RPD % $|(x_2 - x_1)|/((x_2 + x_1)/2)$

How to calculate the Relative Percent Difference (RPD)

The basic equation for RPD is $RPD = \frac{|R1 - R2|}{\left(\frac{R1 + R2}{2}\right)} \times 100,$

where

$R1$ is sample 1, and
$R2$ is sample 2.

R1 and R2 are your sample and duplicate values. Basically, this equation has you calculate the RPD by dividing the difference between the sample and duplicate by the average of the two. Using absolute value signs ensures the RPD doesn't end up as a negative percentage, which wouldn't make sense when looking for a percent difference.

The equation you plug into Excel looks like this:

=ABS((B3-C3)/AVERAGE(B3:C3)*100)

ABS stands for Absolute Value. Using the cell labels in the equation, as seen above (B3, C3), allows you to use the equation down for all your sample/duplicate pairs so you don't have to write a new equation each time. You can do this by clicking on the cell with the equation in it, then click and drag the bottom right corner of the cell down for the rest of your samples.

APPENDIX E CALIBRATION CERTIFICATES

21/06/2022

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **18D102941**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
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
2. pH 7.00		pH 7.00		377339	pH 7.02
3. pH 4.00		pH 4.00		380327	pH 4.01
4. mV		2.39.5mV		380834/378285	238.4mV
5. EC		2.76mS		385047	2.76mS
6. D.O		0.00%		371864	0.00%
7. Temp		20.2		MultiTherm	20.0°C

Calibrated by: **Lebelle Chee**

Calibration date: **21/06/2022**

Next calibration due: **21/07/2022**