



**NGH**



# **Pre-construction Water Quality Monitoring Report**

**Event 5 2022**

**October 2022**

**Project Number: 22-013**



## Document verification

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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.



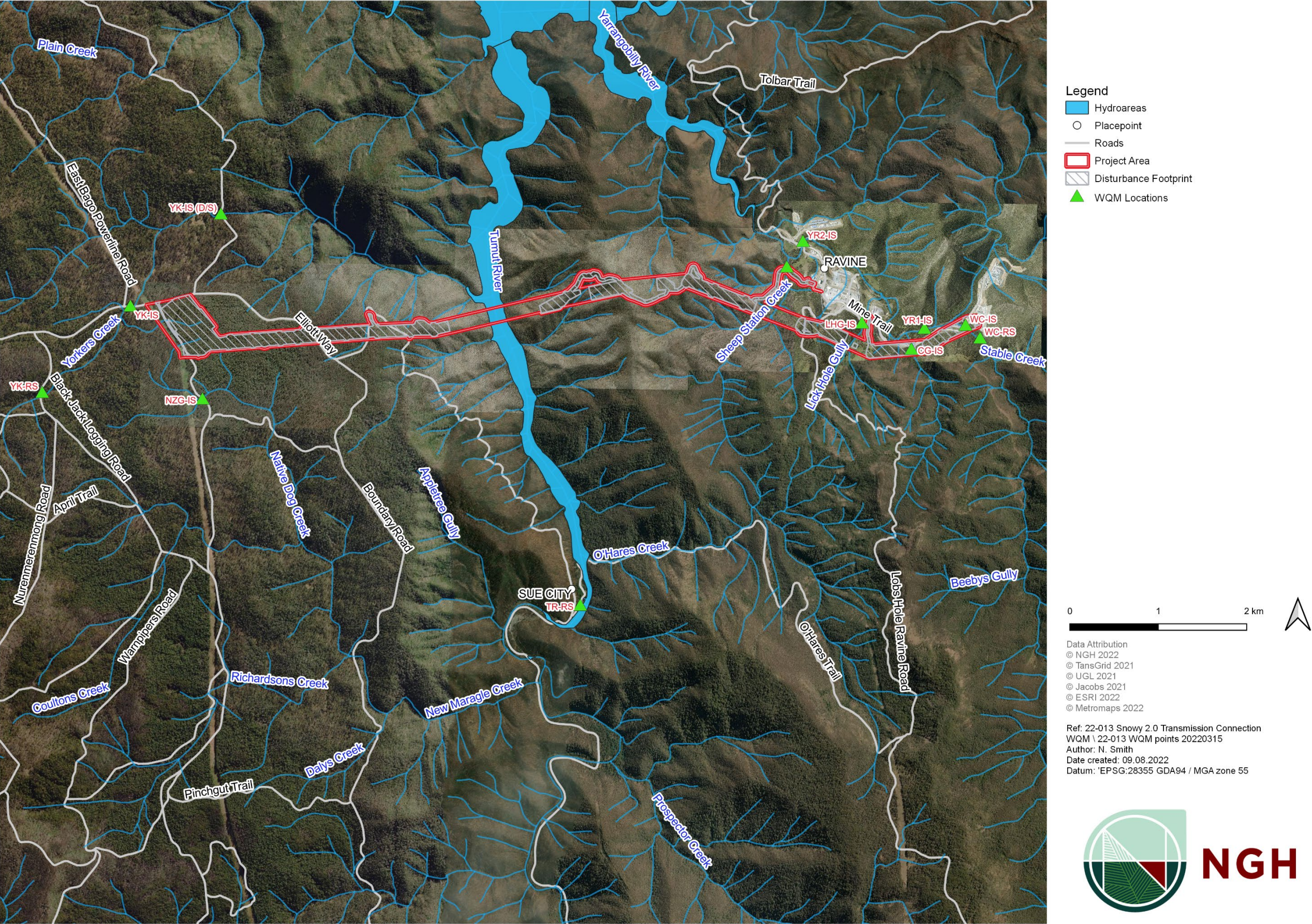


Figure 2-1 WQM locations



### 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 3-4 to Figure 3-12. Field data and observations are provided in Appendix B.

#### 3.1. Event 5

NGH conducted the first, second and third rounds of sampling in March (Event 1), April (Event 2), May and early June (Event 3) and late June (Event 4) 2022. Reports for each event were prepared following receipt of the laboratory results (NGH 2022a; 2022b; 2022c; 2022d). The results of Event 1, Event 2, Event 3 and Event 4 have been compared in this report to the results of Event 5.

NGH Environmental Scientist, Nicola Smith, conducted monitoring event with UGL a representative on 27 and 28 July 2022. The weather was mild with sunshine and a breeze. Data from the Cabramurra SMHEA automatic weather station on 27 July 2022 (Station ID 072161) indicates that wind speeds were from the west at 22km/hr in the morning dropping to 13km/hr in the afternoon. Temperatures on the day included a low of -3.1°C and a high of 2.8°C. Data from the Tumbarumba weather station for 29 June 2022 (Station ID 072043) indicates that the day was calm with a low of 1.0°C and a high of 12.0°C.

Generally, water flow was observed to be clear 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 maintained an elevated level compared to Events 1 and 2 in all channels as a result of the wet weather or snow melt. However, turbidity was observed to have decreased compared to Event 3 (Figure 3-1 to Figure 3-3).



Figure 3-1 Wallaces Creek (WC-RS)



Figure 3-2 Lick Hole Gully (LHG-IS)



Figure 3-3 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. Values recorded at all locations for chemical stressors were all below the DGV for Event 5.

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 (D/S), NZG-IS, YK-IS and YK-RS were above the 0.2mg/L assigned DGV, refer to Figure 3-10 and Appendix A.

Water temperatures ranged from 5.4 – 9.3 degrees Celsius with LHG-IS at 9.3 degrees Celsius and YK-IS (D/S) at 5.4 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.

The following time series, Figure 3-4 to Figure 3-12, display physico-chemical water quality through time for monitoring Event 1 (March), Event 2 (April), Event 3 (May/June), Event 4 (June) and Event 5 (July). Where a DGV is available, these values are shown on the graph and have been included for dissolved oxygen (%), conductivity, pH and turbidity.

Temperatures are lowest at Talbingo Reservoir and the four locations within Bago State Forest (Yorkers Creek sites and New Zealand Gully), refer to Figure 3-4. Temperatures at all locations were higher than in Event 4.

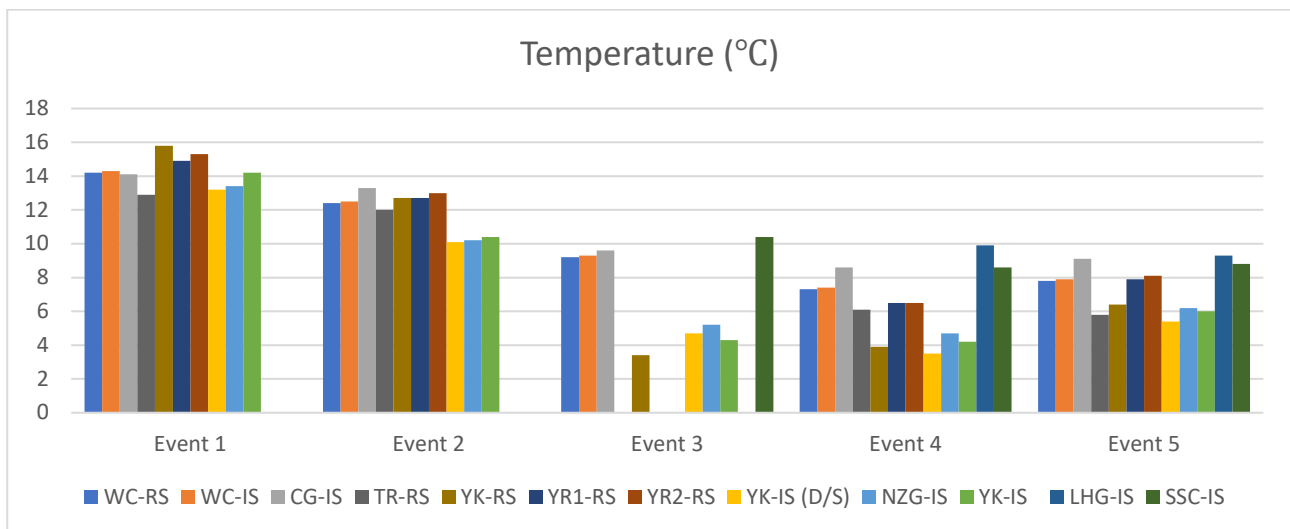


Figure 3-4 Temperature

All DO (%) measurements for Event 5 were within the DGV range or close to the minimum DGV value with the lowest value of 88.7% at YK-RS. The highest values of DO (%) were recorded during Event 5 compared with previous events with TR-RS 103.9% and YR1-RS 102.6%, refer to Figure 3-5.



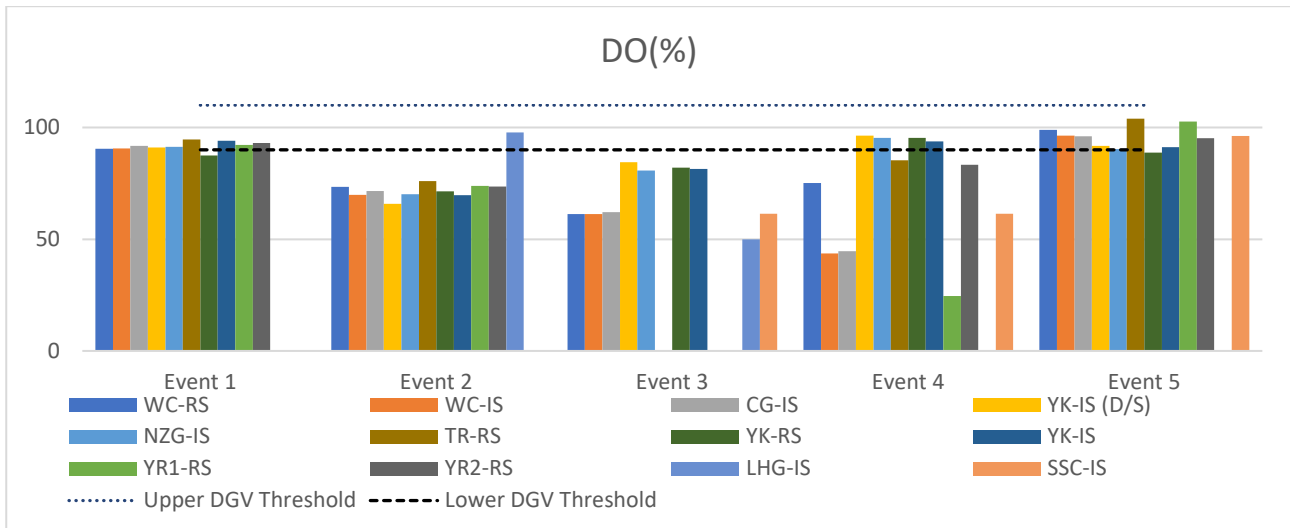


Figure 3-5 Dissolved oxygen (DO%)

The DO (ppm) values and pattern for Event 5 is similar to Event 4 except for the peak of 19.18ppm at YR2-RS in Event 4 was reduced to 11.26ppm during Event 5, refer to Figure 3-6. TR-RS returned the highest value of 13.01ppm for Event 5.

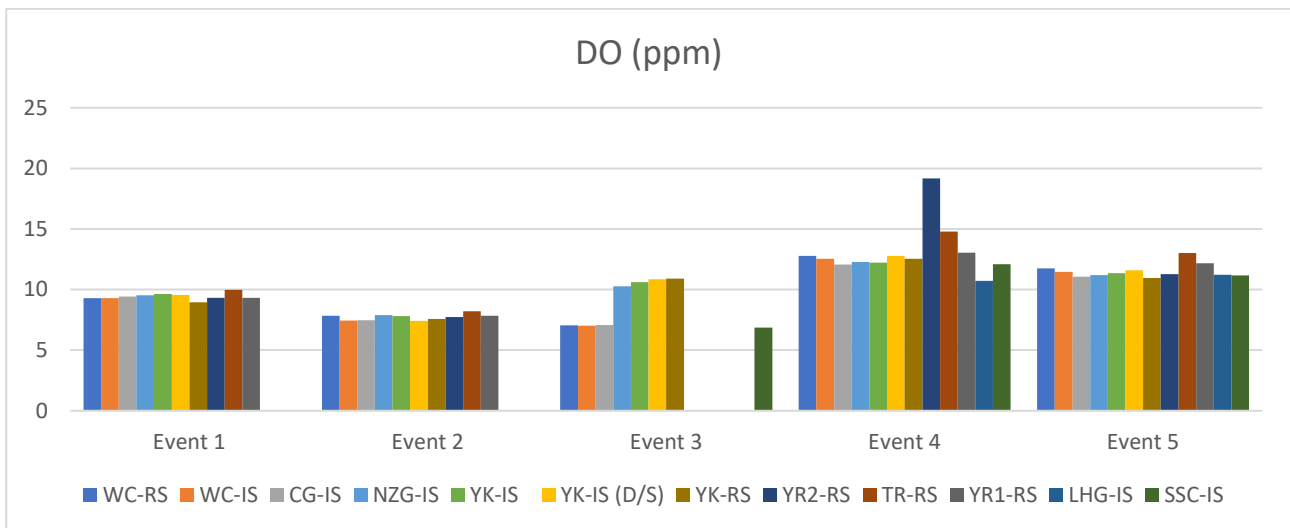
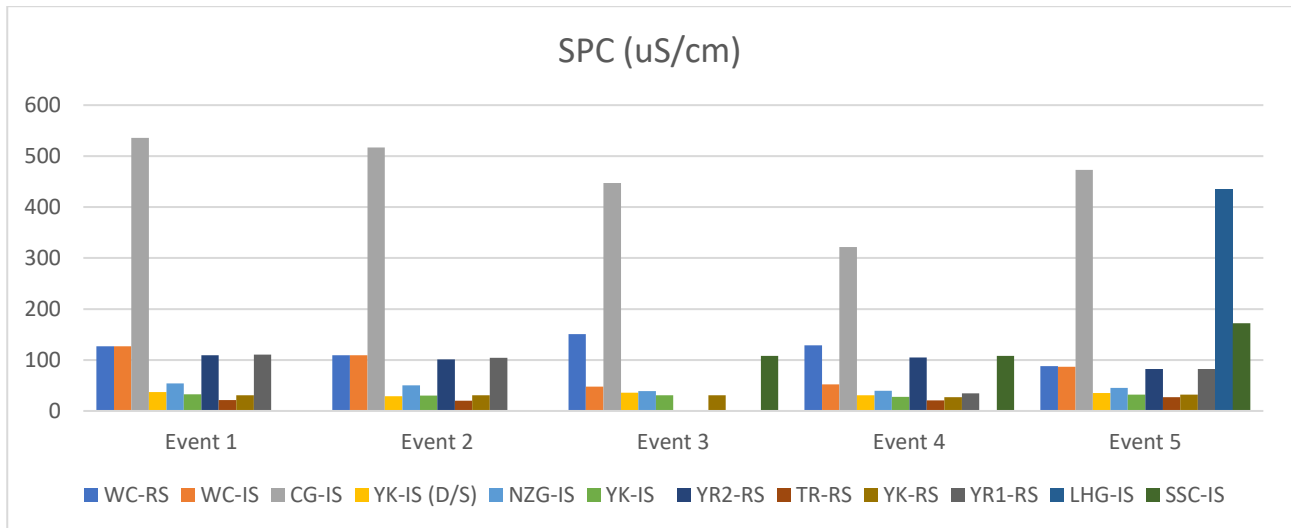
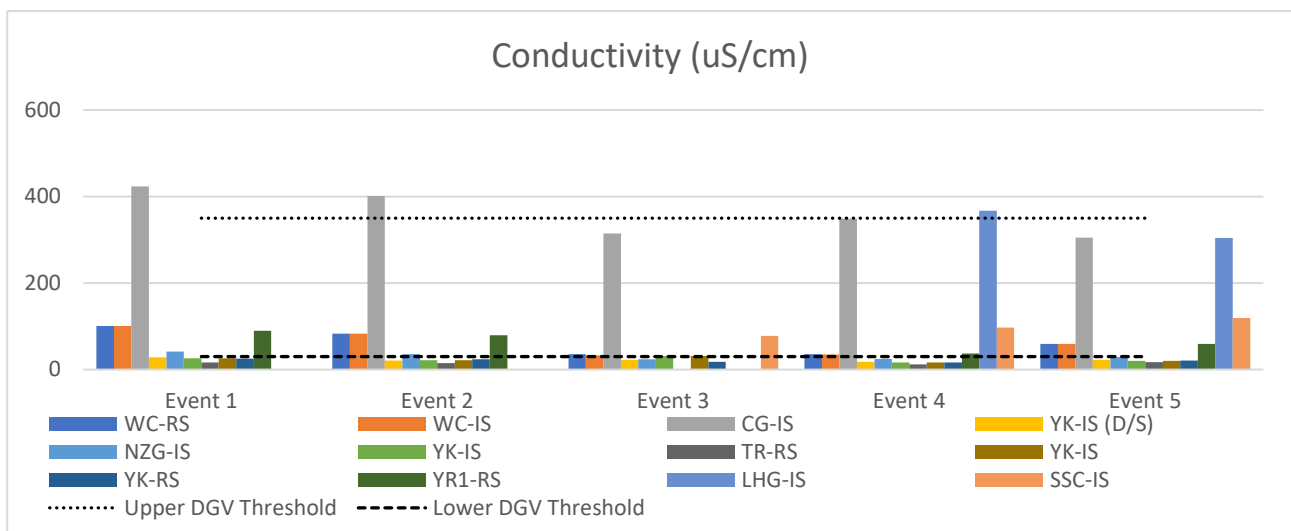


Figure 3-6 Dissolved Oxygen (ppm)

Specific conductance for some sites from Event 4 to Event 5 including CG-IS, WC-IS and YR1-RS. The pattern of specific conductance between sites remains similar with CG-IS having the highest specific conductance, recorded as 473 $\mu$ S/cm for Event 5, refer to Figure 3-7. LHG-IS also returned a high reading of 434 $\mu$ S/cm for Event 5.

Figure 3-7 Specific Conductance (SPC  $\mu\text{S}/\text{cm}$ )

Conductivity at CG-IS for Event 5, compared to Event 4, has decreased from 349  $\mu\text{S}/\text{cm}$  to 305  $\mu\text{S}/\text{cm}$ , refer to Figure 3-8. LHG-IS has a similar reading of 304  $\mu\text{S}/\text{cm}$  for Event 5. This is considered likely a result of the geology upstream. The pattern between sites is mostly reflective of the pattern for specific conductance. Other notable increases in conductivity include WC-RS, WC-IS and YR1-RS.

Figure 3-8 Conductivity ( $\mu\text{S}/\text{cm}$ )

Turbidity values across all sites for Event 5 are within the lower half of the DGV range of 2 – 25 NTU. The three highest values correspond with the three sampling points within Yorkers Creek in Bago State Forest, refer to Figure 3-9.



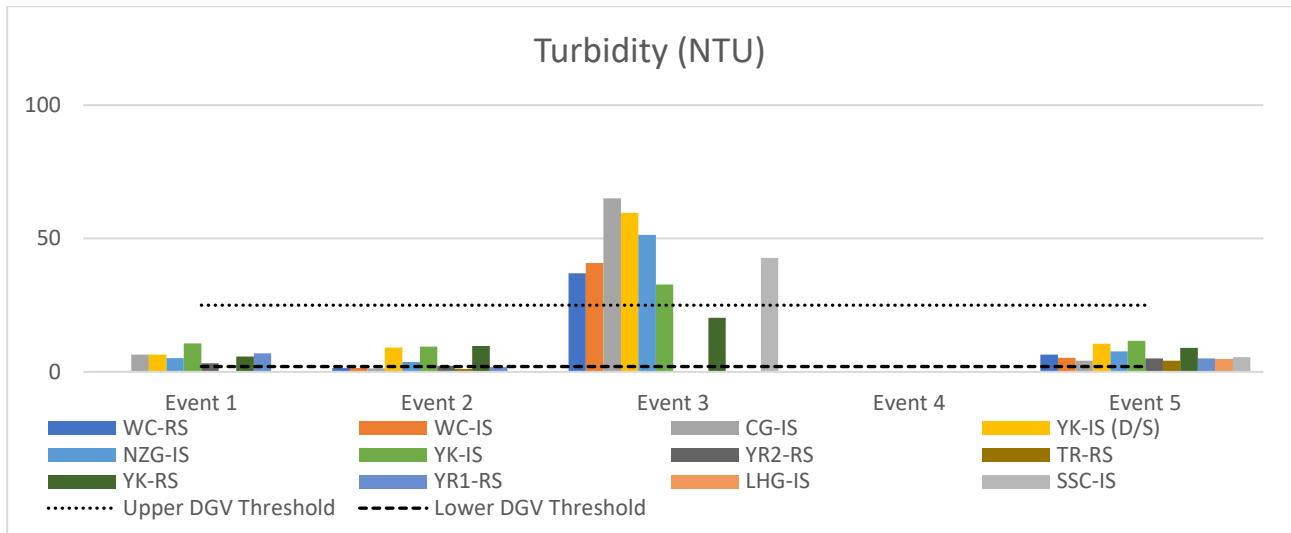


Figure 3-9 Turbidity

The results of total suspended solids across some sites had increased from Event 4 to Event 5, refer to Figure 3-10. The highest value for Event 5 was at YK-IS (D/S) of 8mg/L compared to a value of <0.2mg/L during Event 4.

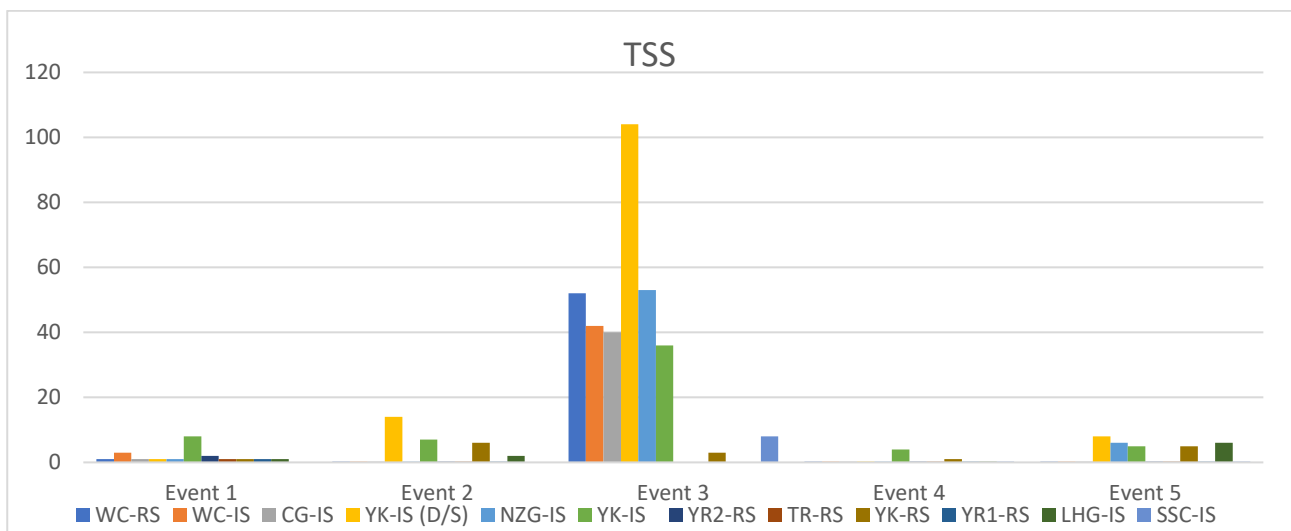


Figure 3-10 Total Suspended Solids

Values of pH for Event 5 have increased from the values recorded during Event 4. Values of pH are within the DGV range of 6.5 to 8 pH units except for TR-RS, which recorded a value of 8.1 pH units, refer to Figure 3-11. The YK-IS, YK-IS (D/S), YK-RS and NZG-IS sites, which are within a different catchment, have recorded lower pH values than those in the Yarrangobilly River catchment during Event 5.

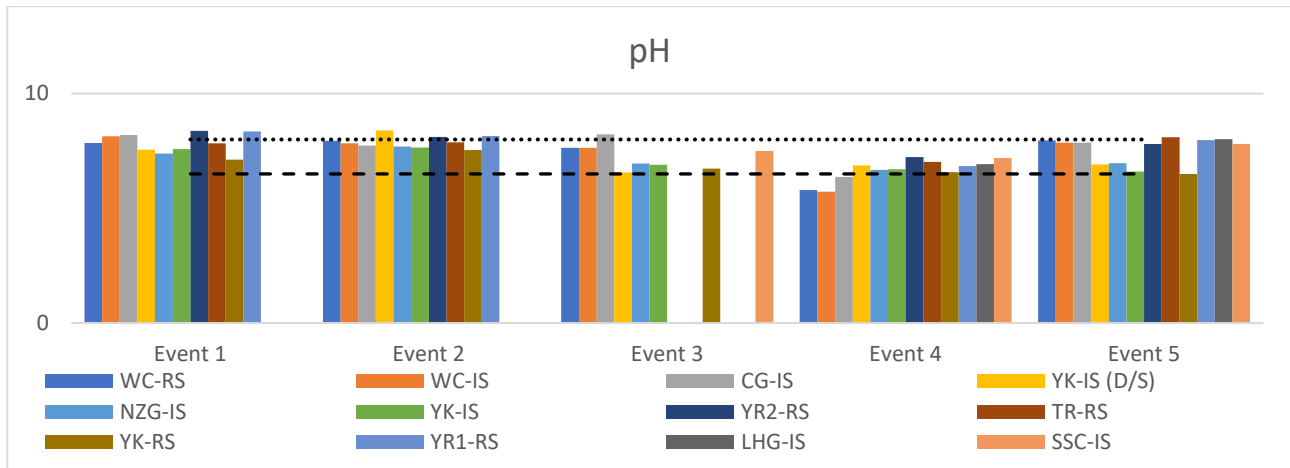


Figure 3-11 Potential of Hydrogen (pH)

The values for the oxygen redox potential during Event 5 have increased from Event 4 at most sites except for WC-RS and WC-IS, refer to Figure 3-12. WC-RS and WC-IS returned reduced values of 65.8mV from 128.4mV in Event 4 and 104.3mV from 115.9mV in Event 4, respectively.

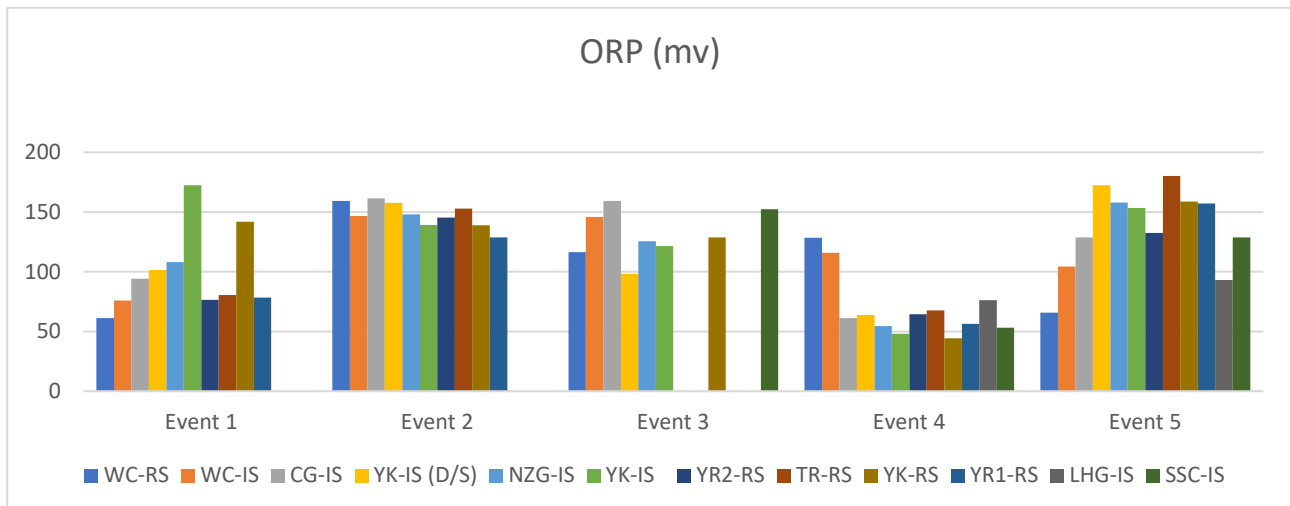


Figure 3-12 Oxygen Redox Potential (ORP)

### 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 27 July 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

Water quality monitoring results for Event 5 were similar to the results of Event 4. Values of pH and oxygen reduction potential increased at most sites from Event 4 to Event 5.

Laboratory results for Event 5 were generally consistent with the results of the previous monitoring events with the majority of analytes reported below the Limit of Reporting. Total suspended solids remained low. However, most values were above the DGV of 0.2mg/L. Total dissolved solids were elevated at CG-IS and LHG-IS, which is a pattern that has carried through all events.

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*.

NGH Pty Ltd. 2022d. *Pre-construction Water Quality Monitoring Report: Event 4 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 (d/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)	Aq (mg/L)	TDS (mg/L)	TSS (mg/L)	Zn (mg/L)
DOY (Default Sampling Value)		No	No	15.1-19.0	1.0-12.0	150-350	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		0.2	0.0024
WC-BS	Event 1	No	14.2	90.5	9.28	126.8	100.7	8.7	64.7	0.47	0.01	0.00013	0.00000	0.0001	0.0001	0.004	0.03	0.0001	0.011	0.000013	0.0008	0.25	0.02	0.00002	12	7	0.0021
	Event 2	No but on sediment	12.4	71.5	7.84	109	81.1	7.95	159.4	1.49	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	41	0.25	0.0021
	Event 3	No	9.2	61.3	7.05	151	35	7.45	119.3	76	0.05	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	50	0.25	0.0021
	Event 4	No	7.3	75.3	12.78	128.9333333	33.3	5.8	129.4	0.01	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	19	0.25	0.0021
	Max	No	7.4	75.3	7.05	151	35	7.45	119.3	76	0.05	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	50	0.25	0.0021
	Min	No	14.2	90.5	12.78	128.9333333	33.3	5.8	129.4	0.01	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	19	0.25	0.0021
	Count	No	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	St. Dev	No	14.2	90.5	12.78	128.9333333	33.3	5.8	129.4	0.01	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	19	0.25	0.0021
	Event 1	No	12.3	61.9	7.44	109	81.1	7.84	148.8	1.49	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	63	0.25	0.0021
	Event 2	No	9.3	81.2	7.01	48	31	7.44	149.8	60.77	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	41	0.25	0.0021
WC-ES	Event 3	No	7.4	12.55	12.55	12.55	15	7.43	119.3	0.01	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	72	0.25	0.0021
	Event 4	No	7.9	96.4	11.45	87	59	7.86	104.3	5.24	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	49	0.25	0.0021
	Max	No	7.40	43.70	7.01	48	31	7.44	149.8	60.77	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	41	0.25	0.0021
	Min	No	14.10	96.40	12.55	126.70	100.80	8.14	146.80	40.77	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	49	0.25	0.0021
	Count	No	10.48	72.36	9.55	86.60	62.72	7.44	117.76	11.93	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	53	0.25	0.0021
	St. Dev	No	9.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	Event 1	No	14.1	91.8	9.43	586	121.6	8.14	96.3	6.47	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Event 2	No	13.3	7.28	16.7	447	315	8.23	159.2	80.5	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	293	0.25	0.0021
	Event 3	No	8.6	54.7	12.06	322.3	345	6.37	61.1	4.71	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	268	0.25	0.0021
	Event 4	No	9.1	96.1	11.07	471	395	7.86	126.7	5.71	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	293	0.25	0.0021
CG-BS	Event 1	No	8.60	44.57	7.07	371.30	305.00	6.37	61.10	1.46	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	268	0.25	0.0021
	Event 2	No	14.10	96.10	12.06	536.00	423.00	8.27	161.40	65.10	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Max	No	10.34	10.34	9.47	638.86	518.73	7.47	120.16	13.79	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Min	No	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	Count	No	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	St. Dev	No	2.46	21.11	2.14	84.55	52.72	7.44	11.10	30.41	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	20.41	17.79	0.0021
	Event 1	No	14.1	91.8	9.43	586	121.6	8.14	96.3	6.47	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Event 2	No	13.3	7.28	16.7	447	315	8.23	159.2	80.5	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	293	0.25	0.0021
	Event 3	No	8.6	54.7	12.06	322.3	345	6.37	61.1	4.71	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	268	0.25	0.0021
	Event 4	No	9.1	96.1	11.07	471	395	7.86	126.7	5.71	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	293	0.25	0.0021
YB-BS	Event 1	No	8.60	44.57	7.07	371.30	305.00	6.37	61.10	1.46	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	268	0.25	0.0021
	Event 2	No	14.10	96.10	12.06	536.00	423.00	8.27	161.40	65.10	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Max	No	10.34	10.34	9.47	638.86	518.73	7.47	120.16	13.79	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.00002	317	0.25	0.0021
	Min	No	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	Count	No	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	St. Dev	No	2.46	21.11	2.14	84.55	52.72	7.44	11.10	30.41	0.015	0.00013	0.00001	0.000006	0.0001	0.0001	0.0001	0.0001	0.001	0.000013	0.0008	0.25	0.02	0.0			

## APPENDIX B OBSERVATIONS AND FIELD DATA



$$\text{mS/cm} \quad \text{mS/cm}$$

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	7.8°C	98.9	11.76	0.088	0.059	7.96	65.8	6.45
	Comment	level down from last sampling no check, No odor. New spot as of unear in DM. <div style="text-align: right;">DUPOI</div>								
WC-IS	Month	NO	7.9	96.4	11.45	0.087	0.059	7.86	104.3	5.24
	Comment	As above								
CG-IS	Month	NO	9.1	96.1	11.07	0.437	0.305	8.17	128.7	4.22
	Comment	As above.								
YR1-IS	Month	NO	7.9	102.6	12.18	0.082	0.055	7.97	157.1	5.00
	Comment	As above								

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	9.3	97.8	11.22	0.434	0.304	8.01	93.1	4.75
	Comment	Decent flow sample pump not moved water is clear								
YR2-IS	Month	No	8.1	95.2	11.26	0.082	0.055	7.81	132.6	5.05
	Comment									
SSC-IS	Month	No	8.8	96.2	11.17	0.172	0.119	7.81	128.7	5.49
	Comment									
TR-RS	Month	No	5.8	103.9	13.01	0.027	0.017	8.10	180.3	4.15
	Comment	Seamount plume close to bank was avoided.								
YK-IS (D/S)	Month	No	5.4	91.8	11.60	0.035	0.022	6.91	172.4	10.56
	Comment									

Help to Ch12

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	6.2	90.4	11.19	0.045	0.029	6.97	158	7.68
	Comment	Horse hoof erosion of bank evident								
YK-IS	Month	No	6.0	91.2	11.35	0.032	0.020	6.6	153.5	11.62
	Comment									
YK-RS	Month	No	6.4	88.7	10.95	0.032	0.021	6.5	158.8	8.97
	Comment									

## APPENDIX C LABORATORY CERTIFICATES





NGH Environmental  
Suite 1/39 Fitzmaurice Street  
Wagga Wagga NSW 2650  
Attention: Nicole Isles

Wednesday, September 28, 2022



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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0278	WC-RS 27.07.22	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	56 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
22Jul-0279	WC-IS 27.07.22				

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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0279	WC-IS 27.07.22	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	48 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

22Jul-0280 CG-IS  
27.07.22

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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0280	CG-IS 27.07.22	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	293 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

22Jul-0281	YR1-IS 27.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0281	YR1-IS 27.07.22	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	53 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

22Jul-0282	LHG-IS 27.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0282	LHG-IS 27.07.22	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)	0.010 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	319 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

22Jul-0283	YR2-IS 27.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0283	YR2-IS 27.07.22	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	57 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

22Jul-0284	SSC-IS 27.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0284	SSC-IS 27.07.22	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	84 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

22Jul-0285 TR-RS  
28.07.22



NGH Environmental

Suite 1/39 Fitzmaurice Street

Wagga Wagga NSW 2650

Attention: Nicole Isles

Wednesday, September 28, 2022



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<b>Facility:</b>	<b>Order #</b>	<b>Date Analysis Commenced</b>
		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0285	TR-RS 28.07.22	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	20 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

22Jul-0286	YK-IS(d/s) 28.07.22
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<b>Facility:</b>	<b>Order #</b>	<b>Date Analysis Commenced</b>
		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0286	YK-IS(d/s) 28.07.22	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)	0.06 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	31 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	8 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002

22Jul-0287	NZG-IS 28.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0287	NZG-IS 28.07.22	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	34 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

22Jul-0288 YK-IS  
28.07.22

NGH Environmental

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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
22Jul-0288	YK-IS 28.07.22	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	30 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	11 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002

22Jul-0289	YK-RS 28.07.22
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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0289	YK-RS 28.07.22	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)	0.05 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	25 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	5 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002

22Jul-0290  
DUP01  
27.07.22

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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
22Jul-0290	DUP01 27.07.22	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
22Jul-0293	Water Blank 27.07.22	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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		29-July-2022

<b>Sample Type</b>	<b>Collected By</b>	<b>Date Received</b>
Water	N. Smith	29-July-2022

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
22Jul-0293	Water Blank 27.07.22				
		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
		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	4 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

Note:

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

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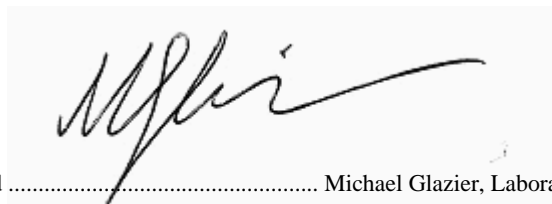
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<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		29-July-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	N. Smith	29-July-2022

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

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



[illegible]

## APPENDIX E CALIBRATION CERTIFICATES

# Multi Parameter Water Meter

Instrument **YSI Pro DSS**  
Serial No. **20F162071**



Air-Met Scientific Pty Ltd  
1300 137 067

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

## Bump Test Certificate

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

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. COND		2.76mS		385047	2.76mS
2. Temp		20.0°C		MultiTherm	18.9°C
3. pH 4		pH 4.00		389384	pH 3.97
4. pH 7		pH 7.00		381241	pH 7.15
6. ORP mV		240.0mV		385070/387761	239.8mV
7. DO		0.00%		371864	0.04%
8. Turbidity		100NTU		381476	100.05 NTU

Calibrated by: **Victor T**

Calibration date: **8/07/2022**

Next calibration due: **7/08/2022**