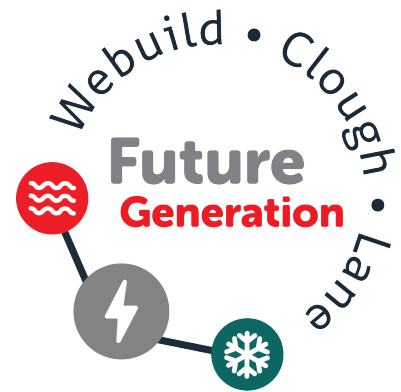




REPORT

QUARTERLY ENVIRONMENTAL WATER REPORT SEPTEMBER 2023 TO NOVEMBER 2023

S2-FGJV-ENV-REP-0094

REV B

DECEMBER 2024

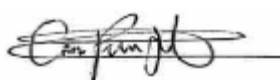
This Report has been prepared to satisfy the reporting requirements in the Main Works – Water Management Plan (WMP) and to meet Condition of Approval (CoA) 31(c)(d) of the Infrastructure Approval Schedule which requires publicly available reporting of the outcomes of the WMP. The Report provides commentary on the performance of the monitoring programs as part of the WMP.

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E ndorsed:	Name: Dave Drummond Job Title: QHSE Director Signed:  Date: 17 Dec 24

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ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
AWS	Automatic weather stations
BoM	Bureau of Meteorology
CoA	Condition of Approval
ECVT	Emergency Cable and Ventilation Tunnel
EPL	Environmental Protection Licence
Future Generation	Future Generation Joint Venture
MAT	Main Access Tunnel
MDB	Murray Darling Basin
NEM	National Electricity Market
Snowy Hydro	Snowy Hydro Limited
Snowy Scheme	Snowy Mountains Hydro-electric Scheme
SWMP	Surface Water Management Plan
TARP	Trigger Action Response Plan
TBM	Tunnel Boring Machine
WMP	Water Management Plan
WQO	Water Quality Objectives

1. INTRODUCTION

Snowy Hydro Limited (Snowy Hydro) is constructing a pumped hydro-electric expansion of the Snowy Mountains Hydro-electric Scheme (Snowy Scheme), called Snowy 2.0. Snowy 2.0 will be built by the delivery of two projects: Exploratory Works and Snowy 2.0 Main Works (which has commenced).

Snowy 2.0 is a pumped hydro-electric project that will link the existing Tantangara and Talbingo reservoirs through a series of new underground tunnels and a hydro-electric power station. Most of the project's facilities will be built underground, with approximately 27 kilometres of concrete-lined tunnels constructed to link the two reservoirs and a further 20 kilometres of tunnels required to support the facility. Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs.

Snowy 2.0 will increase the generation capacity of the Snowy Scheme by an additional 2,200 MW, and at full capacity will provide approximately 350,000 MWh of large-scale energy storage to the National Electricity Market (NEM). This will be enough to ensure the stability and reliability of the NEM, even during prolonged periods of adverse weather conditions.

WeBuild, Clough and Lane have formed the Future Generation Joint Venture (Future Generation) and have been engaged to deliver both Stage 2 of Exploratory Works and Snowy 2.0 Main Works.

2. PURPOSE

This Environmental Water Report has been prepared to satisfy the reporting requirements in the Main Works – Water Management Plan (WMP) and to meet Infrastructure Approval CSSI 9687 (CoA) Schedule 3, Condition 31(c)(d) which requires publicly available reporting of the outcomes of the WMP. The Environmental Water Report is intended to provide commentary on the performance of the monitoring programs as part of the WMP (identified in Table 2-1).

Table 2-1: Monitoring overview

Aspect	Objective
Surface Water Monitoring Program	
Routine receiving surface water quality monitoring	- inform and assess the performance of management processes/measures that seek to minimise the Project’s impact on surface water quality - help determine source and extent of any water quality changes - collect baseline data to characterise water quality and determine site specific values
Event based wet weather overtopping water quality monitoring	
Groundwater Monitoring Program	
Groundwater level monitoring	inform and assess the performance of management processes/measures that seek to minimise the Project’s impact on regional and local (including alluvial) aquifers and GDEs
Groundwater quality monitoring	
Water extraction monitoring	inform and assess water consumption, site water balance and compliance with water access licences

3. OVERVIEW

3.1. Reporting period

This Environmental Water Report covers the monitoring period from 01 September to 30 November 2023.

3.2. Construction progress

Table 3-1 summarises the key construction activities which have been undertaken during the reporting period.

Table 3-1: Key construction activities for 01 September to 30 November 2023.

Location	Key construction activities
Lobs Hole Ravine Road	Asphalt laying of Ravine Road is completed. Signs and line marking remains.
Lobs Hole	- Pad F – Training centre buildings completed. - Fill and spoil processing is ongoing from D&B tunnels to GF01. 350mm tunnel dewatering pipeline works along the mine trail road works on hold FGJV working on ERS comments for IFC. - Transgrid pad (Pad F7) extension works completed. - Main precast shed erection completed, roofing completed and walls ongoing. - ECVT- TBM 1 have installed a total of 1,460 permanent, completing ECVT01 tunnel and TBM1 modification works ongoing for IPS construction.
Marica	- Camp expansion, 3 buildings construction and commissioning completed. - Marica Trail widening between CH0 – CH4700 ongoing. - Road maintenance works are in progress. - Weighbridge commissioning completed. - Drain works ongoing at cut 6.
Plateau	- Along the highway cable pulling is ongoing and Fiber pits installation completed. - HDD 01 completed, HDD02 ongoing. - Road maintenance completed. - Water Quality Monitoring ongoing.
Rock Forest	NA – site under operational use as laydown area.
Talbingo	- Line drilling works are ongoing. - Trail blasts completed. - Stage 2 bench 1 excavation & ground support is completed. - Bench 3 excavation completed. - Bench 5 excavation & ground support ongoing. - MC81 & MC82 access road excavation and ground support ongoing. - TBM 2.2 have installed 151 rings during the period, totaling 476 permanent rings.
Tantangara	- Camp road, general maintenance works ongoing. - Sink hole remediation works completed from Rig 1/Rig 2 and from the surface on top the TBM. - Slurry Treatment Plant commissioning completed and ready to use. - TBM conversion to closed mode completed and ready for mining. - Pre-consolidation from TBM3 and surface completed. - Environmental maintenance ongoing.

4. WEATHER CONDITIONS

There are several weather stations along the alignment of the project that report real-time data. These include:

- “Lobs Hole” - which is an Automatic Weather Station managed by Future Generation in Lobs Hole construction site.
- “Cabramurra” - an Automatic Weather Station located near the lookout in the Cabramurra township managed by the Bureau of Meteorology
- “Tantangara” - an Automatic Weather Station managed by Future Generation in Tantangara construction site.

The Tantangara and Cabramurra gauges are in sub-alpine environments, with elevations of approximately 1220 m and 1475 m, respectively. Cabramurra records substantially higher annual rainfall amount than the lower-elevation gauges at Lobs Hole and Tantangara. Tantangara and Lobs Hole weather stations record actual onsite conditions at the respective construction sites, while Cabramurra weather station, at 1470 m is representative of conditions at Marica – which has an elevation of 1480 m and is approximately 15 km north of the Cabramurra Station.

A summary of climate data for the ravine and plateau areas is provided in Table 4.1

Table 4-1: Weather conditions for 01 September 2023 to 30 November 2023.

Parameter	Lobs Hole ¹			Marica (Cabramurra)			Tantangara ²		
	Sep	Oct	Nov	Sep	Oct	Nov	Sep	Oct	Nov
Temperature									
Mean maximum	19.5	20.1	24.5	12.4	12.0	17.0	16.6	16.8	21.7
Mean minimum	3.3	5.3	9.5	4.3	4.1	7.9	-0.04	2.3	6.4
Rainfall									
Monthly	26.4	89.2	121.4	31.4	113.4	141.2	43.8	89.6	129.8
Long Term Average	90.0	95.2	77.0	120.0	109.4	122.9	60.1	67.8	58.9

1. Lobs Hole long term average rainfall is taken from the Tumbarumba weather station.

2. Tantangara long term average rainfall is taken from the Adaminaby Alpine Tourist Park weather station.

During the fourth quarter 2023, there was greater than average rainfall for Marica (Cabramurra) and Tantangara with respect to the long- term average for October, and November, and greater than average rainfall for Lobs Hole in November. There was less than average rainfall for Lobs Hole during September and October, and less than average rainfall for September at Marica (Cabramurra) and Tantangara (Table 4.1). La Nina conditions were officially reported to have ended in March 2023, however the seasonal variation contributed to the rainfall at all locations.

5. SURFACE WATER MONITORING PROGRAM

5.1. Routine surface water quality monitoring

Routine surface water quality monitoring is undertaken in accordance with CoA31 and the Environment Protection Licence No. 21266 (EPL - 21266) to determine if the project is resulting in any impacts to receiving water quality against the Water Quality Objectives (WQO). The WQOs are specified in Table 2-2 of the Main Works – Surface Water Monitoring Program.

Publicly available surface water quality monitoring results undertaken in accordance with EPL - 21266 can be accessed [here](#).

There were several occasions where EPL monitoring results at Rock Forest, Tantangara, Marica and Lobs Hole exceeded the Water Quality Objectives. There were a number of minor elevations in metals in surface water across the sites which were within historical ranges and are similar to background (See Appendix C for reference) concentrations in the respective locations. There were concentrations of Dissolved Oxygen for many EPL's outside of the water quality criteria possibly due to changes in temperature and fluctuations of naturally occurring bacteria. Minor exceedances of EC and pH were generally within background ranges for the reported period (See Appendix C for reference). There were also exceedances in nutrients, including Ammonia, Total Nitrogen, and Nitrite+Nitrate, especially around the spoil emplacement area, which are being further investigated. Water at EPL55 and EPL52 is being collected and treated on-site at a process water treatment plant.

Exceedances in Iron and Copper are naturally occurring in the area which is mentioned in the EIS background information as follows: "Copper, iron, lead and zinc concentrations exceeded WQO values on an occasional basis. Other metals are generally below WQO values" (See appendix C for reference).

While water was being discharged to Talbingo and Tantangara reservoirs generally over the reporting period, On 17/09/2023, 14/10/2023 and 19/11/2024, the EPL 41 was sampled with a comprehensive round, which included all the parameters requested for the point according to the EPL 21266 ; most parameters were within the WQO except for turbidity (November), Aluminium and Zinc, which is aligned with the background conditions (See Appendix B), which state the following:

"All dissolved metal concentrations were below WQO values except for:

- copper and zinc concentrations exceeded WQO values frequently in summer/autumn and occasionally in winter/spring; and
- chromium (total) and lead concentrations occasionally exceeded WQO values in summer/autumn. It is noted that all but one of the copper and zinc exceedances occurred during March 2018 sampling, where 80% of samples exceeded the WQO values. Different analysis methods (consistent with the methods applied more broadly to EIS sampling) were applied to subsequent sampling (post-March 2018)"

Further, exceedances of the WQO were identified at the reservoir EPL locations however there is no evidence that the source of exceedances originate from the final discharge points at the RO plants. Samples were taken at other discharge areas around site to determine the location or source of nutrient and metal accumulation.

5.2. Event based monitoring

Event based wet weather overtopping water quality monitoring is undertaken in accordance with the SWMP Trigger Action Response Plan (TARP 2) to monitor stormwater overtopping sediment basin

discharges. Sediment basins for the Project have been designed to meet the design rainfalls depths identified in Table 5-1.

Table 5-1: Design rainfall depths (SWMP Section 5.1.1)

Catchment	Description	85 th percentile, 5-day rainfall (mm)	90 th percentile, 5-day rainfall (mm)	95 th percentile, 5-day rainfall (mm)
Yarrangobilly River	Surface works at Lobs Hole and Marica	28.1	35.6	49.0
Upper Eucumbene River	Surface works between Marica and the Snowy Mountain Highway	35.2	43.4	56.9
Tantangara construction compound	Surface works adjacent to the southern portion of Tantangara Reservoir	30.5	37.0	51.0
Goorudee Rivulet	Surface works at Rock Forest	20.0	25.7	36.1

During the reporting period, rainfall exceeded the design rainfall criteria four times, including:

- 2-6 October (63.4 mm - Lobs Hole, 57.6 mm – Tantangara, 58.4 mm - Marica)
- 13-17 October (54.4 mm – Tantangara)
- 6-10 November (30.2 mm – Lobs Hole)
- 25-29 November (62.0 mm - Lobs Hole, 56.4 mm – Tantangara, 66.4 mm - Marica)

Across the sites, water quality results of upstream and downstream were generally consistent following significant rainfall events where turbidity, electrical conductivity, dissolved oxygen, and pH frequently exceeded the WQO. However, most other water quality parameters were within the WQO. It is identified in the Surface Water Management Plan that during periods of wet weather, the WQO are frequently exceeded. Water samples were collected for comprehensive water testing and the EPA were notified of the releases in accordance with R4.1 of EPL 21266. During discharge there were some turbidity exceedances downstream. There was also high DO upstream and downstream. However, most were within the WQO parameters.

6. GROUNDWATER MONITORING PROGRAM

6.1. Groundwater quality

Groundwater quality monitoring is undertaken in accordance with EPL - 21266 to determine if the project is resulting in any impacts to groundwater. Groundwater quality trigger levels for the Project are outlined in Table C-1 of the Main Works – Groundwater Monitoring Program.

Publicly available groundwater quality monitoring results undertaken in accordance with EPL - 21266 can be accessed [here](#).

In this reporting period there were further groundwater sample collected at the GF01 spoil emplacement area and Main Yard area in accordance with the Leachate Detection Procedure. Groundwater samples were collected at 16 locations across the Project. Elevated concentrations of nutrients and metal concentrations were observed in groundwater. EPL 56 and 57, located at the

GF01, have been purged and monitored weekly with in situ parameters. The current well will be redrilled and old well decommissioned.

The metals exceedances for EPL1, EPL2, EPL4, and EPL25 are representative of natural conditions as these metals occur naturally within the Project area. The iron exceedance at EPL25 remains consistent with previous quarterly results. The wells measuring the shallow aquifer (EPL 56, 57, 58, 68 and 69), which are located in the spoil emplacement area (GF01) at Lobs Hole and Tantangara are more likely to see higher nutrient exceedances as nutrients likely leach through the soil into the aquifer during rainfall. The GF01 groundwater bores were sampled throughout the reporting period from September to November 2023 to collect data on the well's water quality and monitor any impact from the spoil emplacement. From the Data collected, it was observed that Nitrogen, Nitrates and Nitrites increased. FGJV started an investigation and installed new sampling points (EPL 70, EPL 72, EPL 73, EPL 80, EPL 81, EPL 82 and EPL 83).

6.2. Groundwater levels

Groundwater level monitoring is undertaken in accordance with the Groundwater monitoring program to determine groundwater drawdown as a result from the Project.

Site specific groundwater level triggers as outlined in Attachment B of the Main Works – Groundwater Monitoring Program have been established to monitor whether observed drawdown is greater than construction related predicted drawdown.

SHL is monitoring the groundwater levels via telemetry.

6.3. Groundwater inflows

Groundwater inflow into the tunnels is monitored during construction. This data is required to monitor the volume of extracted groundwater against water access licence limits (Table 6-1).

Table 6-1: Water access licence

Water Access Licence	Project	Water Source	Share (ML)
WAL42407 – Specific Purpose Access Licence	Exploratory Works	Upper Tumut water source	227
WAL42408 – Groundwater Licence	Exploratory Works	Lachlan Fold Belt MDB	0
WAL42960 – Groundwater Licence	Exploratory Works	Lachlan Fold Belt MDB	354
RO13-19-093 – via Controlled Allocation	Main Works	Lachlan Fold Belt MDB	3,375
RO1-19-092 – via Controlled Allocation	Main Works	Lachlan Fold Belt South Coast	1,722
Specific Purpose Access Licence	Main Works	Tantangara Water Source	532

The monthly inflows for the Construction Water Treatment Plant (CWTP) at the Main Access Tunnel (MAT) Portal are as follows:

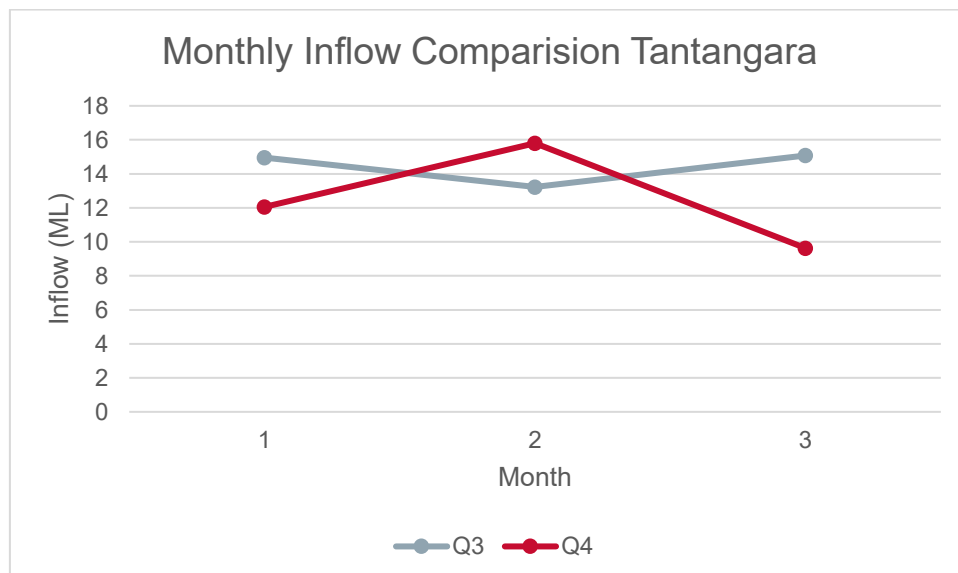
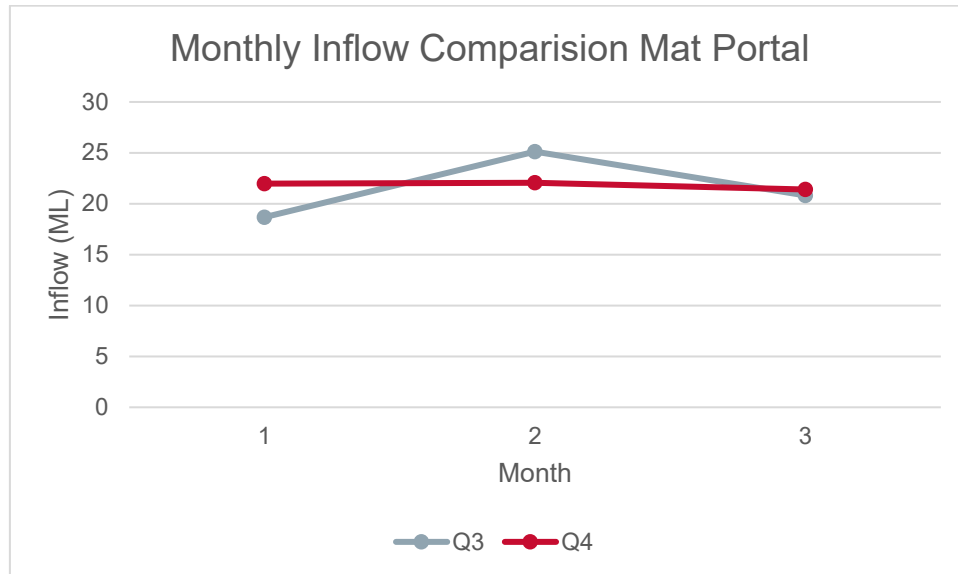
- September 21.97 ML
- October 22.06 ML
- November 21.40 ML

The monthly inflows for the Construction Water Treatment Plant (CWTP) at Tantangara are as follows:

- September 12.06 ML

- October 15.80 ML
- November 9.63 ML

Groundwater inflows in September, October, and November 2023 were similar to those in the previous quarter. The inflows at the MAT portal increased by 3ML in the second month of the quarter, likely due to the volume of drill and blast works occurring. Shotcreting of these tunnels after blasting to minimise inflows is undertaken in accordance with relevant procedures. The Tantangara inflows were less (2ML) during the first month, increased (2.5ML) in the second month and decreased (6ML) in the last month.



7. TRENDS

The Mann-Kendall statistical analysis test has been chosen to assess trends within surface water monitoring data over the 3-month reporting period. Mann-Kendall is non-parametric test that assesses monotonic trends over time; identified as increasing, decreasing, or showing no

significant trend. This test has been selected because it does not assume a specific distribution of the data and is robust against outliers, making it suitable for environmental datasets that may exhibit non-normal behaviour.

In instances where the Mann-Kendall analysis has been inconclusive due to insufficient data (less than 8 data points), a comparison of key general statistics has been undertaken, including an evaluation of mean, standard deviation, minimum, and maximum values. This comparative analysis has allowed for an assessment of construction monitoring data and whether it falls within the ranges identified in pre-project, baseline data. When calculating the mean value, non-detects have been considered as the detection limit value, rather than half the detection limit value, for a conservative output and thus the mean results in this Report are biased to a higher value.

Detailed Mann-Kendall trend analysis and metric summaries are provided in Appendix A. For each monitoring location, a summary of trends, mean, minimum, maximum and standard deviation is provided.

Surface water

The following decreasing trends were identified:

- Aluminium – EPL 10, 11, 12, 14, 15, 16, 26, 27, 28, 29, 30, 31, 32, 34, 35, 38, 39, 40, and 41
- Arsenic – EPL 41, 50 and 51
- Chromium III + IV – EPL 41, 50, 51, 52 and 55
- Copper – EPL 52
- Iron – EPL 10, 12, 14, 16, 24, 29, 30, 32, 33, 35, 36, 41, 50, 52
- Manganese – EPL 5, 6, 8, 9, 12, 14, 15, 16, 33, 34, 35, 36, 37, 41, 50, 52 and 55
- Nickel – EPL 36, 37, 41, 50, 51, 52 and 55
- Lead – EPL 41, 50, 51, 52 and 55
- Silver - EPL 41, 50, 51, 52 and 55
- Zinc – EPL 51, 52 and 55
- Ammonia – 37, 41, 52 and 55
- Cyanide – EPL 41
- Kjeldahl Nitrogen – EPL 41 and 52
- Nitrate + Nitrite – EPL 41, 50 and 52
- Nitrogen – EPL 41 and 52
- Total Phosphorus – EPL 8, 9, 41, 52 and 55
- Hardness – EPL 28
- Total suspended solids – EPL 5, 8, 9, 10, 11, 12, 14, 16 and 31
- Oil and Grease – EPL 10, 11, 12, 14, 16, 24, 31, 33, 35, 36, 37, 41, 50, 51, 52 and 55

The following increasing trends were identified:

- Arsenic – EPL 5, 6, 8, 9, 26, 27, 28, 30, 31, 36, 52 and 55
- Chromium III + IV – EPL 5, 6, 8, 9, 10, 11, 12, 15, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37 and 38

- Copper – EPL 6, 26, 27, 28, 29, 30 and 32
- Iron – EPL 51
- Manganese – EPL 40
- Nickel – EPL 5, 6, 8, 9, 11, 12, 14, 16, 26, 27, 28, 29, 30, 31, 32, 34 and 38
- Lead – EPL 5, 6, 8, 9, 10, 11, 12, 15, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 and 41
- Silver – EPL 5, 6, 8, 9, 10, 11, 12, 15, 24, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36 and 38
- Zinc – EPL 5, 6, 8, 9, 11, 12, 15, 24, 26, 27, 28, 29, 30, 32, 34, 36 and 37
- Ammonia – EPL 27 and 51
- Kjeldahl Nitrogen – EPL 27 and 51
- Nitrate + Nitrite – EPL 10, 11, 24, 26, 28, 29, 30, 31, 32, 34, 36, 37, 38, 39 and 40
- Nitrogen – EPL 12, 24, 27, 39 and 51
- Total Phosphorus – EPL 31, 35 and 40
- Reactive Phosphorus – EPL 29, 32, 39 and 51
- Hardness – EPL 6, 12, 14, 15, 16, 24, 30 and 41
- Total suspended solids – EPL 36 and 37

Groundwater

The following decreasing trends were identified:

- Aluminium – EPL 56, 57 and 58
- Arsenic – EPL 56
- Chromium III + IV – EPL 56, 57 and 58
- Copper – EPL 56, 57 and 58
- Iron – EPL 1, 56, 57 and 58
- Lead – EPL 56, and 57
- Manganese – EPL 1, 56 and 57
- Nickel – EPL 25, 56 and 57
- Silver – EPL 58
- Zinc – EPL 57 and 58
- Ammonia – EPL 56, 57 and 58
- Kjeldahl Nitrogen – EPL 56 and 67
- Nitrate + Nitrite – EPL 56
- Nitrogen – EPL 56 and 57
- Total Phosphorus – EPL 56, 57 and 58
- Hardness – EPL 58

- Total Suspended solids – EPL 57

The following increasing trends were identified:

- Copper – EPL 2
- Lead – EPL 2
- Manganese – EPL 58
- Silver – EPL 1 and 2
- Zinc – EPL 2 and 4
- Nitrogen – EPL 2 and 4

8. CONCLUSION

EPL monitoring results that exceeded the WQO are consistent with natural events such as rainfall and changes in seasonal weather. Background monitoring in the previous quarter has similar readings that display exceedances of particular analytes. Exceedances of the water quality objectives for nutrients and metals are likely due to high rainfall, and naturally occurring concentrations in soils leaching into the waterways. The SWMP, outlines background studies that indicate frequent exceedances of the WQO occurring within all surface waters across the project. There has also been exceedances of nitrogen and Iron, that have been investigated to find sources and find a way to lower levels. Updates will be provided in the next quarterly report and corrective actions are being developed and implemented in the interim. As Q4 2023 displayed some exceedances, the EPL's will be monitored to investigate the root cause of these increased levels.

Across the sites, water quality results display increasing turbidity from overtopping downstream. However, this is a natural and common occurrence found in basin overtopping due to rainfall. Other analyte readings such as electrical conductivity and pH were consistent with naturally occurring conditions during wet weather, as outlined in the SWMP.

Groundwater results from the wells across project had exceedances in Iron and Nitrogen. Shallower wells (EPL1 and EPL25) are more likely to see higher nutrient exceedances and are likely a result of natural influences from historical sources such as decomposing plant material. The nutrient exceedances fall within standard variation for these wells with no evidence of impacts to Yarrangobilly River. Results of the GF01 groundwater Displayed high metal levels of zinc, copper, and chromium. GF01 and Main Yard displayed consistently high levels of nitrogen which has resulted in a TARP. An investigation into the source of nitrogen increase will help to find a method or solution to better treat any.

APPENDIX A – TREND ANALYSIS SUMMARY

Location	Site ID	Aluminium					Arsenic					Chromium III + IV (filtered)					Copper (filtered)					Iron (dissolved)					Manganese (dissolved)				
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	5	80.26	6.00	408.00	92.27	Insufficient	0.6970	0.2000	1.1000	0.3410	Increasing	1.8280	0.2000	35.0000	6.3920	Increasing	0.9280	0.5000	3.4000	0.5710	Insufficient	87.4800	1.0000	699.0000	124.5000	Insufficient	8.2100	0.5000	95.2000	16.9200	Decreasing
	6	36.39	5.00	170.00	40.53	Insufficient	0.64	0.20	1.00	0.37	Increasing	1.1760	0.2000	18.0000	3.2600	Increasing	0.8410	0.5000	3.6000	0.6400	Increasing	51.5900	6.0000	292.0000	50.6400	Insufficient	9.8380	1.5000	24.9000	6.7340	Decreasing
	8	50.88	2.00	189.00	50.56	Insufficient	0.7500	0.2000	1.0000	0.3340	Increasing	1.0200	0.2000	14.0000	2.4820	Increasing	1.2330	0.5000	10.5000	1.8070	Insufficient	64.0000	11.0000	384.0000	67.0400	Insufficient	7.9670	1.0000	60.2000	11.4600	Decreasing
	9	36.43	6.00	496.00	99.96	Insufficient	0.6790	0.2000	1.1000	0.3570	Increasing	1.0930	0.2000	14.0000	2.5130	Increasing	1.0690	0.5000	4.0000	0.8040	Insufficient	73.5900	11.0000	748.0000	131.1000	Insufficient	7.8760	1.6000	61.3000	10.7200	Decreasing
	12	86.22	5.00	466.00	110.90	Decreasing	0.6970	0.2000	1.1000	0.3540	Insufficient	0.7920	0.2000	6.0000	0.9470	Increasing	1.1890	0.5000	12.0000	1.8560	Insufficient	93.3700	1.0000	670.0000	127.1000	Decreasing	9.0680	0.6000	94.7000	18.7300	Decreasing
	14	68.47	5.00	590.00	123.70	Decreasing	0.6750	0.2000	1.1000	0.3600	Insufficient	0.7180	0.2000	4.0000	0.6590	Insufficient	0.9580	0.5000	3.7000	0.6570	Insufficient	81.9000	9.0000	756.0000	136.0000	Decreasing	7.9150	0.7000	81.1000	14.4000	Decreasing
	15	67.78	6.00	490.00	95.33	Decreasing	0.6970	0.2000	1.1000	0.3540	Insufficient	0.6870	0.2000	2.0000	0.4370	Increasing	1.1740	0.5000	7.4000	1.3900	Insufficient	81.2400	1.0000	780.0000	126.8000	Decreasing	7.6030	1.0000	66.7000	12.2600	Decreasing
	16	48.03	6.00	357.00	63.01	Decreasing	0.6780	0.2000	1.0000	0.3550	Insufficient	0.6700	0.2000	2.0000	0.4930	Insufficient	1.1580	0.5000	5.0000	1.0120	Insufficient	63.5000	4.0000	587.0000	89.1300	Decreasing	6.2600	1.3000	58.8000	8.8500	Decreasing
	24	1001.00	5.00	30000.00	5292.00	Insufficient	0.6320	0.2000	1.0000	0.3890	Insufficient	0.7650	0.2000	4.0000	0.7740	Increasing	1.0650	0.5000	4.0000	0.8620	Insufficient	93.9500	2.0000	230.0000	68.0600	Decreasing	224.4000	7.0000	#####	371.1000	Insufficient
	52	19.67	5.00	67.00	16.10	Insufficient	0.79	0.40	1.30	0.26	Increasing	7.09	3.30	29.00	5.05	Decreasing	1.4350	0.5000	9.0000	2.2560	Decreasing	11.0400	2.0000	50.0000	17.9000	Decreasing	2.1420	0.5000	8.8000	2.5350	Decreasing
	53	39.00	20.00	58.00	26.87	Deficient value	0.60	0.20	1.00	0.57	Deficient value	0.65	0.30	1.00	0.50	Deficient value	3.6500	2.3000	5.0000	1.9090	Deficient	52.5000	50.0000	55.0000	3.5360	Deficient value	0.8500	0.7000	1.0000	0.2120	Deficient value
Marica	54	11.00	10.00	12.00	1.41	Deficient value	0.60	0.20	1.00	0.57	Deficient value	0.65	0.30	1.00	0.50	Deficient value	0.7500	0.5000	1.0000	0.3540	Deficient	31.0000	12.0000	50.0000	26.8700	Deficient value	0.7500	0.5000	1.0000	0.3540	Deficient value
	55	37.27	5.00	500.00	106.00	Insufficient	0.39	0.20	1.00	0.32	Insufficient	1.20	0.20	4.00	1.04	Decreasing	0.9640	0.5000	3.0000	0.7610	Insufficient	56.6700	2.0000	489.0000	115.9000	Insufficient	7.1450	0.5000	88.0000	18.9000	Decreasing
	26	16.41	5.00	44.00	10.68	Decreasing	0.6400	0.2000	1.0000	0.4030	Increasing	0.6680	0.2000	2.0000	0.4510	Increasing	0.7750	0.5000	1.0000	0.2520	Increasing	41.4500	2.0000	99.0000	17.9400	Insufficient	5.0100	1.2000	19.0000	3.2910	Insufficient
Tantanga ra	27	14.41	5.00	32.00	8.79	Decreasing	0.6200	0.2000	1.0000	0.4050	Increasing	0.6800	0.2000	3.0000	0.5440	Increasing	0.7700	0.5000	1.0000	0.2490	Increasing	41.1000	10.0000	94.0000	16.5400	Insufficient	4.2930	1.0000	12.0000	2.1190	Insufficient
	28	50.77	6.00	171.00	40.83	Decreasing	0.6430	0.2000	1.0000	0.3940	Increasing	0.6860	0.2000	2.0000	0.5070	Increasing	0.8300	0.5000	2.0000	0.3730	Increasing	150.6000	34.0000	380.0000	101.0000	Insufficient	13.0900	0.8000	68.0000	14.8000	Insufficient
	29	50.58	15.00	110.00	25.40	Decreasing	0.6470	0.2000	1.0000	0.3820	Insufficient	0.6500	0.2000	2.0000	0.4620	Increasing	0.8750	0.5000	3.0000	0.5260	Increasing	164.3000	48.0000	404.0000	102.9000	Decreasing	13.5300	1.1000	111.0000	23.1500	Insufficient
	30	45.47	10.00	154.00	38.09	Decreasing	0.6110	0.2000	1.0000	0.4050	Increasing	0.6380	0.2000	2.0000	0.4610	Increasing	0.8350	0.5000	3.4000	0.5000	Increasing	63.7300	2.0000	127.0000	26.8000	Decreasing	4.4620	0.5000	11.0000	2.1260	Insufficient
	31	44.66	10.00	150.00	33.54	Decreasing	0.6110	0.2000	1.0000	0.4050	Increasing	0.6920	0.2000	3.0000	0.6010	Increasing	0.8570	0.5000	2.1000	0.4020	Insufficient	61.4900	15.0000	189.0000	31.8000	Insufficient	4.5730	0.9000	16.8000	3.0140	Insufficient
	32	50.37	10.00	91.00	24.80	Decreasing	0.6670	0.2000	1.0000	0.3810	Insufficient	0.6720	0.2000	2.0000	0.4590	Increasing	0.8330	0.5000	2.0000	0.3780	Increasing	17.0000	42.0000	392.0000	104.1000	Decreasing	13.5900	0.9000	127.0000	23.4900	Insufficient
	33	51.16	5.00	290.00	51.90	Insufficient	0.6640	0.2000	1.0000	0.3720	Insufficient	0.6500	0.2000	2.0000	0.4620	Increasing	1.0000	0.5000	4.0000	0.6820	Insufficient	224.8000	45.0000	966.0000	195.7000	Decreasing	28.7700	1.0000	280.0000	50.8600	Decreasing
	34	39.93	14.00	120.00	20.93	Decreasing	0.6490	0.2000	1.0000	0.3910	Insufficient	0.6340	0.2000	1.0000	0.4040	Increasing	0.8370	0.5000	2.0000	0.3620	Insufficient	155.8000	22.0000	420.0000	126.6000	Insufficient	6.2170	2.3000	37.0000	5.6640	Decreasing
	35	36.84	5.00	77.00	19.51	Decreasing	0.6500	0.2000	1.0000	0.3850	Insufficient	0.6830	0.2000	3.0000	0.5600	Increasing	0.8530	0.5000	2.7000	0.4510	Insufficient	161.1000	2.0000	450.0000	133.4000	Decreasing	5.8920	2.0000	26.7000	4.4340	Decreasing
	38	56.28	17.00	240.00	42.67	Decreasing	0.6710	0.2000	1.0000	0.3860	Insufficient	0.6570	0.2000	1.0000	0.4020	Increasing	1.2170	0.5000	7.3000	1.5460	Insufficient	170.9000	43.0000	420.0000	112.9000	Decreasing	11.8500	0.9000	142.0000	24.2000	Insufficient
	39	40.18	10.00	110.00	25.47	Decreasing	0.6710	0.2000	1.0000	0.4000	Insufficient	0.6740	0.2000	1.0000	0.3960	Insufficient	0.8350	0.5000	2.0000	0.3180	Insufficient	121.1000	26.0000	320.0000	80.9400	Insufficient	8.4150	1.1000	25.0000	5.1860	Insufficient
	40	39.54	9.00	116.00	26.81	Decreasing	0.6710	0.2000	1.0000	0.4000	Insufficient	0.6710	0.2000	1.0000	0.4000	Insufficient	0.8060	0.5000	1.0000	0.2410	Insufficient	98.9100	21.0000	230.0000	60.1500	Insufficient	6.4740	0.9000	28.0000	4.9860	Increasing
	50	6.73	5.00	21.00	4.32	Insufficient	0.7330	0.2000	1.0000	0.3900	Decreasing	0.8000	0.2000	2.0000	0.5070	Decreasing	0.9000	0.5000	2.0000	0.3870	Insufficient	36.2900	2.0000	50.0000	22.5000	Decreasing	2.9670	0.5000	5.0000	2.2560	Decreasing
	51	46.53	15.00	102.00	25.28	Insufficient	0.7330	0.2000	1.0000	0.3900	Decreasing	0.7330	0.2000	1.0000	0.3900	Decreasing	0.9600	0.5000	2.4000	0.4580	Insufficient	141.6000	60.0000	340.0000	88.1500	Increasing	15.3000	1.0000	69.0000	22.9500	Insufficient
Rock Forest	36	89.91	23.00	279.00	60.69	Insufficient	0.7220	0.2000	1.0000	0.3210	Increasing	0.7080	0.2000	2.0000	0.4150	Increasing	0.9000	0.5000	2.4000	0.4380	Insufficient	438.4000	133.0000	#####	282.2000	Insufficient	23.1500	3.6000	87.5000	24.7900	Decreasing
	37	93.61	5.00	290.00	71.93	Insufficient	0.7810	0.2000	1.0000	0.3130	Insufficient	0.7620	0.2000	3.0000	0.5110	Increasing	0.8490	0.5000	2.0000	0.2940	Insufficient	494.4000	18.0000	#####	369.1000	Insufficient	20.3500	3.2000	142.0000	25.1800	Decreasing
Talbingo	10	33.54	5.00	197.00	39.38	Decreasing	0.6880	0.2000	1.0000	0.3500	Insufficient	0.8020	0.2000	8.0000	1.2190	Increasing	1.0610	0.5000	4.0000	0.8640	Insufficient	47.6300	8.0000	100.0000	22.1500	Decreasing	11.0500	0.7000	122.0000	21.7100	Insufficient
	11	30.71	5.00	195.00	37.95	Decreasing	0.6780	0.2000	1.0000	0.4600	Insufficient	0.8150	0.2000	6.0000	0.9860	Increasing	1.3200	0.5000	9.0000	1.5270	Insufficient	46.7800	8.0000	98.0000	21.9000	Insufficient	9.6800	0.6000	104.0000	19.1100	Insufficient
	41	394.50	5.00	3900.00	912.20	Decreasing	1.0860	0.2000	11.0000	1.8250	Decreasing	39.6800	0.2000	400.0000	95.3100	Decreasing	6.5450	0.5000	76.0000	13.4000	Insufficient	75.8600	2.0000	830.0000	176.7000	Decreasing	5.6590	0.5000	49.0000	10.3400	Decreasing

Location	Site ID	Nickel (dissolved)					Lead (dissolved)					Silver (dissolved)					Zinc (dissolved)				
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	5	1.5240	0.5000	23.0000	4.1370	Increasing	0.5550	0.1000	1.0000	0.4510	Increasing	2.29	0.04	5.00	2.49	Increasing	3.0690	1.0000	8.0000	2.1870	Increasing
	6	1.1620	0.5000	13.0000	2.2900	Increasing	0.5410	0.1000	1.0000	0.4520	Increasing	2.29	0.04	5.00	2.50	Increasing	3.1380	1.0000	8.0000	2.1830	Increasing
	8	1.0700	0.5000	10.0000	1.7040	Increasing	0.5370	0.1000	1.0000	0.4440	Increasing	2.22	0.01	5.00	2.48	Increasing	3.2000	1.0000	6.0000	2.0240	Increasing
	9	1.0410	0.5000	9.0000	1.5490	Increasing	0.5590	0.1000	1.0000	0.4520	Increasing	2.29	0.01	5.00	2.50	Increasing	3.1720	1.0000	8.0000	2.1220	Increasing
	12	0.8890	0.5000	4.0000	0.5740	Increasing	0.6240	0.1000	2.0000	0.4960	Increasing	2.43	0.01	5.00	2.48	Increasing	3.2890	1.0000	10.0000	2.2650	Increasing
	14	0.8350	0.5000	3.0000	0.4310	Increasing	0.5750	0.1000	1.0000	0.4460	Insufficient	2.31	0.01	5.00	2.47	Insufficient	3.0500	1.0000	6.0000	2.0370	Insufficient
	15	0.8420	0.5000	2.0000	0.3180	Increasing	0.5970	0.1000	1.0000	0.4450	Increasing	2.43	0.01	5.00	2.48	Increasing	3.2370	1.0000	7.0000	2.0330	Increasing
	16	0.7850	0.5000	1.2000	0.2550	Increasing	0.5630	0.1000	1.0000	0.4500	Insufficient	2.31	0.01	5.00	2.47	Insufficient	3.0000	1.0000	5.0000	2.0250	Insufficient
	24	1.1650	0.5000	3.9000	0.8350	Insufficient	0.5920	0.1000	1.0000	0.4330	Increasing	2.36	0.01	5.00	2.48	Increasing	5.9730	1.0000	67.0000	10.7200	Increasing
	52	0.5920	0.5000	1.0000	0.1830	Decreasing	0.2380	0.1000	1.0000	0.3310	Decreasing	0.35	0.01	5.00	1.00	Decreasing	1.8080	1.0000	5.0000	1.4970	Decreasing
	53	0.7500	0.5000	1.0000	0.3540	Deficient va	0.6500	0.3000	1.0000	0.4950	Deficient va	0.55	0.10	1.00	0.64	Deficient va	5.5000	5.0000	6.0000	0.7070	Deficient values
	54	0.7500	0.5000	1.0000	0.3540	Deficient va	0.5500	0.1000	1.0000	0.6360	Deficient va	0.55	0.10	1.00	0.64	Deficient va	3.0000	1.0000	5.0000	2.8280	Deficient values
	55	0.6410	0.5000	2.0000	0.3500	Decreasing	0.7910	0.1000	12.0000	2.5240	Decreasing	0.41	0.01	5.00	1.08	Decreasing	2.3640	1.0000	9.0000	2.2160	Decreasing
	26	0.7750	0.5000	1.0000	0.2520	Increasing	0.5950	0.1000	1.0000	0.4530	Increasing	2.5600	0.0100	5.0000	2.4800	Increasing	3.93	1.00	21.00	3.50	Increasing
	27	0.7630	0.5000	1.0000	0.2530	Increasing	0.5730	0.1000	1.0000	0.4550	Increasing	2.4350	0.0100	5.0000	2.4800	Increasing	3.30	1.00	8.00	2.04	Increasing
Tantanga	28	0.7780	0.5000	1.0000	0.2480	Increasing	0.5890	0.1000	1.0000	0.4520	Increasing	2.6040	0.0100	5.0000	2.5010	Increasing	3.97	1.00	16.00	3.69	Increasing
	29	0.8220	0.5000	2.0000	0.3790	Increasing	0.5750	0.1000	1.0000	0.4560	Increasing	2.5380	0.0100	5.0000	2.5030	Increasing	5.53	1.00	91.00	14.79	Increasing
	30	0.7680	0.5000	1.0000	0.2510	Increasing	0.5650	0.1000	1.0000	0.4540	Increasing	2.3610	0.0100	5.0000	2.4760	Increasing	3.32	1.00	9.00	2.37	Increasing
	31	0.7760	0.5000	1.1000	0.2530	Increasing	0.5780	0.1000	1.0000	0.4470	Increasing	2.3610	0.0100	5.0000	2.4760	Increasing	3.54	1.00	11.00	2.49	Insufficient
	32	0.8420	0.5000	2.4000	0.3610	Increasing	0.6000	0.1000	1.0000	0.4540	Increasing	2.6760	0.0100	5.0000	2.4970	Increasing	3.92	1.00	24.00	4.18	Increasing
	33	0.8500	0.5000	2.0000	0.3670	Insufficient	0.5750	0.1000	1.0000	0.4560	Increasing	2.4260	0.0100	5.0000	2.4790	Increasing	4.25	1.00	14.00	3.49	Insufficient
	34	0.7860	0.5000	1.0000	0.2460	Increasing	0.5890	0.1000	1.0000	0.4550	Increasing	2.4950	0.0100	5.0000	2.4800	Insufficient	4.09	1.00	25.00	4.08	Increasing
	35	0.8170	0.5000	2.0000	0.3160	Insufficient	0.5750	0.1000	1.0000	0.4560	Increasing	2.4260	0.0100	5.0000	2.4790	Increasing	3.92	1.00	16.00	3.62	Insufficient
	36	0.7970	0.5000	1.0000	0.2470	Increasing	0.6140	0.1000	1.0000	0.4520	Increasing	2.7520	0.0100	5.0000	2.4910	Insufficient	4.20	1.00	20.00	3.88	Insufficient
	37	0.8060	0.5000	1.0000	0.2450	Insufficient	0.6290	0.1000	1.0000	0.4500	Insufficient	2.8330	0.0100	5.0000	2.4810	Insufficient	4.53	1.00	21.00	3.92	Insufficient
	38	0.8030	0.5000	1.0000	0.2420	Insufficient	0.6290	0.1000	1.0000	0.4500	Insufficient	2.8330	0.0100	5.0000	2.4810	Insufficient	3.71	1.00	8.00	2.10	Insufficient
	39	0.8330	0.5000	1.0000	0.2440	Decreasing	0.7000	0.1000	1.0000	0.4390	Decreasing	2.8170	0.0100	5.0000	2.4350	Decreasing	4.73	1.00	18.00	4.28	Insufficient
	40	0.8330	0.5000	1.0000	0.2440	Decreasing	0.7000	0.1000	1.0000	0.4390	Decreasing	3.0820	0.0100	5.0000	2.4430	Decreasing	3.73	1.00	5.00	1.87	Decreasing
	50	0.9840	0.5000	2.0000	0.3450	Decreasing	0.5860	0.1000	1.0000	0.4550	Increasing	2.4960	0.0100	5.0000	2.4810	Increasing	4.22	1.00	21.00	3.31	Increasing
	51	1.0080	0.5000	2.0000	0.3820	Decreasing	0.6240	0.1000	1.0000	0.4400	Increasing	2.6310	0.0100	5.0000	2.4770	Insufficient	3.60	1.00	5.00	1.76	Increasing
Rock Forest	36	0.9760	0.5000	5.0000	0.9430	Insufficient	0.5830	0.1000	1.0000	0.4540	Increasing	2.5970	0.0100	5.0000	2.4980	Increasing	3.59	1.00	8.00	2.20	Insufficient
	37	0.8460	0.5000	4.0000	0.5620	Increasing	0.5830	0.1000	1.0000	0.4540	Increasing	2.5970	0.0100	5.0000	2.4980	Increasing	3.32	1.00	10.00	2.23	Increasing
Talbingo	10	1.1300	0.5000	5.3000	1.0570	Decreasing	0.6730	0.1000	3.0000	0.6380	Decreasing	2.4460	0.0100	5.0000	2.4770	Decreasing	37.61	4.00	270.00	59.85	Insufficient
	41																				

Location	Site ID	Ammonia					Cyanide					Kjeldahl Nitrogen					Nutrients, Inorganics, and TPH									
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Nitrate + Nitrite					Nitrogen				
Lobbs Hole	5	15.68	4.00	110.00	23.68	Insufficient	4.14	4.00	8.00	0.76	Insufficient	182.10	2.00	2130.00	396.80	Insufficient	22.62	1.00	102.00	24.87	Insufficient	197.30	2.00	2230.00	414.00	Insufficient
	6	14.64	1.00	60.00	17.54	Insufficient	5.18	4.00	18.00	3.74	Insufficient	83.14	1.00	780.00	155.30	Insufficient	42.72	1.00	262.00	66.10	Insufficient	123.80	1.00	850.00	176.50	Insufficient
	8	19.00	1.00	150.00	33.91	Insufficient	4.14	4.00	8.00	0.74	Insufficient	117.10	2.00	530.00	130.20	Insufficient	23.17	1.00	110.00	26.91	Insufficient	1.50	2.00	550.00	137.10	Insufficient
	9	26.46	1.00	390.00	75.22	Insufficient	12.25	4.00	230.00	42.68	Insufficient	108.00	2.00	700.00	147.70	Insufficient	24.93	1.00	120.00	33.72	Insufficient	127.70	2.00	700.00	166.20	Insufficient
	12	21.71	1.00	160.00	32.36	Insufficient	4.22	4.00	9.00	0.85	Insufficient	173.70	2.00	1450.00	294.20	Insufficient	47.92	2.00	530.00	91.59	Insufficient	211.30	8.00	1520.00	311.50	Increasing
	14	13.05	1.00	90.00	16.86	Insufficient	4.15	4.00	8.00	0.67	Insufficient	141.90	1.00	770.00	200.50	Insufficient	39.21	1.00	520.00	89.30	Insufficient	162.10	1.00	800.00	211.00	Insufficient
	15	30.97	1.00	300.00	60.96	Insufficient	4.16	4.00	8.00	0.69	Insufficient	208.20	3.00	2500.00	424.80	Insufficient	21.14	1.00	100.00	26.42	Insufficient	224.10	3.00	2500.00	429.00	Insufficient
	16	19.67	1.00	190.00	36.92	Insufficient	4.49	4.00	10.00	1.47	Insufficient	107.30	2.00	430.00	106.60	Insufficient	22.21	1.00	220.00	29.26	Insufficient	122.40	2.00	590.00	128.70	Insufficient
	24	26.28	2.00	220.00	48.64	Insufficient	5.11	4.00	21.00	4.00	Insufficient	153.80	7.00	750.00	176.90	Insufficient	308.00	6.00	2500.00	546.80	Increasing	452.90	30.00	2500.00	589.00	Increasing
	52	31.48	1.00	170.00	39.39	Decreasing	4.00	4.00	4.00	0.00	Insufficient	2154.00	1.00	6000.00	1883.00	Decreasing	14249.00	13.00	30300.00	10113.00	Decreasing	16422.00	13.00	35100.00	11543.00	Decreasing
	53	45.00	30.00	60.00	21.21	Deficient value	4.00	4.00	4.00	0.00	Deficient value	150.00	100.00	200.00	70.71	Deficient value	15.00	10.00	20.00	7.07	Deficient	150.00	100.00	200.00	70.71	Deficient value
	54	35.00	10.00	60.00	35.36	Deficient value	4.00	4.00	4.00	0.00	Deficient value	100.00	100.00	100.00	0.00	Deficient value	20.00	20.00	20.00	0.00	Deficient	100.00	100.00	100.00	0.00	Deficient value
	55	70.87	1.00	500.00	117.90	Decreasing	4.00	4.00	4.00	0.00	Insufficient	1441.00	1.00	6600.00	1515.00	Insufficient	9501.00	3.00	23900.00	7176.00	Insufficient	10746.00	1.00	26700.00	8205.00	Insufficient
Marica	26	10.69	1.00	100.00	15.78	Insufficient	4.15	4.00	8.00	0.71	Insufficient	88.05	2.00	800.00	128.10	Insufficient	60.79	1.00	1500.00	238.20	Increasing	137.30	2.00	2300.00	357.70	Insufficient
	27	13.74	1.00	160.00	28.05	Increasing	4.59	4.00	10.00	1.84	Insufficient	206.30	1.00	5200.00	811.70	Increasing	227.60	1.00	7000.00	1125.00	Insufficient	415.30	1.00	12000.00	1888.00	Increasing
Tantanga	28	10.36	1.00	70.00	14.92	Insufficient	13.64	4.00	340.00	55.96	Insufficient	163.20	10.00	800.00	145.10	Insufficient	15.46	2.00	110.00	20.12	Increasing	165.90	10.00	800.00	144.90	Insufficient
	29	8.56	1.00	30.00	5.95	Insufficient	4.83	4.00	18.00	3.29	Insufficient	155.80	10.00	440.00	97.96	Insufficient	15.03	2.00	50.00	15.31	Increasing	160.00	10.00	440.00	100.40	Insufficient
	30	10.54	1.00	54.00	12.09	Insufficient	4.17	4.00	9.00	0.85	Insufficient	96.81	2.00	520.00	92.62	Insufficient	17.42	1.00	60.00	15.98	Increasing	104.60	2.00	580.00	98.98	Insufficient
	31	8.54	1.00	34.00	5.98	Insufficient	4.14	4.00	7.00	0.54	Insufficient	90.05	2.00	400.00	71.58	Insufficient	14.78	1.00	139.00	24.25	Increasing	97.89	2.00	400.00	77.04	Insufficient
	32	8.91	5.00	35.00	7.32	Insufficient	10.71	4.00	230.00	38.16	Insufficient	177.20	10.00	940.00	164.90	Insufficient	20.89	2.00	250.00	42.17	Increasing	195.60	10.00	940.00	187.10	Insufficient
	33	13.06	1.00	110.00	19.40	Insufficient	3.91	0.27	5.00	0.75	Insufficient	139.20	2.00	280.00	66.05	Insufficient	14.51	1.00	50.00	12.33	Insufficient	145.50	2.00	290.00	67.41	Insufficient
	34	9.64	1.00	42.00	9.69	Insufficient	4.05	0.23	6.00	0.88	Insufficient	122.70	2.00	300.00	89.00	Insufficient	10.26	1.00	50.00	9.09	Increasing	124.80	2.00	300.00	90.38	Insufficient
	35	8.50	1.00	41.00	7.49	Insufficient	4.06	4.00	5.00	0.24	Insufficient	138.10	2.00	700.00	131.30	Insufficient	48.80	1.00	850.00	147.30	Insufficient	152.50	2.00	700.00	139.10	Insufficient
	38	10.97	5.00	50.00	11.16	Insufficient	4.21	4.00	6.00	0.48	Insufficient	205.70	10.00	1300.00	254.80	Insufficient	812.90	2.00	18000.00	4731.00	Increasing	999.70	10.00	29000.00	4875.00	Insufficient
	39	10.00	5.00	30.00	8.26	Insufficient	4.00	0.13	5.00	0.79	Insufficient	130.30	10.00	500.00	115.90	Insufficient	19.82	2.00	210.00	36.45	Increasing	140.30	10.00	500.00	129.00	Increasing
	40	16.29	5.00	140.00	25.34	Insufficient	4.06	4.00	5.00	0.24	Insufficient	128.20	10.00	450.00	106.60	Insufficient	20.32	2.00	310.00	52.31	Increasing	140.90	10.00	610.00	135.30	Insufficient
	50	30.20	4.00	130.00	45.47	Insufficient	4.20	4.00	6.00	0.56	Insufficient	468.90	3.00	5000.00	1259.00	Insufficient	431.40	9.00	4200.00	1090.00	Decreasing	610.90	4.00	5000.00	1224.00	Insufficient
	51	10.67	5.00	34.00	8.30	Increasing	4.07	4.00	5.00	0.26	Insufficient	144.00	10.00	400.00	99.34	Increasing	32.00	10.00	250.00	61.55	Insufficient	146.70	10.00	400.00	99.19	Increasing
Rock Forest	36	18.70	2.00	220.00	36.54	Insufficient	5.23	4.00	22.00	4.26	Insufficient	353.60	4.00	3000.00	498.40	Insufficient	576.80	2.00	18000.00	2988.00	Increasing	911.00	6.00	21000.00	3402.00	Insufficient
	37	25.51	2.00	210.00	40.29	Decreasing	4.14	4.00	5.00	0.36	Insufficient	355.20	4.00	1880.00	357.00	Insufficient	293.40	2.00	8700.00	1442.00	Increasing	412.30	5.00	2100.00	386.20	Insufficient
Talbingo	10	2.00	1.00	200.00	34.62	Insufficient	4.18	4.00	9.00	0.81	Insufficient	195.20	2.00	900.00	237.10	Insufficient	124.30	1.00	4200.00	670.00	Increasing	310.10	2.00	5100.00	813.80	Insufficient
	11	15.00	1.00	180.00	30.64	Insufficient	4.18	4.00	8.00	0.68	Insufficient	170.60	2.00	630.00	170.20	Insufficient	56.40	1.00	1500.00	235.00	Increasing	218.30	2.00	2100.00	340.60	Insufficient
	41	1701.00	1.00	76600.00	10925.00	Decreasing	4.93	4.00	22.00	2.96	Decreasing	2955.00	1.00	102000.00	14874.00	Decreasing	518.30	3.00	6380.00	1201.00	Decreasing	3467.00	1.00	#####	15676.00	Decreasing

Location	Site ID	Total Phosphorus					Reactive Phosphorus as P (filtered)					Hardness as CaCO3 (filtered)					Total suspended solids					Oil and Grease (ug/L)				
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	5	68.30	1.00	1160.00	238.50	Insufficient	7.61	2.00	29.00	6.56	Insufficient	32.19	14.00	56.00	11.74	Insufficient	107.80	5.00	2190.00	408.30	Decreasing	6.78	1.00	27.00	6.00	Insufficient
	6	58.83	3.00	846.00	173.60	Insufficient	9.28	4.00	24.00	4.86	Insufficient	36.44	21.00	58.00	10.42	Increasing	47.73	5.00	840.00	156.50	Insufficient	5.36	1.00	15.00	2.38	Insufficient
	8	50.54	2.00	924.00	186.20	Decreasing	9.75	2.00	60.00	12.60	Insufficient	36.50	14.00	53.00	9.38	Insufficient	92.11	1.00	1500.00	311.20	Decreasing	6.23	1.00	22.00	4.55	Insufficient
	9	51.52	2.00	873.00	179.50	Decreasing	6.72	2.00	16.00	3.95	Insufficient	34.56	14.00	53.00	9.35	Insufficient	69.09	5.00	1480.00	273.60	Decreasing	6.42	1.00	20.00	4.19	Insufficient
	12	58.22	2.00	1340.00	234.40	Insufficient	6.73	1.00	16.00	4.34	Insufficient	34.09	14.00	64.00	12.66	Increasing	81.72	5.00	1870.00	316.90	Decreasing	5.71	1.00	24.00	4.69	Decreasing
	14	58.29	2.00	1130.00	192.60	Insufficient	7.17	1.00	20.00	3.97	Insufficient	38.09	14.00	65.00	10.98	Increasing	70.94	5.00	1430.00	250.50	Decreasing	5.46	1.00	18.00	4.00	Decreasing
	15	42.31	3.00	731.00	126.90	Insufficient	8.41	1.00	47.00	9.09	Insufficient	34.81	14.00	65.00	12.06	Increasing	79.49	5.00	1510.00	281.10	Decreasing	5.20	1.00	21.00	3.70	Decreasing
	16	39.59	3.00	869.00	146.90	Insufficient	8.72	1.00	50.00	9.04	Insufficient	36.09	14.00	66.00	11.37	Increasing	60.29	5.00	1680.00	264.50	Decreasing	5.66	1.00	30.00	5.34	Decreasing
	24	71.68	2.00	810.00	177.50	Insufficient	12.11	1.00	78.00	18.99	Insufficient	48.87	21.00	220.00	41.53	Increasing	53.29	5.00	820.00	142.40	Insufficient	6.57	1.00	33.00	6.51	Decreasing
	52	30.07	2.00	230.00	46.87	Decreasing	9.74	3.00	10.00	1.35	Insufficient	98.67	72.00	180.00	40.32	Insufficient	12.38	5.00	37.00	7.85	Insufficient	1.60	1.00	5.00	1.32	Decreasing
Marica	53	15.00	10.00	20.00	7.07	Deficient value	10.00	10.00	10.00	0.00	Deficient value	-	-	-	-	Deficient value	18.50	5.00	32.00	19.09	Deficient value	2.00	2.00	2.00	0.00	Deficient values
	54	10.00	10.00	10.00	0.00	Deficient value	10.00	10.00	10.00	0.00	Deficient value	-	-	-	-	Deficient value	5.00	5.00	5.00	0.00	Deficient value	2.00	2.00	2.00	0.00	Deficient values
	55	22.13	1.00	60.00	1.48	Decreasing	9.70	3.00	10.00	1.46	Insufficient	35.40	6.00	53.00	19.33	Insufficient	16.18	5.00	62.00	16.49	Insufficient	1.70	1.00	5.00	1.36	Decreasing
	26	19.35	3.00	97.00	21.95	Insufficient	13.72	1.00	250.00	43.37	Insufficient	13.44	2.00	71.00	11.63	Insufficient	30.45	5.00	964.00	151.50	Insufficient	5.34	1.00	17.00	3.31	Decreasing
Tantanga	27	17.85	3.00	100.00	20.91	Insufficient	9.62	1.00	98.00	17.62	Insufficient	11.56	5.00	35.00	5.64	Insufficient	7.26	5.00	29.00	4.80	Insufficient	6.46	1.00	24.00	5.31	Insufficient
	28	25.58	5.00	210.00	37.15	Insufficient	11.00	1.00	74.00	16.94	Insufficient	6.57	1.00	9.00	2.37	Decreasing	19.16	5.00	476.00	77.25	Insufficient	6.96	1.00	27.00	6.03	Insufficient
	29	16.28	5.00	50.00	11.39	Insufficient	4.54	1.00	10.00	3.54	Increasing	6.42	1.00	9.80	2.66	Insufficient	5.81	5.00	24.00	3.28	Insufficient	13.94	1.00	130.00	26.11	Insufficient
	30	17.88	2.00	69.00	14.56	Insufficient	5.82	1.00	10.00	3.26	Insufficient	8.52	1.00	35.00	5.94	Increasing	10.03	5.00	52.00	8.52	Insufficient	5.88	1.00	24.00	4.77	Insufficient
	31	20.64	5.00	180.00	30.99	Increasing	5.69	1.00	10.00	3.31	Insufficient	7.34	1.00	35.00	6.14	Insufficient	10.22	5.00	49.00	8.15	Decreasing	6.68	1.00	70.00	11.29	Decreasing
	32	111.30	5.00	3100.00	536.80	Insufficient	4.69	1.00	10.00	3.37	Increasing	6.50	1.00	10.00	2.55	Insufficient	6.54	5.00	30.00	4.98	Insufficient	11.51	1.00	140.00	24.92	Insufficient
	33	16.13	1.00	60.00	12.61	Insufficient	5.50	1.00	10.00	3.36	Insufficient	9.94	2.00	35.00	7.21	Insufficient	5.98	5.00	15.00	2.45	Insufficient	5.95	1.00	52.00	8.31	Decreasing
	34	9.84	2.00	30.00	6.65	Insufficient	5.00	1.00	12.00	3.87	Insufficient	5.82	1.00	35.00	6.13	Insufficient	5.77	5.00	14.00	2.14	Insufficient	5.46	1.00	17.00	3.81	Insufficient
	35	14.09	2.00	110.00	21.28	Increasing	5.85	1.00	16.00	4.16	Insufficient	6.13	1.00	35.00	6.38	Insufficient	6.22	5.00	24.00	3.55	Insufficient	5.74	1.00	21.00	4.93	Decreasing
	38	23.75	5.00	150.00	33.34	Insufficient	4.58	1.00	10.00	3.47	Insufficient	6.91	1.00	9.80	2.54	Insufficient	19.43	5.00	473.00	79.12	Insufficient	7.74	1.00	50.00	8.95	Insufficient
	39	26.10	5.00	370.00	66.09	Insufficient	4.63	1.00	10.00	3.39	Increasing	5.87	1.00	10.00	2.64	Insufficient	9.04	5.00	54.00	11.17	Insufficient	7.85	-2.20	63.00	11.75	Insufficient
	40	15.93	5.00	90.00	16.97	Increasing	4.48	1.00	10.00	3.37	Insufficient	6.80	1.00	11.00	2.86	Insufficient	6.16	5.00	22.00	3.48	Insufficient	5.14	1.00	11.00	2.46	Insufficient
	50	12.93	1.00	50.00	12.53	Insufficient	7.13	1.00	18.00	4.85	Insufficient	4.92	1.00	8.30	1.83	Insufficient	5.00	5.00	5.00	0.00	Insufficient	6.93	1.00	30.00	9.10	Decreasing
	51	24.27	5.00	120.00	30.99	Insufficient	5.60	1.00	10.00	4.37	Increasing	5.67	5.00	7.30	0.73	Insufficient	15.16	5.00	140.00	34.75	Insufficient	6.31	1.00	21.00	6.07	Decreasing
Rock Forest	36	21.15	4.00	120.00	22.27	Insufficient	7.46	1.00	33.00	6.40	Insufficient	14.43	7.70	35.00	5.11	Insufficient	7.32	5.00	22.00	3.87	Increasing	8.09	1.00	62.00	10.97	Insufficient
	37	28.18	5.00	120.00	24.75	Insufficient	8.17	1.00	50.00	9.57	Insufficient	15.58	9.10	35.00	5.29	Insufficient	11.36	5.00	80.00	13.86	Increasing	42.82	1.00	1400.00	226.20	Decreasing
Talbingo	10	47.03	3.00	1260.00	211.10	Insufficient	5.61	1.00	14.00	3.73	Insufficient	23.86	5.00	41.00	7.97	Insufficient	7.22	5.00	20.00	4.35	Decreasing	8.09	1.00	28.00	7.61	Insufficient
	11	11.74	1.00	50.00	9.67	Insufficient	7.93	1.00	53.00	10.19	Insufficient	23.34	5.00	40.00	7.26	Insufficient	6.78	5.00	22.00	4.22	Decreasing	7.64	1.00	53.00	8.83	Decreasing
	41	319.50	1.00	13100.00	1928.00	Decreasing	22.35	1.00	510.00	72.20	Insufficient	13.60	1.00	58.00	14.54	Increasing	1.38	5.00	320.00	46.95	Insufficient	4.36	1.00	26.00	5.07	Decreasing

		Heavy Metals																													
Location	Site ID	Aluminium					Arsenic					Chromium III + IV					Copper					Iron					Lead				
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	1	13.38	5	49	14.68	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient value	3.267	0.5	17	5.305	Insufficient	1050	50	2970	1058	Decreasing	0.511	0.1	1	0.465	Insufficient
	2	6.375	5	11	2.066	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient value	69.39	0.5	280	105.8	Increasing	1004	50	2390	958.5	Insufficient	0.511	0.1	1	0.465	Increasing
	4	62.17	5	212	90.49	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient value	2.129	0.5	8.3	2.774	Insufficient	1206	39	4560	1665	Insufficient	0.971	0.1	4.1	1.437	Insufficient
	25	10	5	38	9.839	Insufficient	2.9	0.8	5	2.97	Deficient value	0.6	0.2	1	0.566	Deficient value	2.638	0.5	12	3.328	Insufficient	2880	41	6100	2303	Insufficient	1.038	0.1	5	1.312	Insufficient
	56	13.75	5	130	26.09	Decreasing	0.421	0.2	1	0.322	Decreasing	3.054	0.2	63	12.78	Decreasing	7.308	0.5	25.8	6.087	Decreasing	14.13	2	50	20	Decreasing	0.396	0.1	2.3	0.55	Decreasing
	57	24.33	5	165	42.36	Decreasing	3.283	2	5.2	0.644	Insufficient	0.3	0.2	1	0.24	Decreasing	1.271	0.5	8	1.956	Decreasing	26.83	2	147	44.65	Decreasing	0.208	0.1	1	0.27	Decreasing
	58	10.52	5	120	22.01	Decreasing	0.37	0.2	1	0.283	Insufficient	0.87	0.2	4	0.938	Decreasing	34.82	0.5	191	49.27	Decreasing	11.04	2	70	19.52	Decreasing	1.452	0.2	4	1.085	Insufficient
		Nutrients, Inorganics, and TPH																													
Location	Site ID	Ammonia					Cyanide					Kjeldahl Nitrogen					Nitrate + Nitrite					Nitrogen					Total Phosphorus				
		Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	1	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	473.3	200	1800	512.8	Insufficient	53.33	10	90	40.41	Insufficient
	2	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	1604	60	13000	4274	Increasing	173.3	60	290	115	Insufficient
	4	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	-	-	-	-	Deficient value	398.6	160	1500	488	Increasing	110	110	110	N/A	Deficient value
	25	160	160	160	N/A	Deficient value	-	-	-	-	Deficient value	550	500	600	70.71	Deficient value	25	20	30	7.071	Deficient value	666.2	90	3060	820.8	Insufficient	978	10	4100	1761	Insufficient
	56	68.29	1	370	96.64	Decreasing	4	4	4	0	Insufficient	464.9	2	2100	630.1	Decreasing	271.4	1	4480	936.7	Decreasing	720	2	5100	1189	Decreasing	278.8	8	2230	578	Decreasing
	57	74.54	3	310	75.08	Decreasing	4	4	4	0	Insufficient	846.5	2	4900	1239	Decreasing	66.54	1	500	124.4	Insufficient	900.8	2	4900	1231	Decreasing	1518	12	10800	2482	Decreasing
	58	39.79	1	280	60.21	Decreasing	4	4	4	0	Insufficient	1672	9	5400	1570	Insufficient	10749	10	23500	6799	Insufficient	12396	13	26300	7663	Insufficient	55.25	2	310	67.93	Decreasing

		Manganese					Nickel					Silver					Zinc				
Location	Site ID	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	1	177.1	58	227	50.55	Decreasing	11.63	1	22	8.713	Insufficient	2.228	0.01	5	2.63	Increasing	3.667	1	6	1.936	Insufficient
	2	196.3	150	245	32.12	Insufficient	9.678	2.2	28	8.73	Insufficient	2.228	0.1	5	2.63	Increasing	8.444	1	25	8.705	Increasing
	4	387	69	1370	477.8	Insufficient	19.7	3	39.7	14.64	Insufficient	1.463	0.04	5	2.435	Insufficient	5.143	1	19	6.336	Increasing
	25	1046	91.8	1440	436.6	Insufficient	20.3	3.1	74.7	24.09	Decreasing	2.389	0.01	5	2.53	Insufficient	23.54	1	96	34.82	Insufficient
	56	33.67	5	108	20.6	Decreasing	0.767	0.5	2.2	0.457	Decreasing	0.406	0.01	5	1.045	Insufficient	4.333	1	13	2.278	Insufficient
	57	132.2	15	249	53.74	Decreasing	2.975	0.5	13	3.596	Decreasing	0.124	0.01	1	0.273	Insufficient	1.667	1	5	1.435	Decreasing
	58	32.64	9.4	166	40.09	Increasing	2.7	0.7	7.2	1.515	Insufficient	0.335	0.01	5	0.982	Decreasing	11.3	1	56	10.51	Decreasing
		Reactive Phosphorus as P (filtered)					Hardness as CaCO3 (mg/L)					Total Suspended Solids (mg/L)					Oil and Grease (ug/L)				
Location	Site ID	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend	Mean	Min	Max	StdDv	MK Trend
Lobbs Hole	1	50	50	50	0	Insufficient	200.8	129	340	81.5	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient values
	2	50	50	50	0	Insufficient	169.2	160	186	10.71	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient values
	4	50	50	50	0	Deficient value	193.8	173	238	27.18	Insufficient	-	-	-	-	Deficient value	-	-	-	-	Deficient values
	25	40	10	50	18.52	Insufficient	245.4	233	265	13.24	Insufficient	332	332	332	-	Deficient value	-	-	-	-	Deficient values
	56	43.13	2	590	122	Insufficient	99	12	200	73.91	Insufficient	434.7	54	3470	712.7	Insufficient	3.087	1	5	2.043	Insufficient
	57	13.48	10	70	13.01	Insufficient	128.8	116	145	12.01	Insufficient	1171	29	8690	1917	Decreasing	3.708	1	10	2.789	Insufficient
	58	12.57	2	70	11.99	Insufficient	65.83	11	91	27.95	Decreasing	111.1	8	464	132.8	Insufficient	3.259	1	5	1.992	Insufficient

Insufficient	Insufficient data to identify whether a significant trend exists
Increasing	Statistically significant evidence of an increasing trend
Decreasing	Statistically significant evidence of a decreasing trend
Deficient value	Not enough reported values to undertake Mann-Kendall analysis
Decreasing *	Decreasing trend is attributed to detection limit being adjusted/reduced during the sample period.

APPENDIX B – BACKGROUND CONDITIONS

SURFACE WATER

	PLATEAU	RAVINE
Major watercourses ¹ (Dry weather)	• pH generally ranges between 6.2 and 8.5, with occasional lower and upper bound exceedances. • Carbonate and salinity vary seasonally, with higher levels occurring in summer/autumn than winter/spring. • Low concentrations of suspended solids and low turbidity. • Total nitrogen and phosphorus concentrations exceeded WQO values occasionally. • Aluminium concentrations exceeded the WQO value on a frequent basis. Some exceedances were more than 4 x WQO values. • Copper, iron, lead and zinc concentrations exceeded WQO values on an occasional basis. Other metals are generally below WQO values • The water quality during wet weather conditions is poorly understood. It is expected that concentrations of suspended sediment, nutrients, and some metals would be higher than dry weather concentrations.	• pH ranges between 6.2 to 8.5, with occasional lower and upper bound exceedances. • Low concentrations of suspended solids and low turbidity. • Carbonate and salinity vary seasonally, with higher levels occurring in summer/autumn than winter/spring. • Total nitrogen and phosphorus concentrations exceeded WQO values occasionally. • Aluminium concentrations in the Yarrangobilly River exceeded WQO values frequently in winter/spring and occasionally in summer/autumn. Some exceedances were more than 4 x WQO values. • Copper, chromium and zinc concentrations exceeded WQO values occasionally. Other metals are generally below WQO values. • The understanding of water quality during wet weather conditions is informed by data from monitoring undertaken in March and May 2019 following moderate rainfall. Available data indicates that receiving water quality during wet weather conditions is generally poorer relative to dry weather conditions with higher turbidity, lower pH, higher nutrients and metals such as copper and zinc. The median (from five samples) copper concentration was 6 x the WQO value.
Minor watercourses (near proposed surface infrastructure)	The water quality of minor watercourses near the	The water quality of minor watercourses in Lobs Hole is

	Tantangara construction compound is generally poorer than major watercourses, with total phosphorus, total nitrogen and aluminium all exceeding WQO values on a frequent basis. Turbidity, copper and iron exceeded WQO values on an occasional basis.	generally poorer than major watercourses, with turbidity, total phosphorus, copper and zinc exceeding WQO values on a frequent basis. Total nitrogen, arsenic and aluminium exceeded WQO values on an occasional basis.
Runoff from existing disturbed areas	No sampling from existing disturbed areas has been undertaken at plateau.	Runoff samples were collected from existing disturbed areas in Lobs Hole such as access tracks and remnant copper mining areas in May and March 2019. Disturbed area runoff is characterised as being mildly acidic, having very high suspended sediment and turbidity levels, high total nitrogen and total phosphorous, and very high aluminium and copper concentrations. During wet weather conditions (when runoff is occurring to local watercourses in Lobs Hole), the water quality in the Yarrangobilly River is expected to be degraded as it passes through Lobs Hole.

Notes: 1. Major watercourses in plateau refer to the Murrumbidgee and Eucumbene rivers, Tantangara, Gooandra, Nungar and Kellys Plain creeks. Major watercourses in ravine refers to the Yarrangobilly River and Wallaces Creek.

2. General note: exceedances are described in the WCR as:

- frequent if the WQO value was exceeded in 20% or more of samples; and
- occasional if the WQO value was exceeded in at least one sample, but in less than 20% of samples.

RESERVOIR

TALBINGO

Water quality characteristics are described as follows:

- pH ranges between 6.3 and 8.2, with occasional lower and upper bound exceedances.
- Low concentrations of suspended solids and low turbidity.
- Carbonate and salinity vary seasonally, with higher levels occurring in summer/autumn, correlating with the higher salinity of streamflow over summer and autumn months.
- Oxidised nitrogen concentrations exceeded WQO values frequently in winter/spring and occasionally in summer/autumn. This is the opposite trend to the Yarrangobilly River, where exceedances are more likely to occur in summer/autumn.
- Ammonia concentrations frequently exceed WQO values during winter/spring, correlating with the elevated oxidised nitrogen.
- Total phosphorus concentrations exceed WQO values in all summer/autumn samples and in approximately 25% of winter/spring samples.
- All dissolved metal concentrations were below WQO values except for:

*Copper and zinc concentrations exceeded WQO values frequently in summer/autumn and occasionally in winter/spring; and

*Chromium (total) and lead concentrations occasionally exceeded WQO values in summer/autumn.

It is noted that all but one of the copper and zinc exceedances occurred during March 2018 sampling, where 80% of samples exceeded the WQO values. Different analysis methods (consistent with the methods applied more broadly to EIS sampling) were applied to subsequent sampling (post-March 2018).

- Reservoir water quality during and following wet weather conditions is poorly understood. There is potential for elevated turbidity, nutrients and some metals to occur near watercourse inflow locations for several weeks following a substantial runoff event.

TANTANGARA

Water quality characteristics are described as follows:

- pH ranges between 6.6 and 8.0, with one lower and upper bound exceedance occurring.
- Low levels of suspended solids and low turbidity.
- Carbonate and salinity vary seasonally, with higher levels occurring in summer/autumn.
- Oxidised nitrogen and ammonia occasionally exceeded WQO values in summer/autumn.
- Total phosphorus frequently exceeded WQO values in summer/autumn and winter/spring while reactive phosphorus occasionally exceeded WQO values.
- All dissolved metal concentrations were below WQO values except for:
 - * aluminium concentrations exceeded WQO values on a frequent basis;
 - * copper, iron and zinc exceeded WQO values on a frequent basis during summer/autumn; and
 - * chromium (total), cobalt and lead exceeded WQO values on an occasional basis during summer/autumn.

It is noted that all of the copper exceedances and the zinc exceedances occurred during March 2018 sampling, where 100% of samples exceeded the WQO values. Different analysis methods (consistent with the methods applied more broadly to EIS sampling) were applied to subsequent sampling (post-March 2018).

- Reservoir water quality during and following wet weather conditions is poorly understood. There is potential for elevated turbidity, nutrients and some metals to occur near watercourse inflow locations for several weeks following a substantial runoff event.



APPENDIX C – EPL WATER RESULTS

EPL MONTHLY MONITORING SEPTEMBER 2023

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01-30 September 2023 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Physiochemical			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	No Water Quality Objective Value
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (Nox)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL56	EPL57	EPL58	EPL68	EPL69
14/09/2023	14/09/2023	14/09/2023	16/09/2023	16/09/2023
7.98	8.26	6.4	6.22	6.59
277	298	347	26	36
149	66	231	310	298
18.87	19.65	17.55	15.09	16.21
12.5	5	66.7	66.1	70
688	264	29.9	118	40.7
489	685	386	126	88
124	140	79	<1	<1
80	30	<10	<10	<10
60	380	13,600	1,450	150
2,100	300	1,600	500	200
2,200	700	15,200	2,000	400
<10	<10	<10	10	<10
270	210	30	140	20
<4	<4	<4	<4	<4
<1	<1	<1	<5	<5
<5	<5	<5	<5	86
8,320	15,100	5,000	2,900	2,690
0.3	3.3	0.3	<0.2	<0.2
3.4	10.1	10.7	0.7	1
0.3	<0.2	0.3	<0.2	<0.2
26.8	31.5	13.8	2.8	3.6
9.4	<0.5	191	<0.5	0.8
105	162	426	3.7	5.7
<2	<2	<2	<2	49
12,600	19,200	9,030	2,400	2,460
<0.1	<0.1	1.1	<0.1	<0.1
70.7	45.4	57.8	2.2	2.8
23	115	29.4	7.6	7.1
471	740	204	190	110
1.1	0.6	1.9	<0.5	<0.5
33.8	64.4	18.5	3.3	3.4
<0.01	<0.01	<0.01	<0.01	0.08
0.19	0.13	0.07	0.09	0.41
3	<1	10	4	13
140	76	40	15	35

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 September 2023 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Nitrite + Nitrate as N (NO _x)	µg/L	10	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biochemical Oxygen Demand	mg/L	2	1/5 [^]

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMICANZ (2000), they are not pollutant limits imposed by EPL 21266.

** Algal blooms can present as faecal coliforms - green tinge noted in Talbingo Reservoir water at time of sampling.

[^] 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
17/9/23	17/9/23	20/9/23	21/9/23	20/9/23	20/9/23	20/9/23	20/9/23	20/9/23
8.26	8.34	6.29	7.21	6.66	6.96	7	6.59	6.94
88	94	26	299	42	22	27	30	23
311	312	163	231	255	178	279	289	190
15.3	13.51	13.26	12.45	14.14	13.52	13.65	13.21	13.11
193.2	165.6	171.1	194.6	175.3	162.3	195.4	228.5	178.7
0	0	53.5	44.2	2.7	121	3.5	13.1	95.7
<5	<5	476	24	22	473	41	22	140
36	28	2	2	2	<1	<1	2	2
<10	<10	70	<10	<10	50	<10	<10	20
40	30	10	20	20	40	10	10	20
100	100	800	300	400	1,000	300	300	400
100	100	800	300	400	1,000	300	300	400
<10	<10	<10	<10	<10	<10	<10	<10	<10
10	10	210	20	30	150	20	20	120
<4	<4	<4	<4	<4	<4	<4	<4	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1
10	9	16	28	27	31	17	16	47
0.3	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
26	18	138	115	110	141	72	90	130
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	9.2	42.7	75	43.3	12.2	6.8	9.6	64.1
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
<1	<1	<1	<1	<1	<1	<1	<1	<1
5	1	3	-	-	-	-	-	2
<2	<2	<2	<2	<2	<2	<2	<2	<2

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 September 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (NO _x)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37	EPL52	EPL53	EPL54	EPL55
13/09/23	13/09/23	13/09/23	13/09/23	13/09/23	13/09/23	13/09/23	13/09/23	13/09/23	23/09/23	23/09/23	16/09/23	16/09/23	16/09/23	16/09/23	16/09/23	16/09/23	16/09/23	14/09/23	-	-	14/09/23
5.88	7.32	7.83	7.8	6.76	7.64	7.85	7.83	7.02	7.35	8.19	7.43	7.06	7.64	7.5	7.88	7.09	7.27	8.68	-	-	8.07
174	77	78	80	81	74	73	79	111	42	356	27	23	23	18	15	47	52	634	-	-	289
261	219	197	197	228	201	196	186	198	213	172	232	250	216	212	180	214	196	176	-	-	188
13.15	11.16	13.23	15.34	12.19	12.52	13.04	15.51	16.47	8.42	8.38	15.35	14.91	13.95	14.46	13.78	15.15	16.41	17.05	-	-	16.87
128.3	84.6	65.5	87.3	82.1	77.1	79	64.4	52.7	118.2	225.5	81.2	97.2	75.1	75.3	80.2	94.8	88.9	77.9	-	-	85.8
0	0	0	0	0	0	0	0	0	0	0	34.3	28.7	20.9	27.2	25.9	27.8	38.6	4.9	-	-	0
<5	<5	<5	<5	6	<5	<5	6	6	<5	<5	17	-	9	12	10	7	16	19	-	-	47
33	36	36	36	33	36	36	36	35	12	12	7	2	2	<1	<1	13	13	182	-	-	83
<10	<10	<10	<10	20	<10	<10	<10	<10	100	<10	<10	<10	<10	<10	<10	<10	10	10	-	-	<10
20	<10	<10	<10	200	10	<10	<10	1,420	30	250	20	10	20	<10	<10	60	70	21,500	-	-	15,000
100	<100	<100	100	<100	<100	<100	<100	200	200	200	300	400	200	300	300	700	600	2,500	-	-	1,300
100	<100	<100	100	200	<100	<100	<100	1,600	200	400	300	400	200	300	300	800	700	24,000	-	-	16,300
<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	-	-	<10
<10	<10	<10	<10	<10	10	20	<10	<10	70	<10	20	40	<10	<10	10	40	50	30	-	-	20
<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	-	-	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1
10	<5	10	10	11	10	10	11	5	<5	<5	12	15	28	19	20	91	85	9	-	-	<5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	716	-	-	1260
0.2	<0.2	0.2	0.2	0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	0.4	0.5	-	-	-	<0.2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	0.6
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.4	4.4	-	-	-	0.4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2	-	-	2.9
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1.6
13	5	13	13	15	14	14	14	13	14	14	28	26	102	64	64	307	342	<2	-	-	3
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1060	-	-	1380
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	-	-	4.4
1.3	2	1.3	2.8	1	1.2	1.4	1.9	52.4	2.7	2	1.4	2.2	25.1	2.6	2.6	5.4	11.6	<0.5	-	-	0.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29.7	-	-	42.2
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.6	<0.5	-	-	<0.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6	-	-	2.7
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	<0.01
<1	<1	<1	<1	<1	<1	<1	<1	4	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	8

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

- Samples not required at this location

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 September 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day	-	-
Outflow [#]	ML/day	-	4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350/- [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	<5	5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
17/09/2023							
-	0.0027	0.4473	0.0498	0.1531	0.0652	0.1218	-
-	-	-	-	-	-	-	-
8.06	-	-	-	-	-	-	7.06
189	-	-	-	-	-	-	19
587	-	-	-	-	-	-	174
10.54	-	-	-	-	-	-	12.34
154.9	-	-	-	-	-	-	55.7
0	-	-	-	-	-	-	8.8
<5	-	-	-	-	-	-	<5
24	-	-	-	-	-	-	<1
<10	-	-	-	-	-	-	<10
100	-	-	-	-	-	-	200
200	-	-	-	-	-	-	300
<10	-	-	-	-	-	-	<10
20	-	-	-	-	-	-	10
<4	-	-	-	-	-	-	<4
<1	-	-	-	-	-	-	<1
64	-	-	-	-	-	-	<5
0.2	-	-	-	-	-	-	<0.2
<0.2	-	-	-	-	-	-	<0.2
6.6	-	-	-	-	-	-	<0.5
8	-	-	-	-	-	-	<2
0.2	-	-	-	-	-	-	<0.1
0.6	-	-	-	-	-	-	<0.5
2.6	-	-	-	-	-	-	<0.5
<0.01	-	-	-	-	-	-	<0.01
141	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<2	-	-	-	-	-	-	<2

Note: Treated water was not being discharged at Talbingo Reservoir at the time of EPL sampling. Due to the discharge to Talbingo Reservoir being limited through September, samples could not be coordinated to be collected while discharge was occurring.
There is no 100th percentile limit for Nitrogen (Total).

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required at this location

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 September 2023 - Treated Water

Date
1/09/2023
2/09/2023
3/09/2023
4/09/2023
5/09/2023
6/09/2023
7/09/2023
8/09/2023
9/09/2023
10/09/2023
11/09/2023
12/09/2023
13/09/2023
14/09/2023
15/09/2023
16/09/2023
17/09/2023
18/09/2023
19/09/2023
20/09/2023
21/09/2023
22/09/2023
23/09/2023
24/09/2023
25/09/2023
26/09/2023
27/09/2023
28/09/2023
29/09/2023
30/09/2023

EPL 43 *	EPL 50 ^
Discharge volume (Megalitres)	
-	0.78
-	-
-	0.27
0.34	-
-	-
-	0.75
-	-
-	0.14
-	0.57
-	0.12
-	0.49
-	-
-	-
-	-
-	0.11
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	0.09
-	-
-	-
-	-

EPL 44	EPL 45	EPL 47	EPL 48	EPL 49
Discharge volume (Megalitres)				
	0.078	0.168	0.0654	0.36891
	0.0540	0.1620	0.0670	0.3851
	0.0480	0.1480	0.0608	0.1540
	0.048	0.109	0.0477	0.115
	0.05	0.15	0.06	0.36
	0.05	0.17	0.07	0.45
	0.06	0.17	0.06	0.14
	0.07	0.22	0.08	0.13
	0.04	0.32	0.07	0.12
	0.04	0.01	0.08	0.11
	0.05	0.11	0.08	0.19
	0.04	0.19	0.06	--
	0.05	0.13	0.06	0.04
	0.05	0.15	0.06	0.01
	0.07	0.15	0.07	0.01
	0.04	0.15	0.07	0.12
	0.02	0.15	0.07	0.06
	0.02	0.16	0.07	0.16
	0.08	0.12	0.06	0.20
	0.04	0.15	0.06	0.02
	0.04	0.08	0.07	0.32
	0.05	0.20	0.06	0.08
	0.03	0.14	0.07	0.15
	0.04	0.16	0.06	0.20
	0.03	0.12	0.06	0.07
	--	0.20	0.06	0.31
	0.09	0.18	0.06	0.24
	--	0.21	0.07	0.09
	--	0.23	0.07	0.27
	--	0.18	0.07	0.28

Note: The EPL discharge volume limit for EPL 43 and 50 is 4.32 megalitres per day. Compliance with this criteria was met during the reporting month.

EPL 44 volume inflows were not recorded in September 2023 due to the technology upgrades.

* The maximum flow rate capacity for Lobs Hole STP/PWTP during the reporting month was 4 L/s.

^ The maximum flow rate capacity for Tantangara STP/PWTP during the reporting month was 9 L/s

- Water not discharged on this day

— Flow meter non-operational. Water volumes are considered to be similar daily flows to those recorded for each respective plant as works progressed at the same rate.



EPL MONTHLY MONITORING OCTOBER 2023

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01-31 October 2023 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Physiochemical			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	No Water Quality Objective Value
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (Nox)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL56	EPL57	EPL58	EPL68	EPL69	EPL70
9/10/2023	9/10/2023	9/10/2023	10/10/2023	10/10/2023	12/10/2023
8.1	8.06	6.62	6.53	7.05	7.06
231	267	238	25	35	95
138	138	195	235	213	224
13.07	13.42	15.1	14.9	13.81	14.62
4.5	14.7	36.2	65.2	78.3	76.7
221	242	142	170	94	0
362	180	18	148	56	210
126	134	75	<1	2	25
<10	10	20	20	20	20
20	<10	13,100	1,020	160	520
<100	200	1,800	200	100	300
<100	200	14,900	1,200	300	800
<10	<10	10	<10	<10	40
5	42	1	3	<1	29
<4	<4	<4	<4	<4	<4
<5	<5	<5	<5	<5	<1
27	16	<5	15	157	<5
9,540	6,920	489	2,560	1,070	17,600
0.3	3.4	0.2	<0.2	<0.2	<0.2
3.6	6.0	0.8	0.5	0.3	1.8
<0.2	<0.2	0.4	0.3	0.2	<0.2
28.6	15.0	1.8	2.2	1.2	9.0
9.7	2.3	9.0	2.8	2.1	<0.5
92.6	18.1	47.0	3.3	1.2	9.1
25	31	5	11	63	<2
13,900	8,460	806	2,120	824	13,600
0.5	<0.1	2.2	<0.1	0.1	<0.1
71.6	21.7	6.8	2.1	1.0	5.9
30.0	119	15.3	4.8	2.6	6.5
484	400	25.8	177	35.2	185
<0.5	0.7	1.9	1.8	<0.5	<0.5
34.9	27.3	3.4	2.5	1.0	5.9
<0.01	0.04	0.02	<0.01	<0.01	<0.01
0.13	0.04	<0.01	0.12	<0.01	0.08
13	4	12	8	6	3
136	38	10	13	4	38

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMICANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 October 2023 - Talbingo and Tantangara
Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Nitrite + Nitrate as N (NO _x)	µg/L	10	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 ^a
Biochemical Oxygen Demand	mg/L	2	1/5 ^a

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

** Algal blooms can present as faecal coliforms - green tinge noted in Talbingo Reservoir water at time of sampling.

^a 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
8/10/23	8/10/23	13/10/23	13/10/23	13/10/23	13/10/23	13/10/23	13/10/23	13/10/23
7.95	7.93	6.6	6.52	6.57	6.67	7.6	7.13	6.43
57	56	21	21	21	21	22	21	21
376	412	304	315	312	302	257	281	318
15.08	14.08	11.06	12.73	12.63	11.83	10.67	9.76	12.05
93.2	95.4	56	73.6	72.3	88.8	85.7	64.3	91.7
118	128	121	128	135	125	102	98.8	106
<5	<5	<5	<5	<5	<5	<5	<5	<5
28	28	2	2	2	2	2	2	2
<10	<10	20	<10	20	20	<10	20	<10
<10	<10	40	20	20	20	30	40	20
100	100	100	100	200	100	100	<100	200
100	100	100	100	200	100	100	<100	200
<10	<10	<10	<10	<10	<10	<10	<10	<10
<1	<1	<1	<1	1	<1	<1	<1	3
<4	<4	<4	<4	<4	<4	<4	<4	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1
7	6	28	44	41	45	17	17	102
0.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4
17	15	58	124	118	127	46	44	140
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
1.2	0.8	23.1	31.7	34.2	32.2	8.4	6.4	40.6
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
<1	<1	<1	<1	<1	<1	<1	<1	2
2	3	15	-	-	-	-	-	2
<2	<2	<2	<2	<2	2	<2	2	<2

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 October 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (NO _x)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37	EPL52	EPL53	EPL54	EPL55
6/10/23	6/10/23	6/10/23	6/10/23	6/10/23	6/10/23	6/10/23	6/10/23	6/10/23	3/10/23	3/10/23	10/10/23	10/10/23	10/10/23	10/10/23	10/10/23	10/10/23	10/10/23	9/10/23	-	-	9/10/23
8.17	7.58	8.18	8.18	7.81	7.5	7.72	8.01	7.72	7.05	6.84	7.6	7.38	7.78	7.78	7.73	7.47	7.84	7.74	-	-	7.98
51	69	54	53	50	53	52	54	80	34	32	27	34	23	30	15	51	50	316	-	-	291
208	223	188	187	213	224	214	185	195	251	263	216	224	214	215	209	220	205	175	-	-	166
10.76	11.47	12.73	12.95	11.05	12.1	12.66	13.29	13.74	11.03	9.66	14.75	14.95	17.28	15.32	13.93	16.21	17.76	16.86	-	-	16.2
99.2	75.5	83.3	82.5	69.9	78.2	79	72.8	75.5	42.9	10.7	75.1	109	92.8	96.8	68.5	94.2	71.7	87.9	-	-	101.8
139	130	136	132	140	135	135	127	183	61.4	62.9	91	90.8	89.2	86.6	78.6	117	132	106	-	-	94.2
16	10	15	16	15	14	15	14	18	6	10	10	11	<5	<5	<5	<5	8	<5	-	-	<5
22	33	24	28	22	24	24	24	30	12	12	7	7	2	<1	<1	17	17	93	-	-	96
<10	<10	<10	<10	<10	<10	<10	<10	10	<10	<10	40	10	110	<10	10	40	50	<10	-	-	<10
10	<10	10	10	10	<10	20	10	490	20	10	20	<10	10	<10	140	90	7,010	-	-	-	19,300
100	100	<100	100	1,000	700	300	300	200	100	200	200	100	200	200	200	600	500	800	-	-	2,400
100	100	<100	100	1,000	700	300	300	700	100	200	200	100	200	200	200	700	600	7,800	-	-	21,700
<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	<10
2	3	<1	12	3	6	6	3	6	2	4	2	2	1	1	1	4	4	<1	-	-	<1
<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	-	-	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1
40	9	40	46	53	42	39	39	27	10	9	55	57	86	49	52	279	290	67	-	-	<5
0.2	0.2	0.2	0.2	0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.5	0.6	0.9	-	-	<0.2
<0.2	<0.2	0.2	<0.2	0.2	0.2	<0.2	<0.2	0.3	0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	0.5	0.5	5.9	-	-	0.4
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.7	4.3	-	-	0.6
57	18	56	61	66	57	56	57	60	27	30	54	42	122	92	95	471	605	2	-	-	9
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.3	<0.1	-	-	<0.1
2.4	1.9	2.4	3.0	2.0	2.0	2.2	2.4	9.6	4.2	2.5	3.2	2.2	35.8	4.6	4.8	20.8	21.0	2	-	-	0.9
1.1	1.0	0.9	1.2	1.2	1.2	1.1	1.2	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.8	<0.5	-	-	0.6
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
<1	<1	<1	<1	<1	<1	<1	<1	<1	2	2	<1	<1	1	1	1	21	2	3	-	-	6
																		<1	-	-	3

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 October 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [†]	ML/day	-	-
Outflow [†]	ML/day	-	4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350/- [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	<5	5

Note: Treated water was not being discharged at Talbingo or Tantangara Reservoirs at the time of EPL sampling.

There is no 100th percentile limit for Nitrogen (Total).

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[†] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
17/09/2023							17/09/2023
-	0.0111	0.4351	0.0330	0.1522	0.0565	0.1014	-
-	-	-	-	-	-	-	-
8.06	-	-	-	-	-	-	7.06
189	-	-	-	-	-	-	19
587	-	-	-	-	-	-	174
10.54	-	-	-	-	-	-	12.34
154.9	-	-	-	-	-	-	55.7
0	-	-	-	-	-	-	8.8
<5	-	-	-	-	-	-	<5
24	-	-	-	-	-	-	<1
<10	-	-	-	-	-	-	<10
100	-	-	-	-	-	-	200
200	-	-	-	-	-	-	300
<10	-	-	-	-	-	-	<10
20	-	-	-	-	-	-	10
<4	-	-	-	-	-	-	<4
<1	-	-	-	-	-	-	<1
64	-	-	-	-	-	-	<5
0.2	-	-	-	-	-	-	<0.2
<0.2	-	-	-	-	-	-	<0.2
6.6	-	-	-	-	-	-	<0.5
8	-	-	-	-	-	-	<2
0.2	-	-	-	-	-	-	<0.1
0.6	-	-	-	-	-	-	<0.5
2.6	-	-	-	-	-	-	<0.5
<0.01	-	-	-	-	-	-	<0.01
141	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<2	-	-	-	-	-	-	<2

Date
1/10/2023
2/10/2023
3/10/2023
4/10/2023
5/10/2023
6/10/2023
7/10/2023
8/10/2023
9/10/2023
10/10/2023
11/10/2023
12/10/2023
13/10/2023
14/10/2023
15/10/2023
16/10/2023
17/10/2023
18/10/2023
19/10/2023
20/10/2023
21/10/2023
22/10/2023
23/10/2023
24/10/2023
25/10/2023
26/10/2023
27/10/2023
28/10/2023
29/10/2023
30/10/2023
31/10/2023

EPL 43 *	EPL 50 ^
Discharge volume (Megalitres)	
-	-
-	-
-	-
-	0.14
-	0.64
-	0.75
-	0.86
-	0.71
-	0.66
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	0.58
-	-
-	-

EPL 44	EPL 45	EPL 47	EPL 48	EPL 49
Discharge volume (Megalitres)				
	--	0.20	0.06	0.19
	--	0.20	0.06	--
	--	0.21	0.06	0.00
	--	0.16	0.07	0.00
	--	0.18	0.07	0.19
	0.40	0.22	0.08	0.21
	0.04	0.15	0.09	0.19
	0.05	0.12	0.08	0.11
	0.05	0.20	0.08	0.45
	0.05	0.18	0.06	0.33
	0.05	0.13	0.07	0.40
	0.04	0.15	0.07	0.38
	0.07	0.14	0.04	0.19
	0.04	0.12	0.10	0.05
	0.05	0.21	0.07	0.02
	0.04	0.15	0.07	0.18
	0.04	0.18	0.07	0.37
	0.04	0.16	0.07	0.42
	0.05	0.14	0.06	0.08
	0.06	0.15	0.07	--
	0.05	0.17	0.07	--
	0.05	0.16	0.05	--
	0.04	0.15	0.06	--
	0.05	0.18	0.06	--
	0.04	0.19	0.06	--
	0.04	0.15	0.04	--
	0.06	0.10	0.07	--
	0.04	0.18	0.06	--
	0.05	0.17	0.05	--
	0.05	0.17	0.06	--
	0.05	0.15	0.07	--

-- Flow meter non-operational. Water volumes are considered to be similar daily flows to those recorded for each respective plant as works progressed at the same rate.

EPL MONTHLY MONITORING NOVEMBER 2023

snowy2.0

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01-30 November 2023 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Physiochemical			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	No Water Quality Objective Value
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (Nox)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL1	EPL2	EPL4	EPL25	EPL56	EPL57	EPL58	EPL68	EPL69	EPL70	EPL72	EPL73	EPL80	EPL81	EPL82	EPL83
3/11/2023	3/11/2023	3/11/2023	3/11/2023	21/11/2023	21/11/2023	21/11/2023	19/11/2023	19/11/2023	19/11/2023	13/11/2023	13/11/2023	21/11/2023	21/11/2023	18/11/2023	21/11/2023
8	6.59	8.07	7.46	7.63	7.96	5.98	5.69	5.96	6.25	8.3	7.82	6.6	6.72	5.78	6.07
1220	520	1250	471	256	314	270	24.5	42.6	77.3	43	62	935	531	724	535
-93	9	-195	100	99	39	188	-35.2	-17	-19.8	180	228	28	-32	171	124
19.96	19.27	19.94	18.63	16.92	17.13	18.74	14.3	14.2	14.2	20.54	15.54	21.33	20.4	19.73	20.69
158.3	156.8	179.9	59.3	42.1	43.7	3.6	87.5	72.7	72.6	79.6	104.8	60.9	88.2	87.1	63.4
217	435	0	405	485	292	301	17.5	14.3	54.4	57.7	51.6	146	773	0	114
56	130	1,310	126	323	209	149	152	63	138	24	17	6	568	2,230	21
132	223	184	160	113	116	68	<1	2	25	51	46	345	256	246	107
160	30	440	30	30	30	<10	20	100	60	10	30	40	90	50	40
40	20	<10	<10	20	20	12100	930	140	480	40	60	20	60	50	3010
400	<100	1700	600	300	400	4400	200	200	400	<100	200	300	800	1100	1000
400	<100	1700	600	300	400	16500	1100	300	900	<100	300	300	900	1200	4000
10	<10	<10	<10	<10	<10	<10	1100	400	900	-	-	<10	40	<10	<10
70	240	680	80	140	130	80	70	30	330	40	50	60	220	1440	80
-	-	-	-	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	17
-	-	-	-	6510	1850	1830	2570	1460	5200	572	601	23	5110	16400	492
1.4	0.7	11	0.3	0.2	3.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	9.1	9.5	<0.2	11
-	-	-	-	2.5	4.1	2.6	0.4	0.6	<0.2	0.3	27.4	84.7	53.2	15.9	
0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
-	-	-	-	18.3	4.5	5	1.3	1.5	4	4	0.9	0.5	8.9	37.7	1.6
1.8	0.8	<0.5	23.2	3.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	1	10.8
-	-	-	-	90.2	5.7	3.7	2.2	1.8	4.6	6.8	3.4	<0.5	13.1	71.2	36.7
<0.2	3	80	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2	<0.2	<0.2	4
-	-	-	-	9390	2290	2760	1720	998	3760	398	546	514	11300	22700	722
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	38.7	6.6	18.9	1.5	1	2.6	0.6	5.4	<0.1	12.7	8.2	0.5
92.2	209	394	770	32.2	126	66.4	8.8	1.6	12.2	201	115	155	179	376	46.8
-	-	-	-	336	213	112	124	40.3	104	192	122	160	218	700	60.9
6.3	1.1	1.8	24.4	<0.5	0.6	3.3	<0.5	<0.5	1.6	3.1	1.3	22.7	6	14.2	17
-	-	-	-	24.6	7.2	8.2	1.8	1	4	5.6	1.9	29.1	30.4	59.7	21.9
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
-	-	-	-	0.08	<0.01	0.02	0.09	0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.04	<0.01
1	2	<1	74	5	<1	10	4	2	4	11	22	1	3	3	16
-	-	-	-	104	13	22	11	5	13	13	26	4	49	76	30

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 November 2023 - Talbingo and Tantangara
Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Nitrite + Nitrate as N (NO _x)	µg/L	10	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biochemical Oxygen Demand	mg/L	2	1/5 [^]

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

** Algal blooms can present as faecal coliforms - green tinge noted in Talbingo Reservoir water at time of sampling.

[^] 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
26/11/23	26/11/23	21/11/23	21/11/23	21/11/23	21/11/23	-	-	22/11/23	21/11/23
7.45	7.05	7.11	7.8	7.07	7.32	Dry	Dry	7.36	7.52
75	62	31	44.9	55.4	34.3	Dry	Dry	35.1	26.5
194	211	-22.7	-99.8	-21.5	-24.5	Dry	Dry	-39	-36.6
19.03	19.4	22.3	19.1	22.8	20.8	Dry	Dry	16.2	19.6
99	82.8	80	78.9	75.2	77.7	Dry	Dry	66.7	78
123	96.9	62.1	7.12	3.84	6.63	Dry	Dry	3.43	2.54
<5	<5	192	<5	8	6	Dry	Dry	<5	<5
38	33	<1	2	2	<1	Dry	Dry	<1	2
<10	<10	30	<10	30	20	Dry	Dry	10	<10
10	<10	<10	<10	<10	20	Dry	Dry	<10	<10
200	200	2600	200	200	200	Dry	Dry	200	200
200	200	2600	200	200	200	Dry	Dry	200	200
<10	<10	0	0	0	0	Dry	Dry	0	0
30	10	360	<10	<10	10	Dry	Dry	10	<10
<4	<4	<4	<4	<4	<4	Dry	Dry	<4	<4
<1	<1	<1	<1	<1	<1	Dry	Dry	<1	<1
7	7	18	35	27	34	Dry	Dry	31	33
0.3	0.3	0.2	<0.2	<0.2	<0.2	Dry	Dry	<0.2	<0.2
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	Dry	Dry	<0.2	<0.2
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Dry	Dry	<0.5	<0.5
36	52	224	133	213	183	Dry	Dry	128	129
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Dry	Dry	<0.1	<0.1
8.7	13	228	24.4	131	59	Dry	Dry	31.7	22.9
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Dry	Dry	<0.5	<0.5
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	Dry	<0.01	<0.01
<1	<1	<1	<1	<1	<1	Dry	Dry	<1	<1
8200**	6500**	180**	-	-	-	Dry	Dry	-	33**
4	<2	<2	<2	<2	<2	Dry	Dry	<2	<2

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 November 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Nitrite + Nitrate as N (NOx)	µg/L	10	15
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL17	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37	EPL52	EPL53	EPL54	EPL55	EPL71
16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	16/11/23	17/11/23	17/11/23	15/11/23	15/11/23	15/11/23	15/11/23	15/11/23	15/11/23	15/11/23	25/11/23	-	-	25/11/23	17/11/23
7.42	7.49	8.48	8.31	7.43	8.23	7.98	7.38	8.02	6.22	7.52	7.67	8.41	8.41	8.36	8.52	5.52	7.98	8.26	8.82	Dry	Dry	6.93	7.07
113	109	120	113	110	108	109	112	529	218	43	58	31	30	30	26	24	70	62	336	Dry	Dry	194	41
209	216	152	188	217	162	198	196	196	233	190	188	199	216	223	217	211	229	218	143	Dry	Dry	179	213
20.16	18.5	23.04	23.28	19.58	19.44	19.77	21.75	21	19.08	10.61	11.16	20.2	21.3	20.26	20.52	20.11	17.12	19.96	19.86	Dry	Dry	19.39	10.54
119.3	106.8	108.2	105.7	181.1	111.3	173.7	99.9	174.6	94.7	136.8	82.6	166	164.8	128	92.9	163.5	111.5	119.1	94.1	Dry	Dry	83.2	77.7
92.1	80.9	77.1	76.5	107	75.6	73.4	94.3	99.2	152	97.2	106	100	119	77.8	84.1	89.5	134	180	461	Dry	Dry	281	223
<5	<5	<5	<5	6	<5	<5	<5	34	<5	<5	<5	<5	10	<5	<5	<5	<5	11	70	Dry	Dry	12	12
48	48	46	48	48	48	48	43	259	56	16	16	9	<1	2	4	4	17	17	72	Dry	Dry	60	13
40	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	<10	20	20	30	Dry	Dry	10	40
<10	<10	<10	<10	640	<10	<10	100	40	5640	10	<10	<10	<10	<10	<10	<10	170	110	8720	Dry	Dry	3690	<10
200	100	200	200	200	100	300	200	100	700	200	100	200	200	200	200	200	400	400	3200	Dry	Dry	1500	200
200	100	200	200	800	100	300	300	100	6300	200	100	200	200	200	200	200	600	500	11900	Dry	Dry	5200	200
30	<10	<10	<10	40	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	Dry	Dry	<10	<10
10	30	20	20	20	20	30	30	40	20	30	30	20	50	10	20	20	40	50	50	Dry	Dry	100	30
<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	Dry	Dry	<4	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry	<1	<1
9	<5	6	6	8	6	6	7	<5	<5	6	6	17	16	38	25	26	38	35	26	Dry	Dry	11	9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500	Dry	Dry	3050	5190
0.5	0.3	0.5	0.4	0.4	0.4	0.4	0.5	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.3	0.3	0.4	1	Dry	Dry	<0.2	0.6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	Dry	Dry	1.1	5.4
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.3	Dry	Dry	0.6	<0.2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5	Dry	Dry	6.3	6.3
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Dry	Dry	0.8	<0.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	Dry	Dry	3.5	6.5
10	6	11	11	10	9	10	11	<2	2	20	14	38	25	111	205	200	216	180	<2	Dry	Dry	42	21
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3070	Dry	Dry	3320	6280
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Dry	Dry	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	Dry	Dry	8.6	6
<0.5	2.1	1.2	1.6	0.6	0.7	1	1.3	<0.5	287	7.4	2.8	1.4	1.2	11.4	5	2.8	16.4	7.8	<0.5	Dry	Dry	1	26.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88.1	Dry	Dry	65.4	153
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	Dry	Dry	<0.5	0.6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3	Dry	Dry	4.9	8.1
0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Dry	Dry	<0.01	<0.01
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00001	Dry	Dry	0.01	<0.01
<1	<1	<1	<1	<1	<1	<1	<1	<1	7	<1	2	<1	<1	<1	25	<1	4	<1	<1	Dry	Dry	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	Dry	Dry	12	18

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

- Sample not required at this location.

^ Due to a laboratory error metals for 17/11/2023 were not analysed. Metal analysis results are from 22/11/2023

Snowy Hydro 2.0 Main Works Monthly EPL Sampling: 01 - 30 November 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350/- [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	<5	5

EPL 41	EPL 50
19/11/2023	17/11/2023
7.71	6.51
108	162
207	199
18.33	17.59
109.5	73.8
92.2	122
<5	<5
33	<1
<10	40
<100	300
<100	400
+	<10
<10	<10
<4	<4
<1	<1
72	<5
0.4	<0.2
<0.2	<0.2
6.3	<0.5
49	<2
0.3	<0.1
2.3	<0.5
0.7	<0.5
<0.01	<0.01
15	<1
<1	<1
<2	<2

Note: Treated water was not being discharged at Talbingo or Tantangara Reservoirs at the time of EPL sampling.

There is no 100th percentile limit for Nitrogen (Total).

* Works EIS.

+ Due to a laboratory error, no result was returned for this analyte

[^] 90 Percentile concentration limit/100 Percentile limit

* Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 November 2023 - Treated Water

Date
1/11/2023
2/11/2023
3/11/2023
4/11/2023
5/11/2023
6/11/2023
7/11/2023
8/11/2023
9/11/2023
10/11/2023
11/11/2023
12/11/2023
13/11/2023
14/11/2023
15/11/2023
16/11/2023
17/11/2023
18/11/2023
19/11/2023
20/11/2023
21/11/2023
22/11/2023
23/11/2023
24/11/2023
25/11/2023
26/11/2023
27/11/2023
28/11/2023
29/11/2023
30/11/2023

EPL 43 *	EPL 50 ^
Discharge volume (Megalitres)	
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	0.21
-	0.30
-	-
-	-
-	0.12
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	0.44
-	0.04
-	-
-	-
-	-
-	-
-	-

EPL 44	EPL 45	EPL 47	EPL 48	EPL 49
Discharge volume (Megalitres)				
0.40	0.04	0.17	0.06	0.61
0.21	0.04	0.15	0.08	0.38
0.36	0.04	0.18	0.07	0.30
0.17	0.04	0.17	0.08	0.35
0.21	0.04	0.15	0.06	0.24
0.24	0.03	0.14	0.06	0.45
0.31	0.05	0.21	0.06	0.44
0.18	0.04	0.16	0.07	0.17
0.18	0.04	0.16	0.07	0.43
0.06	0.05	0.17	0.07	0.96
0.27	0.04	0.16	0.08	0.90
0.21	0.04	0.16	0.06	0.29
0.40	0.04	0.16	0.08	0.27
0.26	0.04	0.13	0.05	0.27
0.27	0.06	0.07	0.06	0.39
0.32	0.03	0.23	0.06	0.23
0.16	0.03	0.27	0.08	0.39
0.17	0.05	0.16	0.06	0.35
0.31	0.03	0.05	0.09	0.16
0.29	0.09	0.24	0.07	0.58
0.27	0.04	0.15	0.06	0.34
0.25	0.04	0.16	0.08	0.49
0.07	0.01	0.13	0.07	0.32
0.23	0.07	0.20	0.08	0.47
0.31	0.05	0.19	0.07	0.63
0.31	0.03	0.16	0.07	0.87
0.03	0.04	0.19	0.08	0.51
0.60	0.04	0.20	0.08	0.61
0.34	0.04	0.15	0.05	0.55
0.17	0.02	0.07	0.08	0.53

- Water not discharged on this day
Note: The EPL discharge volume limit for EPL 43 and 50 is 4.32 megalitres per day. Compliance with this criteria was met during the reporting month.
EPL 44 volume inflows were not recorded in October 2023 due to the technology upgrades.
- * The maximum flow rate capacity for Lobs Hole STP/PWTP during the reporting month was 0.0 ML/day.
- ^ The maximum flow rate capacity for Tantangara STP/PWTP during the reporting month was 0.9 ML/day
- Flow meter non-operational. Water volumes are considered to be similar daily flows to those recorded for each respective plant as works progressed at the same rate.