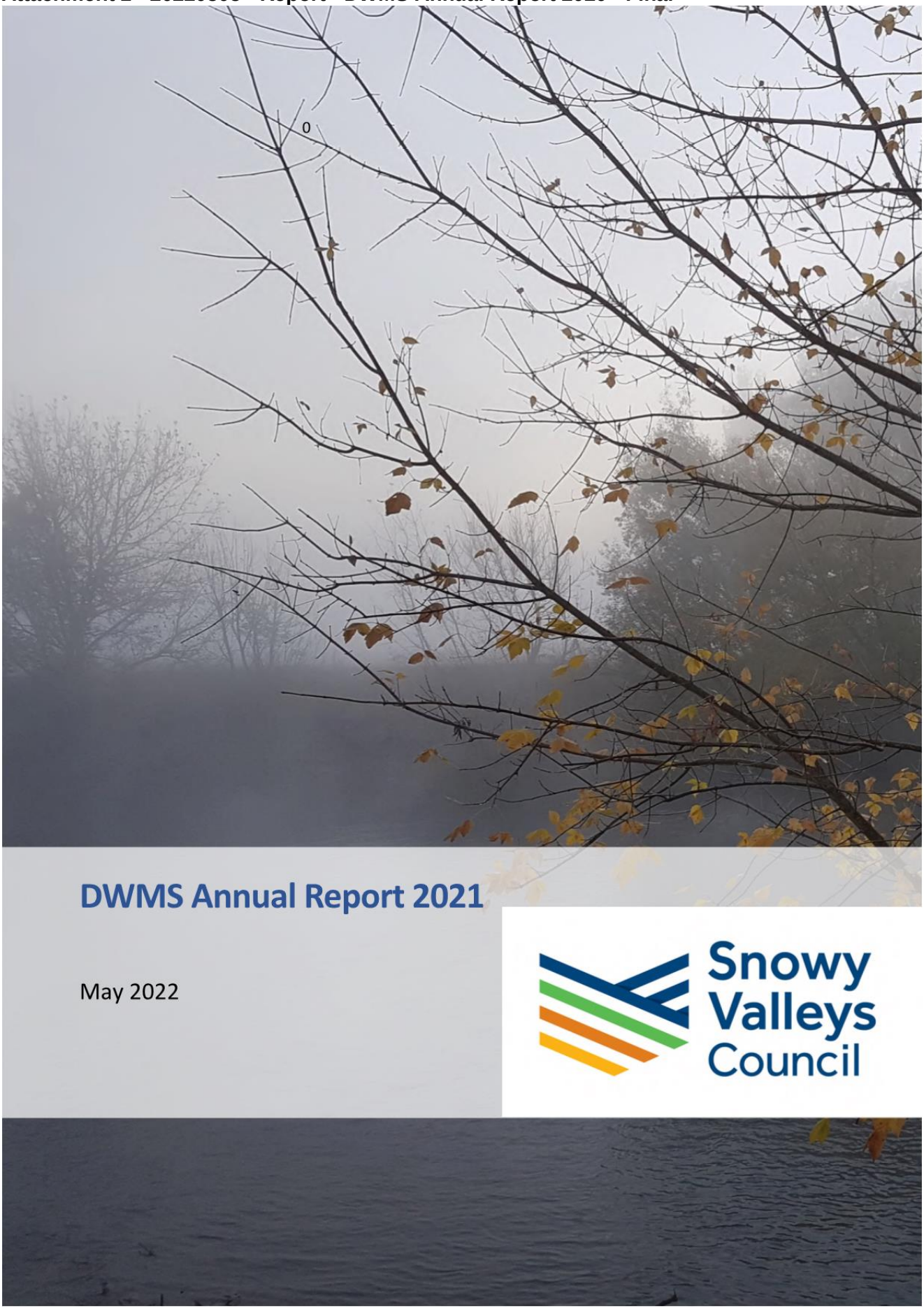
Attachment 1 - 20220505 - Report - DWMS Annual Report 2020 - Final



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EXECUTIVE SUMMARY

Water suppliers in New South Wales (NSW) are required to establish and adhere to a 'quality assurance program', referred to as a Drinking Water Management System (DWMS). An annual review of the DWMS is recommended to ensure that it is valid and being implemented effectively. Furthermore, an annual report is required to be prepared and submitted to the local Public Health Unit (PHU), NSW Health.

Viridis Consultants P/L (Viridis) was engaged by Snowy Valleys Council (SVC) to prepare the DWMS Annual Report for the 2021 reporting period from 1 January 2021 to 31 December 2021.

SVC is responsible for treating and distributing water to:

- Batlow Township
- Brungle Township
- Khancoban Township
- Talbingo Township
- Tumbarumba Township
- Tumut Township
- Morgans Reserve- Cloverdale
- Adelong Township.

Verification monitoring results for all schemes were100% compliant with the *Australian Drinking Water Guidelines* (ADWG) health-based guidelines. The ADWG aesthetic guideline values were met on over 94% of samples taken across all schemes noting a small number of results exceeded the guideline.

There were occasional critical limit breaches during the reporting period, particularly for fluoride (failure to meet the minimum concentration). CCPs were reviewed and all critical control points will be managed as per the DWMS to ensure operational control remains inside target criteria.

SVC maintained overall good customer satisfaction, with eighteen water quality customer complaints across all schemes.

GLOSSARY

Word	Description
ADWG	Australian Drinking Water Guidelines
CCP	Critical Control Point
CRM	Customer Relations Management software
Disinfection	The process designed to kill most microorganisms in water, including essentially all pathogenic (disease-causing) bacteria. There are several ways to disinfect, with chlorine being most frequently used in water treatment.
DWMS	Drinking Water Management System
kL	Kilo litres
mg/L	Milligram per litre
ML	Mega litres
NSW	New South Wales
NTU	Nephelometric Turbidity Units
pH	An expression of the intensity of the basic or acid condition of a liquid. Natural waters usually have a pH between 6.5 and 8.5
PHU	Public Health Unit
PIRMP	Pollution incident response management plan
RPZ	Reduced pressure zone
SCADA	Supervisory control and data acquisition
SOP	Standard operating procedure
Turbidity	The cloudiness of water caused by the presence of fine suspended matter.
SVC	Snowy Valleys Council
WTP	Water Treatment Plant

1. INTRODUCTION

Water suppliers in New South Wales (NSW) are required to establish and adhere to a 'quality assurance program', referred to as a Drinking Water Management System (DWMS). The DWMS is a risk-based approach to managing drinking water quality.

An annual review of the DWMS is recommended to ensure that it is valid and is being implemented effectively. In addition, an Annual Report is required to be prepared and submitted to the local Public Health Unit (PHU), NSW Health.

Snowy Valleys Council (SVC) has engaged Viridis Consultants P/L (Viridis) to prepare the DWMS Annual Report for 2021. This DWMS Report covers a 12-month reporting period from 1 January 2021 to 31 December 2021. It summarises SVC's drinking water quality performance for the reporting period and progress on the implementation of the improvement plan.

2. SUPPLY SCHEME

SVC operates and manages the following drinking water supply schemes, as outlined in Table 1 below.

Table 1 Snowy Valleys Council's Drinking Water Supply Schemes

Scheme Name	Primary Source	Secondary Source	Emergency Supply	Treatment Processes	Serviced Areas
Batlow	Kunama Dam (via Little Gilmore Creek)	-	-	• Flocculation • Ultrafiltration • Disinfection (chlorine gas) • Fluoridation (sodium fluoride) • Storage (Batlow Reservoir)	Batlow Township
Brungle	Nimbo Creek	-	Tumut River	• Limestone Contact Tank (optional) • Microfiltration • Disinfection (sodium hypochlorite) • Storage (Brungle Reservoir)	Brungle Township
Khancoban	Khancoban Creek	-	-	• Course filtration (offline) • Disinfection (chlorine gas) • Storage	Khancoban Township
Talbingo	Jounama Creek	-	Jounama Pondage	• Flocculation • Sand Filtration • Disinfection (chlorine gas) • Storage (high level and low level reservoir	Talbingo Township
Tumbarumba	Burra Creek	Tumbarumba Creek	McKeenin Street and Common Bore	• Flocculation • Sand Filtration • Fluoridation (sodium fluoride) • Disinfection (chlorine gas)	Tumbarumba Township
Tumut	Tumut River	-	-	• Powdered activated carbon (optional) • Flocculation • Fluoridation (sodium fluoride) • Sand Filtration • Disinfection (chlorine gas) • Adelong Re-chlorination (chlorine gas)	Tumut Township Morgans Reserve-Cloverdale Adelong Township

3. SCHEME CHANGES

The scheme changes are discussed in this section.

3.1. Batlow Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

3.2. Brungle Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

3.3. Khancoban Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

3.4. Talbingo Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

3.5. Tumbarumba Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

3.6. Tumut Scheme

There were no significant permanent changes to the scheme, including catchment characteristics, treatment processes, chemicals used and the distribution network.

4. CRITICAL CONTROL POINTS

Critical control points (CCP) are selected as points that control hazards that represent a significant risk and require elimination or reduction to assure supply of safe drinking water. These points are applied to important treatment processes and must have a timely measurable parameter and corrective actions that are able to be applied in response to a deviation. Alert and critical limits applied to the parameter are used to assess process performance rather than final water quality (which is discussed in the Verification Monitoring Performance section). A critical limit exceedance may indicate that a treatment process is no longer operating properly whereas an ADWG non-compliance indicates that water delivered to customers did not meet required specifications. Both should be managed in accordance with the IERP, and CCP procedures where applicable.

A review of the CCPs was undertaken during 2020 as part of the Risk Assessment Review. This resulted in some recommended changes to CCP limit values and treatment processes that are still to be implemented.

4.1. Batlow

The current CCPs for the Batlow scheme are presented in Table 2. Table 3 shows the summary of CCP performance over the reporting period. Table 4 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 2 Batlow Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Batlow CCP 1: Filtration	Turbidity	<0.2 NTU	>0.2 NTU	>0.8 NTU
	TMP	TMP -60 to -30 kPa	-30 <= TMP <-25 kPa	TMP >= -25 kPa
Batlow CCP 2: Primary Disinfection	pH	pH 7.5 - 7.8	pH <7.5 or >7.8 for >24 hours	pH >8.2 (instantaneous)
	Turbidity	Turbidity <0.3 NTU	Turbidity >0.5 NTU (instantaneous)	Turbidity >1.0 NTU (instantaneous)
	Chlorine residual	Free Chlorine 0.7 - 1.0 mg/L	Free chlorine <0.7 mg/L or >1 mg/L (instantaneous)	Free chlorine <0.3 mg/L or >1.5 mg/L (instantaneous)
Batlow CCP 3: Fluoridation	Fluoride	0.9 - 1.1 mg/L	<0.9 mg/L or >1.1 mg/L (instantaneous)	<0.9 mg/L for greater than 72 hours or >1.5 mg/L (instantaneous)*
Batlow CCP 4: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 3 Batlow CCP Data Analysis

Parameter	Filtered Turbidity (NTU)	Turbidity (NTU)	Fluoride Reading (mg/l)	pH To Town	TMP (kPa)	Free Residual Chlorine (mg/l)
Min	0.00	0.00	0.01	6.6	-62	0.39
5th percentile	0.01	0.06	0.05	7.0	-60	0.67
Mean	0.10	0.14	0.71	7.5	-48	1.00
95th percentile	0.20	0.30	1.07	8.2	-31	1.25
Max	0.89	0.68	1.28	8.7	-29	1.65

Table 4 Batlow CCP Sample Count for Operational Targets Analysis

Limit Band/Range	Filtered Turbidity	Turbidity	Fluoride Reading	pH To Town	TMP	Free Residual Chlorine
Above Upper Critical Limit	1	0	0	20	0	3
Above Upper Adjustment Limit	16	3	13	74	15	190
Within Operational Target	240	350	112	206	348	147
Below Lower Adjustment Limit	NA	NA	66	62	NA	24
Below Lower Critical Limit	NA	NA	165	NA	NA	0
Total Sample Count	257	353	356	362	363	364

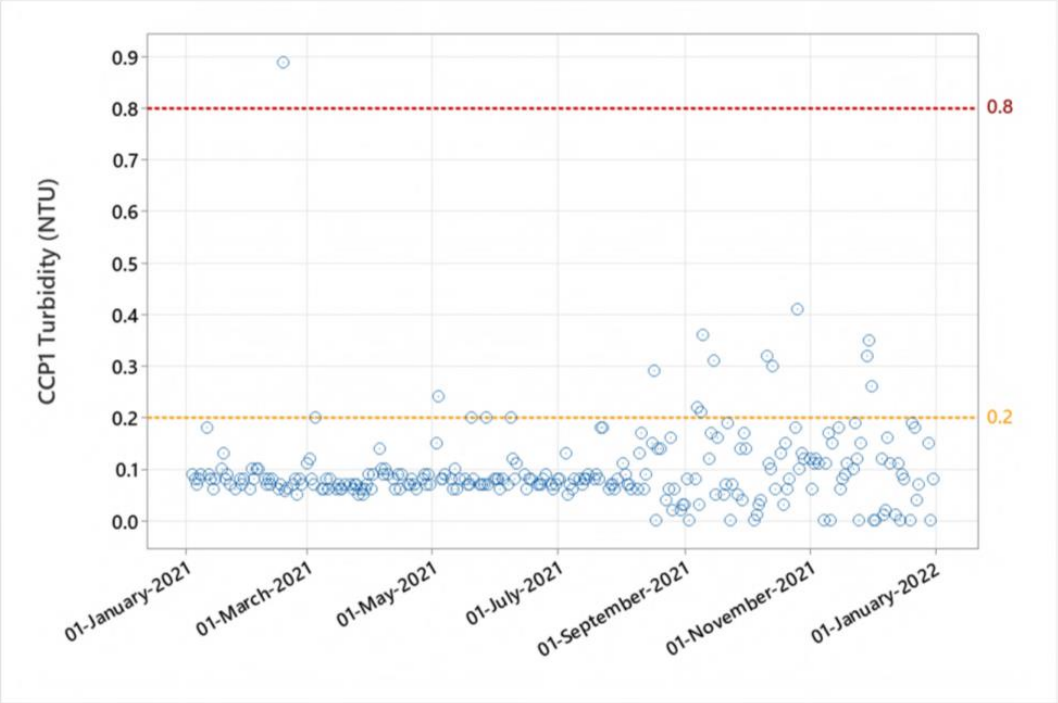

Figure 1 Batlow CCP 1 Filtered Water Turbidity

Turbidity trend of the filtered water is shown in Figure 1. There was very good compliance (mostly <0.2 NTU). Few values exceeded the alert limit of 0.2 NTU. February 2021 noted an exceedance of the critical limit. The issue was resolved, and the turbidity returned to target levels following the exceedance.

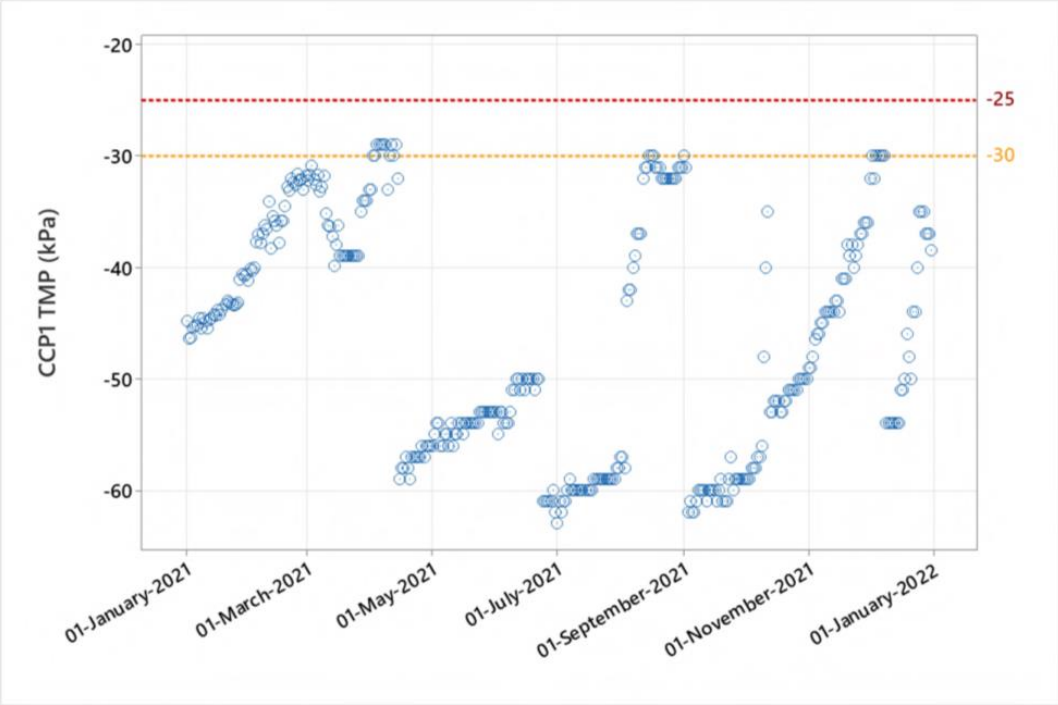

Figure 2 Batlow CCP 1 TMP flow to Reticulation Network

TMP trend of the filtered water is shown in Figure 2. There was very good compliance (mostly <-30 kPa). Few values exceeded the alert limit of -30 kPa. There were no instances where critical limit was exceeded.

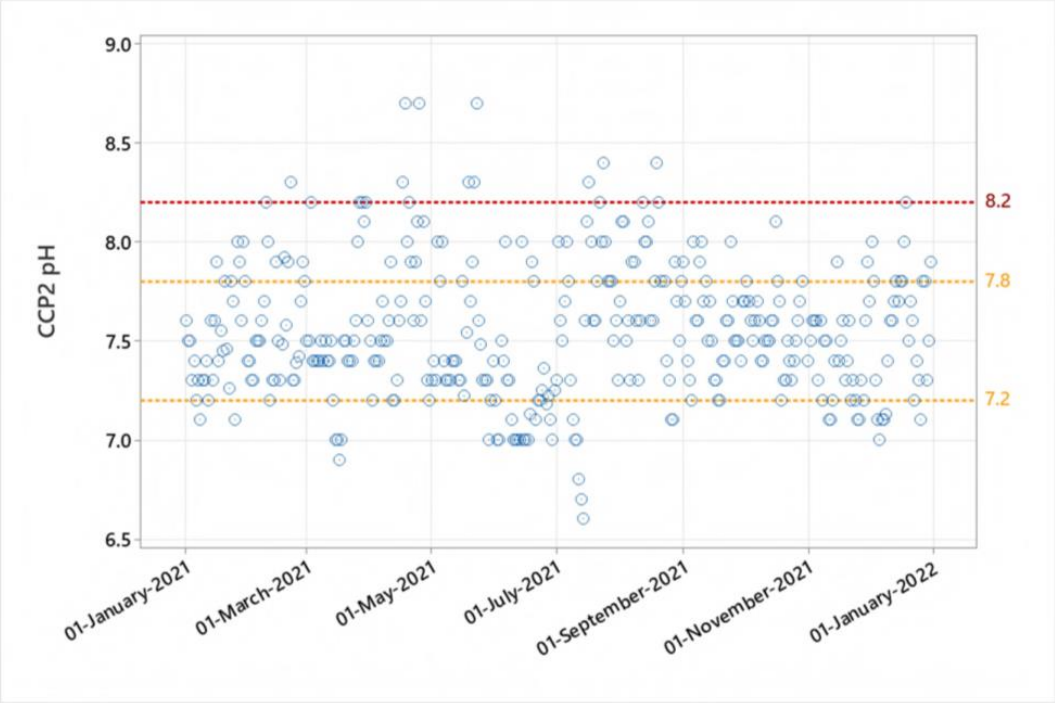

Figure 3 Batlow CCP2 pH flow to Reticulation Network

The pH trend of the filtered water is shown in Figure 3. There were many pH values that lay outside the upper and lower alert limits. The pH exceeded the upper critical limit a number of times, with 3 instances where pH exceeded the ADWG limit of 8.5.
The when the pH limits were triggered, operators made adjustments and any issues were resolved, and the pH returned to target levels following the exceedances.

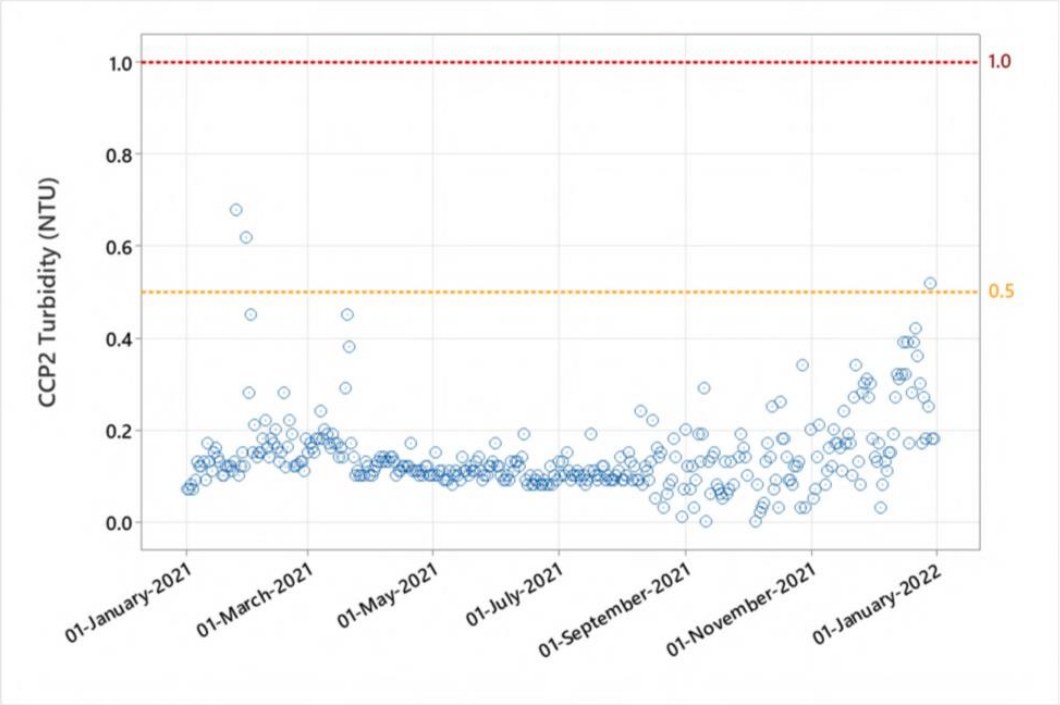

Figure 4 Batlow CCP2 Turbidity flow to Reticulation Network

Turbidity trend of the reticulation water is shown in Figure 4. There was very good compliance (mostly <0.5 NTU). Few values exceeded the alert limit of 0.5 NTU. There were no instances where critical limit was exceeded.

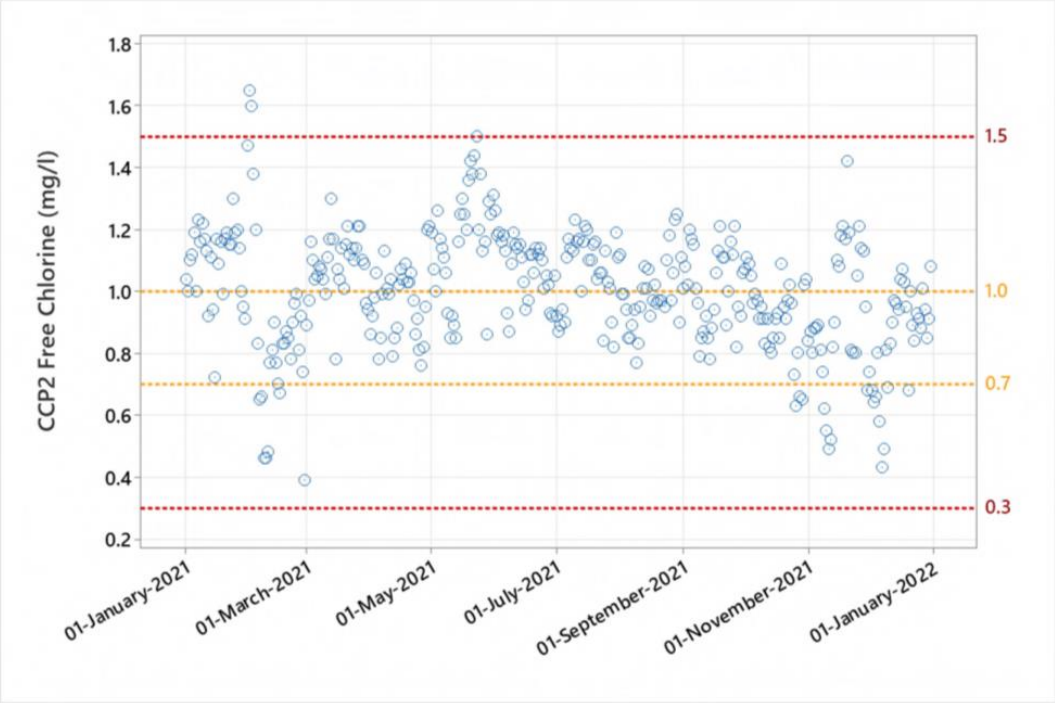

Figure 5 Batlow CCP2 Free Chlorine Residual flow to Reticulation Network

The free chlorine trend of the reticulation water is shown in Figure 5. The trend shows that there were no times when the free chlorine residual fell below the lower critical limit and was mostly above the lower alert limit. The free chlorine did exceed the upper alert limit many times, however there were very few instances of the upper critical limit being breached, and there were no times when the free chlorine residual approached the ADWG limit of 5 mg/L.

When the free chlorine alert limits were triggered, operators made adjustments, any issues were resolved, and the free chlorine residual returned to target levels following the exceedances.

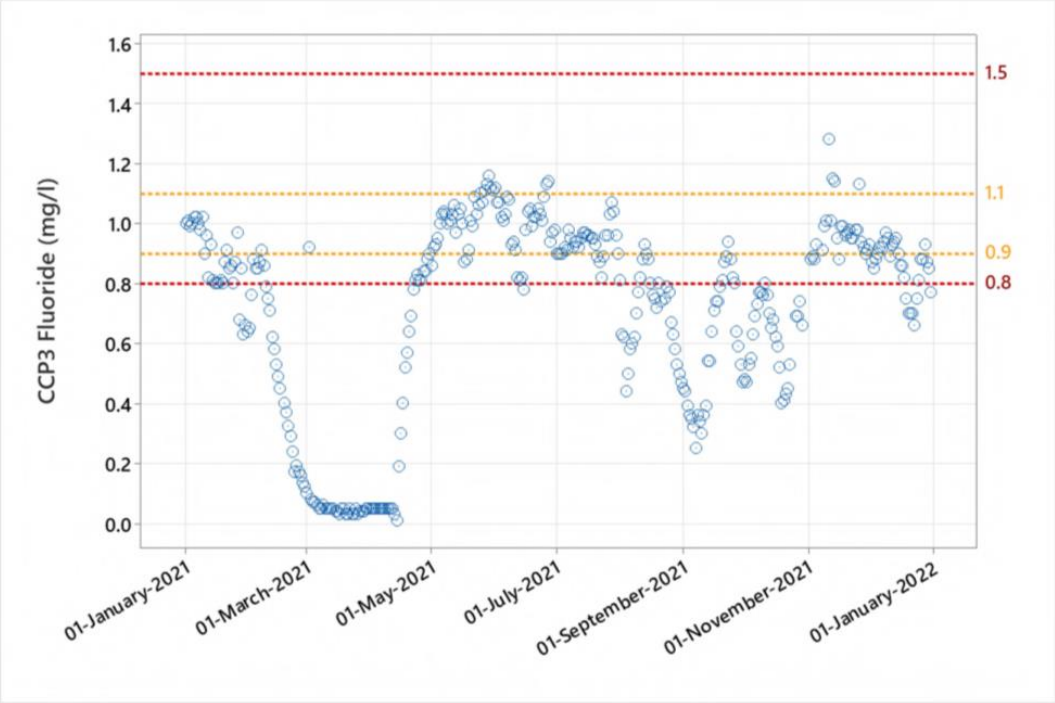

Figure 6 Batlow CCP3 Fluoride flow to Reticulation Network

The fluoride trend of the reticulation water is shown in Figure 6. The trend shows that there were no times when the fluoride exceeded the upper critical limit and was mostly below the upper alert limit. The fluoride did fall below the lower alert and critical limit many times. There were no times when the fluoride approached the ADWG limit of 1.5 mg/L.

4.2. Brungle

The current CCPs for the Brungle scheme are presented in Table 5. Table 6 shows the summary of CCP performance over the reporting period. Table 7 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 5 Brungle Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Brungle CCP 1: Filtration	Turbidity	<0.4 NTU	>0.5 NTU (instantaneous)	>1.0 NTU after 24 hours
	TMP	50 kPa	70 kPa	>150 kPa
Brungle CCP 2: Primary Disinfection	pH	pH 7.5 - 7.8	pH <7.5 or >7.8 for >24 hours	pH >8.2 (instantaneous)
	Turbidity	Turbidity <0.3 NTU	Turbidity >0.5 NTU (instantaneous)	Turbidity >1.0 NTU (instantaneous)
	Chlorine residual	Free Chlorine 0.7 - 1.0 mg/L	Free chlorine <0.7 mg/L or > 1 mg/L (instantaneous)	Free chlorine <0.3 mg/L or >1.5 mg/L (instantaneous)
Brungle CCP 3: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 6 Brungle CCP Data Analysis

Parameter	Filtered Turbidity	TMP	pH	Turbidity	Free Residual Chlorine
Min	0.04	20	7.13	0.01	0.39
5th percentile	0.06	21	7.25	0.06	0.65
Mean	0.13	26	7.49	0.17	1.62
95th percentile	0.27	39	7.78	0.33	2.38
Max	0.83	49	8.23	0.50	3.00

Table 7 Brungle CCP Sample Count for Operational Targets Analysis

Limit Band/Range	Filtered Turbidity (NTU)	TMP (kPa)	pH	Turbidity (NTU)	Free Residual Chlorine (mg/l)
Above Upper Critical Limit	0	0	1	0	64
Above Upper Adjustment Limit	1	0	4	1	20
Within Operational Target	95	96	90	95	4
Below Lower Adjustment Limit	NA	NA	1	NA	8
Below Lower Critical Limit	NA	NA	NA	NA	0
Total Sample Count	96	96	96	96	96

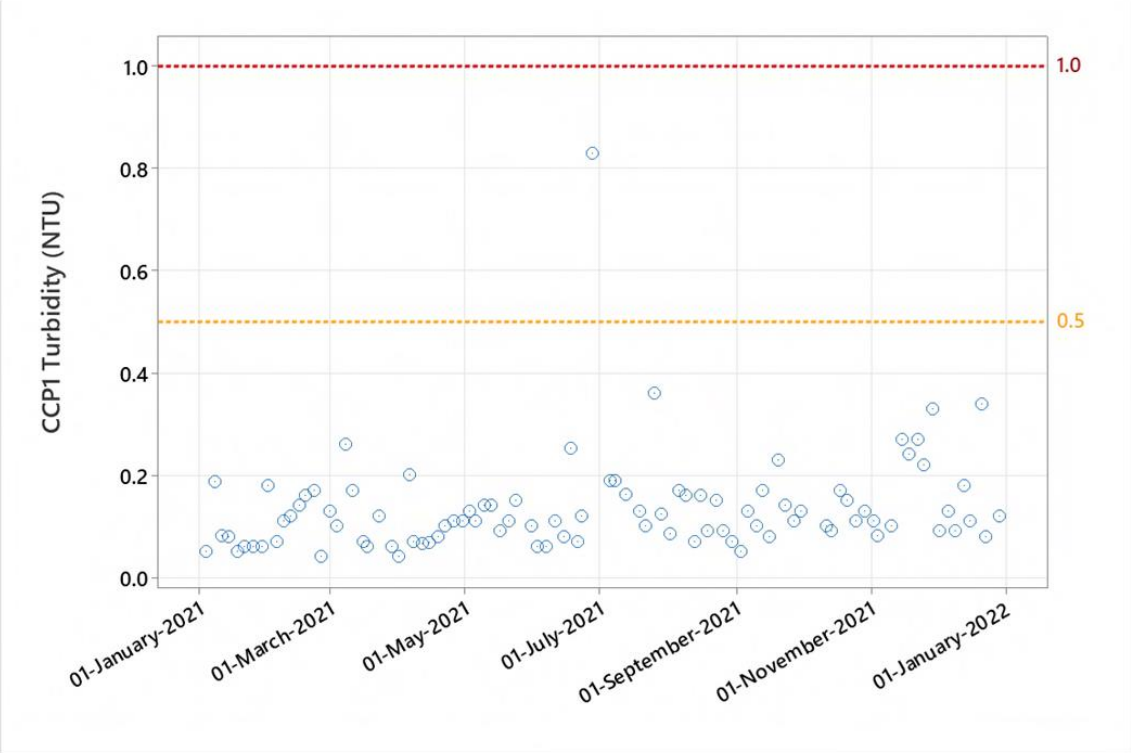

Figure 7 Brungle CCP1 Filtered Water Turbidity

Turbidity trend of the filtered water is shown in Figure 7. There was very good compliance (mostly <0.5 NTU). There were no instances where critical limit was exceeded.

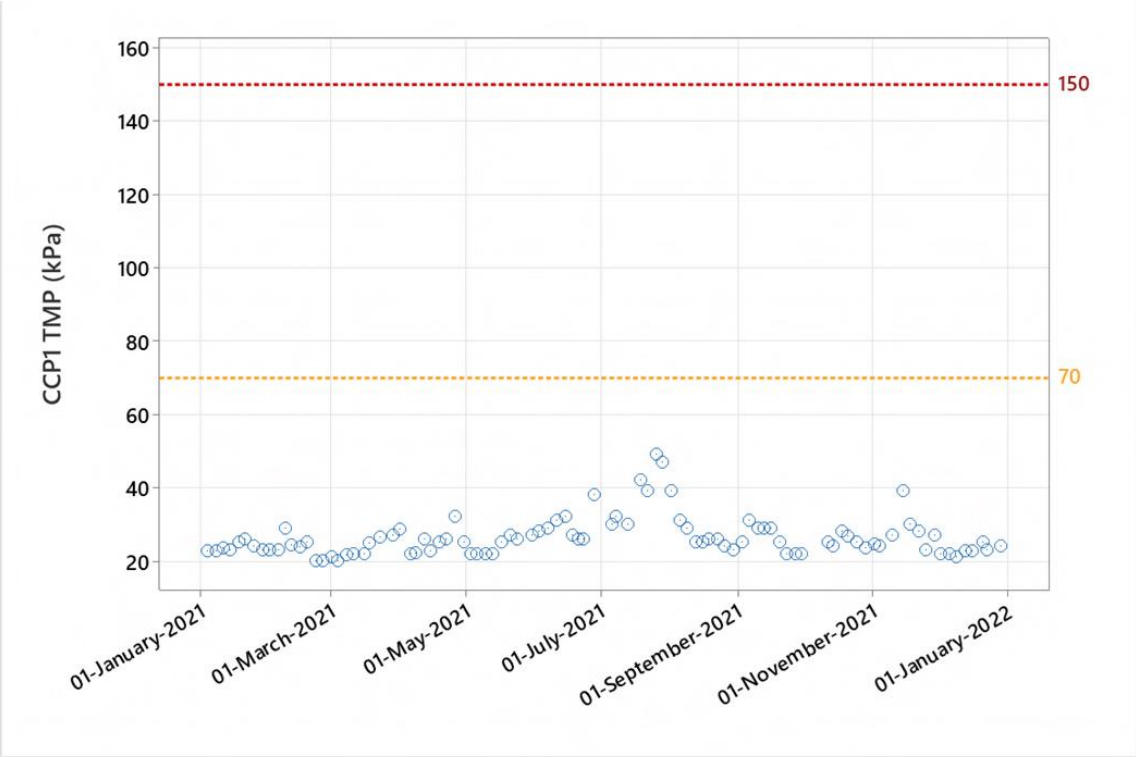

Figure 8 Brungle CCP1 Treated Water TMP

TMP trend of the treated water is shown in Figure 8. There was 100% compliance with the CCP limits.

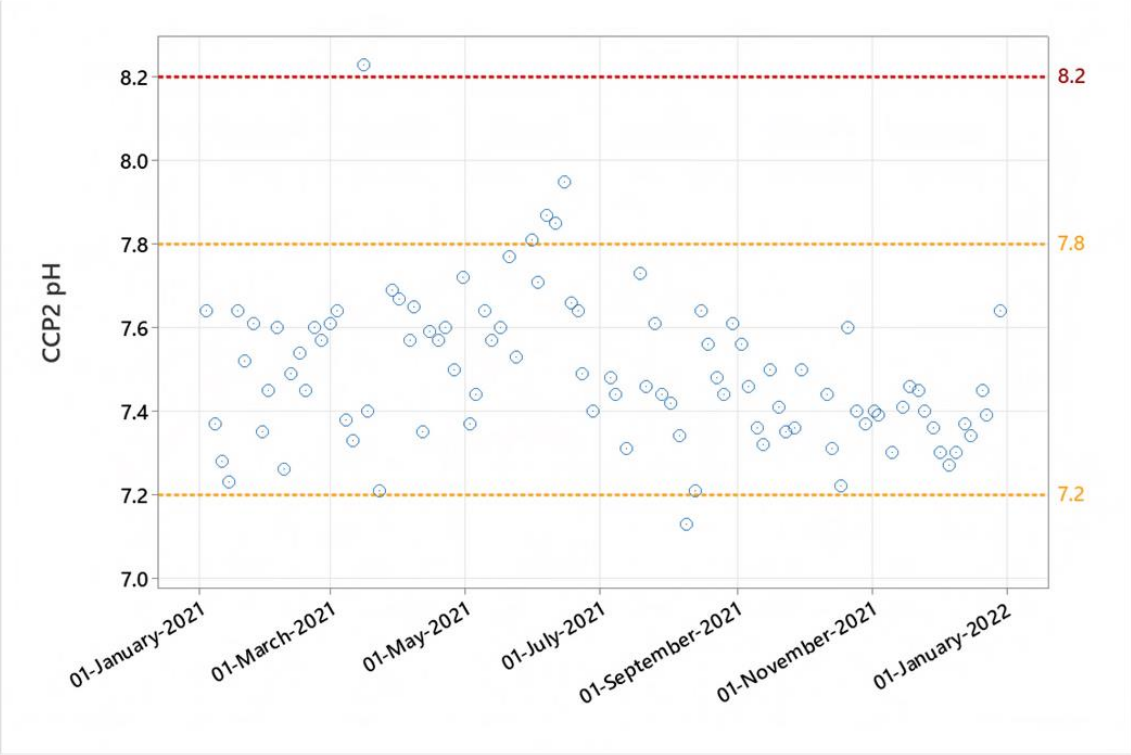

Figure 9 Brungle CCP2 Treated Water pH

The pH trend of the treated water is shown in Figure 9. There was one exceedances of the upper critical limit and one exceedance of the lower alert limit. The issues were resolved, and the pH returned to target levels following the exceedances.

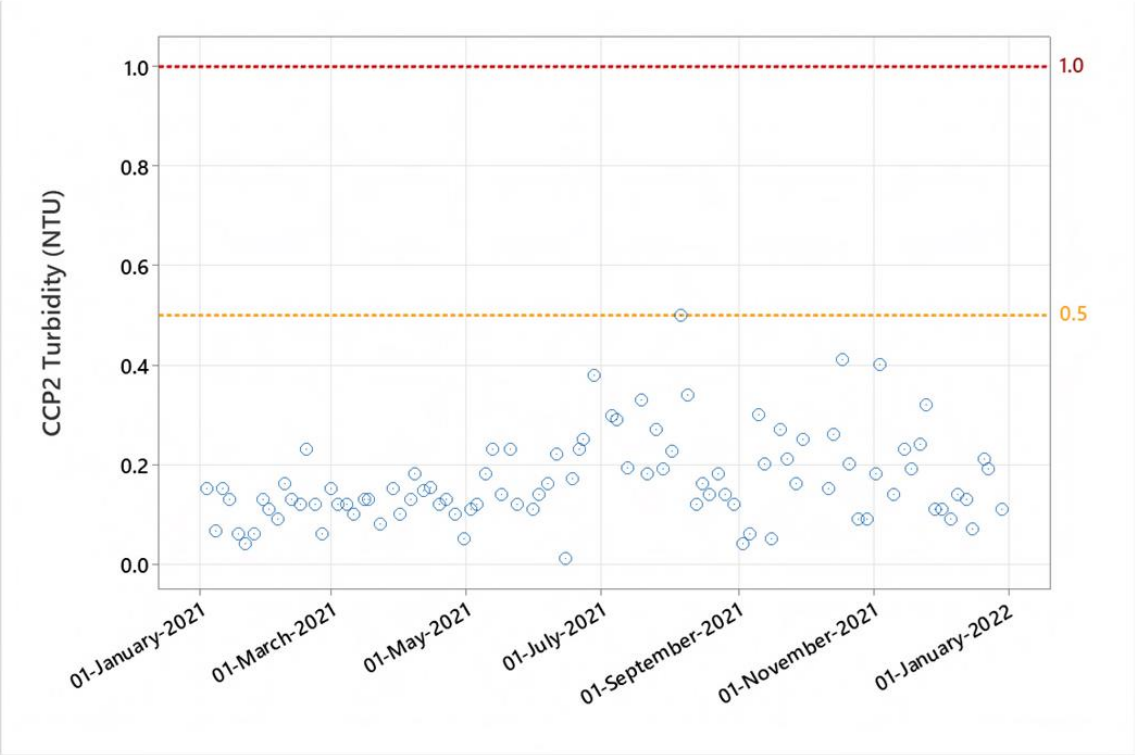

Figure 10 Brungle CCP2 Treated Water Turbidity

Turbidity trend of the treated water is shown in Figure 10. There was very good compliance (mostly <0.5 NTU). There were no instances where critical limit was exceeded.

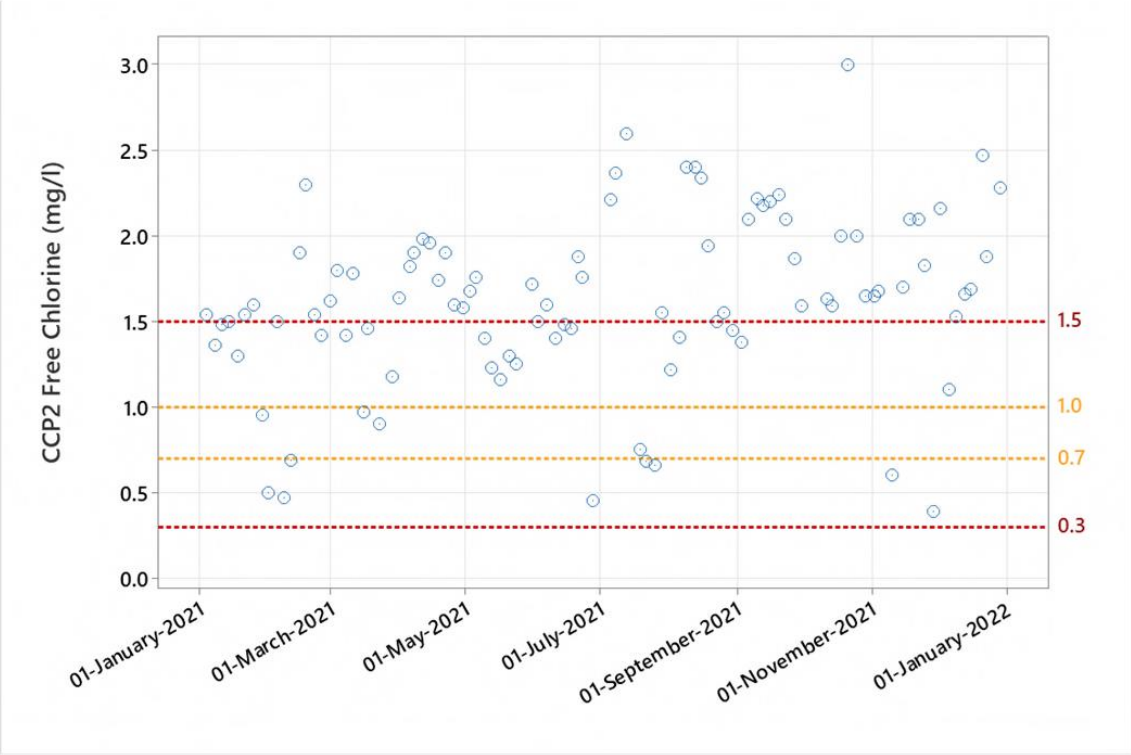

Figure 11 Brungle CCP2 Treated Water Free Chlorine Residual

The free chlorine trend of the treated water is shown in Figure 11. Most values exceeded the upper alert limit as well as the upper critical limit. There were no times when the free chlorine residual approached the ADWG limit of 5 mg/L. The lower alert limit was breached a few times, however there were no breaches of the lower critical limit.

4.3. Khancoban

The current CCPs for the Khancoban scheme are presented in Table 8. Table 9 shows the summary of CCP performance over the reporting period. Table 10 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 8 Khancoban Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Khancoban CCP 1: Primary Disinfection	Chlorine residual	0.6 mg/L – 1 mg/L	< 0.5 mg/L or > 2 mg/L	< 0.3 mg/L > 24 hr or 5 mg/L
Khancoban CCP 2: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 9 Khancoban CCPs Data Analysis

Parameter	Free Chlorine (mg/l)
Min	0.14
5th percentile	1.10
Mean	1.49
95th percentile	1.92
Max	2.40

Table 10 Khancoban CCP Sample Count for Operational Targets Analysis

Limit Band/Range	Free Chlorine
Above Upper Critical Limit	0
Above Upper Adjustment Limit	7
Within Operational Target	356
Below Lower Adjustment Limit	1
Below Lower Critical Limit	1
Total Sample Count	365

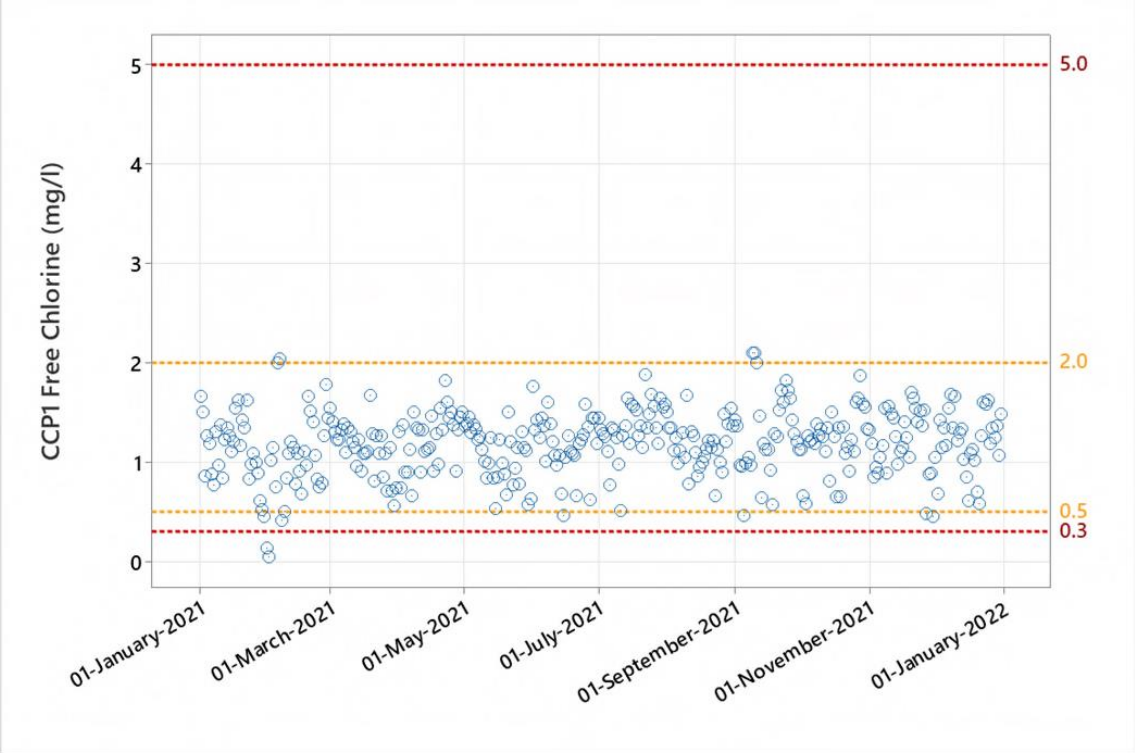

Figure 12 Khancoban CCP1 Treated water Free Chlorine

The free chlorine trend of the treated water is shown in Figure 12. There was very good compliance, and few values fell below the lower alert limit of 0.5 mg/l. There were two instances in February 2021 where the free chlorine fell below the lower critical limit. This was readily rectified by operators. There were a small number of times where free chlorine residual exceeded the upper limit, however there were no times where the free chlorine residual exceeded the ADWG Limit.

4.4. Talbingo

The current CCPs for the Talbingo scheme are presented in Table 11. Table 12 shows the summary of CCP performance over the reporting period. Table 13 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 11 Talbingo Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Talbingo CCP 1: Filtration	Turbidity	<0.1 NTU	>0.2 NTU (instantaneous)	>0.8 NTU for 15 minutes
Talbingo CCP 2: Primary Disinfection	pH	pH 7.5 - 7.8	pH <7.5 or >7.8 for >24 hours	pH >8.2 (instantaneous)
	Turbidity	Turbidity <0.3 NTU	Turbidity >0.5 NTU (instantaneous)	Turbidity >1.0 NTU (instantaneous)
	Chlorine residual	Free Chlorine 0.7 - 1.0 mg/L	Free chlorine <0.7 mg/L or >1 mg/L (instantaneous)	Free chlorine <0.3 mg/L or >1.5 mg/L (instantaneous)
Talbingo CCP 3: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 12 Talbingo CCP Data Analysis

Parameter	Filtered Turbidity (NTU)	pH	Turbidity (NTU)	Free Residual Chlorine (mg/l)
Min	0.051	7.2	0.070	0.55
5th percentile	0.059	7.5	0.074	0.71
Mean	0.105	7.8	0.094	0.89
95th percentile	0.179	8.1	0.123	1.12
Max	0.560	8.3	0.137	1.29

Table 13 Brungle CCP Sample Count for Operational Target Analysis

Limit Band/Range	Filtered Turbidity	pH	Turbidity	Free Residual Chlorine
Above Upper Critical Limit	0	2	0	0
Above Upper Adjustment Limit	3	180	0	67
Within Operational Target	92	183	365	281
Below Lower Adjustment Limit	NA	0	NA	17
Below Lower Critical Limit	NA	NA	NA	0
Total Sample Count	95	365	365	365

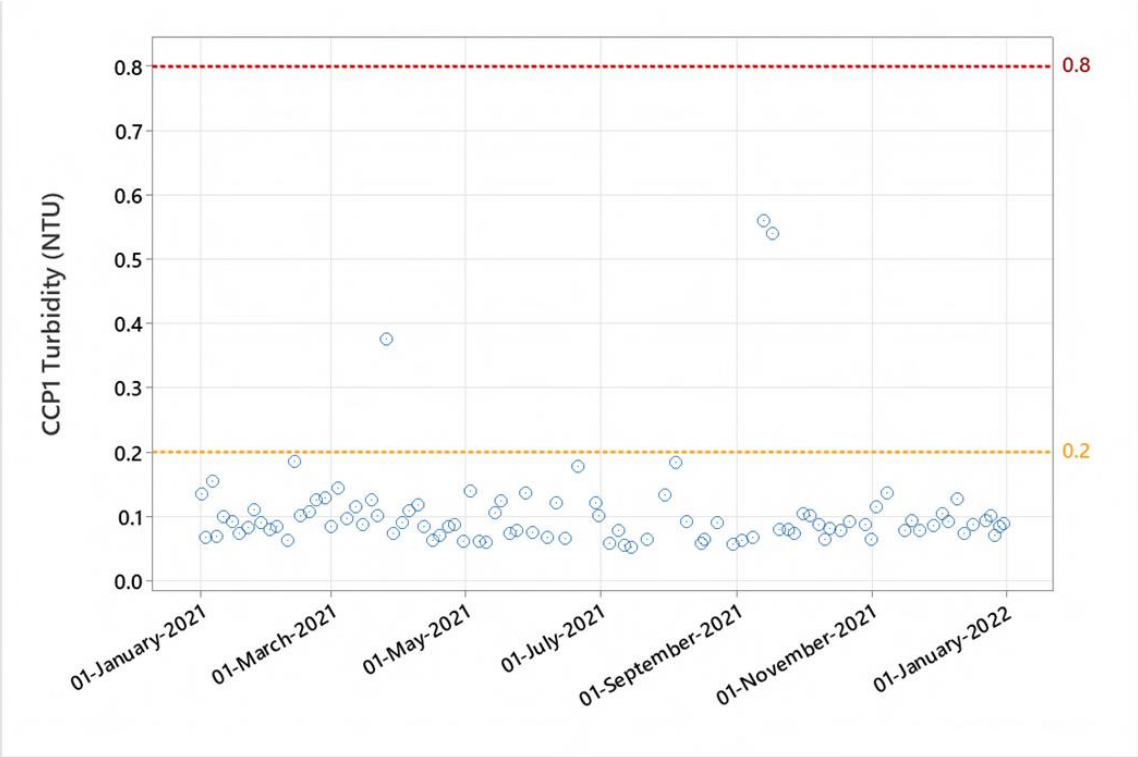

Figure 13 Talbingo CCP1 Post Filter Water Turbidity

Turbidity trend of the post filtered water is shown in Figure 13. There was very good compliance (mostly <0.2 NTU). Three tests exceeded the alert limit of 0.2 NTU. There were no instances where critical limit was exceeded.

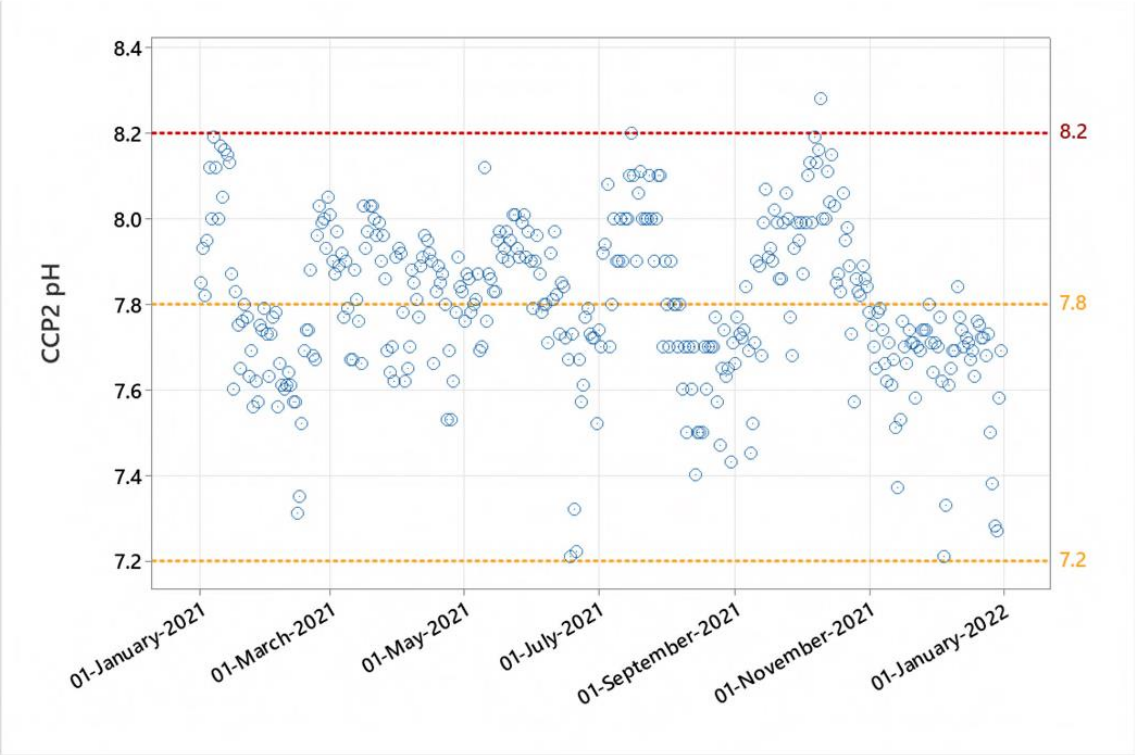

Figure 14 Talbingo CCP2 filtered water pH

pH trend of the filtered water is shown in Figure 14. There was generally good compliance though many values exceeded the upper alert limit. October 2021 noted one exceedance of the critical limit. The issue was resolved, and the pH returned to target levels following the exceedance.

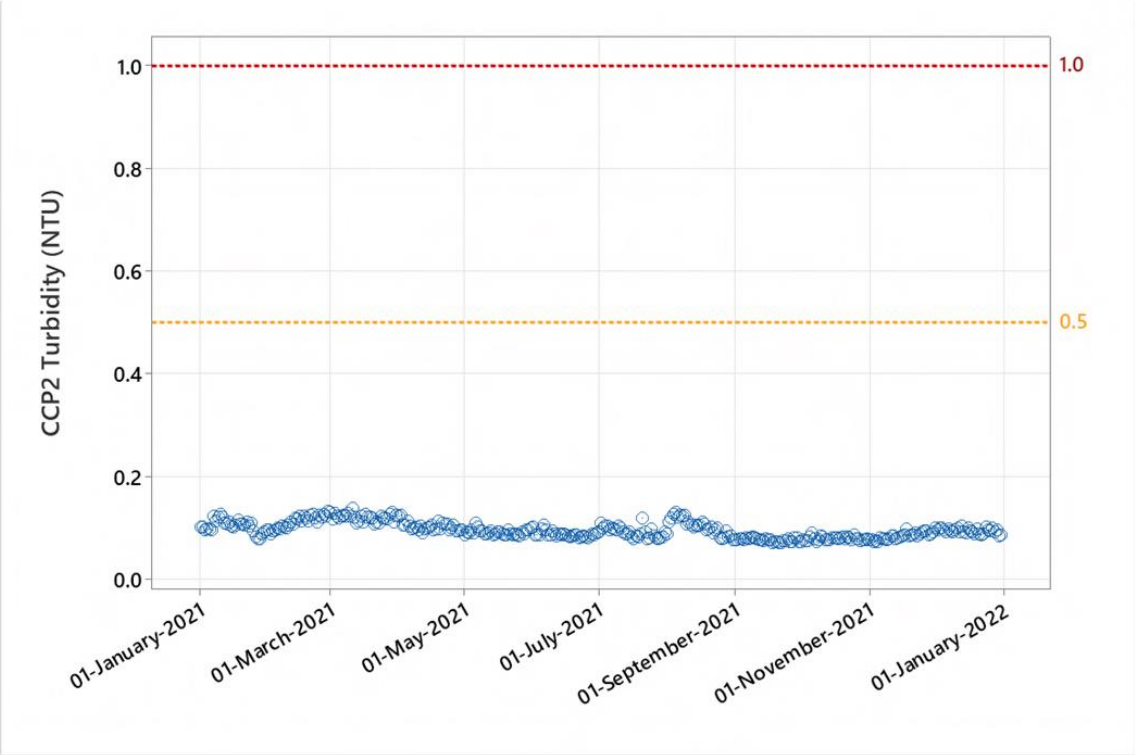

Figure 15 Talbingo CCP2 Filtered Water Turbidity

Turbidity of the filtered water is shown in Figure 15. There was 100% compliance with the CCP limits.

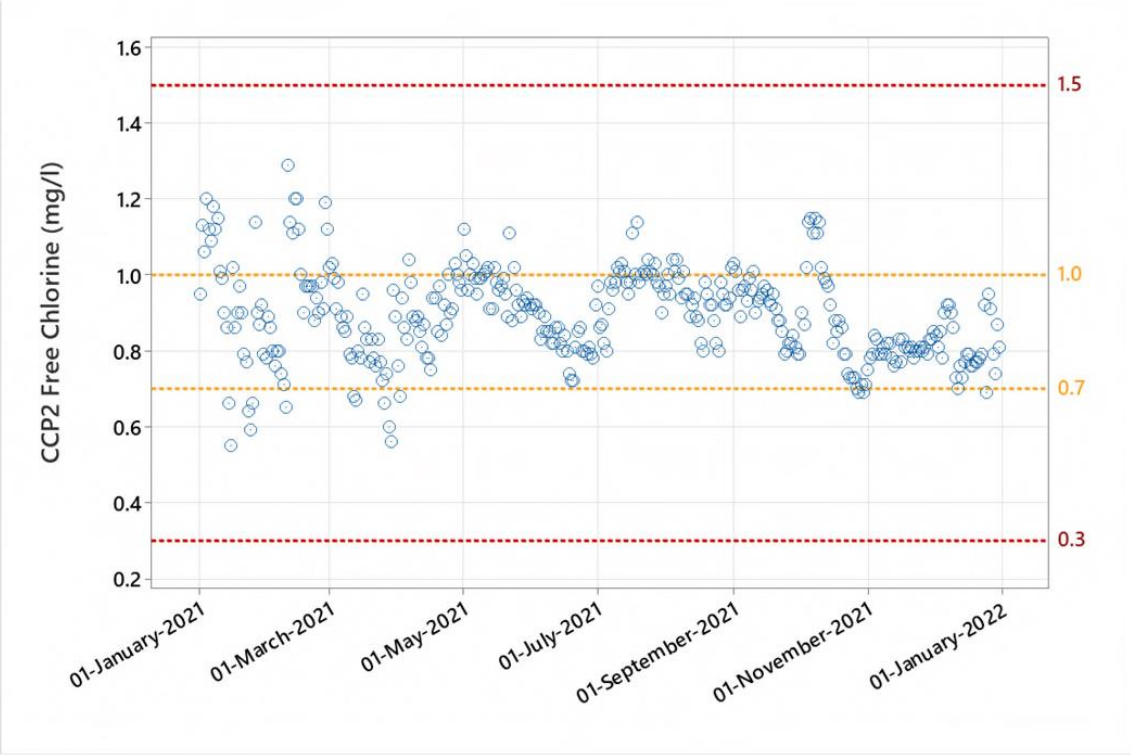

Figure 16 Talbingo CCP2 Free Chlorine Residual flow to Reticulation Network

The free chlorine trend of the reticulation water is shown in Figure 16. There was very good compliance (mostly between 0.7 mg/l and 1.0 mg/l). Some values exceeded the upper and lower alert limit, but there were no instances where critical limit was exceeded.

4.5. Tumbarumba

The current CCPs for the Tumbarumba scheme are presented in Table 14. Table 15 shows the summary of CCP performance over the reporting period. Table 16 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 14 Tumbarumba Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Tumbarumba CCP 1: Filtration	Turbidity	<0.2 NTU	0.4 NTU	>0.5 NTU
Tumbarumba CCP 2: Primary Disinfection	Chlorine residual	Free Chlorine 0.6 mg/L	Free chlorine <0.45 mg/L or >1.2 mg/L (instantaneous)	Free chlorine <0.3 mg/L or >1.5 mg/L (instantaneous)
Tumbarumba CCP 3: Fluoridation	Fluoride	0.9 - 1.1 mg/L	<0.9 mg/L or >1.1 mg/L (instantaneous)	<0.9 mg/L for greater than 72 hours or >1.5 mg/L (instantaneous)*
Tumbarumba CCP 4: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 15 Tumbarumba CCP Data Analysis

Parameter	Filtered Turbidity (NTU) – Filter 2	Filtered Turbidity (NTU) – Filter 1	Free Residual Chlorine (mg/l)	Fluoride (mg/l)
Min	0.04	0.03	0.22	0.411
5th percentile	0.06	0.03	0.58	0.720
Mean	0.15	0.07	0.73	0.974
95th percentile	0.28	0.16	0.91	1.174
Max	1.82	0.97	1.03	1.345

Table 16 Brungle CCP Sample Count for Operational Target Analysis

Limit Band/Range	Filtered Turbidity – Filter 2	Filtered Turbidity – Filter 1	Free Residual Chlorine	Fluoride
Above Upper Critical Limit	14	5	0	0
Above Upper Adjustment Limit	13	1	0	58
Within Operational Target	879	900	362	217
Below Lower Adjustment Limit	NA	NA	2	NA
Below Lower Critical Limit	NA	NA	1	90
Total Sample Count	906	906	365	365

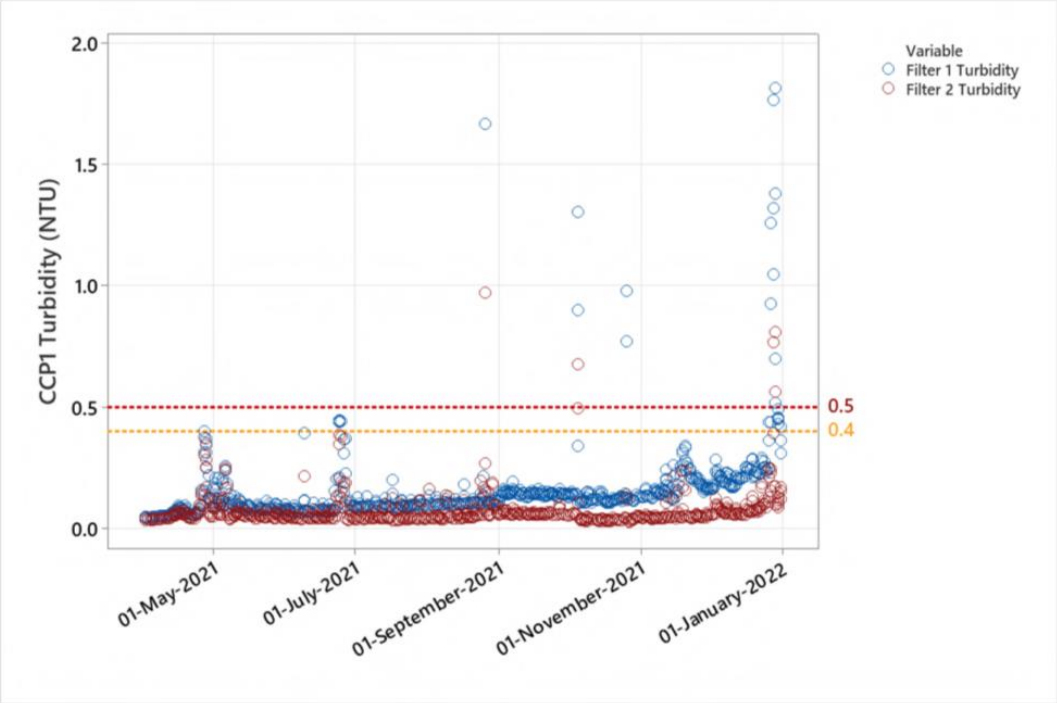

Figure 17 Tumbarumba CCP1 Filtered Water Turbidity

Turbidity trend of the filtered water is shown in Figure 17. There was generally very good compliance (mostly <0.4 NTU) across both filters. There were a few values in filter 1 that exceeded the alert limit of 0.4 NTU. There were some instances across both filters where critical limit was exceeded. The when the turbidity limits were triggered, the issues were resolved, and the turbidity returned to target levels following the exceedances.

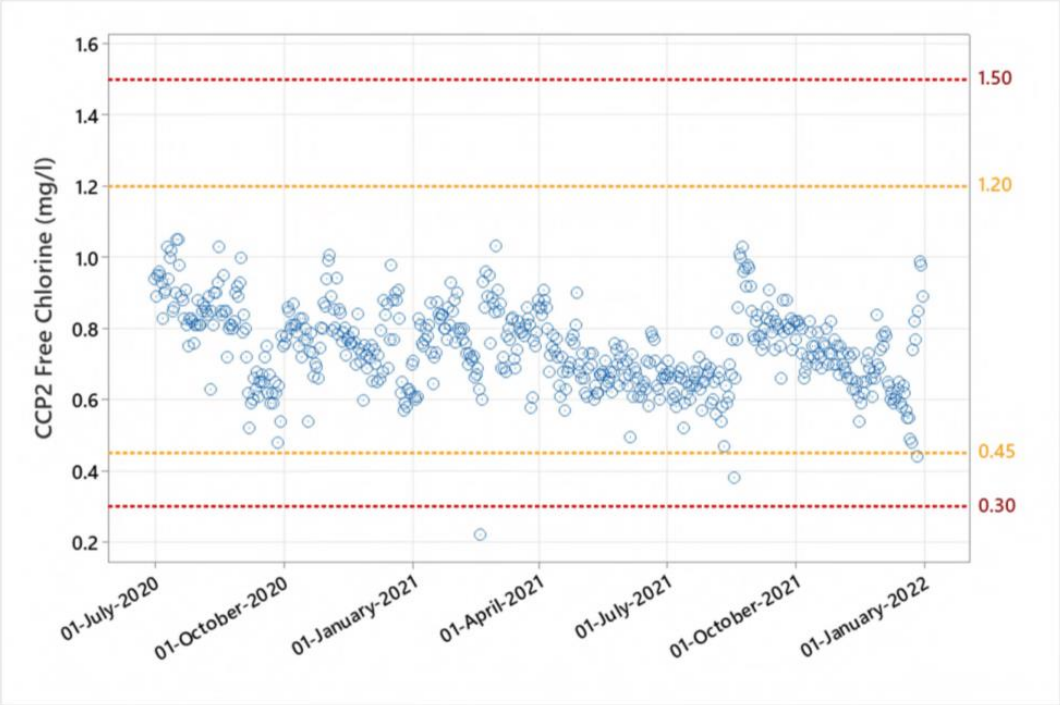

Figure 18 Tumbarumba CCP2 Treated Water Free Chlorine Residual

The free chlorine trend of the filtered water is shown in Figure 18. There was very good compliance (mostly between 0.45 mg/l and 1.20 mg/l). There were a small number of times when the free chlorine fell below the lower alert limit of 0.45 mg/l. February 2021 noted one instance when free chorine fell below critical limit. The issue was resolved, and the free chlorine returned to target levels following the exceedance.

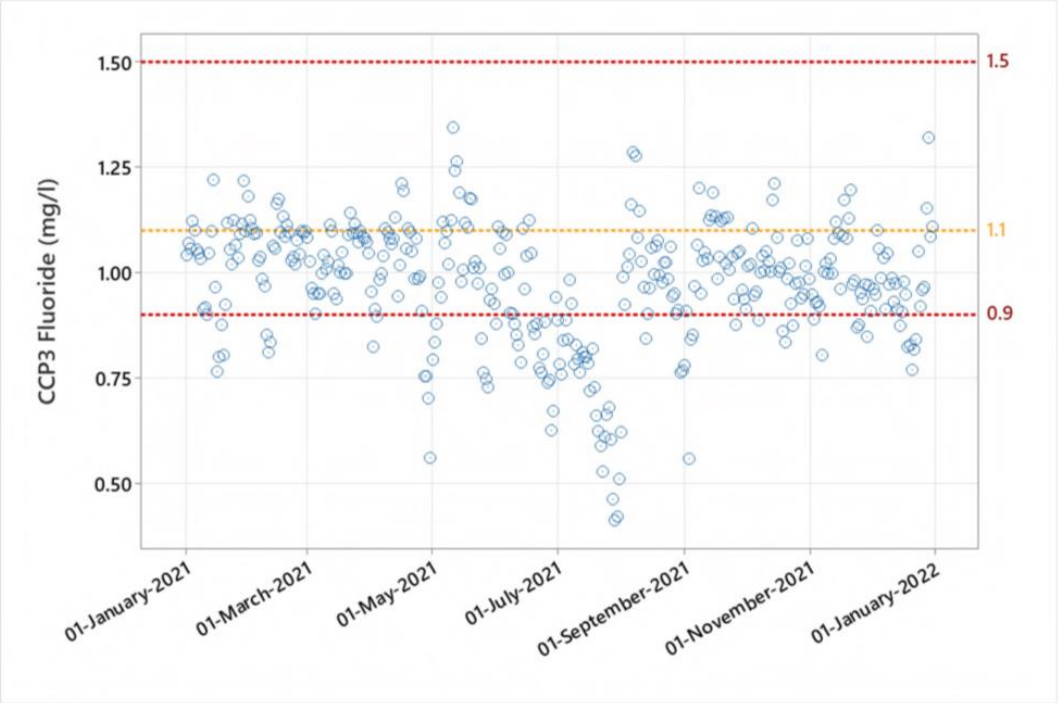

Figure 19 Tumbarumba CCP3 Treated Water Fluoride

The fluoride trend of the treated water is shown in Figure 19. Many values fell below the lower critical limit of 0.9 mg/l throughout the recording period. No values exceeded the ADWG health limit of 1.5 mg/l.

4.6. Tumut

The current CCPs for the Tumut scheme are presented in Table 17. Table 18 shows the summary of CCP performance over the reporting period. Table 19 provides a breakdown of the number of readings within each CCP Limit Band (target, adjustment limit and critical limit ranges).

Table 17 Tumut Scheme CCPs

Critical Control Point	Parameter	Operational Target	Adjustment Limit	Critical Limit
Tumut OCP 1: Raw Water Extraction	Turbidity, rainfall	<1 NTU	-	Operator adjustable
		No rain event	Rain event or forecast of rain event	
Tumut CCP 2: Filtration	Turbidity, rainfall	<0.2 NTU	>0.5 NTU	>1 NTU
Tumut CCP 3: Primary Disinfection	pH	pH 7.5 - 7.8	pH <7.5 or >7.8 for >24 hours	pH >8.2 (instantaneous)
	Turbidity	Turbidity <0.3 NTU	Turbidity >0.5 NTU (instantaneous)	Turbidity >1.0 NTU (instantaneous)
	Chlorine residual	Free Chlorine 0.7 - 1.0 mg/L	Free chlorine <0.7 mg/L or >1.2 mg/L (instantaneous)	Free chlorine <0.3 mg/L or >1.5 mg/L (instantaneous)
Tumut CCP 4: Fluoridation	Fluoride	0.9 - 1.1 mg/L	<0.9 mg/L or >1.1 mg/L (instantaneous)	<0.9 mg/L for greater than 72 hours or > 1.5 mg/L (instantaneous)
Tumut CCP 5: Distribution Reservoirs	Reservoir integrity	Vermin proof	Evidence of integrity breach	Integrity breach not rectified
		Secure and leak proof	Evidence of security breach	Security breach not rectified

Table 18 Tumut CCP Data Analysis

Parameter	Raw Water Turbidity (NTU)	Filtered Turbidity (NTU)	pH	Fluoride (mg/l)	Free Residual Chlorine (mg/l)
Min	0.88	0.06	6.76	0.18	0.63
5th percentile	1.12	0.07	7.03	0.92	0.92
Mean	7.41	0.13	7.34	1.02	1.35
95th percentile	29.04	0.29	7.75	1.13	1.73
Max	192.00	0.66	8.18	1.80	1.93

Table 19 Brungle CCP Sample Count for Operational Targets Analysis

Limit Band/Range	Raw Water Turbidity	Filtered Turbidity	pH	Fluoride	Free Residual Chlorine
Above Upper Critical Limit	NA	0	0	1	116
Above Upper Adjustment Limit	50	3	13	50	217
Within Operational Target	315	357	249	302	27
Below Lower Adjustment Limit	NA	NA	99	8	5
Below Lower Critical Limit	NA	NA	1	4	0
Total Sample Count	365	360	362	365	365

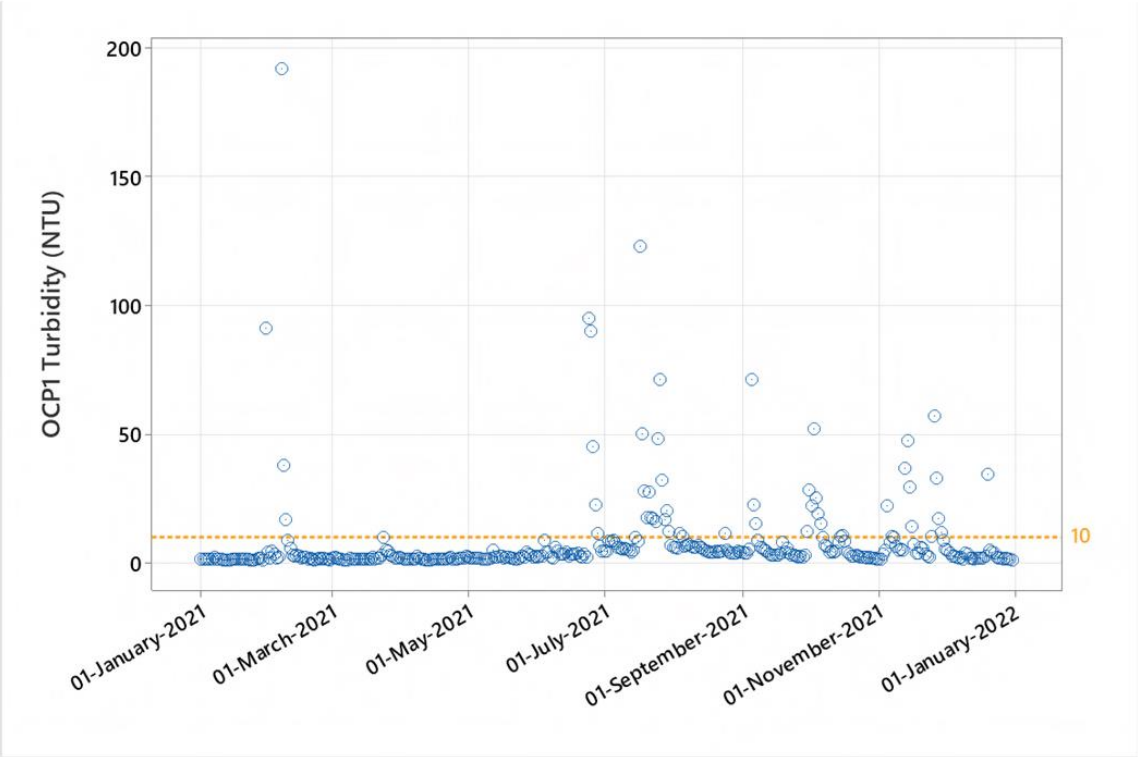

Figure 20 Tumut OCP1 Raw Water Turbidity

Turbidity trend of the raw water is shown in Figure 20. There was very good compliance (mostly <10 NTU). Few values exceeded the operational alert limit of 10 NTU.

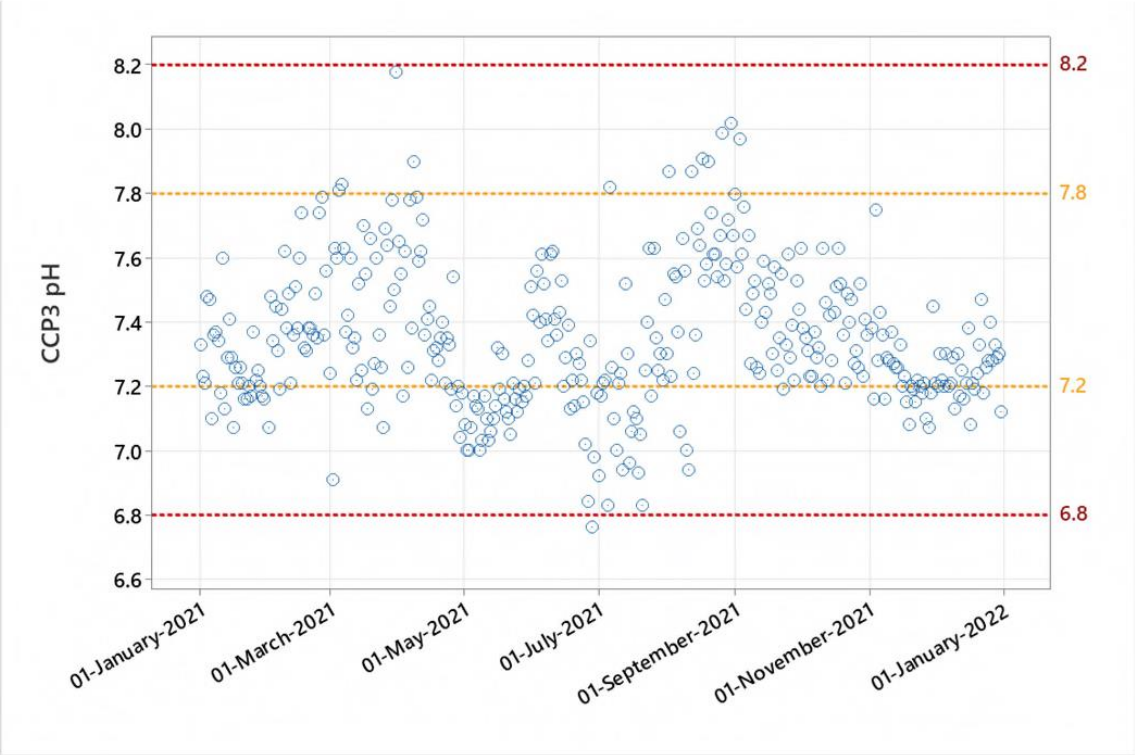

Figure 21 Tumut CCP3 Treated Water pH

pH trend of the treated water is shown in Figure 21. There was generally good compliance, though many values exceeded the upper and lower alert limits. June 2021 noted an exceedance of the lower critical limit. The issue was resolved, and the pH returned to target levels following the exceedance.

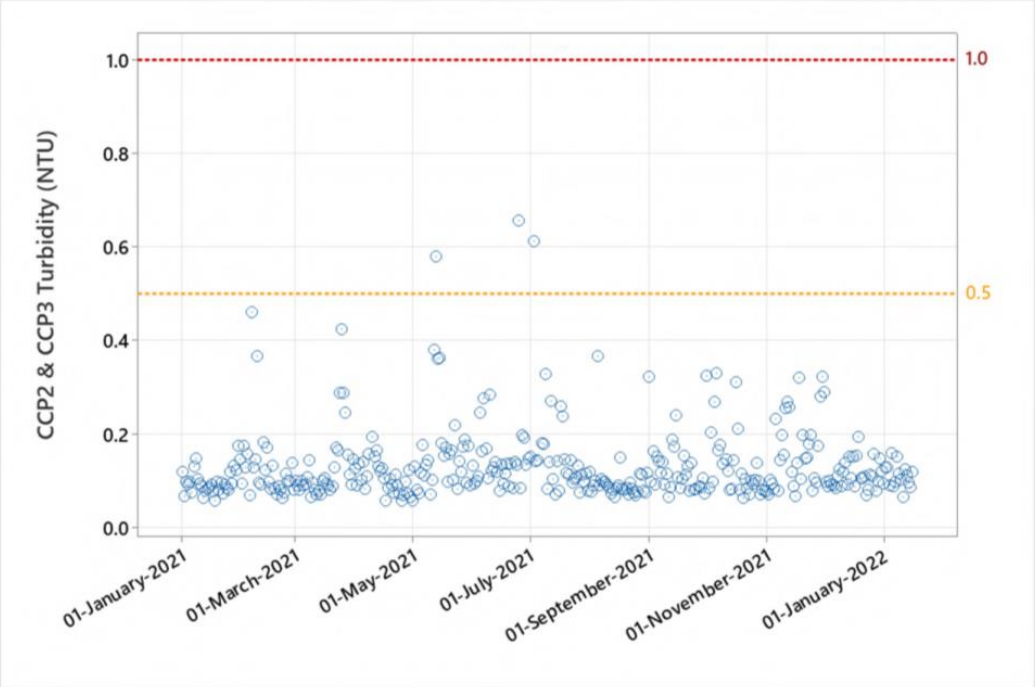

Figure 22 Tumut CCP2 and CCP3 Treated Water Turbidity

Turbidity trend of the treated water is shown in Figure 22. There was very good compliance (mostly <0.5 NTU). Few values exceeded the alert limit of 0.5 NTU. There were no exceedances of the critical limit during the reporting period.

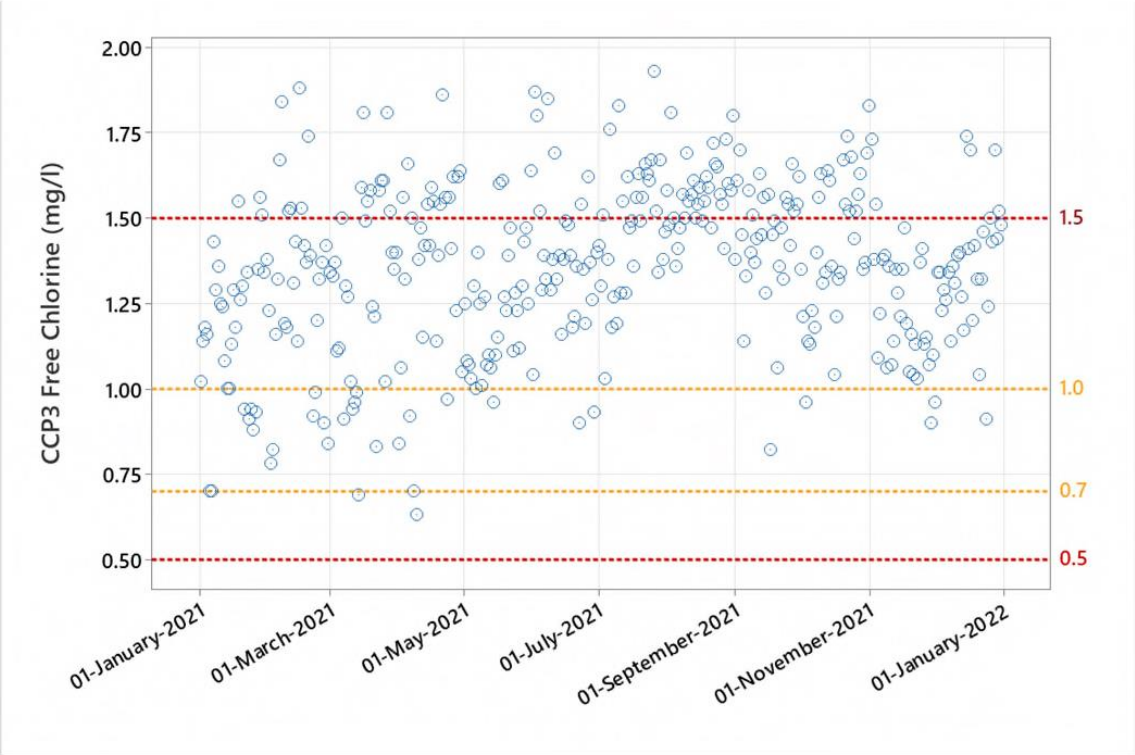

Figure 23 Tumut CCP3 Treated Water Free Chlorine

The free chlorine trend of the reticulation water is shown in Figure 23. The upper and lower alert limits were triggered numerous times, however the free chlorine residual did not fall below the lower critical limit. There were multiple exceedances of the upper critical limit 1.5 mg/l throughout the reporting period, however the ADWG limit of 5 mg/L was not exceeded.

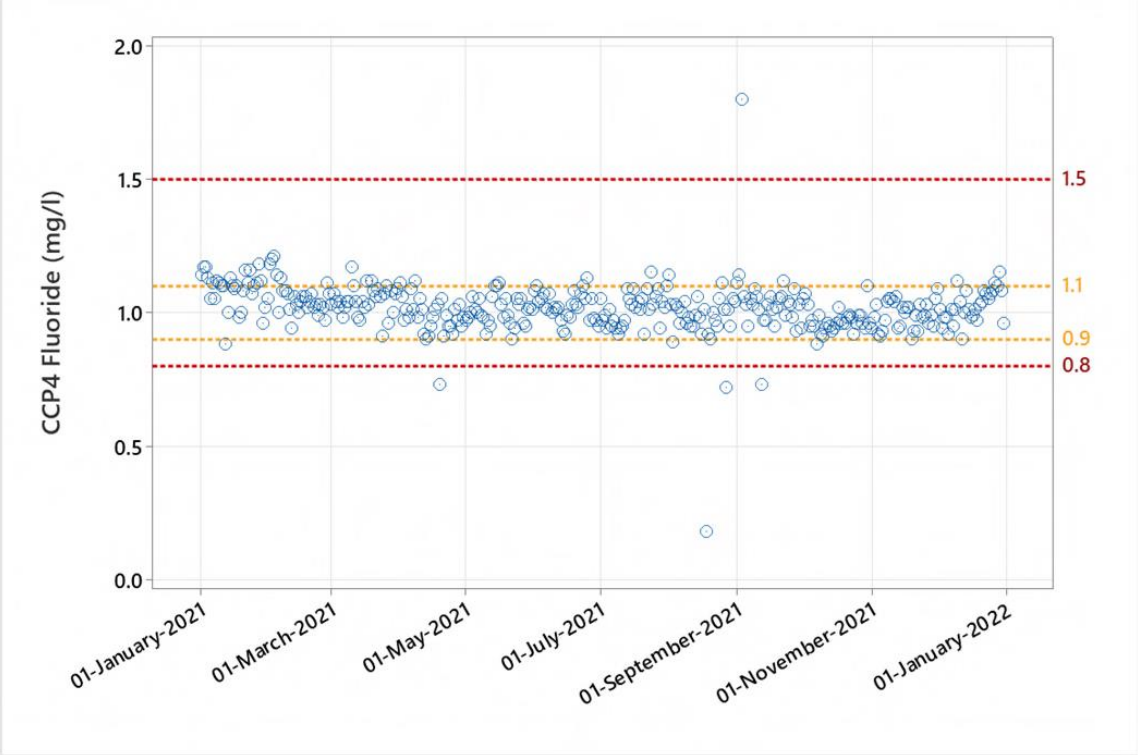

Figure 24 Tumut CCP4 Treated Water Fluoride

The fluoride trend of the filtered water is shown in Figure 24. There was very good compliance (mostly between 0.9 mg/l and 1.1 mg/l). There were four instances where the lower alert limit of 0.9 mg/l was triggered and one instance where the upper alert limit was triggered. The issue was resolved, and the free chlorine returned to target levels following the exceedance. The upper health limit was not exceeded.

5. RESERVOIR INTEGRITY

SVC has a CCP for reservoir integrity. Maintaining the integrity of the distribution system is an important barrier in keeping the supply safe from potential recontamination. This includes ensuring that the service reservoirs are not vulnerable to contamination, for example, by vermin, birds, or rainwater runoff ingress. Security of the facilities is also examined to deter contamination by human agency.

SVC has a planned schedule of detailed reservoir inspections for each facility at either two-yearly or four-yearly intervals. A detailed inspection was undertaken in February 2020 and issues were highlighted for maintenance A summary of the SVC ASAM RT database which stores the records of reservoir inspections and cleans is summarised in Table 20.

The reservoir integrity is a CCP and should be monitored weekly as a minimum. A program should be kept for reservoir and clear water tank inspections including consistent record keeping as required for CCPs.

Table 20: Reservoir inspections

Reservoir	Last Inspection date in ASAM RT	Next Inspection date scheduled	Last Clean date in ASAM RT	Next Clean date scheduled
Adelong	16/02/2020	16/02/2024	16/02/2020	16/02/2024
Adelong Break Tank	16/02/2020	16/02/2024	16/02/2020	16/02/2024
Batlow WTP CWT	15/02/2020	15/02/2024	15/02/2020	15/02/2024
Batlow WTP RWT	15/02/2020	15/02/2024	15/02/2020	15/02/2024
Brungle	12/02/2020	12/02/2024	12/02/2020	12/02/2024
Cherry Lane Concrete	14/11/2013	14/11/2017	14/11/2013	14/11/2022
Cherry Lane Steel	16/02/2020	16/02/2024	16/02/2020	16/02/2024
Cloverdale 1 (Offline)	17/11/2013	NA	16/11/2013	NA
Cloverdale 2 (Offline)	17/11/2013	NA	16/11/2013	NA
Godfrey	15/02/2020	15/02/2024	15/02/2020	15/02/2024
Golf Club	13/02/2020	13/02/2024	13/02/2020	13/02/2024
Khancoban No1	17/02/2020	17/02/2024	17/02/2020	17/02/2024
Khancoban No2	17/02/2020	17/02/2024	17/02/2020	17/02/2024
Lambie	14/02/2020	14/02/2024	14/02/2020	14/02/2024
Southern	12/02/2020	12/02/2024	12/02/2020	12/02/2024
Talbingo HL	13/02/2020	13/02/2024	13/02/2020	13/02/2024
Talbingo LL	15/11/2013	15/11/2017	15/11/2013	15/11/2022
Tumbarumba	17/02/2020	17/02/2024	17/02/2020	17/02/2024
Withers 1	14/02/2020	14/02/2024	14/02/2020	14/02/2024
Withers 2	14/02/2020	14/02/2024	14/02/2020	14/02/2024

There were 4 reservoirs that were identified to have overdue inspections and cleans. Cloverdale 1 and Cloverdale 2 have been offline and disconnected for a few years and will be brought back online and included in the program following network reconfiguration and updates. Cherry Lane Concrete and Talbingo LL inspections and cleaning are scheduled for 2022.

6. INCIDENTS REPORTED TO NSW HEALTH

Table 21 includes the notifications made to the Regulator (NSW Health PHU) for the Jan 2021 to Dec 2021 reporting period.

Table 21 Notifications made to NSW Health PHU for Jan 2021 to Dec 2021 period

Date notified	Scheme	Type	Issue	Actions taken	Comments
27/04/21	Tumbarumba	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.75 mg/L after 72 hours, and reaching a lowest reading of 0.56 mg/L.	A compressed air leak was discovered, leaking through the vacuum exhaust. The fault was corrected, the PHU was notified, and relevant corrective actions were undertaken to rectify the issue. Dosing equipment checked and confirmed as back working correctly.	No impact on public health due to the incident.
24/05/21	Tumbarumba	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.73 mg/L after 72 hours.	It was identified the dose rate needed to be increased. The PHU was notified, and relevant corrective actions were undertaken to rectify the issue.	No impact on public health due to the incident.
15/06/21	Batlow	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.82 mg/L after 72 hours.	It was identified the dose rate needed to be increased. The PHU was notified, and relevant corrective actions were undertaken to rectify the issue.	No impact on public health due to the incident.
03/08/21	Batlow	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.63 mg/L after 72 hours.	The dose pump had a fault and had not been dosing correctly. The fault was corrected, the PHU was notified, and relevant corrective actions were undertaken to rectify the issue. Dosing equipment checked and confirmed as back working correctly.	No impact on public health due to the incident.
01/09/21	Tumbarumba	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.78 mg/L after 72 hours.	It was identified the dose rate needed to be increased. The PHU was notified, and relevant corrective actions were undertaken to rectify the issue.	No impact on public health due to the incident.
22/12/21	Batlow	Incident	CCP Fluoride – critical limit of 0.9 mg/L breached with a reading of 0.7 mg/L after 72 hours.	It was identified the dose rate needed to be increased. The PHU was notified, and relevant corrective actions were undertaken to rectify the issue.	No impact on public health due to the incident.

7. VERIFICATION MONITORING PERFORMANCE

Verification of drinking water quality provides an assessment of the overall performance of the system and the ultimate quality of drinking water being supplied to consumers. This incorporates monitoring drinking water quality as well as assessment of consumer satisfaction.

7.1. Reticulation Water Quality Monitoring

Drinking water quality monitoring is a wide-ranging assessment of the quality of water in the reticulation or distribution system and importantly, as supplied to the consumer. It includes regular sampling and testing to assess whether water quality is complying with ADWG guideline values. Monitoring of drinking water is regarded as the final check that, overall, the barriers and preventive measures implemented to protect public health are working effectively.

The reticulation drinking water quality data for the schemes for the reporting period is presented in Appendix A. ADWG compliance for each scheme is summarized in Table 22 below.

Table 22 Verification monitoring ADWG Compliance Jan 2021 to Dec 2021 period

Scheme	ADWD Health-based guidelines	ADWD Aesthetic-based guidelines
Batlow	100% compliance	• 1 out of 51 of samples had free chlorine out-of-spec
Brungle	100% compliance	• 1 out of 34 of samples had free chlorine out-of-spec • 1 out of 34 of samples had detected total coliforms
Khancoban	100% compliance	• 1 out of 22 of samples had turbidity out-of-spec
Morgans Reserve	100% compliance	100% compliance
Talbingo	100% compliance	• 5 out of 24 of samples had pH out-of-spec
Tumbarumba	100% compliance	• 1 out of 49 of samples had pH out-of-spec • 1 out of 44 of samples had turbidity out-of-spec
Tumut	100% compliance	• 3 out of 71 of samples had pH out-of-spec • 2 out of 73 of samples had detected total coliforms

7.2. Sampling Frequency Compliance

Sampling frequency in accordance with the monitoring program is summarized in Table 23.

The following supply systems did not achieve the sampling frequency requirement.

- Batlow (microbiology)
- Brungle (microbiology)
- Khancoban (microbiology)
- Morgans Reserve (microbiology)
- Talbingo (microbiology)
- Tumbarumba (microbiology)
- Tumut (chemistry and microbiology)

Table 23 Verification monitoring Sampling Frequency Jan 2021 to Dec 2021 period

Supply System	Analysis Type	Allocations (any part) in Period	Samples Expected in Period	Samples Collected in Period				Collected as % of Expected Samples
				Allocated	Additional	Repeat	Total	
Batlow SN03	Chemistry	2	2	2	0	1	3	100.00%
Batlow SN03	Microbiology	52	52	51	0	0	51	98.08%
Brungle SN04	Chemistry	2	2	1	0	1	2	50.00%
Brungle SN04	Microbiology	36	36	34	0	0	34	94.44%
Khancoban SN07	Chemistry	2	2	2	0	0	2	100.00%
Khancoban SN07	Microbiology	26	26	23	0	0	23	88.46%
Morgans Reserve SN06	Chemistry	2	2	1	0	1	2	50.00%
Morgans Reserve SN06	Microbiology	12	12	11	0	0	11	91.67%
Talbingo SN05	Chemistry	2	2	1	0	1	2	50.00%
Talbingo SN05	Microbiology	26	26	24	0	0	24	92.31%
Tumbarumba SN08	Chemistry	2	2	2	0	0	2	100.00%
Tumbarumba SN08	Microbiology	52	52	49	0	0	49	94.23%
Tumut SN01	Chemistry	12	12	11	0	1	12	91.67%
Tumut SN01	Microbiology	76	76	72	2	2	76	97.37%

While the right-hand column indicates 50% compliance with the collection of expected samples for Brungle, Morgans Reserve and Talbingo, further analysis of the sample collection dates indicates that two chemistry samples were collected over the reporting period. These supply systems have complied with the sample allocations and have achieved 100% sample collection.

7.3. Water Quality Customer Complaints

Monitoring of consumer complaints can provide valuable information on potential problems that may not have been identified by performance monitoring of the water supply system. Consumer satisfaction with drinking water quality is largely based on a judgment that the aesthetic quality of tap water is 'good', which usually means that it is colourless, free from suspended solids and has no unpleasant taste or odour.

Table 24 includes the water quality complaints received and actions taken for the reporting period.

There were 18 water quality complaints in the Jan 2021 to Dec 2021 reporting period. The majority complaints were of odour, taste and dirty water. Dirty water issues were actioned by flushing hydrants near the property until cleared, and then testing chorine residual. Odour and taste issues in the Tumbarumba water supply were a result of algae present in the raw water. The raw water testing indicated that algae concentrations were low and non-toxic.

Table 24 Water Quality Complaints

Date	Scheme	Issue
18/01/21	Tumbarumba	Odour, taste
18/01/21	Tumbarumba	Odour
19/01/21	Tumbarumba	Odour, taste
01/02/21	Tumut	Odour, taste
09/02/21	Tumbarumba	Taste
10/02/21	Batlow	Debris in Dam
16/02/21	Tumut	Odour, taste
16/02/21	Tumbarumba	Odour
22/02/21	Brungle	Dirty Water
17/03/21	Tumut	Dirty Water
24/03/21	Tumut	Dirty Water
30/03/21	Tumut	Dirty Water
21/05/21	Tumut	Dirty Water
08/06/21	Tumut	Odour, taste, dirty water
30/08/21	Tumut	Taste
09/09/21	Tumut	Dirty Water
15/09/21	Tumut	Dirty Water
10/12/21	Batlow	Odour, taste

8. IMPROVEMENT PLAN IMPLEMENTATION

An Improvement Plan is part of a management system and demonstrates the continual improvement process in place for an organisation. SVC has an Improvement Plan, which is part of their DWMS.

8.1. Status

The Improvement Plan was reviewed and updated during the preparation of this Annual Report. For detailed progress and commentary, refer to the Improvement Plan.

9. DWMS REVIEW OUTCOMES

There was no formal DWMS review undertaken in 2021.

10. DWMS AUDIT OUTCOMES

There was no formal DWMS audit undertaken in 2021.

DOCUMENT HISTORY AND TRACKING

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Viridis Consultants Pty Ltd
PO Box 131
Bulimba Qld 4171
Australia

1300 799 310

www.viridis.net.au
ABN: 49 129 185 271

A. VERIFICATION MONITORING

VIRIDIS CONSULTANTS

Table 25 Batlow Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.0167	0.01	0.0115	0.01	0.03	3	0	0.03	0.01	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.00005	3	0	0.00005	0.00005	100
	Arsenic	0.01	mg/L	0.0007	0.0005	0.0003	0.0005	0.001	3	0	0.001	0.0005	100
	Barium	2	mg/L	0.0055	0.0055	0.0008	0.0047	0.0062	3	0	0.0062	0.0047	100
	Boron	4	mg/L	0.0026	0.0036	0.0019	0.0004	0.0037	3	0	0.0037	0.0004	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	3	0	0.00005	0.00005	100
	Calcium	10000	mg/L	4.3	4.8	1.3229	2.8	5.3	3	0	5.3	2.8	100
	Chloride	250	mg/L	5.6667	5	1.1547	5	7	3	0	7	5	100
	Chromium	0.05	mg/L	0.0013	0.001	0.0006	0.001	0.002	3	0	0.002	0.001	100
	Copper	2	mg/L	0.0143	0.004	0.0179	0.004	0.035	3	0	0.035	0.004	100
	Fluoride	1.5	mg/L	0.6667	0.84	0.3444	0.27	0.89	3	0	0.89	0.27	100
	Iodine	0.5	mg/L	0.02	0.02	0.01	0.01	0.03	3	0	0.03	0.01	100
	Iron	0.3	mg/L	0.0067	0.005	0.0029	0.005	0.01	3	0	0.01	0.005	100
	Lead	0.01	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	3	0	0.0002	0.0001	100
	Magnesium	10000	mg/L	0.74	0.82	0.1562	0.56	0.84	3	0	0.84	0.56	100
	Manganese	0.5	mg/L	0.0024	0.0024	0.001	0.0014	0.0034	3	0	0.0034	0.0014	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	3	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0011	0.0013	0.0009	0.0002	0.0019	3	0	0.0019	0.0002	100
	Nickel	0.02	mg/L	0.006	0.0057	0.0037	0.0025	0.0099	3	0	0.0099	0.0025	100
	Nitrate	50	mg/L	0.6667	0.5	0.2887	0.5	1	3	0	1	0.5	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	3	0	0.05	0.05	100
	pH	6.5 - 8.5		7.2333	7.3	0.2082	7	7.4	3	0	7.4	7	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	3	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	3	0	0.0001	0.0001	100
	Sodium	180	mg/L	4	4	1	3	5	3	0	5	3	100
	Sulfate	500	mg/L	0.5	0.5	0	0.5	0.5	3	0	0.5	0.5	100
	Total Dissolved Solids (TDS)	10000	mg/L	21.6667	22	1.5275	20	23	3	0	23	20	100
	Total Hardness as CaCO3	10000	mg/L	13.7667	15.4	3.9145	9.3	16.6	3	0	16.6	9.3	100
	True Colour	15	Hazen Units (HU)	1.5	2	0.866	0.5	2	3	0	2	0.5	100
	Turbidity	5	NTU	1.05	0.3	1.5207	0.05	2.8	3	0	2.8	0.05	100
	Uranium	0.017	mg/L	0.0001	0.0001	0	0.00005	0.00005	3	0	0.00005	0.00005	100
	Zinc	3	mg/L	0.0367	0.03	0.0115	0.03	0.05	3	0	0.05	0.03	100
Fluoride Barcode	Fluoride	1.5	mg/L	0.7909	0.92	0.2996	0.05	1	11	0	1	0.05	100
	Fluoride (WU result)	1.5	mg/L	0.93	0.93	0	0.93	0.93	1	0	0.93	0.93	100
	Fluoride Ratio	0.8 - 1.2		0.97	0.97	0	0.97	0.97	1	0	0.97	0.97	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	49	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	0.8631	0.96	0.309	0.17	1.32	51	1	1.29	0.21	98.04

	pH	6.5 - 8.5		7.7247	7.7	0.3219	7.17	8.44	47	0	8.41	7.21	100
	Temperature	30	C	14.7533	14.9	3.8563	9.2	20.8	15	0	20.8	9.2	100
	Total Chlorine	5	mg/L	0.9734	0.99	0.332	0.21	1.47	51	0	1.4	0.25	100
	Total Coliforms	0	mpn/100 mL	0	0	0	0	0	49	0	0	0	100
	Turbidity	5	NTU	0.1306	0.12	0.0922	0.01	0.39	50	0	0.27	0.02	100

Table 26 Brungle Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.0075	0.0075	0.0035	0.005	0.01	2	0	0.01	0.005	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.0001	2	0	0.0001	0.00005	100
	Arsenic	0.01	mg/L	0.0008	0.0008	0.0004	0.0005	0.001	2	0	0.001	0.0005	100
	Barium	2	mg/L	0.0114	0.0114	0.0031	0.0092	0.0136	2	0	0.0136	0.0092	100
	Boron	4	mg/L	0.0017	0.0017	0.0018	0.0004	0.0029	2	0	0.0029	0.0004	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Calcium	10000	mg/L	7.75	7.75	1.4849	6.7	8.8	2	0	8.8	6.7	100
	Chloride	250	mg/L	12.5	12.5	0.7071	12	13	2	0	13	12	100
	Chromium	0.05	mg/L	0.0008	0.0008	0.0004	0.0005	0.001	2	0	0.001	0.0005	100
	Copper	2	mg/L	0.047	0.047	0.0523	0.01	0.084	2	0	0.084	0.01	100
	Fluoride	1.5	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	Iodine	0.5	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Iron	0.3	mg/L	0.0125	0.0125	0.0106	0.005	0.02	2	0	0.02	0.005	100
	Lead	0.01	mg/L	0.0004	0.0004	0.0003	0.0002	0.0006	2	0	0.0006	0.0002	100
	Magnesium	10000	mg/L	3.115	3.115	1.9021	1.77	4.46	2	0	4.46	1.77	100
	Manganese	0.5	mg/L	0.0033	0.0033	0.0018	0.002	0.0046	2	0	0.0046	0.002	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	2	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0005	0.0005	0.0002	0.0003	0.0006	2	0	0.0006	0.0003	100
	Nickel	0.02	mg/L	0.0015	0.0015	0.0008	0.0009	0.0021	2	0	0.0021	0.0009	100
	Nitrate	50	mg/L	1.5	1.5	0.7071	1	2	2	0	2	1	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	pH	6.5 - 8.5		7.6	7.6	0	7.6	7.6	2	0	7.6	7.6	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	2	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Sodium	180	mg/L	10.5	10.5	0.7071	10	11	2	0	11	10	100
	Sulfate	500	mg/L	1.5	1.5	0.7071	1	2	2	0	2	1	100
	Total Dissolved Solids (TDS)	10000	mg/L	59.5	59.5	7.7782	54	65	2	0	65	54	100
	Total Hardness as CaCO3	10000	mg/L	32.2	32.2	4.1012	29.3	35.1	2	0	35.1	29.3	100
	True Colour	15	Hazen Units (HU)	7	7	1.4142	6	8	2	0	8	6	100
	Turbidity	5	NTU	0.2	0.2	0.1414	0.1	0.3	2	0	0.3	0.1	100
	Uranium	0.017	mg/L	0.0001	0.0001	0	0.00005	0.0001	2	0	0.0001	0.00005	100
	Zinc	3	mg/L	0.0275	0.0275	0.0318	0.005	0.05	2	0	0.05	0.005	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	34	0	0	0	100

	Free Chlorine	0.2 - 5	mg/L	0.7829	0.725	0.3813	0.18	1.9	34	1	1.34	0.24	97.06
	pH	6.5 - 8.5		7.7691	7.77	0.2712	7.29	8.4	33	0	8.28	7.38	100
	Temperature	30	C	11.34	11.4	2.3891	7.8	14.4	5	0	14.4	7.8	100
	Total Chlorine	5	mg/L	0.9738	0.975	0.4074	0.29	2	34	0	1.5	0.29	100
	Total Coliforms	0	mpn/100 mL	0.0294	0	0.1715	0	1	34	1	0	0	97.06
	Turbidity	5	NTU	0.2481	0.19	0.1709	0.04	0.86	32	0	0.58	0.05	100

Table 27 Khancoban Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.035	0.035	0.0212	0.02	0.05	2	0	0.05	0.02	100
	Antimony	0.003	mg/L	0.0001	0.0001	0.0001	0.00005	0.0002	2	0	0.0002	0.00005	100
	Arsenic	0.01	mg/L	0.0005	0.0005	0	0.0005	0.0005	2	0	0.0005	0.0005	100
	Barium	2	mg/L	0.0035	0.0035	0.0006	0.003	0.0039	2	0	0.0039	0.003	100
	Boron	4	mg/L	0.001	0.001	0.0008	0.0004	0.0016	2	0	0.0016	0.0004	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Calcium	10000	mg/L	2.85	2.85	0.3536	2.6	3.1	2	0	3.1	2.6	100
	Chloride	250	mg/L	2.5	2.5	2.1213	1	4	2	0	4	1	100
	Chromium	0.05	mg/L	0.0008	0.0008	0.0004	0.0005	0.001	2	0	0.001	0.0005	100
	Copper	2	mg/L	0.2175	0.2175	0.0601	0.175	0.26	2	0	0.26	0.175	100
	Fluoride	1.5	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	Iodine	0.5	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Iron	0.3	mg/L	0.02	0.02	0.0141	0.01	0.03	2	0	0.03	0.01	100
	Lead	0.01	mg/L	0.0005	0.0005	0.0002	0.0003	0.0006	2	0	0.0006	0.0003	100
	Magnesium	10000	mg/L	1.11	1.11	0.1838	0.98	1.24	2	0	1.24	0.98	100
	Manganese	0.5	mg/L	0.0006	0.0006	0.0002	0.0004	0.0007	2	0	0.0007	0.0004	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	2	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0004	0.0004	0.0004	0.0001	0.0006	2	0	0.0006	0.0001	100
	Nickel	0.02	mg/L	0.001	0.001	0.0011	0.0002	0.0018	2	0	0.0018	0.0002	100
	Nitrate	50	mg/L	0.5	0.5	0	0.5	0.5	2	0	0.5	0.5	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	pH	6.5 - 8.5		6.8	6.8	0	6.8	6.8	2	0	6.8	6.8	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	2	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Sodium	180	mg/L	3	3	0	3	3	2	0	3	3	100
	Sulfate	500	mg/L	0.75	0.75	0.3536	0.5	1	2	0	1	0.5	100
	Total Dissolved Solids (TDS)	10000	mg/L	19.5	19.5	3.5355	17	22	2	0	22	17	100
	Total Hardness as CaCO3	10000	mg/L	11.65	11.65	1.6263	10.5	12.8	2	0	12.8	10.5	100
	True Colour	15	Hazen Units (HU)	1.5	1.5	0.7071	1	2	2	0	2	1	100
	Turbidity	5	NTU	0.15	0.15	0.0707	0.1	0.2	2	0	0.2	0.1	100
	Uranium	0.017	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100

	Zinc	3	mg/L	0.015	0.015	0.0071	0.01	0.02	2	0	0.02	0.01	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	23	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	1.0861	1.1	0.3429	0.45	1.74	23	0	1.54	0.46	100
	pH	6.5 - 8.5		7.0023	7.175	0.3275	6.5	7.4	22	0	7.35	6.5	100
	Temperature	30	C	15.5	15.5	4.9497	12	19	2	0	19	12	100
	Total Chlorine	5	mg/L	1.1465	1.14	0.3072	0.49	1.78	23	0	1.56	0.6	100
	Total Coliforms	0	mpn/100 mL	0	0	0	0	0	23	0	0	0	100
	Turbidity	5	NTU	1.1386	0.535	2.6567	0.3	13	22	1	1.07	0.34	95.45

Table 28 Morgans Reserve Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.03	0.03	0.0141	0.02	0.04	2	0	0.04	0.02	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Arsenic	0.01	mg/L	0.0005	0.0005	0	0.0005	0.0005	2	0	0.0005	0.0005	100
	Barium	2	mg/L	0.007	0.007	0.0011	0.0062	0.0077	2	0	0.0077	0.0062	100
	Boron	4	mg/L	0.0024	0.0024	0.0011	0.0016	0.0032	2	0	0.0032	0.0016	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0.0001	0.00005	0.0002	2	0	0.0002	0.00005	100
	Calcium	10000	mg/L	4.6	4.6	1.1314	3.8	5.4	2	0	5.4	3.8	100
	Chloride	250	mg/L	4	4	0	4	4	2	0	4	4	100
	Chromium	0.05	mg/L	0.0008	0.0008	0.0004	0.0005	0.001	2	0	0.001	0.0005	100
	Copper	2	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Fluoride	1.5	mg/L	0.885	0.885	0.0495	0.85	0.92	2	0	0.92	0.85	100
	Iodine	0.5	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Iron	0.3	mg/L	0.0075	0.0075	0.0035	0.005	0.01	2	0	0.01	0.005	100
	Lead	0.01	mg/L	0.0004	0.0004	0.0004	0.0001	0.0007	2	0	0.0007	0.0001	100
	Magnesium	10000	mg/L	1.1	1.1	0.099	1.03	1.17	2	0	1.17	1.03	100
	Manganese	0.5	mg/L	0.0044	0.0044	0.0035	0.0019	0.0069	2	0	0.0069	0.0019	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	2	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0002	0.0002	0	0.0002	0.0002	2	0	0.0002	0.0002	100
	Nickel	0.02	mg/L	0.0006	0.0006	0.0002	0.0004	0.0007	2	0	0.0007	0.0004	100
	Nitrate	50	mg/L	0.75	0.75	0.3536	0.5	1	2	0	1	0.5	100
	Nitrite	3	mg/L	0.075	0.075	0.0354	0.05	0.1	2	0	0.1	0.05	100
	pH	6.5 - 8.5		7.45	7.45	0.0707	7.4	7.5	2	0	7.5	7.4	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	2	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Sodium	180	mg/L	6.5	6.5	0.7071	6	7	2	0	7	6	100
	Sulfate	500	mg/L	1	1	0	1	1	2	0	1	1	100
	Total Dissolved Solids (TDS)	10000	mg/L	29	29	1.4142	28	30	2	0	30	28	100
	Total Hardness as CaCO3	10000	mg/L	16	16	3.2527	13.7	18.3	2	0	18.3	13.7	100
	True Colour	15	Hazen Units (HU)	0.75	0.75	0.3536	0.5	1	2	0	1	0.5	100

	Turbidity	5	NTU	0.55	0.55	0.6364	0.1	1	2	0	1	0.1	100
	Uranium	0.017	mg/L	0.0001	0.0001	0.0001	0.00005	0.0002	2	0	0.0002	0.00005	100
	Zinc	3	mg/L	0.02	0.02	0.0141	0.01	0.03	2	0	0.03	0.01	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	11	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	0.7564	0.63	0.3864	0.3	1.7	11	0	1.7	0.3	100
	pH	6.5 - 8.5		7.972	7.955	0.2009	7.7	8.37	10	0	8.37	7.7	100
	Temperature	30	C	11.25	11.25	3.7477	8.6	13.9	2	0	13.9	8.6	100
	Total Chlorine	5	mg/L	0.8655	0.76	0.4227	0.35	1.93	11	0	1.93	0.35	100
	Total Coliforms	0	mpn/100 mL	0	0	0	0	0	11	0	0	0	100
	Turbidity	5	NTU	0.189	0.2	0.0642	0.08	0.28	10	0	0.28	0.08	100

Table 29 Talbingo Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.025	0.025	0.0071	0.02	0.03	2	0	0.03	0.02	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Arsenic	0.01	mg/L	0.0005	0.0005	0	0.0005	0.0005	2	0	0.0005	0.0005	100
	Barium	2	mg/L	0.0053	0.0053	0.0012	0.0044	0.0061	2	0	0.0061	0.0044	100
	Boron	4	mg/L	0.0014	0.0014	0.0007	0.0009	0.0019	2	0	0.0019	0.0009	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Calcium	10000	mg/L	5.6	5.6	0.7071	5.1	6.1	2	0	6.1	5.1	100
	Chloride	250	mg/L	2.5	2.5	0.7071	2	3	2	0	3	2	100
	Chromium	0.05	mg/L	0.0008	0.0008	0.0004	0.0005	0.001	2	0	0.001	0.0005	100
	Copper	2	mg/L	0.002	0.002	0.0014	0.001	0.003	2	0	0.003	0.001	100
	Fluoride	1.5	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	Iodine	0.5	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Iron	0.3	mg/L	0.0075	0.0075	0.0035	0.005	0.01	2	0	0.01	0.005	100
	Lead	0.01	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Magnesium	10000	mg/L	0.41	0.41	0.2687	0.22	0.6	2	0	0.6	0.22	100
	Manganese	0.5	mg/L	0.0009	0.0009	0.0001	0.0008	0.0009	2	0	0.0009	0.0008	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	2	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0002	0.0002	0.0001	0.0001	0.0003	2	0	0.0003	0.0001	100
	Nickel	0.02	mg/L	0.0005	0.0005	0.0004	0.0002	0.0007	2	0	0.0007	0.0002	100
	Nitrate	50	mg/L	0.5	0.5	0	0.5	0.5	2	0	0.5	0.5	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	pH	6.5 - 8.5		7.75	7.75	0.0707	7.7	7.8	2	0	7.8	7.7	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	2	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Sodium	180	mg/L	9.5	9.5	2.1213	8	11	2	0	11	8	100
	Sulfate	500	mg/L	6.5	6.5	0.7071	6	7	2	0	7	6	100
	Total Dissolved Solids (TDS)	10000	mg/L	36.5	36.5	2.1213	35	38	2	0	38	35	100

	Total Hardness as CaCO3	10000	mg/L	15.65	15.65	2.8991	13.6	17.7	2	0	17.7	13.6	100
	True Colour	15	Hazen Units (HU)	0.5	0.5	0	0.5	0.5	2	0	0.5	0.5	100
	Turbidity	5	NTU	0.225	0.225	0.2475	0.05	0.4	2	0	0.4	0.05	100
	Uranium	0.017	mg/L	0.0001	0.0001	0.0001	0.00005	0.0002	2	0	0.0002	0.00005	100
	Zinc	3	mg/L	0.0225	0.0225	0.0247	0.005	0.04	2	0	0.04	0.005	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	24	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	0.6354	0.65	0.2088	0.24	1.05	24	0	0.94	0.32	100
	pH	6.5 - 8.5		8.1358	8.09	0.4577	7.31	9.06	24	5	8.99	7.41	79.17
	Temperature	30	C	14.7143	15.1	1.6456	12.2	16.6	7	0	16.6	12.2	100
	Total Chlorine	5	mg/L	0.7004	0.715	0.2114	0.26	1	24	0	1	0.37	100
	Total Coliforms	0	mpn/100 mL	0	0	0	0	0	24	0	0	0	100
	Turbidity	5	NTU	0.1736	0.14	0.1534	0.03	0.68	22	0	0.49	0.03	100

Table 30 Tumbarumba Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.085	0.085	0.0919	0.02	0.15	2	0	0.15	0.02	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Arsenic	0.01	mg/L	0.0005	0.0005	0	0.0005	0.0005	2	0	0.0005	0.0005	100
	Barium	2	mg/L	0.0049	0.0049	0.0001	0.0048	0.005	2	0	0.005	0.0048	100
	Boron	4	mg/L	0.0016	0.0016	0.0016	0.0004	0.0027	2	0	0.0027	0.0004	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Calcium	10000	mg/L	1.5	1.5	0.5657	1.1	1.9	2	0	1.9	1.1	100
	Chloride	250	mg/L	3	3	0	3	3	2	0	3	3	100
	Chromium	0.05	mg/L	0.0005	0.0005	0	0.0005	0.0005	2	0	0.0005	0.0005	100
	Copper	2	mg/L	0.0195	0.0195	0.0262	0.001	0.038	2	0	0.038	0.001	100
	Fluoride	1.5	mg/L	1.02	1.04	0.0529	0.96	1.06	3	0	1.06	0.96	100
	Fluoride (WU result)	1.5	mg/L	1.08	1.08	0.05	1.03	1.13	3	0	1.13	1.03	100
	Fluoride Ratio	0.8 - 1.2		1.06	1.07	0.0173	1.04	1.07	3	0	1.07	1.04	100
	Iodine	0.5	mg/L	0.01	0.01	0	0.01	0.01	2	0	0.01	0.01	100
	Iron	0.3	mg/L	0.005	0.005	0	0.005	0.005	2	0	0.005	0.005	100
	Lead	0.01	mg/L	0.0002	0.0002	0.0001	0.0001	0.0003	2	0	0.0003	0.0001	100
	Magnesium	10000	mg/L	0.515	0.515	0.1485	0.41	0.62	2	0	0.62	0.41	100
	Manganese	0.5	mg/L	0.0004	0.0004	0.0001	0.0003	0.0004	2	0	0.0004	0.0003	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	2	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Nickel	0.02	mg/L	0.0002	0.0002	0	0.0002	0.0002	2	0	0.0002	0.0002	100
	Nitrate	50	mg/L	0.5	0.5	0	0.5	0.5	2	0	0.5	0.5	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	2	0	0.05	0.05	100
	pH	6.5 - 8.5		7.4	7.4	0.1414	7.3	7.5	2	0	7.5	7.3	100

	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	2	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	2	0	0.0001	0.0001	100
	Sodium	180	mg/L	15	15	2.8284	13	17	2	0	17	13	100
	Sulfate	500	mg/L	17.5	17.5	0.7071	17	18	2	0	18	17	100
	Total Dissolved Solids (TDS)	10000	mg/L	43	43	4.2426	40	46	2	0	46	40	100
	Total Hardness as CaCO3	10000	mg/L	5.85	5.85	2.0506	4.4	7.3	2	0	7.3	4.4	100
	True Colour	15	Hazen Units (HU)	0.5	0.5	0	0.5	0.5	2	0	0.5	0.5	100
	Turbidity	5	NTU	0.9	0.9	1.1314	0.1	1.7	2	0	1.7	0.1	100
Fluoride Barcode	Uranium	0.017	mg/L	0.0001	0.0001	0	0.00005	0.00005	2	0	0.00005	0.00005	100
	Zinc	3	mg/L	0.0075	0.0075	0.0035	0.005	0.01	2	0	0.01	0.005	100
	Fluoride	1.5	mg/L	0.9456	0.98	0.0981	0.75	1.04	9	0	1.04	0.75	100
Microbiology	Fluoride (WU result)	1.5	mg/L	0.9978	1.01	0.1038	0.87	1.13	9	0	1.13	0.87	100
	Fluoride Ratio	0.8 - 1.2		1.0589	1.07	0.0948	0.84	1.16	9	0	1.16	0.84	100
	E. coli	0	mpn/100 mL	0	0	0	0	0	48	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	0.5839	0.59	0.1337	0.29	0.98	49	0	0.79	0.34	100
	pH	6.5 - 8.5		7.3194	7.32	0.2798	6.49	7.89	49	1	7.83	6.94	97.96
	Temperature	30	C	15.2071	15.3	3.1322	10.7	20.8	42	0	19.6	10.9	100
	Total Chlorine	5	mg/L	0.6925	0.69	0.1413	0.37	1.11	49	0	0.92	0.42	100
	Total Coliforms	0	mpn/100 mL	0	0	0	0	0	48	0	0	0	100
	Turbidity	5	NTU	0.8257	0.2	2.4057	0.1	15.4	44	1	2.72	0.1	97.73

Table 31 Tumut Verification Monitoring

Analysis Type	Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
Chemistry	Aluminium	0.2	mg/L	0.02	0.02	0.0126	0.005	0.05	12	0	0.05	0.005	100
	Antimony	0.003	mg/L	0.0001	0.0001	0	0.00005	0.00005	12	0	0.00005	0.00005	100
	Arsenic	0.01	mg/L	0.0005	0.0005	0	0.0005	0.0005	12	0	0.0005	0.0005	100
	Barium	2	mg/L	0.0068	0.0066	0.0011	0.0057	0.01	12	0	0.01	0.0057	100
	Boron	4	mg/L	0.0018	0.0018	0.0011	0.0004	0.0035	12	0	0.0035	0.0004	100
	Cadmium	0.002	mg/L	0.0001	0.0001	0	0.00005	0.00005	12	0	0.00005	0.00005	100
	Calcium	10000	mg/L	3.7042	3.85	1.3609	0.05	5.6	12	0	5.6	0.05	100
	Chloride	250	mg/L	3.75	4	0.866	3	6	12	0	6	3	100
	Chromium	0.05	mg/L	0.0013	0.001	0.0009	0.0005	0.003	12	0	0.003	0.0005	100
	Copper	2	mg/L	0.0113	0.009	0.0075	0.004	0.023	12	0	0.023	0.004	100
	Fluoride	1.5	mg/L	0.9317	0.94	0.0508	0.81	0.99	12	0	0.99	0.81	100
	Fluoride (WU result)	1.5	mg/L	0.94	0.94	0	0.94	0.94	1	0	0.94	0.94	100
	Fluoride Ratio	0.8 - 1.2		0.95	0.95	0	0.95	0.95	1	0	0.95	0.95	100

	Iodine	0.5	mg/L	0.0117	0.01	0.0039	0.01	0.02	12	0	0.02	0.01	100
	Iron	0.3	mg/L	0.0071	0.005	0.0045	0.005	0.02	12	0	0.02	0.005	100
	Lead	0.01	mg/L	0.0002	0.0001	0.0001	0.0001	0.0004	12	0	0.0004	0.0001	100
	Magnesium	10000	mg/L	1.1779	1.18	0.4928	0.005	2.23	12	0	2.23	0.005	100
	Manganese	0.5	mg/L	0.0024	0.0019	0.0016	0.0005	0.0054	12	0	0.0054	0.0005	100
	Mercury	0.001	mg/L	0.0004	0.0004	0	0.0004	0.0004	12	0	0.0004	0.0004	100
	Molybdenum	0.05	mg/L	0.0008	0.0005	0.0008	0.0001	0.0024	12	0	0.0024	0.0001	100
	Nickel	0.02	mg/L	0.0031	0.0016	0.0037	0.0002	0.0104	12	0	0.0104	0.0002	100
	Nitrate	50	mg/L	0.75	0.75	0.2611	0.5	1	12	0	1	0.5	100
	Nitrite	3	mg/L	0.05	0.05	0	0.05	0.05	12	0	0.05	0.05	100
	pH	6.5 - 8.5		7.45	7.45	0.1243	7.2	7.6	12	0	7.6	7.2	100
	Selenium	0.01	mg/L	0.0035	0.0035	0	0.0035	0.0035	12	0	0.0035	0.0035	100
	Silver	0.1	mg/L	0.0001	0.0001	0	0.0001	0.0001	12	0	0.0001	0.0001	100
	Sodium	180	mg/L	5.125	5	1.7073	0.5	7	12	0	7	0.5	100
	Sulfate	500	mg/L	1	1	0	1	1	12	0	1	1	100
	Total Dissolved Solids (TDS)	10000	mg/L	27	25.5	3.8612	23	36	12	0	36	23	100
	Total Hardness as CaCO3	10000	mg/L	14.1167	14.7	5.1386	0.3	23.2	12	0	23.2	0.3	100
	True Colour	15	Hazen Units (HU)	0.5417	0.5	0.1443	0.5	1	12	0	1	0.5	100
	Turbidity	5	NTU	0.5208	0.35	0.4938	0.05	1.2	12	0	1.2	0.05	100
	Uranium	0.017	mg/L	0.0001	0.0001	0	0.00005	0.0002	12	0	0.0002	0.00005	100
	Zinc	3	mg/L	0.0188	0.02	0.0133	0.005	0.05	12	0	0.05	0.005	100
Microbiology	E. coli	0	mpn/100 mL	0	0	0	0	0	73	0	0	0	100
	Free Chlorine	0.2 - 5	mg/L	0.8008	0.8	0.2463	0.2	1.2	76	0	1.19	0.33	100
	pH	6.5 - 8.5		7.8411	7.77	0.3396	7.24	9.17	71	3	8.49	7.31	95.77
	Temperature	30	C	16.1684	16.3	3.8946	10.6	23.1	19	0	23.1	10.6	100
	Total Chlorine	5	mg/L	0.9179	0.92	0.2505	0.34	1.37	75	0	1.3	0.45	100
	Total Coliforms	0	mpn/100 mL	2.7808	0	23.5232	0	201	73	2	0	0	97.26
	Turbidity	5	NTU	0.2332	0.19	0.1832	0.02	1.19	73	0	0.57	0.05	100