

Annual Report Drinking Water Quality Management Plan 2022-2023



Presented by: Director of Water and Waste
Current as at: 18/12/2023

ISAAC
REGIONAL COUNCIL
HELPING TO ENERGISE THE WORLD

ISAAC.QLD.GOV.AU ISAAC REGIONAL COUNCIL ABN 39 274 142 600

P 1300 472 227 F 07 4941 8666 A PO Box 97 Moranbah QLD 4744

f isaacregionalcouncil i isaacregionalcouncil t isaaccouncil

TABLE OF CONTENTS

INTRODUCTION	3
SECTION 1: ACTIONS TAKEN TO IMPLEMENT THE DWQMP	3
SECTION 2: COMPLIANCE WITH WATER QUALITY CRITERIA	5
SECTION 3: NOTIFICATIONS TO THE REGULATOR	6
SECTION 4: CUSTOMER COMPLAINTS RELATED TO WATER QUALITY	7
SECTION 5: OUTCOME OF THE REVIEW OF THE DWQMP	8
SECTION 6: FINDINGS AND RECOMMENDATIONS OF THE DWQMP AUDITOR	9
APPENDIX A SUMMARY OF COMPLIANCE WITH WATER QUALITY CRITERIA	10

INTRODUCTION

This report documents the performance of Isaac Regional Council's (IRC) drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the Water Supply (Safety and Reliability) Act 2008 (the Act). The approved DWQMP applies to eight (8) drinking water supply schemes owned and operated by Isaac Regional Council - Carmila, Clermont, Dysart, Glenden, Middlemount, Moranbah, Nebo, and St Lawrence.

SECTION 1: ACTIONS TAKEN TO IMPLEMENT THE DWQMP

PROGRESS IN IMPLEMENTING THE RISK MANAGEMENT IMPROVEMENT PROGRAM

Council's Risk Management Improvement Program (RMIP) is aimed at implementing improvements and minimising risks in the provision of reliable and safe drinking water. Actions captured in the RMIP may originate from the following sources:

- Risk Assessments
- DWQMP reviews and audits
- Drinking water incidents
- Regulator feedback
- General Improvements.

The RMIP will be reviewed as part of the overall 2023 DWQMP review. Some of the improvement items from the current DWQMP may no longer be relevant following the review.

UPDATE ON IMPROVEMENT ITEMS

Progress has been made across all water schemes to meet the requirements of the DWQMP. A summary of completed actions and actions in progress are detailed below. Some improvement items are delayed due to priority and budgetary constraints.

Improvements in Progress

CW202846 - Nebo WTP Electrical Conductivity Improvement

CW222970 - Moranbah WTP Bobby Plant filter media replacement

- Replacement of filter media and filter nozzles. Epoxy coat internal walls of filter units to protect against corrosion.

CW222971 - Clermont Water Network Augmentation

- Upgrade the pipeline network improvements in the northern area of Clermont to address low pressure areas and allow for growth.

CW222983 - Moranbah WTP roof replacement

- Replace the corroding roof and purlins of the water storage tank 1 at Moranbah WTP along with addressing other areas of tank corrosion.

CW223019 - Moranbah 400ML raw water dam - remediations works

- Repair the dam wall to ensure full utilisation of this storage facility and prolong its life.

CW233141 - NBO Water Network Augmentations

- Install additional water mains in six locations to provide network loops and extra capacity, which improves water pressure and quality. Also install a non-return on the WTP side of the elevated water storage tower to offer protection against water loss during water feed pipe breakage.

CW233150 - Moranbah WTP filter valve replacement

- Replacement of the 45 valves and actuators. The project also consolidates the pneumatic air tubing to a single ring-main system and upgrade the electronic control system to include the operation of the new components and integrated into the SCADA system to allow automation.

CW233151 - St Lawrence Water storage and raw water main

- Install 1.2 km of water mains from the east side of Bruce highway to the weir dam pump station and install new raw water reservoir beside the treatment plant. This is to address water security by replacing an old pipe with a recent history of failing and additional raw water storage.

Improvements Completed

CW222996 – Corporate (CORP) WTP old Failed equipment– Completed

CW233154 - Lab equipment for treatment plants– Completed

- Replace existing laboratory equipment used for testing water where the equipment condition and age are affecting the accuracy and range of the tests.

CW233147 - CORP WTP old failed equipment– Completed

CW222989 - TCD Riparian valve redundancy Clermont – Completed

- Repair of the riparian valve at Theresa Creek Dam to allow a riparian release of water for downstream benefit.

CW222960 - CORP Water Valve and Hydrant Repair Replacement – Completed

CW222993 – Clermont Theresa Creek Dam (TCD) floating offtake structure - Completed

- Install a floating raw water off-take at Theresa Creek Dam to withdraw water from higher levels within the dam.

REVISIONS MADE TO THE VERIFICATION MONITORING PROGRAM

IRC periodically conducts a review of the verification monitoring program and testing conducted by Mackay Regional Council Laboratory to ensure it is appropriate for the magnitude of the scheme and the risks identified. The verification monitoring program was last reviewed in July 2020 and has been followed for this reporting period. The verification monitoring program will be reviewed in 2023 as part of the overall DWQMP review.

REVISIONS MADE TO THE OPERATIONAL MONITORING PROGRAM

The operational monitoring program has remained unchanged although the range of tests and test methods have been improved. The frequency of monitoring increases beyond the operational monitoring program requirement in response to an incident or event. The risk management improvement plan includes actions to transition to online monitoring of critical control points where automation allows. The operational monitoring program will be reviewed in 2023 as part of the overall DWQMP review.

SECTION 2: COMPLIANCE WITH WATER QUALITY CRITERIA

IRC sends verification monitoring samples to the Mackay Regional Council Laboratory (MRCL).

A sample taken in Middlemount recorded a Total Trihalomethanes (THM) result above the Australian Drinking Water Guidelines (ADWG) health guidelines on 2/11/22 which was reported to the regulator as can be seen in Table 1. Following this incident six (6) further THM results above the ADWG guideline were received and recorded under the same incident number.

A sample taken in Carmila exceeded the Queensland Health (QH) guideline for chlorate (0.8 mg/L) which was reported to Department of Resource Development, Manufacturing and Water (DRDMW) as soon as Council became aware of the incident.

Detailed summaries of each supply system's verification monitoring and compliance with water quality criteria are included in Appendix A.

Carmila:	1x Chlorate QH exceedance
Clermont:	1x Formaldehyde ADWG health exceedance
Dysart:	No ADWG health exceedance
Glenden:	No ADWG health exceedance
Middlemount:	1x THM exceedance
Moranbah:	No ADWG health exceedance
Nebo:	No ADWG health exceedance
St Lawrence:	No ADWG health exceedance

SECTION 3: NOTIFICATIONS TO THE REGULATOR

There were four events or exceedances reported to the Regulator across eight IRC schemes in FY 22/23. These notifications related to exceedances of IRC DWQMP Critical Control Point (CCP) limits, ADWG health limits or Queensland Health limits. The exceedances are summarised in Table 1. Of the four incidents reported to the Regulator in FY 22-23 two (2) have been formally closed and two (2) remain open at this time. The incidents remaining open are the turbidity incident in Moranbah (24/03/23) and the THM incident in Middlemount (2/11/2022). The Middlemount THM incident was raised after Council became aware of the first result. Within this open incident, six (6) more THM results above the ADWG health guideline were recorded.

A low chlorine result in the Middlemount network was also reported to the regulator but was not classified as an incident.

Table 1 Summary of Notifications

INCIDENT DATE	Reference	SCHEME	LOCATION	PARAMETER	DESCRIPTION OF EVENT	IMPROVEMENT
2/11/2022	DWI-486-22-09932	Carmila	Treated water	Chlorate (1.54 mg/L)	Chlorate in the treated water was measured at 1.54 mg/L against a QH limit of 0.8 mg/L.	Investigate change in procedures where each treatment plant manages their own chemical stock levels rather than central bulk ordering
2/11/2022	DWI-486-22-09950	Middlemount	Treated water	THMs (0.28 mg/L)	THMs were detected in the Middlemount treated water above the ADWG guideline of 0.25 mg/L. The Powdered Activated Carbon (PAC) dosing system was under repair at the time of the event. Six (6) additional exceedances were recorded due to repeat sampling as part of the investigation.	Investigation to use potassium permanganate for primary oxidation in preference to chlorine when Natural Organic Matter (NOM) in raw water is elevated.
24/03/2023	DWI-486-23-10228	Moranbah	Combined filtered Water	Turbidity (1.73 NTU)	Combined filtered water turbidity was measured at 22.6 NTU against the DWQMP CCP critical limit of 1 NTU. Further, network water turbidity was measured at 1.73 NTU. Moranbah went on a boil water alert on 25/3/23.	The plant is to be shut down or to be put on divert if the filtered turbidity exceeds 1 NTU and corrective measures taken. The coagulant and polymer pumps are being drop tested in the morning and afternoon.
25/06/2023	DWI-486-23-10315	St Lawrence	Treated water	Turbidity (1.28 NTU)	Treated water turbidity was measured at 1.28 NTU against the DWQMP CCP critical limit of 1 NTU.	Investigate daily procedure for water quality and identify improvements. Measuring variable raw water quality of a daily basis to ensure correct dosing.

SECTION 4: CUSTOMER COMPLAINTS RELATED TO WATER QUALITY

Error! Reference source not found. Table 2 outlines the water quality complaints reported by consumers in the 2022-2023 reporting year. Complaints decreased significantly compared to the previous year.

Table 2 Summary of Water Quality Complaints

	Health Concern	Discoloured Water	Taste	Odour	Other	Total
CARMILA		1				1
CLERMONT		1				1
DYSART						0
GLENDEN						0
MIDDLEMOUNT		3				3
MORANBAH	1	1			4	6
NEBO						0
ST LAWRENCE		2			1	3
TOTAL						14

HEALTH CONCERN

Customers who suspect their water may be of a health concern can contact Isaac Regional Council on 1300 ISAACS. This concern will be investigated with respect to water quality, typically by testing the closest reticulation sampling point.

During 2022/23 one (1) health concern was reported to IRC relating to water in Moranbah. The complaint addressed a strong chlorine smell which was correlated to an upset stomach.

AESTHETIC COMPLAINTS

When water quality complaints are received, the following standard responses are performed as appropriate. Between each action, the water is sampled to determine whether the situation has been rectified.

1. Localised flushing.
2. Mains flushing.
3. Samples collected for further investigation (if required, particularly if the cause of the complaint is unknown).

TASTE AND ODOUR

Taste and odour complaints can be related to the taste of chlorine in the water supply. During testing, staff explain to customers the importance of free chlorine in drinking water.

Where there are complaints of an earthy taste or odour, samples are collected and tested for Methyl-Isoborneol (MIB) and Geosmin. After complaints or if Council becomes aware of an algal bloom, treated water samples are tested for MIB and Geosmin as part of the Algal Management Plan.

DISCOLOURED WATER

The majority of complaints for the current reporting year FY 22/23 related to discoloured water across Carmila, Clermont, Middlemount, St Lawrence and Moranbah with 1-3 complaints each.

When a complaint is received relating to discoloured drinking water, the following investigations are conducted, and the corrective actions taken as considered appropriate:

- a. Conduct sampling and testing of the affected water.
- b. Review treatment processes and chemical dosing systems.
- c. Drain the vessels in treatment plant if contamination is suspected.
- d. Undertake flushing of network mains.
- e. Take corrective actions and monitor water quality at a higher frequency.
- f. Continue to monitor water quality at a higher frequency for at least seven days after the incident has been resolved.

OTHER

Between 25 March to 28 March 2023, four (4) complaints/enquiries were received from customers in Moranbah regarding and/or requesting water while there was a boil water alert.

SECTION 5: OUTCOME OF THE REVIEW OF THE DWQMP

No review was required or conducted during the financial year 01/07/2022 to 30/06/2023. A review of the DWQMP is due on the 11th of November 2023 with a submission 30 business days later on the 22nd of December 2023.

SECTION 6: FINDINGS AND RECOMMENDATIONS OF THE DWQMP AUDITOR

Isaac Regional Council's Drinking Water Quality Management Plan Audit was undertaken by Bligh Tanner (Sean Hinton) between August and October 2022, with the on-site audits occurring between 4th and 6th of October 2022. The audit was completed on 13th October 2022.

In accordance with the Drinking Water Quality Management Plan Review and Audit Guideline, the audit was required to:

- verify whether the monitoring and performance data given to the regulator under the plan is accurate,
- assess the provider's compliance with the plan and its conditions; and
- assess the plan's relevance to the water service.

There were six (6) non-conformances which are summarised in Table 3. The auditor also made a number of suggested opportunities for improvement which are being considered by IRC on a case-by-case basis.

Table 3 IRC DWQMP Audit Findings

Non-conformance	Recommendation
1. Not all of the preventative measures listed in the risk assessment were implemented as stated in the Plan.	Ensure all preventative measures listed in the approved DWQMP are implemented.
2. Not all RMIP actions have been completed as indicated within the RMIP register.	Ensure RMIP actions are completed as required and that updates made to the RMIP register are accurate. Urgently replace the Carmila clearwater tank hatch with a newer structure that prevents water and vermin ingress (i.e. raised flange sealed flush with the roof, with a hatch that sits over the top).
3. Evidence could not be provided to verify that all water quality incidents (specifically, THMs exceedances in St Lawrence from 2018 and 2019) have been identified and reported in accordance with regulatory requirements.	Ensure incident reporting requirements are well understood by all staff members and maintain accurate records of reported incidents. It is noted that the missing incident reports are from several years prior to the audit, and in more recent years the records are complete.
4. Not all of the operational documentation listed in the DWQMP exists, or if it does, staff do not know how to access it; and not all of the available operational documentation was available through the intranet as stated in the plan.	Clarify the coverage of the operational documentation listed under the section 'Information Distribution' within the DWQMP, as well as how it is accessed.
5. The operational monitoring is not being implemented as stated in the DWQMP.	Ensure the DWQMP reflects the current operational monitoring regime and that the operational monitoring program is implemented. Consider refresher training or staff reminders to ensure Operators understand the monitoring requirements. If the intention is to undertake 'daily' tests only on weekdays or days when the WTP is attended by staff, ensure this is clear in the DWQMP. Ensure the Dysart online water quality analysers are serviced, calibrated and in good working order as these form an important part of the operational monitoring for this scheme as per the approved DWQMP.
6. The verification monitoring program is not fully implemented as stated in the DWQMP, noting that the issues identified (e.g., gaps in sampling frequency) are considered relatively minor.	Implement the verification monitoring program as stated in the DWQMP, and/or describe the circumstances in which the stated monitoring frequencies may not fully apply (e.g., inaccessible sampling points, reduced staff available for sampling etc).

APPENDIX A SUMMARY OF COMPLIANCE WITH WATER QUALITY CRITERIA

All verification testing was obtained via the Mackay NATA accredited laboratory. These results were supplemented with operator collected data in accordance with the operational monitoring program as part of the DWQMP and individual to the specific schemes. Some schemes do not operate every day, so daily sampling refers to days on which plant was operational. ADWG health exceedances and QH exceedances are highlighted and counted in tables.

- Microbial values lower than the limit of detection (<LOR) are reported as 0
- All other analyte values lower than the limit of detection (<LOR) are reported as 0.5 x LOR

CARMILA SUPPLY SYSTEM

Table 4 Carmila Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	12	78	116	38	78	116	95	11	
Aluminium (Total) (µg/L)	51	2.5	1010	1008	20	474	93	169	
Ammonia (mg/L)	4	0.0025	0.007	0.0045	0.0025	0.007	0.0036	0.0023	
Arsenic (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Barium (Total) (µg/L)	1	20	20	0	20	20	20	0	
Bicarbonate (mg/L)	10	92	137	45	92	137	114	14	
Boron (Total) (µg/L)	1	16	16	0	16	16	16	0	
Bromate (µg/L)	13	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	10	16	25	8.7	16	25	21	3	
Bromoform (µg/L)	10	0.5	3	2.5	0.5	3	0.92	0.81	
Cadmium (Total) (µg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	11	24	41	18	24	41	29	5.3	
Carbonate (mg/L)	10	0.05	0.1	0.05	0.05	0.1	0.085	0.024	
Chlorate (µg/L)	13	59	1544	1485	59	1544	465	379	1* QH
Chlorite (µg/L)	13	10	10	0	10	10	10	0	
Chloroform (µg/L)	10	24	79	55	24	79	46	15	
Chromium (Total) (µg/L)	4	0.05	0.15	0.097	0.05	0.15	0.098	0.055	
Colour - True (TCU)	12	0.5	2	1.5	0.5	2	0.67	0.44	
Conductivity (µS/cm)	51	269	1253	984	291	521	373	137	
Copper (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Dibromochloromethane (µg/L)	10	3.3	8.9	5.6	3.3	8.9	7.4	1.7	
Dissolved Oxygen (% Sat)	12	46	96	50	46	96	59	13	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
E. coli (MPN/100mL)	113	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	4	0	0	0	0	0	0	0	
Fluoride (mg/L)	12	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	10	11	22	11	11	22	17	3.6	
Free Chlorine Residual (Client tested) (mg/L)	114	0.68	3.5	2.8	0.95	2.9	1.8	0.72	
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	
Gross beta (Bq/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Hardness - Temporary (mg/L)	2	86	86	0.2	86	86	86	0.14	
Hardness (mg/L)	11	103	170	67	103	170	120	21	
Hydroxide (mg/L)	10	0.05	0.05	0	0.05	0.05	0.05	0	
Iodide (µg/L)	1	10	10	0	10	10	10	0	
Iron (Total) (µg/L)	51	0.5	1617	1616	2.9	792	105	267	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	11	9.2	16	7.2	9.2	16	12	2.1	
Manganese (Total) (µg/L)	51	0.5	88	88	0.5	45	8.1	15	
Mercury (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nickel (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Nitrate (mg/L)	12	0.15	0.83	0.68	0.15	0.83	0.36	0.22	
Nitrite (mg/L)	12	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	114	6.9	8.5	1.7	7	7.9	7.4	0.3	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Sulphide (mg/L)	4	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Tin (Total) (µg/L)	1	8.9	8.9	0	8.9	8.9	8.9	0	
Total Coliforms (MPN/100mL)	23	0	5	5	5	4.3	0.71	1	
Total Dissolved Solids (mg/L)	51	161	752	591	175	312	224	82	
Trihalomethanes (Total) (µg/L)	10	47	111	64	47	111	75	16	
Turbidity (Client tested) (NTU)	81	0.05	0.5	0.45	0.1	0.5	0.27	0.11	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Zinc (Total) (µg/L)	4	0.5	4	3.5	0.5	4	3.1	1.7	

ND = Not Detected

Carmila Reticulation

Table 5 Carmila - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L	103	0	190	190	0	154	96	45	
Free Chlorine	mg/L	167	0.68	4.2	3.5	1.1	3.5	2.4	0.63	
pH		159	7	8.1	1.1	7.4	7.9	7.6	0.15	
Total Aluminium	mg/L	101	0	0.26	0.26	0.011	0.18	0.08	0.045	
Total Iron	mg/L	105	0	0.99	0.99	0	0.13	0.037	0.1	
Total Manganese	mg/L	87	0	0.3	0.3	0	0.035	0.0093	0.035	
True Colour	HU	155	0	7.5	7.5	0	0	0.081	0.72	
Turbidity	NTU	169	0.11	3.1	2.9	0.14	0.7	0.32	0.27	
UVA	Abs	90	0.007	0.33	0.33	0.011	0.25	0.053	0.063	

Table 6 Carmila - *E. coli* Compliance

Financial Year	2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	11	12	12	9	11	8	8	7	10	8	10	8
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	146	149	153	155	156	159	155	155	148	145	131	121
No. of failures in previous 12 months	5	5	5	5	5	5	4	4	2	2	0	0
% of samples that comply	96.58%	96.64%	96.73%	96.77%	96.79%	96.86%	97.42%	97.42%	98.65%	98.62%	100.00%	100.00%
Compliance with 98% annual value	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES

CLERMONT SUPPLY SYSTEM

Table 7 Clermont Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	12	48	81	34	48	81	62	11	
Aluminium (Total) (µg/L)	52	14	68	54	15	48	26	10	
Ammonia (mg/L)	4	0.0025	0.014	0.012	0.0025	0.014	0.0074	0.0048	
Arsenic (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Barium (Total) (µg/L)	1	27	27	0	27	27	27	0	
Beryllium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Bicarbonate (mg/L)	10	56	95	39	56	95	71	14	
Boron (Total) (µg/L)	1	28	28	0	28	28	28	0	
Bromate (µg/L)	12	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	10	15	28	13	15	28	20	3.7	
Bromodichloromethane^ (µg/L)	2	14	20	6	14	20	17	4.2	
Bromoform (µg/L)	10	0.5	3.6	3.1	0.5	3.6	1	1	
Bromoform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Cadmium (Total) (µg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	12	11	20	9.3	11	20	16	2.7	
Carbonate (mg/L)	10	0.05	0.2	0.15	0.05	0.2	0.095	0.044	
Chlorate (µg/L)	12	10	10	0	10	10	10	0	
Chlorite (µg/L)	12	10	10	0	10	10	10	0	
Chloroform (µg/L)	10	24	61	37	24	61	47	11	
Chloroform^ (µg/L)	2	17	29	12	17	29	23	8.4	
Chromium (Total) (µg/L)	4	0.05	0.2	0.15	0.05	0.2	0.12	0.079	
Colour - True (TCU)	12	0.5	1	0.5	0.5	1	0.67	0.25	
Conductivity (µS/cm)	51	192	291	99	197	288	248	27	
Copper (Total) (µg/L)	4	1.2	1.8	0.68	1.2	1.8	1.4	0.29	
Dibromochloromethane (µg/L)	10	4.1	14	10	4.1	14	7.9	3	
Dibromochloromethane^ (µg/L)	2	7.2	13	5.6	7.2	13	9.9	3.9	
Dissolved Oxygen (% Sat)	12	74	98	24	74	98	83	8.9	
E. coli (MPN/100mL)	105	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	4	0	0	0	0	0	0	0	
Fluoride (mg/L)	12	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	4	0.05	0.7	0.65	0.05	0.07	0.21	0.33	1x ADWG (H)
Free Carbon Dioxide (mg/L)	10	3	7.6	4.6	3	7.6	5.3	1.4	
Free Chlorine Residual (Client tested) (mg/L)	104	0.75	2.6	1.9	0.9	2.3	1.7	0.41	
Geosmin (ng/L)	12	1	1	0	1	1	1	0	
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Gross beta (Bq/L)	1	0.11	0.11	0	0.11	0.11	0.11	0	
Hardness - Temporary (mg/L)	2	63	76	13	63	76	70	9.1	
Hardness (mg/L)	12	43	78	35	43	78	62	11	
Hydroxide (mg/L)	10	0.05	0.05	0	0.05	0.05	0.05	0	
Iodide (µg/L)	1	10	10	0	10	10	10	0	
Iron (Total) (µg/L)	52	0.5	487	487	1	45	17	67	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	12	3.8	7.1	3.4	3.8	7.1	5.5	1.2	
Manganese (Total) (µg/L)	52	0.5	3.3	2.8	0.5	2.1	0.73	0.56	
Mercury (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	12	1	1	0	1	1	1	0	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nitrate (mg/L)	12	0.15	1.6	1.4	0.15	1.6	0.57	0.42	
Nitrite (mg/L)	12	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	105	7.1	7.7	0.56	7.2	7.6	7.4	0.13	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Sulphide (mg/L)	4	0.0025	0.007	0.0045	0.0025	0.007	0.0036	0.0023	
Tin (Total) (µg/L)	1	7.1	7.1	0	7.1	7.1	7.1	0	
Total Coliforms (MPN/100mL)	16	0	0	0	0	0	0	0	
Total Dissolved Solids (mg/L)	51	115	175	60	118	172	149	16	
Total Saxitoxins (µg/L)	5	1	1	0	1	1	1	0	
Trihalomethanes (Total) (µg/L)	10	48	98	50	48	98	75	14	
Trihalomethanes (Total)^ (µg/L)	2	38	65	27	38	65	51	19	
Turbidity (Client tested) (NTU)	68	0.05	0.26	0.21	0.05	0.2	0.08	0.05	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Zinc (Total) (µg/L)	4	0.5	1.9	1.4	0.5	1.9	1	0.67	

ND = Not Detected

Clermont Reticulation

Table 8 Clermont - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L	324	35	150	115	46	95	69	16	
Apparent Colour	HU	338	0	25	25	0	5	1	2.8	
Free Chlorine	mg/L	340	0.72	3	2.3	1.3	2.5	1.9	0.37	
Hardness	mg/L	287	20	95	75	40	83	62	13	
pH		341	7	9.5	2.5	7.2	7.8	7.4	0.21	
Total Aluminium	mg/L	334	0	0.09	0.09	0.01	0.08	0.043	0.019	
Total Iron	mg/L	335	0	0.06	0.06	0	0.02	0.0059	0.0073	
Total Manganese	mg/L	338	0	0.064	0.096	0	0.027	0.0075	0.0099	
Turbidity	NTU	341	0.04	16	16	0.06	0.34	0.19	0.87	

Table 9 Clermont - *E. coli* Compliance

Financial year	2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	11	8	8	10	8	8	8	10	8	10	8
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	104	103	106	104	104	106	105	105	105	105	105	107
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

DYSART SUPPLY SYSTEM

Table 10 Dysart Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	12	60	210	149	60	210	80	41	
Aluminium (Total) (µg/L)	50	11	162	151	12	108	39	27	
Ammonia (mg/L)	4	0.0025	0.017	0.015	0.0025	0.017	0.0061	0.0073	
Arsenic (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Barium (Total) (µg/L)	1	26	26	0	26	26	26	0	
Beryllium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Bicarbonate (mg/L)	10	71	247	176	71	247	98	53	
Boron (Total) (µg/L)	1	42	42	0	42	42	42	0	
Bromate (µg/L)	12	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	10	8.5	18	10	8.5	18	15	3.3	
Bromodichloromethane^ (µg/L)	2	12	13	0.89	12	13	13	0.63	
Bromoform (µg/L)	10	0.5	8.6	8.1	0.5	8.6	1.8	2.6	
Bromoform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Cadmium (Total) (µg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	12	15	24	8.3	15	24	18	2.7	
Carbonate (mg/L)	10	0.05	0.5	0.45	0.05	0.5	0.15	0.14	
Chlorate (µg/L)	12	10	10	0	10	10	10	0	
Chlorite (µg/L)	12	10	10	0	10	10	10	0	
Chloroform (µg/L)	10	17	43	27	17	43	33	8.4	
Chloroform^ (µg/L)	2	18	24	5.8	18	24	21	4.1	
Chromium (Total) (µg/L)	4	0.05	0.2	0.15	0.05	0.2	0.11	0.07	
Colour - True (TCU)	12	0.5	4	3.5	0.5	4	1.1	1.1	
Conductivity (µS/cm)	49	201	556	354	209	382	266	61	
Conductivity (Client tested) (µS/cm)	1	238	238	0	238	238	238	0	
Copper (Total) (µg/L)	4	5	11	6.1	5	11	7.5	2.7	
Cylindrospermopsin (µg/L)	5	0.1	0.1	0	0.1	0.1	0.1	0	
Dibromochloromethane (µg/L)	10	4	10	6.1	4	10	6.8	2	
Dibromochloromethane^ (µg/L)	2	6.4	7.7	1.3	6.4	7.7	7	0.9	
Dissolved Oxygen (% Sat)	12	76	98	22	76	98	85	7.9	
E. coli (MPN/100mL)	106	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	4	0	0	0	0	0	0	0	
Fluoride (mg/L)	12	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	10	0.5	33	33	0.5	33	10	9.4	
Free Chlorine Residual (Client tested) (mg/L)	106	0.5	2.6	2.1	0.6	2.3	1.5	0.51	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Geosmin (ng/L)	12	1	2	1	1	2	1.1	0.29	
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	
Gross beta (Bq/L)	1	0.17	0.17	0	0.17	0.17	0.17	0	
Hardness - Temporary (mg/L)	2	62	65	3.6	62	65	63	2.5	
Hardness (mg/L)	12	61	103	42	61	103	73	13	
Heterotrophic Plate Count (cfu/mL)	1	0	0	0	0	0	0	0	
Hydroxide (mg/L)	10	0.05	0.05	0	0.05	0.05	0.05	0	
Iodide (µg/L)	1	10	10	0	10	10	10	0	
Iron (Total) (µg/L)	50	0.5	146	146	0.78	37	11	21	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	12	5.2	11	5.5	5.2	11	6.8	1.5	
Manganese (Total) (µg/L)	50	0.5	2.5	2	0.5	2	0.75	0.51	
Mercury (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	12	1	5	4	1	5	1.8	1.4	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nickel (Total) (µg/L)	4	0.25	0.61	0.36	0.25	0.61	0.42	0.2	
Nitrate (mg/L)	12	0.15	1.6	1.5	0.15	1.6	0.77	0.4	
Nitrite (mg/L)	12	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	106	7	8.6	1.7	7	8.2	7.5	0.36	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Sulphide (mg/L)	4	0.0025	0.006	0.0035	0.0025	0.006	0.0034	0.0018	
Tin (Total) (µg/L)	1	6.8	6.8	0	6.8	6.8	6.8	0	
Total Coliforms (MPN/100mL)	24	0	0	0	0	0	0	0	
Total Dissolved Solids (mg/L)	49	121	333	212	125	230	160	37	
Total Saxitoxins (µg/L)	5	1	1	0	1	1	1	0	
Trihalomethanes (Total) (µg/L)	10	30	71	42	30	71	57	13	
Trihalomethanes (Total)^ (µg/L)	2	39	45	6.5	39	45	42	4.6	
Turbidity (Client tested) (NTU)	84	0.05	1.2	1.2	0.11	0.63	0.23	0.18	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Zinc (Total) (µg/L)	4	3.6	7.6	4	3.6	7.6	5.5	2.1	

ND = Not Detected

Dysart Reticulation

Table 11 Dysart - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L	1684	0	70	85	95	275	275	60	
Colour	HU	281	0	0	0	0	5	5	0	
Free Chlorine	mg/L	1731	0.07	1.8	2.1	2.4	4.7	4.6	1.3	
Hardness	mg/L	1682	5	70	80	95	220	215	50	
pH		1735	6.8	7.2	7.4	7.5	8.8	2	7	
Soluble Iron	mg/L	10	0	0	0	0	0	0	0	
Total Aluminium	mg/L	1590	0	0.02	0.03	0.05	0.4	0.4	0	
Total Iron	mg/L	1633	0	0	0.01	0.01	0.15	0.15	0	
Total Manganese	mg/L	1571	0	0.002	0.003	0.004	0.85	0.85	0	
True Colour	HU	1514	0	0	0	5	75	75	0	
Turbidity	NTU	422	0.095	0.22	0.33	0.64	12	12	0.13	
Turbidity (Inline)	NTU	1262	0	0.07	0.15	0.26	7.3	7.3	0.01	
Turbidity (Lab)	NTU	1710	0	0.11	0.14	0.19	6.1	6.1	0.09	
UVA	Abs	127	0.006	0.015	0.018	0.024	0.22	0.21	0.009	

Table 12 Dysart *E. coli* Compliance

Financial year		2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	8	16	6	6	10	8	8	8	10	8	10	8	
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0	
No. of samples collected in previous 12 months	103	103	111	107	105	107	106	106	106	106	106	108	
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0	
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

GLENDEN SUPPLY SYSTEM

Table 13 Glenden Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	11	40	67	28	40	67	54	11	
Aluminium (Total) (µg/L)	49	13	57	43	14	55	31	13	
Ammonia (mg/L)	4	0.0025	0.015	0.013	0.0025	0.015	0.0056	0.0063	
Arsenic (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Barium (Total) (µg/L)	1	16	16	0	16	16	16	0	
Beryllium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Bicarbonate (mg/L)	9	50	79	29	50	79	67	11	
Boron (Total) (µg/L)	1	15	15	0	15	15	15	0	
Bromate (µg/L)	11	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	9	9.9	19	9.1	9.9	19	14	3.5	
Bromodichloromethane^ (µg/L)	2	11	14	3	11	14	13	2.1	
Bromoform (µg/L)	9	0.5	3.3	2.8	0.5	3.3	1.1	0.99	
Bromoform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Cadmium (Total) (µg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	11	15	24	9.1	15	24	20	3.4	
Carbonate (mg/L)	9	0.05	0.1	0.05	0.05	0.1	0.078	0.026	
Chlorate (µg/L)	11	172	566	394	172	566	363	127	
Chlorite (µg/L)	11	10	10	0	10	10	10	0	
Chloroform (µg/L)	9	15	49	35	15	49	27	12	
Chloroform^ (µg/L)	2	15	27	12	15	27	21	8.6	
Chromium (Total) (µg/L)	4	0.05	0.87	0.82	0.05	0.87	0.3	0.38	
Colour - True (TCU)	11	0.5	1	0.5	0.5	1	0.59	0.2	
Conductivity (µS/cm)	49	179	265	86	180	256	220	24	
Copper (Total) (µg/L)	4	3.4	7.4	4	3.4	7.4	6	1.8	
Cylindrospermopsin (µg/L)	4	0.1	0.1	0	0.1	0.1	0.1	0	
Dibromochloromethane (µg/L)	9	4.7	8.8	4.1	4.7	8.8	6.2	1.4	
Dibromochloromethane^ (µg/L)	2	2.5	6.4	3.9	2.5	6.4	4.4	2.7	
Dissolved Oxygen (% Sat)	11	89	107	18	89	107	98	4.7	
E. coli (MPN/100mL)	98	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	4	0	0	0	0	0	0	0	
Fluoride (mg/L)	11	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	9	4.9	9.5	4.6	4.9	9.5	6.7	1.5	
Free Chlorine Residual (Client tested) (mg/L)	98	0.8	2	1.2	0.88	1.9	1.4	0.3	
Geosmin (ng/L)	11	1	5	4	1	5	1.5	1.3	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	
Gross beta (Bq/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Hardness - Temporary (mg/L)	2	40	42	1.9	40	42	41	1.3	
Hardness (mg/L)	11	48	78	30	48	78	66	12	
Hydroxide (mg/L)	9	0.05	0.05	0	0.05	0.05	0.05	0	
Iodide (µg/L)	1	10	10	0	10	10	10	0	
Iron (Total) (µg/L)	49	0.5	84	83	4.2	32	12	12	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	11	2.4	5	2.6	2.4	5	3.7	0.95	
Manganese (Total) (µg/L)	49	0.5	5	4.5	0.82	4	2.5	0.97	
Mercury (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	11	1	1	0	1	1	1	0	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nickel (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Nitrate (mg/L)	11	0.15	0.59	0.44	0.15	0.59	0.32	0.17	
Nitrite (mg/L)	11	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	98	6.9	7.8	0.9	7	7.7	7.3	0.19	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Sulphide (mg/L)	4	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Tin (Total) (µg/L)	1	6	6	0	6	6	6	0	
Total Coliforms (MPN/100mL)	18	0	0	0	0	0	0	0	
Total Dissolved Solids (mg/L)	49	107	159	52	108	154	132	14	
Total Saxitoxins (µg/L)	4	1	1	0	1	1	1	0	
Trihalomethanes (Total) (µg/L)	9	30	77	47	30	77	48	17	
Trihalomethanes (Total)^ (µg/L)	2	30	51	20	30	51	40	14	
Turbidity (Client tested) (NTU)	52	0.05	0.45	0.4	0.05	0.34	0.1	0.091	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Zinc (Total) (µg/L)	4	1.4	6.4	5	1.4	6.4	3.8	2.1	

ND = Not Detected

Glenden Reticulation

Table 14 Glenden - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L	334	25	85	60	35	75	52	13	
Free Chlorine	mg/L	355	0.37	2.4	2	1.1	1.9	1.4	0.28	
pH		356	6.5	7.8	1.3	7	7.5	7.2	0.16	
Total Aluminium	mg/L	303	0	0.1	0.1	0	0.08	0.033	0.023	
Total Iron	mg/L	323	0	0.09	0.09	0	0.02	0.0033	0.0099	
Total Manganese	mg/L	309	0	0.15	0.15	0.001	0.014	0.0038	0.0092	
Turbidity	NTU	355	0	2	2	0.008	0.32	0.078	0.15	

Table 15 Glenden *E. coli* Compliance

Year	2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	10	6	4	8	10	8	8	10	8	10	8
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	101	101	103	99	95	95	96	96	96	96	96	100
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

MIDDLEMOUNT SUPPLY SYSTEM

Table 16 Middlemount Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	11	47	98	51	47	98	68	16	
Aluminium (Total) (µg/L)	50	2.5	36	33	2.5	32	11	8.3	
Ammonia (mg/L)	4	0.0025	0.11	0.11	0.0025	0.11	0.031	0.055	
Arsenic (Total) (µg/L)	4	0.5	1.3	0.79	0.5	1.3	0.7	0.4	
Barium (Total) (µg/L)	1	27	27	0	27	27	27	0	
Beryllium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Bicarbonate (mg/L)	9	61	115	54	61	115	85	17	
Boron (Total) (µg/L)	1	36	36	0	36	36	36	0	
Bromate (µg/L)	11	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	21	15	46	31	15	45	29	7.9	
Bromodichloromethane^ (µg/L)	5	15	23	8	15	23	20	3	
Bromoform (µg/L)	21	0.5	3.2	2.7	0.5	3.1	0.91	0.77	
Bromoform^ (µg/L)	5	2.5	3.2	0.72	2.5	3.2	2.7	0.3	
Cadmium (Total) (µg/L)	4	0.05	1.4	1.3	0.05	1.4	0.38	0.66	
Calcium (Total) (mg/L)	11	11	24	13	11	24	17	4.7	
Carbonate (mg/L)	9	0.05	0.4	0.35	0.05	0.4	0.17	0.14	
Chlorate (µg/L)	11	10	10	0	10	10	10	0	
Chlorite (µg/L)	11	10	10	0	10	10	10	0	
Chloroform (µg/L)	21	37	256	219	37	256	160	73	
Chloroform^ (µg/L)	5	12	35	23	12	35	26	9.1	
Chromium (Total) (µg/L)	4	0.05	0.2	0.15	0.05	0.2	0.15	0.068	
Colour - True (TCU)	11	0.5	3	2.5	0.5	3	1.1	0.84	
Conductivity (µS/cm)	50	200	410	210	204	397	268	62	
Copper (Total) (µg/L)	4	19	33	14	19	33	28	6.5	
Dibromochloromethane (µg/L)	21	2	11	8.9	2	11	5.6	2.5	
Dibromochloromethane^ (µg/L)	5	10	17	6.9	10	17	13	2.8	
Dissolved Oxygen (% Sat)	11	82	99	17	82	99	91	5.7	
E. coli (MPN/100mL)	100	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	4	0	0	0	0	0	0	0	
Fluoride (mg/L)	11	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	9	1.7	12	10	1.7	12	5.6	3.2	
Free Chlorine Residual (Client tested) (mg/L)	100	0.2	3.7	3.5	0.29	3	1.6	0.9	
Geosmin (ng/L)	11	1	4	3	1	4	1.6	0.92	
Green Algae Total Cells (cells/mL)	1	240	240	0	240	240	240	0	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	
Gross beta (Bq/L)	1	0.18	0.18	0	0.18	0.18	0.18	0	
Hardness - Temporary (mg/L)	2	47	53	5.7	47	53	50	4	
Hardness (mg/L)	11	45	112	67	45	112	70	23	
Hydroxide (mg/L)	9	0.05	0.05	0	0.05	0.05	0.05	0	
Iodide (µg/L)	1	10	10	0	10	10	10	0	
Iron (Total) (µg/L)	50	0.5	22	21	1	16	4.9	4.1	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	11	4	13	8.6	4	13	6.8	2.9	
Manganese (Total) (µg/L)	50	0.5	28	27	0.5	17	5	6.1	
Mercury (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	11	1	3	2	1	3	1.2	0.6	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nickel (Total) (µg/L)	4	0.95	2.3	1.3	0.95	2.3	1.5	0.57	
Nitrate (mg/L)	11	0.15	2	1.8	0.15	2	1.1	0.6	
Nitrite (mg/L)	11	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	100	6.9	8.5	1.6	7	7.9	7.4	0.29	
Potentially Toxic Algae Total Cells (cells/mL)	1	30	30	0	30	30	30	0	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Sulphide (mg/L)	4	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Tin (Total) (µg/L)	1	5.2	5.2	0	5.2	5.2	5.2	0	
Total Coliforms (MPN/100mL)	18	0	0	0	0	0	0	0	
Total Dissolved Solids (mg/L)	50	120	246	126	123	238	161	37	
Trihalomethanes (Total) (µg/L)	21	60	287	227	61	287	195	77	7x ADWG (H)
Trihalomethanes (Total)^ (µg/L)	5	41	69	28	41	69	61	12	
Turbidity (Client tested) (NTU)	64	0.05	0.33	0.28	0.05	0.29	0.15	0.056	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Zinc (Total) (µg/L)	4	4.1	8.4	4.2	4.1	8.4	6	1.9	

ND = Not Detected

Middlemount Reticulation

Table 17 Middlemount - Operator Tested Treated Water Quality

			Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L		40	50	65	75	84	140	90	51	
Free Chlorine	mg/L		357	0.75	2.2	2.7	3.1	4.3	3.6	1.6	
Hardness	mg/L		38	25	50	60	71	90	65	35	
pH			361	6.8	7.3	7.5	7.8	9.5	2.7	7	
TDS	mg/L		359	1.3	105	119	146	401	400	96	
Total Aluminium	mg/L		38	0	0	0.02	0.04	0.09	0.09	0	
Total Iron	mg/L		361	0	0.01	0.01	0.02	0.1	0.1	0	
Total Manganese	mg/L		359	0	0.002	0.005	0.012	0.19	0.19	0	
True Colour	HU		360	0	0	0	0	3	3	0	
Turbidity	NTU		228	0.06	0.13	0.16	0.2	1.3	1.2	0.1	
Turbidity (Lab)	NTU		360	0.05	0.11	0.12	0.16	0.29	0.24	0.08	
UVA	Abs		179	0.024	0.051	0.054	0.057	0.5	0.48	0.044	

Table 18 Middlemount *E. coli* Compliance

Financial year		2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	8	10	8	4	10	8	8	9	10	8	10	8	
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0	
No. of samples collected in previous 12 months	112	112	114	112	108	110	109	105	101	101	101	103	
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0	
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

MORANBAH SUPPLY SYSTEM

Table 19 Moranbah Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	10	36	49	13	36	49	41	3.6	
Aluminium (Total) (µg/L)	50	7	53	46	7.6	51	22	12	
Ammonia (mg/L)	3	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Arsenic (Total) (µg/L)	3	0.5	0.5	0	0.5	0.5	0.5	0	
Bicarbonate (mg/L)	8	42	50	8	42	50	47	3.2	
Bromate (µg/L)	10	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	8	11	16	5.3	11	16	13	1.5	
Bromodichloromethane^ (µg/L)	2	9.5	13	3.4	9.5	13	11	2.4	
Bromoform (µg/L)	8	0.5	3.5	3	0.5	3.5	1.7	1	
Bromoform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Cadmium (Total) (µg/L)	3	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	10	9.1	12	3.1	9.1	12	11	1.1	
Carbonate (mg/L)	8	0.05	0.1	0.05	0.05	0.1	0.056	0.018	
Chlorate (µg/L)	10	10	10	0	10	10	10	0	
Chlorite (µg/L)	10	10	10	0	10	10	10	0	
Chloroform (µg/L)	8	10	27	17	10	27	18	5.2	
Chloroform^ (µg/L)	2	22	29	7.4	22	29	26	5.2	
Chromium (Total) (µg/L)	3	0.14	0.18	0.047	0.14	0.18	0.17	0.026	
Colour - True (TCU)	10	0.5	2	1.5	0.5	2	0.7	0.48	
Conductivity (µS/cm)	50	160	293	133	162	271	197	30	
Copper (Total) (µg/L)	3	1.2	1.7	0.43	1.2	1.7	1.4	0.23	
Dibromochloromethane (µg/L)	8	7.5	13	5.3	7.5	13	8.9	1.7	
Dibromochloromethane^ (µg/L)	2	2.5	5.7	3.2	2.5	5.7	4.1	2.3	
Dissolved Oxygen (% Sat)	10	82	102	20	82	102	91	6.1	
<i>E. coli</i> (MPN/100mL)	56	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	3	0	0	0	0	0	0	0	
Fluoride (mg/L)	50	0.05	0.76	0.71	0.05	0.69	0.4	0.19	
Formaldehyde (mg/L)	3	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	8	2.9	6.7	3.8	2.9	6.7	4.4	1.1	
Free Chlorine Residual (Client tested) (mg/L)	57	0.78	2.9	2.1	1.3	2	1.6	0.29	
Geosmin (ng/L)	10	1	3	2	1	3	1.2	0.63	
Hardness - Temporary (mg/L)	2	44	49	4.4	44	49	46	3.1	
Hardness (mg/L)	10	42	62	20	42	62	48	5.9	
Hydroxide (mg/L)	8	0.05	0.05	0	0.05	0.05	0.05	0	
Iron (Total) (µg/L)	50	0.5	56	56	3	28	11	9.2	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Lead (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	10	4.7	7.7	3	4.7	7.7	5.3	0.89	
Manganese (Total) (µg/L)	50	0.5	7.1	6.6	0.5	4.2	1.5	1.3	
Mercury (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	10	1	1	0	1	1	1	0	
Nickel (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Nitrate (mg/L)	10	0.15	0.64	0.49	0.15	0.64	0.37	0.21	
Nitrite (mg/L)	10	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	57	7.1	15	7.9	7.1	7.5	7.4	1	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	3	2.5	2.5	0	2.5	2.5	2.5	0	
Sulphide (mg/L)	3	0.0025	0.005	0.0025	0.0025	0.005	0.0033	0.0014	
Total Coliforms (MPN/100mL)	9	0	0	0	0	0	0	0	
Total Cyanobacteria (Count)	2	12	97	85	12	97	55	60	
Total Cyanotoxins (Count)	2	0.5	0.5	0	0.5	0.5	0.5	0	
Total Dissolved Solids (mg/L)	50	96	176	80	98	162	118	18	
Trihalomethanes (Total) (µg/L)	8	33	56	24	33	56	42	6.8	
Trihalomethanes (Total)^ (µg/L)	2	33	51	18	33	51	42	12	
Turbidity (Client tested) (NTU)	57	0.05	1.3	1.3	0.05	0.83	0.26	0.21	
Turbidity (NTU)	8	0.12	6.6	6.4	0.12	6.6	1.1	2.2	
Zinc (Total) (µg/L)	3	11	17	5.2	11	17	14	2.6	

ND = Not Detected

Moranbah Reticulation

Table 20 Moranbah - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Fluoride	mg/L	282	0	0.92	0.92	0.45	0.86	0.66	0.14	
Free chlorine	mg/L	282	0	2	2	0.76	1.7	1.3	0.32	
pH		282	0	8.6	8.6	7.2	7.8	7.4	0.79	
Temperature	°C	271	0	35	35	20	29	25	4	
Total manganese	mg/L	209	0	0.027	0.027	0	0.009	0.0037	0.003	
True colour	HU	277	0	8	8	0	0	0.09	0.6	
Turbidity	NTU	282	0	3.6	3.6	0.1	0.55	0.28	0.31	
UVA	Abs	127	0	0.7	0.7	0	0.025	0.014	0.062	

Table 21 Moranbah *E. coli* Compliance

Financial year		2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	12	14	6	5	14	12	11	12	47	12	14	12	
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0	
No. of samples collected in previous 12 months	151	151	153	145	138	140	139	138	138	171	171	173	
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0	
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

NEBO SUPPLY SYSTEM

Table 22 Nebo Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	12	52	182	130	52	182	166	36	
Aluminium (Total) (µg/L)	51	2.5	39	37	2.5	29	6.8	8.1	
Ammonia (mg/L)	3	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Antimony (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Arsenic (Total) (µg/L)	4	0.5	0.5	0	0.5	0.5	0.5	0	
Barium (Total) (µg/L)	1	20	20	0	20	20	20	0	
Beryllium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Bicarbonate (mg/L)	10	61	215	154	61	215	193	46	
Boron (Total) (µg/L)	1	13	13	0	13	13	13	0	
Bromate (µg/L)	11	10	10	0	10	10	10	0	
Bromide (mg/L)	1	0.2	0.2	0	0.2	0.2	0.2	0	
Bromodichloromethane (µg/L)	9	0.5	2.7	2.2	0.5	2.7	1.2	0.82	
Bromodichloromethane^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Bromoform (µg/L)	9	0.5	20	19	0.5	20	9.9	5.8	
Bromoform^ (µg/L)	2	7.8	14	6.7	7.8	14	11	4.7	
Cadmium (Total) (µg/L)	4	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	49	8.9	114	105	23	55	42	13	
Carbonate (mg/L)	10	0	0.3	0.3	0	0.3	0.14	0.084	
Chlorate (µg/L)	11	10	425	415	10	425	49	125	
Chloride (mg/L)	1	21	21	0	21	21	21	0	
Chlorite (µg/L)	11	10	10	0	10	10	10	0	
Chloroform (µg/L)	9	0.5	1.7	1.2	0.5	1.7	0.78	0.45	
Chloroform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Chromium (Total) (µg/L)	4	0.05	0.43	0.38	0.05	0.43	0.23	0.18	
Cobalt (Total) (µg/L)	1	0.1	0.1	0	0.1	0.1	0.1	0	
Colour - True (TCU)	12	0.5	1	0.5	0.5	1	0.63	0.23	
Conductivity (µS/cm)	51	185	1150	965	968	1135	1048	131	
Conductivity (Client tested) (µS/cm)	1	1026	1026	0	1026	1026	1026	0	
Copper (Total) (µg/L)	4	0.5	8.1	7.6	0.5	8.1	5.4	3.5	
Dibromochloromethane (µg/L)	9	3.5	8.4	4.9	3.5	8.4	5.7	2	
Dibromochloromethane^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Dissolved Oxygen (% Sat)	12	84	95	11	84	95	89	3.2	
E. coli (MPN/100mL)	101	0	0	0	0	0	0	0	
Fluoride (mg/L)	12	0.05	0.05	0	0.05	0.05	0.05	0	
Formaldehyde (mg/L)	3	0.05	0.05	0	0.05	0.05	0.05	0	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Free Carbon Dioxide (mg/L)	10	2.4	38	36	2.4	38	22	11	
Free Chlorine Residual (Client tested) (mg/L)	101	0.97	1.6	0.66	1	1.6	1.3	0.15	
Free Chlorine Residual (mg/L)	1	2.1	2.1	0	2.1	2.1	2.1	0	
Gross alpha (Bq/L)	1	0.025	0.025	0	0.025	0.025	0.025	0	
Gross beta (Bq/L)	1	0.05	0.05	0	0.05	0.05	0.05	0	
Hardness - Temporary (mg/L)	2	177	182	5.7	177	182	179	4	
Hardness (mg/L)	49	42	551	509	107	268	208	63	
Heterotrophic Plate Count (cfu/mL)	1	24	24	0	24	24	24	0	
Hydroxide (mg/L)	10	0	0.05	0.05	0	0.05	0.045	0.016	
Iron (Total) (µg/L)	51	0.5	25	25	0.8	22	5.9	5.4	
Lead (Total) (µg/L)	4	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	49	4.9	65	60	12	32	25	7.5	
Manganese (Total) (µg/L)	51	0.5	6.3	5.8	0.5	2.6	0.73	0.96	
Mercury (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Molybdenum (Total) (µg/L)	1	0.5	0.5	0	0.5	0.5	0.5	0	
Nickel (Total) (µg/L)	4	0.25	0.93	0.68	0.25	0.93	0.53	0.34	
Nitrate (mg/L)	12	0.43	2.9	2.5	0.43	2.9	1.9	0.79	
Nitrite (mg/L)	12	0.2	0.2	0	0.2	0.2	0.2	0	
Pesticides	4	ND	ND						
pH (Client tested) (pH unit)	101	6.8	7.8	1	7	7.5	7.2	0.19	
pH (pH unit)	1	7.6	7.6	0	7.6	7.6	7.6	0	
Phosphate (mg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Potassium (Total) (mg/L)	1	1.5	1.5	0	1.5	1.5	1.5	0	
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	4	2.5	2.5	0	2.5	2.5	2.5	0	
Silver (Total) (µg/L)	1	0.4	0.4	0	0.4	0.4	0.4	0	
Sodium (Total) (mg/L)	31	13	365	352	44	249	133	52	
Strontium (Total) (µg/L)	1	101	101	0	101	101	101	0	
Sulphate (mg/L)	1	1.9	1.9	0	1.9	1.9	1.9	0	
Sulphide (mg/L)	3	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Thallium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Tin (Total) (µg/L)	1	5	5	0	5	5	5	0	
Titanium (Total) (µg/L)	1	2.1	2.1	0	2.1	2.1	2.1	0	
Total Chlorine (mg/L)	1	2.3	2.3	0	2.3	2.3	2.3	0	
Total Coliforms (MPN/100mL)	19	0	2	2	0	2	0.58	0.34	
Total Dissolved Solids (mg/L)	50	579	690	111	590	681	639	28	
Total Organic Carbon (mg/L)	1	1.3	1.3	0	1.3	1.3	1.3	0	
Trihalomethanes (Total) (µg/L)	9	5.7	30	24	5.7	30	18	8.3	
Trihalomethanes (Total)^ (µg/L)	2	12	19	7.6	12	19	16	5.4	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Turbidity (Client tested) (NTU)	47	0.05	0.34	0.29	0.05	0.19	0.087	0.058	
Turbidity (NTU)	1	0.13	0.13	0	0.13	0.13	0.13	0	
Uranium (Total) (µg/L)	1	0.25	0.25	0	0.25	0.25	0.25	0	
Vanadium (Total) (µg/L)	1	0.87	0.87	0	0.87	0.87	0.87	0	
Zinc (Total) (µg/L)	4	0.5	4.1	3.6	0.5	4.1	2.5	1.5	

ND = Not Detected

Nebo Reticulation

Table 23 Nebo - Operator Tested Treated Water Quality

		Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg /L	300	95	285	190	155	235	189	26	
Conductivity	mS/cm	301	723	1381	658	906	1180	1079	86	
Free Chlorine	mg /L	301	1	1.8	0.8	1.1	1.7	1.4	0.15	
Hardness	mg /L	140	95	227	132	145	204	191	17	
pH		300	6.8	7.8	1.1	7.1	7.6	7.3	0.17	
Total Aluminium	mg /L	299	0.01	0.36	0.35	0.04	0.19	0.097	0.054	
Total Iron	mg /L	201	0	0.2	0.2	0	0.04	0.018	0.021	
Total Manganese	mg /L	298	0	0.06	0.06	0.002	0.006	0.0037	0.0051	
True Colour	HU	287	0	0.19	0.19	0	0	0.00066	0.011	
Turbidity	NTU	299	0	0.58	0.58	0.01	0.22	0.097	0.071	

Table 24 Nebo *E. coli* Compliance

Financial year		2022-2023										
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	10	6	6	10	8	8	8	10	9	10	8
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	103	104	106	102	100	102	101	100	100	100	101	103
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

ST LAWRENCE SUPPLY SYSTEM

Table 25 St Lawrence Treated Water Summary (at WTP)

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity (mg/L)	10	11	92	81	11	92	72	24	
Aluminium (Total) (µg/L)	49	2.5	1202	1200	9.4	839	144	260	
Ammonia (mg/L)	3	0.0025	0.007	0.0045	0.0025	0.007	0.004	0.0026	
Arsenic (Total) (µg/L)	3	0.5	0.5	0	0.5	0.5	0.5	0	
Bicarbonate (mg/L)	8	13	108	95	13	108	88	31	
Bromate (µg/L)	10	10	10	0	10	10	10	0	
Bromodichloromethane (µg/L)	8	6.1	19	13	6.1	19	14	4.8	
Bromodichloromethane^ (µg/L)	2	11	18	6.5	11	18	14	4.6	
Bromoform (µg/L)	8	0.5	3.1	2.6	0.5	3.1	1.3	1.1	
Bromoform^ (µg/L)	2	2.5	2.5	0	2.5	2.5	2.5	0	
Cadmium (Total) (µg/L)	3	0.05	0.05	0	0.05	0.05	0.05	0	
Calcium (Total) (mg/L)	10	6.3	19	12	6.3	19	10	3.8	
Carbonate (mg/L)	8	0.05	0.4	0.35	0.05	0.4	0.21	0.11	
Chlorate (µg/L)	10	61	534	473	61	534	314	135	
Chlorite (µg/L)	10	10	10	0	10	10	10	0	
Chloroform (µg/L)	8	5.6	66	61	5.6	66	46	26	
Chloroform^ (µg/L)	2	16	33	17	16	33	24	12	
Chromium (Total) (µg/L)	3	0.05	0.21	0.16	0.05	0.21	0.15	0.086	
Colour - True (TCU)	10	0.5	1	0.5	0.5	1	0.6	0.21	
Conductivity (µS/cm)	49	184	433	249	235	385	300	42	
Copper (Total) (µg/L)	3	0.1	0.5	0	0.5	0.5	0.5	0	
Cylindrospermopsin (CYN) (µg/L)	3	0.1	0.1	0	0.1	0.1	0.1	0	
Dibromochloromethane (µg/L)	8	2.9	7.8	4.9	2.9	7.8	5.7	1.8	
Dibromochloromethane^ (µg/L)	2	5.9	9.6	3.6	5.9	9.6	7.8	2.6	
Dissolved Oxygen (% Sat)	10	34	99	65	34	99	69	17	
E. coli (MPN/100mL)	97	0	0	0	0	0	0	0	
Endosulphan (alpha + beta + sulphate) (µg/L)	2	0	0	0	0	0	0	0	
Fluoride (mg/L)	10	0.05	0.77	0.72	0.05	0.77	0.12	0.23	
Formaldehyde (mg/L)	3	0.05	0.05	0	0.05	0.05	0.05	0	
Free Carbon Dioxide (mg/L)	8	1.3	6.1	4.8	1.3	6.1	3.7	1.5	
Free Chlorine Residual (Client tested) (mg/L)	98	0.17	3.3	3.1	0.5	2.9	1.9	0.75	
Geosmin (ng/L)	10	1	8	7	1	8	2.4	2.2	
Hardness - Temporary (mg/L)	2	62	65	3.5	62	65	63	2.5	
Hardness (mg/L)	10	23	74	51	23	74	41	14	
Heterotrophic Plate Count (cfu/mL)	3	0	1	1	0	1	0.67	0.29	

	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Hydroxide (mg/L)	8	0.05	0.05	0	0.05	0.05	0.05	0	
Iron (Total) (µg/L)	49	0.5	107	106	0.75	48	14	18	
Lead (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Magnesium (Total) (mg/L)	10	1.8	6.6	4.8	1.8	6.6	3.7	1.4	
Manganese (Total) (µg/L)	49	1.1	169	168	1.3	109	22	35	
Mercury (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Methyl Isoborneol (ng/L)	10	1	43	42	1	43	8.3	13	
Nickel (Total) (µg/L)	3	0.25	0.25	0	0.25	0.25	0.25	0	
Nitrate (mg/L)	10	0.15	0.55	0.4	0.15	0.55	0.3	0.17	
Nitrite (mg/L)	10	0.2	0.2	0	0.2	0.2	0.2	0	
pH (Client tested) (pH unit)	98	7.2	8	0.85	7.3	8	7.7	0.19	
Pesticides	4	ND	ND						
Residual Alkalinity (mg/L)	2	0.05	0.05	0	0.05	0.05	0.05	0	
Selenium (Total) (µg/L)	3	2.5	2.5	0	2.5	2.5	2.5	0	
Sulphide (mg/L)	3	0.0025	0.0025	0	0.0025	0.0025	0.0025	0	
Total Coliforms (MPN/100mL)	18	0	0	0	0	0	0	0	
Total Dissolved Solids (mg/L)	49	110	260	150	142	231	180	25	
Total Saxitoxins (µg/L)	3	1	1	0	1	1	1	0	
Trihalomethanes (Total) (µg/L)	8	22	92	70	22	92	67	29	
Trihalomethanes (Total)^ (µg/L)	2	33	63	30	33	63	48	21	
Turbidity (Client tested) (NTU)	79	0.11	1.9	1.8	0.19	0.9	0.44	0.28	
Zinc (Total) (µg/L)	3	1.5	152	150	1.5	152	53	86	

ND = Not Detected

St Lawrence Reticulation

Table 26 St Lawrence - Operator Tested Treated Water Quality

	Unit	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Alkalinity	mg/L	93	40	140	100	55	122	91	21	
Free Chlorine	mg/L	165	0.23	4.9	4.7	0.69	3.3	2.4	0.75	
Hardness	mg/L	20	30	95	65	30	95	63	28	
pH		166	7.2	8.5	1.3	7.5	8	7.7	0.2	
Total Aluminium	mg/L	101	0	0.4	0.4	0.031	0.16	0.089	0.048	
Total Iron	mg/L	116	0	0.68	0.68	0	0.26	0.077	0.11	
Total Manganese	mg/L	108	0	0.41	0.44	0	0.22	0.054	0.071	
True Colour	HU	155	0	20	20	0	15	1.7	4.1	

	Unit	Number of values	Minimum	Maximum	Range	5% Percentile	95% Percentile	Mean	Std. Deviation	Number of Exceedances
Turbidity	NTU	169	0.2	8.2	8	0.27	2.2	0.97	0.87	
UVA	Abs	159	0.019	0.48	0.46	0.027	0.17	0.091	0.054	

Table 27 St Lawrence – *E. coli* Compliance

Financial year												2022-2023											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun											
No. of samples collected	8	10	6	4	9	8	8	8	10	8	10	8											
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0											
No. of samples collected in previous 12 months	85	85	87	83	79	80	78	82	86	91	92	97											
No. of failures in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0											
% of samples that comply	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%											
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES											