Water Supply

Huntly & Ngaaruawaahia Supply Zones

DRINKING WATER SAFETY PLAN

2025

Community Code	**HUN002**
Source Code	**S00071 Huntly; S00070 Ngaaruawaahia**
Treatment Plant Code	**TP00132 Huntly; TP00131 Ngaaruawaahia**
Zone Code	**HUN002 Huntly; NGA002NG Ngaaruawaahia**

Watercare

An Auckland Council Organisation

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1.0	Drinking Water Safety Plan 2022 update	Grant King **Water Quality Scientist**	Bliss Pappachan **Water Quality Scientist** Tatiana Derevianko **Water Quality & Science Manager**	October 2022	Mathew Telfer **Operations Manager Waikato District**
2.0	Drinking Water Safety Plan 2023 update	Bliss Pappachan, **Water Quality Scientist**	Marieka van der Lee **Water Quality Scientist** Tatiana Derevianko **Water Quality & Science Manager**	November 2023	Mathew Telfer **Operations Manager Waikato District**
3.0	Drinking Water Safety Plan 2024 update	Mitchell Adams **Water Quality Scientist**	Tatiana Derevianko **Water Quality Compliance & Science Manager**	November 2024	Anin Nama **Head of Service Delivery – Waikato**
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Executive Summary

This Drinking Water Safety Plan (DWSP) has been developed using the *New Zealand Drinking Water Safety Plan Framework* and provides a comprehensive review of the Huntly and Ngaaruawaahia water supply systems. It outlines how public health risks associated with these supplies are managed and summarises monthly compliance requirements required to ensure the delivery of safe and reliable drinking water.

The Huntly and Ngaaruawaahia supplies are owned by Waikato District Council (WDC) and operated by Watercare Services Limited (Watercare). This DWSP satisfies the legislative requirements of the *Water Services Act 2021* and must be viewed alongside the *Watercare Waikato General DWSP (Version 1.0; Appendix 1).*

WDC and Watercare adhere to the six principles of drinking-water safety, which are embedded into all systems, processes, and behaviours:

1) Embrace a high standard of care
2) Protect source water
3) Maintain multiple barriers against contamination
4) Change precedes contamination
5) Suppliers must own the safety of drinking-water
6) Apply a preventive risk management approach.

This DWSP will be reviewed and updated regularly to reflect changes in infrastructure, operations, or risk profiles, ensuring ongoing compliance and continuous improvement in drinking water safety.

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Amendments

Requests for amendments or revisions of the manual are submitted to the document controller, who is responsibility of reviewing requests and implementing changes to the document. Amendments and updates are documented in the *Table 1: Document Control Record.* Amendments or revisions of the document will result in a new version number and updated date in the footer.

1. Assessment of the Huntly & Ngaaruawaahia Drinking-Water Supply

Table 3: Water Supply Details.

Supply Details	
Supply Name	Huntly - Ngaruawahia
Hinekōrako Community Code	HUN002
Supply Owner	Waikato District Council
Population Served by Supply	18,610 (based on 2025 active metered connections)
Source Details – Huntly WTP	
Easting: 1790715	**Northing**: 5839360
Source	Waikato River
Hinekōrako Code	S00071
Consent	136806 - To take water from the Waikato River at two locations for domestic and municipal supply to the Ngaruawahia, Hopuhopu and Huntly communities.
Consent Expiry	12-Jan-46
Maximum Consented water take:	Commencement to 30 June 2021 – 11,800 m^3/day **1 July 2021 to 30 June 2027 – 11,950 m^3/day** 1 July 2027 to 30 June 2033 – 12,150 m^3/day 1 July 2033 to 30 June 2039 – 12,500 m^3/day 1 July 2039 to Expiry – 12,800 m^3/day
Treatment – Huntly WTP	
Hinekōrako Code	TP00132
Treatment Processes	Coagulation, Clarification, Filtration, Ultraviolet (UV) Disinfection, Chlorination, Fluoridation
Average Daily Volume	4,215 m^3/day (2024 - 25)
Peak Daily Volume	5,814 m^3/day (2024 - 25)
Distribution – Huntly Zone	
Hinekōrako Code	HUN002HU
Distribution Zone Population	8,690 (based on 2025 active metered connections)

Source Details – Ngaaruawaahia WTP	
Easting: 1788729	**Northing**: 5830355
Source	Waikato River
Hinekōrako Code	S00070
Consent	136806 - To take water from the Waikato River at two locations for domestic and municipal supply to the Ngaruawahia, Hopuhopu and Huntly communities.
Maximum Consented water take:	Commencement to 30 June 2021 – 11,800 m^3/day **1 July 2021 to 30 June 2027 – 11,950 m^3/day** 1 July 2027 to 30 June 2033 – 12,150 m^3/day 1 July 2033 to 30 June 2039 – 12,500 m^3/day 1 July 2039 to Expiry – 12,800 m^3/day
Treatment – Ngaaruawaahia WTP	
Hinekōrako Code	TP00131
Treatment Processes	Filtration, Chlorination, UV, Coagulation, Flocculation, Sedimentation, Fluoridation
Average Daily Volume	2,585 m^3/day (2024 - 25)
Peak Daily Volume	3,839 m^3/day (2024 - 25)
Distribution – Ngaaruawaahia Zone	
Hinekōrako Code	NGA002NG
Distribution Zone Population	9,920 (based on 2025 active metered connections)

The Huntly and Ngaaruawaahia water supplies are connected by a one-way bulk transfer pipeline. The line, from Huntly WTP to Ngaaruawaahia WTP, connects at two points: Great South Road (Taupiri) and Ashwell Crescent, supplying the Hopuhopu reservoir and Ngaaruawaahia distribution zone. Installed in 2019, the pipeline has improved system resilience and is regularly used to meet supply demands.

Source Water Quality and Log Credit Requirements

Both the Huntly and Ngaaruawaahia WTPs source raw water from the Waikato River. The primary water quality risks are microbiological—protozoa, bacteria, viruses, and cyanobacteria. The river typically has low turbidity but elevated colour, with relatively stable quality due to upstream influences from Lake Taupō and hydro-electric impoundments.

Based on catchment risk assessments and protozoa data provided by Massey University in 2018, the source water for both plants is classified as 4-log risk *(Appendix 2).* However, extensive monitoring conducted in 2023 indicated that a 3-log protozoa removal credit is sufficient to meet *Drinking Water Standards for New Zealand (DWSNZ)* protozoal treatment requirements.

Each WTP is configured to achieve 7-log removal under normal operating conditions through filtration and UV disinfection:

- 4-log credits are achieved through coagulation, sedimentation, and filtration.
- 3-log credits are achieved through ultraviolet (UV) disinfection.

Huntly Water Supply System Description

Located on Jackson Road, Huntly WTP supplies treated water to the township, nearby rural areas, and key industrial users including Genesis Huntly Power Station and the Solid Energy Mine. A conventional treatment facility, Huntly WTP uses coagulation, flocculation, clarification, filtration, UV disinfection, chlorination and fluoridation. The distribution zone is primarily urban with on-demand supply. A small rural area to the west receives a mix of on-demand and restricted supply. Treated water is delivered via direct supply or through reservoir-fed reticulation.

Intake:

Raw water is pumped from the Waikato River via two submersible intake pumps (duty/standby), housed in a wet well where water levels are continuously monitored. Intake screens prevent debris and aquatic life from entering the system. An automated backwash system, powered by air compressors, helps prevent blockages. Key water quality parameters including turbidity, conductivity, UV transmittance (UVT), and pH are continuously monitored to assess incoming water conditions. A flow meter monitors the rate of abstraction in real time, and backup power is available through a portable generator connection to ensure operational continuity during outages. While no generator is permanently installed on site, a mobile unit can be deployed when needed and is capable of running the entire treatment plant for extended durations.

Coagulation, Flocculation and Clarification:

Aluminium sulphate (alum, $Al_2(SO_4)_3$) and pre-caustic soda (sodium hydroxide, NaOH) are dosed using dual duty/standby pumps - alum to support coagulation and pre-caustic soda to counteract the resulting pH drop. Polyelectrolyte, a charged polymer used to promote floc formation, is dosed into the flash mixer via duty/standby pumps and mixed by an in-line static mixer. Powdered activated carbon (PAC) is added as required for taste, odour, and cyanotoxin control. Coagulant and flocculant dosing is flow-paced and adjusted using a streaming current meter, with jar testing conducted periodically to optimise dosing rates.

Flow is distributed across five clarifiers where turbidity is continuously monitored. A single turbidimeter cycles through each unit to monitor effluent quality. Sludge is discharged to a holding tank, where supernatant is siphoned back to the river and settled sludge is directed to the sewer for treatment at the Huntly Wastewater Treatment Plant (WWTP).

Filtration and UV Disinfection:

Chlorine gas is dosed in a flow-paced manner to aid with iron and manganese removal prior to filtration. Clarified water passes through five gravity filters containing sand and pumice media. Each filter is equipped with a level meter, outflow meter, turbidimeter and a filter-to-waste system post-backwash. Filters are backwashed routinely or when triggered by high turbidity, head loss, or manual override. Air scour is provided by two blowers (duty/standby). Backwash water is drawn from the clear water tank and discharged to a holding tank, where supernatant is siphoned to the river and sludge is sent to the sewer.

Filtered water is collected in a clear water tank, where a UVT meter monitors filtered water quality prior to disinfection. Water is pumped via two submersible duty/standby pumps to the UV units. Disinfection is provided by two WEDECO Spektron 250e UV reactors (duty/manual standby), validated to UVDGM standards (*Appendix 3)*. Any deviation from the required dose triggers an alarm. Outflow meters monitor flow exiting the UV units.

Chemical Dosing and Post Treatment Monitoring:

Chlorine gas is dosed by a single chlorinator following UV disinfection. Dosing is flow-paced and manually adjusted via a venturi vacuum system. One 920 kg drum and a 70 kg cylinder, acting as duty/standby, are maintained at the treatment plant. Hydrofluorosilicic acid (HFA, H_2SiF_6) and post-caustic soda are dosed via dosing pumps for fluoridation and pH correction. Water is transferred to two onsite treated water reservoirs (3,200 m^3 and 900 m^3 respectively) via duty/standby pumps, providing a minimum contact time of 30 minutes.

Final water is continuously monitored for flow, turbidity, chlorine, pH, and fluoride. Data is telemetered to WDC, with monitoring equipment calibrated weekly and validated quarterly.

Reticulation and Reservoirs:

Four high-lift pumps at the WTP supply water to the reticulation system and five reservoirs:

- Kimihia – 1,135 m^3
- Upland Road – 1,135 m^3
- Huntly West (Rotowaro Road) – 2,270 m^3
- Huntly West (Heatherington Road) – 500 m^3
- Jackson Street – 2,273 m^3

Two additional pumps transfer water to the Ngaaruawaahia WTP via the Ngaaruawaahia network when demands requires.

All reservoirs are alarmed for high and low levels, with alerts sent to the duty operator and controller. The distribution network has been progressively upgraded and currently consists of PE, HDPE, and PVC pipes. Reservoir details are included in the *Reservoir Register* (*Appendix 4*).

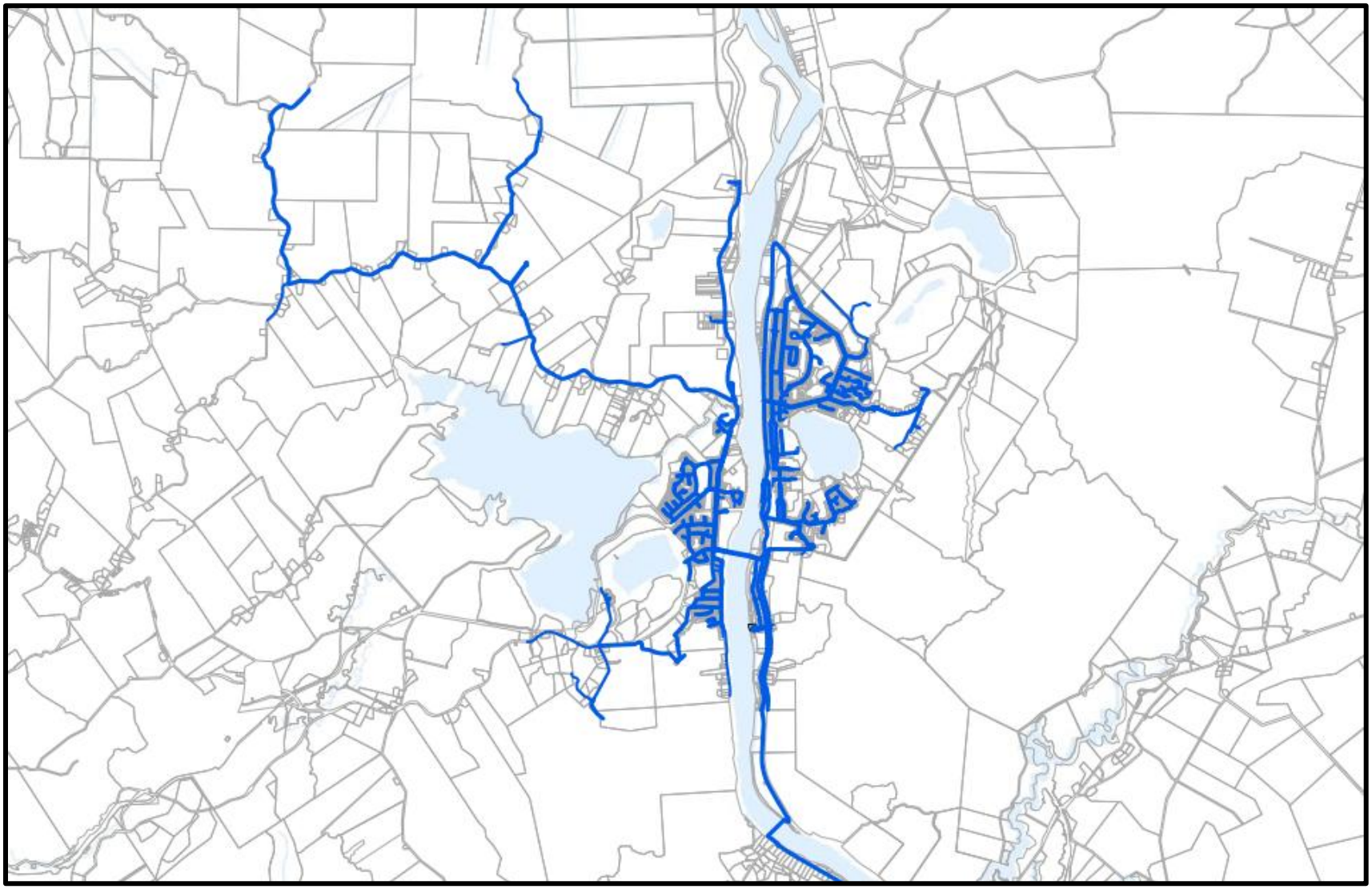

Figure 1: Huntly Water Supply Location.

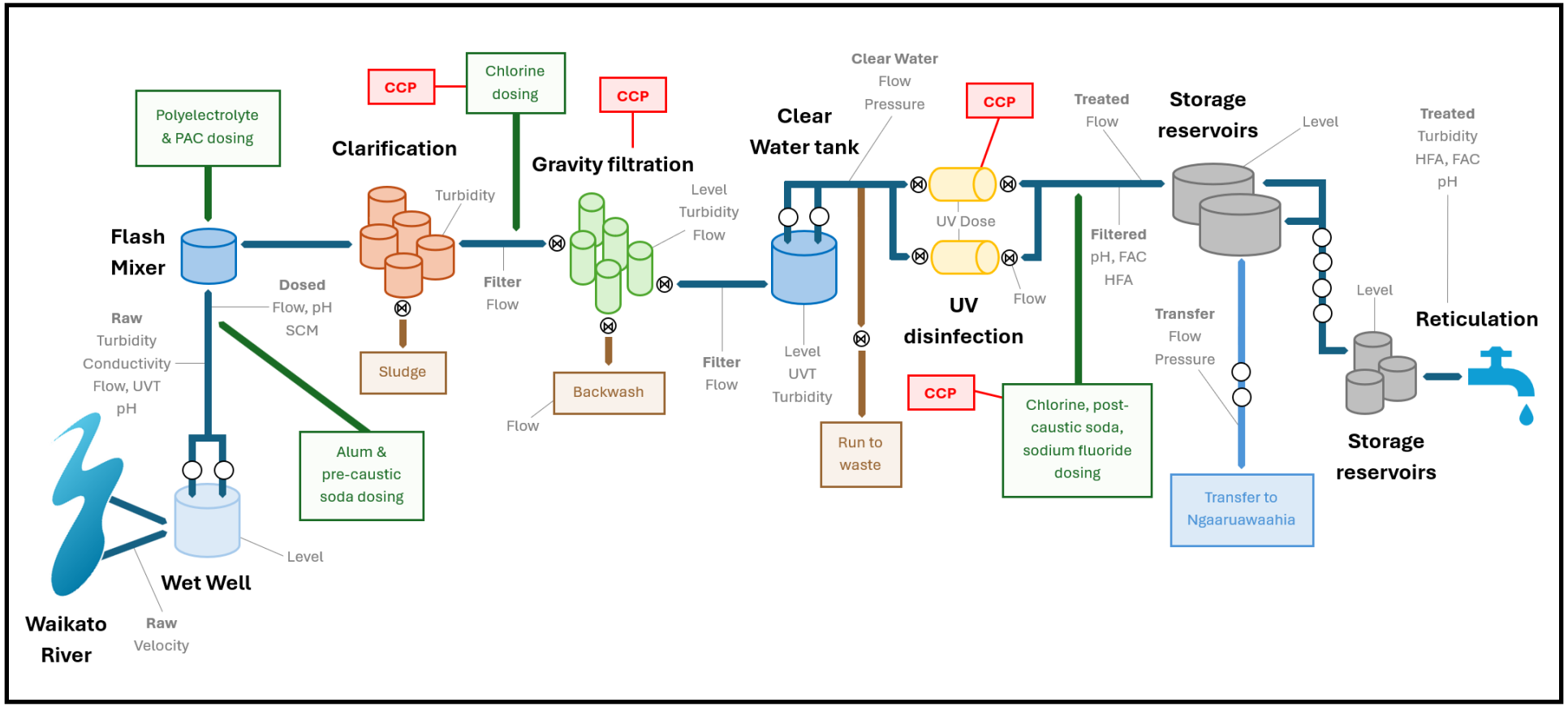

Figure 2: Huntly Water Supply Flow Diagram.

Ngaaruawaahia Water Supply System Description

Located on Brownlee Avenue, Ngaaruawaahia WTP supplies treated water for domestic, commercial, and industrial use across Ngaaruawaahia, Horotiu, Hopuhopu, and Taupiri. Ngaaruawaahia WTP uses conventional treatment processes: coagulation, flocculation, filtration, clarification, UV disinfection, chlorination and fluoridation to treat water sourced from the Waikato River. Urban areas receive on-demand supply, while rural areas are served via restricted supply.

Intake:

Raw water is abstracted from the Waikato River by two submersible pumps (duty/standby), housed in a wet well where water levels are continuously monitored. Intake screens prevent debris and aquatic life entry, supported by an automated backwash system powered by an air compressor. Key water quality parameters including turbidity, conductivity, UVT, and pH are continuously monitored to assess incoming water conditions. A flow meter monitors abstraction rate. Powdered activated carbon (PAC) is dosed seasonally at the intake for taste, odour, and cyanotoxin control. Backup power is available via a portable generator connection, with a mobile unit able to be delivered to site when required to operate the plant for the duration of an outage.

Coagulation, Flocculation and Clarification:

Alum and pre-caustic soda are dosed using dual duty/standby pump. PAC is added as required for taste, odour, and cyanotoxin control. Polyelectrolyte is dosed into the flash mixer via duty/standby pumps and mixed by an in-line static mixer. Alum, pre-caustic and polyelectrolyte dosing is flow-paced and adjusted using a streaming current meter, with jar testing used to optimise dosing.

Flow is divided between two clarifiers. A single turbidimeter monitors combined clarifier effluent. Sludge is discharged to the sewer for treatment at the Ngaaruawaahia WWTP. Prior to filtration, clarified water, housed in a clarified water tank, is dosed with caustic soda for final pH correction.

Filtration and UV Disinfection:

Clarified water is pumped via a lift station (two duty/standby pumps) to three gravity filters, each containing dual beds of sand and pumice. Prior to filtration, the water is dosed with HFA for fluoridation using a duty/standby pump. Each filter has a dedicated level meter, outflow meter, turbidimeter, and a filter-to-waste system is in place post-backwash. Filters are regularly backwashed or when triggered by turbidity, head loss, or manual override. Air scour is provided by one blower. Backwash water is drawn from the clear water tank and discharged to the Mangarata Stream.

Filtered water is collected in a clear water and pumped via two submersible pumps (duty/standby) the UV units. Two WEDECO Spektron 250e UV reactors (duty/manual standby) provide disinfection, validated to UVDGM standards *(Appendix 3)*. Any deviation from required dose triggers an alarm. Flow meters monitor flow exiting the UV units.

Chemical Dosing and Post-Treatment Monitoring:

Chlorine gas, housed in a 920 kg drum and a 70 kg cylinder (duty/standby), is dosed by a chlorinator post UV disinfection. Dosing is flow paced and feedback-controlled to a set point, delivered via a pressurised venturi vacuum system. Duty/standby pumps transfer water to the upper on-site reservoir, while an altitude valve controls flow to the lower reservoir, providing at minimum 30 minutes of contact time. Each reservoir has a capacity of 1,150 m^3 and is alarmed for high/low water levels, with alerts sent to the duty operator.

Final water is continuously monitored for flow, chlorine, pH, and fluoride. Monitoring equipment is calibrated weekly and validated quarterly or as per manufacturer requirements. Backup power is available via portable generator connection.

Divert to Waste and Backwash Discharge:

A divert-to-waste system is in place both post-filtration and post-UV disinfection, allowing flow to be redirected into two waste holding tanks. Water directed these tanks is dosed with sodium thiosulphate to neutralise residual chlorine and dechlorinate the water. From here, dechlorinated water is normally pumped to the Waingaro wastewater pumpstation for treatment at the Ngaaruawaahia WWTP.

However, despite the capacity in the holding tanks, wet weather events impacted by infiltration and inflow in the downstream sewerage network results in the inability to discharge the process wastewater into the sewerage network. In these instances, filter backwash and clear water from the holding tanks is discharged into Mangarata Stream, in accordance with consent conditions.

Reticulation and Reservoirs:

Treated water is gravity fed to the reticulation network and the Hopuhopu reservoir (1,134 m^3). The reservoir is alarmed for high and low water level, sending a message to the duty operator. The distribution network has been progressively upgraded and currently consists of PE, HDPE, and PVC pipes. Reservoir descriptions are included in the *Reservoir Register (Appendix 4).*

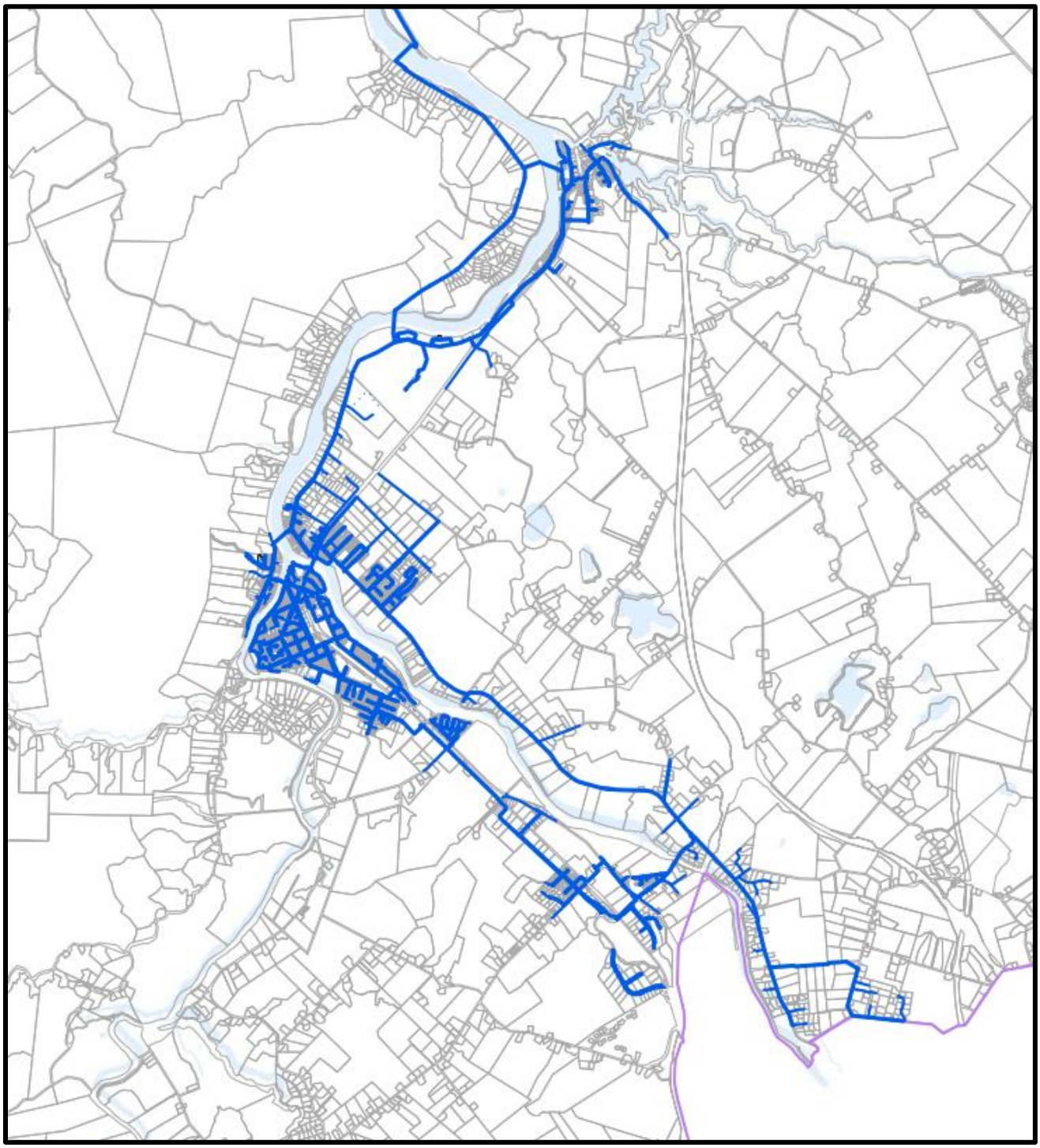

Figure 3: Ngaaruawaahia Water Supply Location.

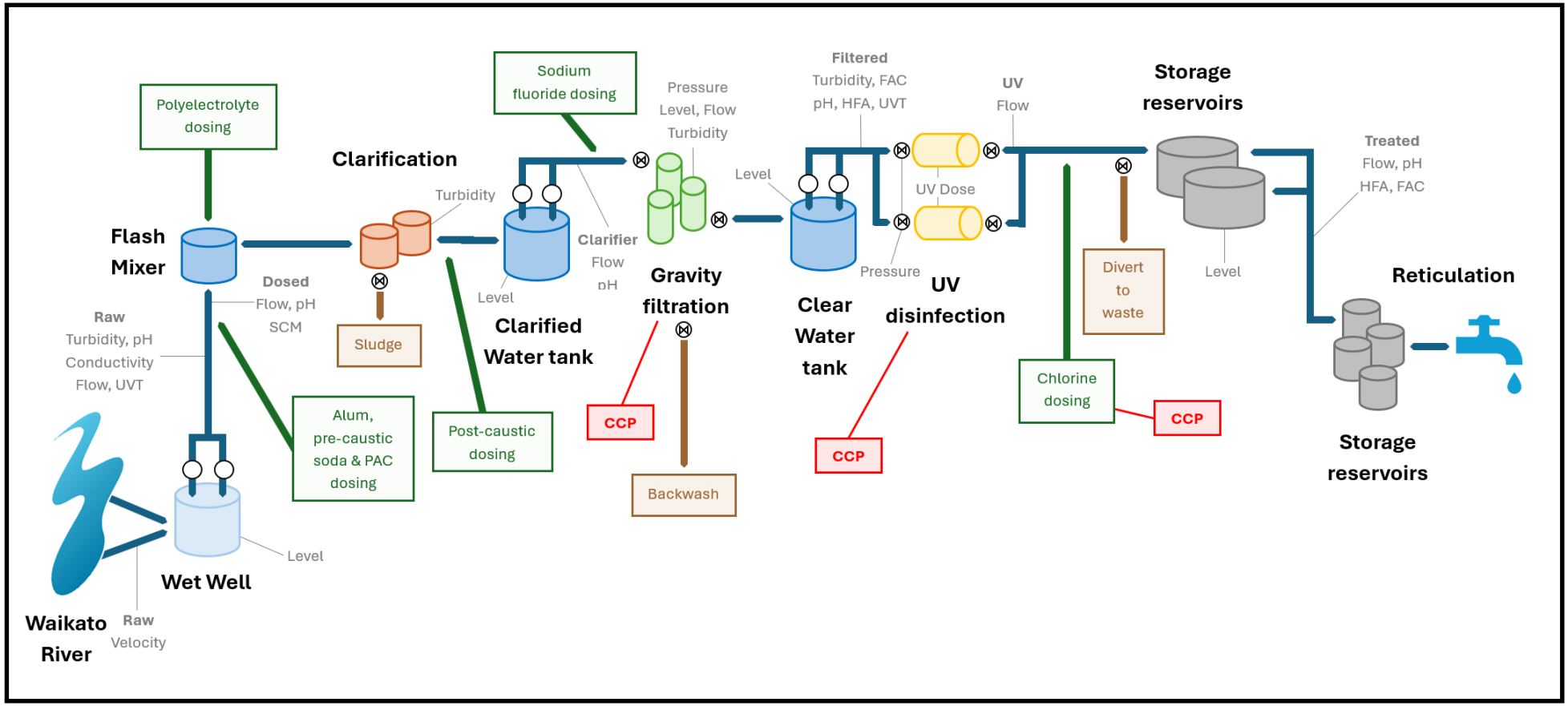

Figure 4: Ngaaruawaahia Water Supply Flow Diagram.

2. Risk Identification and Preventive Measures

A qualitative risk assessment of the Huntly and Ngaaruawaahia water supply systems is detailed in the *Water Supply Risk Table* (*Appendix 5*). The table identify potential public health risks across the entire supply system, with each hazardous event assessed based on its likelihood and consequence, and includes the following components:

- Catchment
- Intake
- Coagulation, Flocculation Sedimentation/PAC Dosing
- Filtration
- UV Disinfection
- Chlorination
- Clear Water Tank and Lift Pumps
- pH Correction
- Fluoridation
- Storage Reservoirs
- Reticulation
- Other

A multiple barrier approach is used to manage these risks. This approach ensures that if one barrier fails, others remain in place to maintain the safety and reliability of the supply. Key barriers include physical treatment processes, chemical dosing, operational monitoring, and system redundancies.

As part of this approach, Critical Control Points (CCPs) are established at key stages of the treatment process. These are process barriers and monitoring points designed to detect and respond to deviations that could compromise water safety. Each CCP has defined operational limits and is monitored at a frequency that ensures timely detection of any failures.

The location of CCPs are shown in the supply flow diagram and further details are included in *Critical Control Points (Appendix 6)*.

Table 4: Barriers and Preventative Measures in place at the Huntly and Ngaaruawaahia WTPs.

Four Types of Barriers	Existing Preventive Measures Include:
Preventing hazards entering the aw water	• Wedge wire intake screens - CCP
Removing particles and hazardous chemicals from the water by physical treatment	• Coagulation, Flocculation, Sedimentation • Rapid sand filtration – CCP
Killing or inactivating pathogens in the water by disinfection	• UV disinfection – CCP • Chlorination with contact time – CCP
Maintaining the quality of the water in the distribution system	• Residual disinfection maintained. • Hygiene and construction codes of practice • Adequate network pressures maintained • Backflow prevention programme • Reservoirs protected from ingress - CCP • Online continuous SCADA monitoring and alarms

3. Compliance Monitoring and Reporting Requirements

The Huntly and Ngaaruawaahia WTPs are required to demonstrate compliance with the Drinking Water Quality Assurance Rules (2022), revised 29 November 2024 (DWQAR) Level 3. The reporting period is monthly, with compliance data submitted to Taumata Arowai within 10 working days following the end of each month. Determinands listed in Table 5 are reported via API transfers from Water Outlook to Taumata Arowai's compliance database, Hinekorako. The sampling plan is detailed in *Appendix 7*.

Table 5: Monitoring Requirements for Huntly and Ngaaruawaahia WTPs.

Population	Determinands	Compliance Limit		Hazard	DWQAR	Sampling Frequency	Compliance Period
17,500	C.t	15 min.mg/L (min. 95%)		Bacteria	4.10.1.1 - T3.2	Continuous	1 Day
17,500	FACe	0.2 mg/L		Bacteria	4.10.1.1 - T3.3	Continuous	1 Day
17,500	T_{10}	5 minutes		Bacteria	4.10.1.1 - T3.4	Continuous	1 Day
17,500	Turbidity	< 1.0 NTU (min. 95%)		Bacteria	4.10.1.1 - T3.5	Continuous	1 Day
17,500	Turbidity	< 2.0 NTU (15-min max)		Bacteria	4.10.1.1 - T3.6	Continuous	1 Day
17,500	UV Flow	1.00 - 440m³/hr (90% UVT)		Bacteria	4.10.1.4 – T3.15	Continuous	1 Day
17,500	RED	>= 40 mJ/cm² (min. 95%)		Bacteria	4.10.1.4 - T3.16	Continuous	1 Day
17,500	RED	< 40 mJ/cm² (15-min max)		Bacteria	4.10.1.4 - T3.17	Continuous	1 Day
17,500	Turbidity	< 5.0 NTU (15-min max)		Bacteria	4.10.1.4 - T3.18	Continuous	1 Day
17,500	Turbidity	< 0.3 NTU (min 95%)		Protozoa	4.10.2.5 – T3.39	Continuous	1 Day
17,500	Turbidity	< 0.5 NTU (15-min max)		Protozoa	4.10.2.5 – T3.40	Continuous	1 Day
17,500	Turbidity	< 0.1 NTU (min. 95%)		Protozoa	4.10.2.7 – T3.47	Continuous	1 Day
17,500	Turbidity	< 0.3 NTU (15-min max)		Protozoa	4.10.2.7 – T3.48	Continuous	1 Day
17,500	UV Flow	1.00 - 440m³/hr		Protozoa	4.10.2.13 - T3.85	Continuous	1 Year
17,500	UV Dose	137.7 mJ/cm²	25.9 mJ/cm²	Protozoa	4.10.2.13 - T3.86	Continuous	1 Day
17,500	UV Dose	137.7 mJ/cm²	25.9 mJ/cm²	Protozoa	4.10.2.13 - T3.87	Continuous	1 Day
17,500	Turbidity	< 5.0 NTU (15-min max)		Protozoa	4.10.2.13 - T3.88	Continuous	1 Day
17,500	UVT	> 93.1% (min 95%)	> 85.5% (min 95%)	Protozoa	4.10.2.13 - T3.89	Continuous	1 Day
17,500	UVT	> 55.2% (15-min)	> 72% (15-min)	Protozoa	4.10.2.13 - T3.90	Continuous	1 Day
17,500	Chemical Constituents	DWQAR		Chemical	4.10.3 Tables 33 & 34	Various	Various

APPENDIX 1: GENERAL WATER SAFETY PLAN (VERSION 1.0)

Addresses the ten fundamental components for the provision of safe and secure drinking water across all WDC-owned water supplies in alignment with the *New Zealand Drinking Water Safety Plan Framework.*
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP General

APPENDIX 2: CATCHMENT RISK ASSESSMENT OF INTAKES ALONG THE WAIKATO RIVER

Identifies potential sources of contamination within the water supply catchment and assess risks to drinking water quality. Supports proactive risk management and informs mitigation strategies.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\Catchment Risk Assessment

APPENDIX 3: UV VALIDATION CERTIFICATE

Confirms that the WEDECO Spektron 250e UV reactors at Huntly and Ngaaruawaahia WTPs are validated to UVDGM standards. Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 4: RESERVOIR STORAGE MANAGEMENT PLAN

Details operational parameters and maintenance requirements for drinking water storage facilities, aligned with the *DWQAR D3.12*.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 5: WATER SUPPLY RISK TABLES

Summarises potential risks to drinking water quality for the Huntly and Ngaaruawaahia supplies, supporting control prioritisation and improvement planning.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 6: CRITICAL CONTROL POINTS

Outlines key process barriers and monitoring points to manage drinking water quality risks with defined limits and response protocols to mitigate public health risks.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 7: DISTRIBUTION NETWORK SAMPLING PLAN

Outlines WDC's distribution network compliance monitoring schedule, reviewed annually per DWQAR D3.18 and D3.28. Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 8: OPERATOR MONITORING AND MAINTENANCE SCHEDULE

Outlines a defined set of performance criteria used to assess and verify the functionality of key components within the water supply system. The Operator Monitoring and Maintenance Schedule is included in the General Drinking Water Safety Plan.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Huntly-Ngaaruawaahia

APPENDIX 9: STANDARD OPERATING PROCEDURES (SOPS)

Step-by-step instructions for routine tasks, maintenance activities, and incident response, ensuring compliance with regulatory requirements and best practice standards.
Available at: O:\Ops\Watercare Waikato\1. CONTROL of WORKS\CONTROL OF WORKS\SOPs\Production\Water