Title	**Describe drinking-water reticulation system management, and management of critical control points**		
Level	**5**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: describe the importance of maintaining continuity of supply of water and drinking-water; describe the factors that affect the risk of water supply contamination due to construction and maintenance of reservoirs and the reticulation system; describe the procedures for taking a reservoir and reticulation main out of service, cleaning, disinfection, and putting back into service; and identify critical control points**,** hazards, preventive actions, and corrective actions of water reticulation systems.

Classification	Water Industry > Water Reticulation

Available grade	Achieved

Guidance Information

1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.

2 Legislation and references relevant to this unit standard include: Health and Safety at Work Act 2015, Water Services Act 2021, Fire Service Act 1975, and subsequent amendments;
SNZ PAS 4509:2008 *New Zealand Fire Service Firefighting Water Supplies Code of Practice*;
Ministry of Health, *Drinking-Water Standards for New Zealand, 2005* (Revised 2018), Wellington: Ministry of Health, and subsequent replacements, available at www.taumataarowai.govt.nz*.*

3 Definitions
Critical control point – specific point, procedure, or step in water reticulation processes at which control can be exercised to reduce, eliminate, or prevent the possibility of a public health hazard.
Drinking-water supply – the supply catchment, treatment plant, and distribution including tankers. The drinking-water supplier has responsibility for managing the public health risks of the drinking-water supply.

Industry requirements may refer to but are not limited to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, site safety plans, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, procedural documents, Waka Kotahi New Zealand Transport Agency specifications and guidelines.
Water reticulation – in this context refers to all pipe systems, pumping systems, and components that contribute to the distribution of drinking-water.

Outcomes and performance criteria

Outcome 1

Describe the importance of maintaining continuity of supply of water and drinking-water.

Performance criteria

1.1 The supply of water and drinking-water is described in terms of the importance of continuity of supply, legislative requirements, and the implications for disruption of supply.

Range pressure requirements, flow, storage.

1.2 Water service requirements for point of supply options are described.

Outcome 2

Describe the factors that affect the risk of water supply contamination due to construction and maintenance of reservoirs and the reticulation system.

Performance criteria

2.1 Factors that contribute to poor water quality are described in terms of reticulation problem areas.

Range includes but is not limited to – low pressure areas, long detention times, chlorine levels and forms, dead ends, 'dead spots', flushing.

2.2 The causes and impacts of corrosion and hard water are described in terms of the chemistry of the water.

Range causes include but are not limited to – pH levels, hardness and alkalinity, langelier saturation index.

2.3 The opportunities for contamination during new pipeline construction are described in terms of water quality risks, and methods to reduce these risks.

Range includes but is not limited to – pipe storage, site cleanliness, hygiene facilities, personal hygiene, trench inundation, pipe plugs, flushing, disinfection.

2.4 The opportunities for contamination during maintenance are described in terms of water quality risks, and methods to reduce these risks.

Range includes but is not limited to – positive water flows, site cleanliness, trench inundation, flushing, pigging, disinfection, air scouring, hygiene facilities, personal hygiene.

2.5 The opportunities for contamination due to inadequate reservoir maintenance or security are described in terms of water quality risks and methods to reduce these risks.

Range includes but is not limited to – protective equipment, site cleanliness, washing, disinfection, construction and security requirements, hygiene facilities, personal hygiene.

2.6 The hazards and causes of backflow, and methods of prevention in drinking-water reticulation systems are described in terms of the strengths and limitations of prevention methods.

Range evidence is required for three prevention methods.

Outcome 3

Describe the procedures for taking a reservoir out of service, cleaning, disinfection, and putting back into service.

Performance criteria

3.1 The purpose and timing of the procedures are described with consideration for safety.

Range may include but is not limited to – safety plan(s) for confined space entry and/or excess height access, hazardous chemicals use.

3.2 The procedures to draw down the reservoir, take out of service, and drain down are described.

3.3 The procedures for advising consumers and providing an alternative water supply are described.

3.4 The cleansing procedure is described.

3.5 The method and procedures for chlorine application are described.

Range includes but is not limited to – dose levels, times, test measurements, disposal of chlorinated water in an environmentally acceptable manner.

3.6 The procedures for refilling the reservoir, checking the water quality and putting back into service, are described.

Outcome 4

Describe the procedures for taking a reticulation main out of service, cleaning, disinfection, and putting back into service.

Performance criteria

4.1 The purpose and timing of the procedures are described with consideration for safety.

Range may include but is not limited to – safety plan(s) for confined space entry, trench safety, traffic, excess height access, hazardous chemicals use.

4.2 Procedures for advising consumers and providing an alternative water supply are described.

4.3 Procedures for reticulation main shut-down and draining are described.

4.4 The repair procedure and reticulation mains flush are described.

4.5 Procedure for chlorine application is described.

Range includes but is not limited to – method, dose levels, times, test measurements, methods of disposal of chlorinated water in an environmentally acceptable manner.

4.6 The procedure for mains refill, water quality check, and mains put back into service is described.

Outcome 5

Identify critical control points, hazards, preventive actions, and corrective actions of water reticulation systems.

Range piped reticulation systems, service reservoirs, reticulation components.

Performance criteria

5.1 The critical control points in water reticulation system disinfection are identified.

5.2 The hazards, the causes of the events leading to their appearance, and the level of risk are identified at each critical control point.

5.3 The preventive and corrective actions for persistent problems or events related to each hazard are identified.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 August 2001	31 December 2018
Revision	2	12 February 2003	31 December 2018
Review	3	19 September 2008	31 December 2018
Review	4	16 March 2017	31 December 2023
Review	5	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference	0101

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.