

Title	Describe drinking-water contaminants of public health significance		
Level	5	Credits	8

Purpose	People credited with this unit standard are able to describe: the relationship between drinking-water supply systems and public health; pathogenic micro-organisms relevant to water supplies; the unique features, signs of presence, and trigger levels of cyanobacteria found in New Zealand; common water borne diseases; the use of indicator organisms for water quality and for water-supply performance monitoring; the burden of disease, the incidence of sporadic disease, and water-borne disease outbreaks; the chemistry of drinking-water supplies and the chemicals of public health significance that may be found in drinking water supplies; and public health toxicological principles as they apply to drinking-water.
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Classification	Water Industry > Water Treatment
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Available grade	Achieved
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Guidance Information

- 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.
- Legislation and references relevant to this unit standard include: Health and Safety at Work Act 2015, Water Services Act 2021 and subsequent amendments; Ministry of Health, *Drinking-water Standards for New Zealand*, Ministry of Health, Wellington, 2005 (Revised 2018), and subsequent replacements, available at www.taumataarowai.govt.nz.
- Definitions
Drinking-water supply – 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 include manufacturers' specifications; and enterprise requirements which may include documented workplace policies, procedures, specifications, business, and quality management requirements relevant to the workplace in which assessment is carried out.
- Learning and assessment activities for this unit standard must be informed by Te Mana o te Wai (refer to [Taumata Arowai](http://www.taumataarowai.govt.nz)) and the *National Policy Statement for Freshwater Management 2020* available from <https://environment.govt.nz/>.

Outcomes and performance criteria

Outcome 1

Describe the relationship between drinking-water supply systems and public health.

Performance criteria

- 1.1 The purposes of drinking-water supply systems are described in terms of protection of public health of communities.
- Range may include but is not limited to – uses of water, potability of water, ability to prevent endemic diseases, examples of disease outbreaks due to non-potable supplies.
- 1.2 Drinking-water supplies are described in terms of the implications of the development of public health services in New Zealand.

Outcome 2

Describe pathogenic micro-organisms relevant to water supplies.

Range bacteria, viruses, cyanobacteria, protozoa, helminths.

Performance criteria

- 2.1 Pathogens are described in terms of their impact on human health.
- 2.2 Pathogens are described in terms of their microbiological classification.
- 2.3 Pathogens are described in terms of their size, prevalence, and life cycle.
- 2.4 Pathogens are described in terms of their susceptibility to water treatment processes.

Outcome 3

Describe the unique features, signs of presence, and trigger levels of cyanobacteria found in New Zealand.

Performance criteria

- 3.1 Cyanobacteria are described in terms of the signs of their presence, and trigger levels for action.
- 3.2 Cyanobacteria are described in terms of their unique features relating to toxicity.
- Range toxin production and frequency, factors stimulating toxicity.

Outcome 4

Describe common water borne diseases.

Performance criteria

- 4.1 The cause and general symptoms of water borne diseases are described in terms of the pathogen, significance, prevalence, infective dose, factors affecting susceptibility, and pathways of contamination.

Outcome 5

Describe the use of indicator organisms for water quality and for water-supply performance monitoring.

Performance criteria

- 5.1 The use of faecal coliform and *E. coli* testing as an indicator of faecal contamination is described in terms of water quality monitoring.
- Range includes but is not limited to – advantages/disadvantages of this test, disease risk, most probable number concept, membrane filter methods, enzyme substrate methods, the referee method concept and the choice of the enzyme substrate method as the referee method for *E. coli*.
- 5.2 The use of other common indicators is described in terms of indicators for faecal contamination or for water supply performance monitoring.
- Range includes but is not limited to – heterotrophic plate count testing, turbidity monitoring, free available chlorine, biofilm.

Outcome 6

Describe the burden of disease, the incidence of sporadic disease, and water-borne disease outbreaks.

Performance criteria

- 6.1 Water-borne diseases are described in terms of their occurrence, prevention, and investigation.
- 6.2 Epidemiological investigation of disease outbreaks are described in terms of their methods and limitations.
- 6.3 Sporadic water-borne disease and outbreaks are described in terms of the relative importance to the overall disease burden.
- 6.4 Sporadic water-borne diseases are described in terms of the limitations of reporting and investigation.

Outcome 7

Describe the chemistry of drinking-water supplies and the chemicals of public health significance that may be found in drinking water supplies.

Performance criteria

- 7.1 Chemical contaminants in the New Zealand drinking-water supply are described in terms of their significance and source.
- 7.2 Radiological contaminants are described in terms of their testing frequency, significance, and source.

Outcome 8

Describe public health toxicological principles as they apply to drinking-water.

Performance criteria

- 8.1 Public health toxicology is described in terms of its application to drinking-water supplies.

Replacement information	This unit standard replaced unit standard 18460.
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Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 September 2008	31 December 2018
Review	2	16 March 2017	31 December 2024
Review	3	26 May 2022	N/A

Consent and Moderation Requirements (CMR) reference	0101
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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@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.