Title	**Demonstrate knowledge of flows in wastewater and flow measurement techniques**		
Level	**4**	**Credits**	**4**

Purpose	People credited with this unit standard are able to demonstrate knowledge of external factors affecting wastewater flows, and flow measurement techniques for wastewater.

Classification	Water Industry > Water Reticulation

Available grade	Achieved

Guidance Information

1 Legislation and references relevant to this unit standard include:
Health Act 1956;
Health and Safety at Work Act 2015;
Local Government Act 2002;
Resource Management Act 1991, and subsequent amendments;
AS 2865:2009 *Confined spaces,* available from https://infostore.saiglobal.com/;
NZS 4404:2010 *Land Development and Subdivision Infrastructure,* available from http://www.standards.govt.nz;
Local authority hygiene codes.

2 Definition
Water reticulation – in this context refers to all pipe systems, pumping systems, and components that contribute to the collection and disposal of wastewater and stormwater.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of external factors affecting wastewater flows.

Performance criteria

1.1 Sewer flows are described in terms of design criteria for pipe capacity.

Range flows – domestic, commercial, industrial.

1.2 Sewer flows are described in terms of the reasons for their variability.

1.3 Inflow, infiltration, and exfiltration are described and distinguished in terms of source and potential causes.

1.4 Excessive infiltration and exfiltration are described in terms of their consequences.

1.5 Methods used to identify, prevent, or reduce inflow, infiltration, and exfiltration are described in terms of their techniques.

Outcome 2

Demonstrate knowledge of flow measurement techniques for wastewater.

Performance criteria

2.1 Gravity flow measurement is described in terms of methods used.

Range weirs, flumes; open channel meters – velocity measurement and ultrasonic or pressure depth sensors.

2.2 Pressure flow measurement is described in terms of the meter types used and suitable situations for their use.

Range magflow, ultrasonic, pressure transducer.

2.3 Network flow simulation models are described in terms of their type, operation, and purpose.

Replacement information	This unit standard, unit standard 19212 and unit standard 22112 were replaced by unit standard 31527.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 October 2005	31 December 2016
Rollover	2	20 February 2009	31 December 2016
Rollover	3	21 July 2011	31 December 2018
Review	4	16 March 2017	31 December 2021
Review	5	29 November 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference	0101

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