

Title	Demonstrate knowledge of irrigation systems, components, and performance		
Level	4	Credits	6

Purpose	People credited with this unit standard are able to demonstrate knowledge of: irrigation systems; irrigation system components, faulty components, and blockages; and irrigation system performance.
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Classification	Water Industry > Irrigation
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Available grade	Achieved
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Guidance Information

- 1 Legislation relevant to this unit standard includes but is not limited to the Health and Safety at Work Act 2015.
- 2 Definition
Organisational procedures – the verbal and written instructions to staff on irrigation system performance.
- 3 Reference
Irrigation Code of Practice: On-Farm Evaluation, referred to as the Irrigation Code of Practice is available from Irrigation NZ, <https://www.irrigationnz.co.nz/>.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of irrigation systems.

Performance criteria

- 1.1 Irrigation systems are compared in terms of costs and benefits.

Range irrigation systems include but are not limited to – centre pivot, linear move, traveling gun, traveling linear boom, traveling rotating boom, sprayline, fixed sprinkler, drip-micro, surface.

- 1.2 Irrigation systems are described in terms of their comparative advantages and disadvantages.
- Range irrigation systems include but are not limited to – center pivot, linear move, traveling gun, traveling linear boom, traveling rotating boom, sprayline, fixed sprinkler, drip-micro, surface.
- 1.3 Irrigation terms and principles are defined in accordance with their use in industry.
- Range potential evapo-transpiration, crop factor, crop irrigation requirement, readily available water, root zone, water-holding capacity, soil moisture deficit, trigger point, management allowed depletion, infiltration rate, application rate, application depth, return interval, field capacity wilting point.

Outcome 2

Demonstrate knowledge of irrigation system components, common faults, and blockages.

Performance criteria

- 2.1 Irrigation system and component function are described in terms of their importance in an irrigation system, and their working principles.
- Range irrigation systems include but are not limited to – center pivot, linear move, traveling gun, traveling boom, traveling rotating boom, sprayline, fixed sprinkler, drip-micro, surface; components include but are not limited to – pumps, flow meter, filters (screen, media, disk/ring, cyclone) pressure gauge, injectors, controllers, computer and/or other scheduling devices, valves (pressure regulating, flow regulating, solenoid, wiring, quick coupling, flushing), off-takes, pipes (mainline, sub-mains, laterals), emission devices (sprinklers, sprays, rotators, jets, emitters, integrated dripline), seals, outlets, gears.
- 2.2 Monitoring and maintenance records are described in terms of their features.
- Range log books, fault records, power log books.
- 2.3 Faults in components and blockages are described in terms of the reasons for their occurrence, and potential impact on the system.
- Range components include but are not limited to – pumps, flow meter, filters (screen, media, disk/ring, cyclone) pressure gauge, injectors, controllers, computer and/or other scheduling devices, valves (pressure regulating, flow regulating, solenoid, wiring, quick coupling, flushing), off-takes, pipes (mainline, sub-mains, laterals), emission devices (sprinklers, sprays, rotators, jets, emitters, integrated dripline), seals, outlets, gears.

Outcome 3

Describe irrigation system performance.

Range irrigation systems include but are not limited to – centre pivot, linear move, traveling gun, traveling boom, traveling rotating boom, sprayline, fixed sprinkler, drip-micro, surface.

Performance criteria

3.1 System pressures and flows are described in accordance with organisational procedures and Irrigation Code of Practice.

Range measuring equipment includes but is not limited to – flow meter, collectors (catch cans), pressure gauge, pitot gauge, pressure transducers, air lines; evidence is required for at least five.

3.2 Irrigation system operational performance indicators are described in accordance with organisational procedures and Irrigation Code of Practice.

Range includes but is not limited to – variations in pressures, water flow rates, variations in water flow, distribution, equipment and component function, sprinkler performance, drag hose condition, nozzle condition.

3.3 Irrigation system key performance indicators are described in accordance with organisational procedures and Irrigation Code of Practice.

Range water use efficiency, energy, labour, capital, effectiveness, environment, flow rate, water velocity.

3.4 Factors external to the system that may cause interference are described in accordance with organisational procedures and Irrigation Code of Practice.

Range external factors may include but are not limited to – pests and vermin, organic, fire, mechanical damage, power spikes, power failures, storm run off, system breakage.

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	19 August 2004	31 December 2022
Review	2	27 February 2020	31 December 2022

Consent and Moderation Requirements (CMR) reference	0179
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.