



Australian Government

Department of Education, Employment and Workplace Relations

AHCIRG423A Manage a surface irrigation system

Release: 1

AHCIRG423A Manage a surface irrigation system

Modification History

Not applicable.

Unit Descriptor

This Unit covers the process of managing a surface irrigation system and defines the standard required to: develop procedures for system operation; troubleshoot faults and blockages; measure performance of the system; and benchmark energy use and water efficiency of the system.

Application of the Unit

This Unit applies to irrigation managers of irrigation systems in the amenity horticulture and food and fibre production industries.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This Unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Ensure <i>the surface irrigation system</i> is prepared for operation	1.1 Staff are trained in carrying out pre-start checks and routine servicing 1.2 The irrigation controller is programmed and/or adjusted to meet the required schedule 1.3 Procedures are established for adjusting valves and checking filters and emitters
2 Develop and implement start-up and shutdown procedures for a surface irrigation system	2.1 Start-up procedures for a sprinkler irrigation system are developed according to system specifications and technical manuals 2.2 Training is provided in priming pumps and setting gates to commence irrigating 2.3 Shut down sequence and isolation procedures are developed according to system specifications and technical manuals 2.4 Soil conditions for operation are specified, or tracks maintained, to reduce compaction
3 Measure performance of a surface irrigation system	3.1 Variations in pressures at the headworks and control valves are recorded in accordance with enterprise policy and procedures 3.2 Water flow rates are measured and recorded in accordance with enterprise policy and procedures 3.3 Variations in water flow and distribution are identified and recorded in accordance with enterprise policy and procedures 3.4 Pump performance parameters are measured as necessary and recorded in accordance with enterprise policy and procedures 3.5 Variations in pump performance parameters are measured where relevant and recorded in accordance with enterprise policy and procedures 3.6 Distribution, drainage and water measurement systems are inspected and malfunctions in system are identified, fixed and actions recorded in accordance with enterprise policy and procedures 3.7 Factors external to the system that may cause interference are identified and recorded in accordance with enterprise policy and procedures
4 Review system performance status	4.1 System pressures and variations are recorded in accordance with enterprise policy and procedures 4.2 System flow rates and variations are recorded in accordance with enterprise policy and procedures 4.3 Distribution uniformity and mean application rates are calculated and recorded in accordance with enterprise policy and procedures

- 4.4 Watering depth is determined and recorded in accordance with enterprise policy and procedures
- 4.5 Quantity and quality of tailwater are measured, and amount of water reused
- 4.6 Calculations are made for energy use and water efficiency and compared to industry benchmarks

Required Skills and Knowledge

This section describes the skills and knowledge required for this Unit.

Required skills include:

Ability to:

- develop procedures and provide training to staff to
- set up pipes, system equipment and outlets
- use syphons
- check pressure at the headworks and control valves
- carry out running repairs on irrigation delivery and drainage systems
- carry out shut down procedures
- develop procedures for starting up, carrying out operational checks and shutting down
- provide supervision and training
- measure and record water flow rates
- identify and record variations in water flow and distribution
- identify adverse environmental impacts of irrigation activities and appropriate remedial action
- implement and follow relevant enterprise OHS and environmental policies and procedures.

Required knowledge includes:

Knowledge of:

- main components of surface irrigation systems
- set up of headwater, tailwater, channels and beds
- pump types used in surface irrigation systems and their operating requirements
- physical soil characteristics such as infiltration rate, water holding capacity and wetted volume in the root zone
- water in soils and plants
- water requirements of plants/crops consistent with sound environmental management
- critical measures for moisture availability:
 - readily available water
 - water holding capacity
 - wilting point
 - field capacity
 - infiltration rates
 - evapotranspiration
- soil moisture testing techniques
- environmental impacts of irrigation using water from any ground or underground source
- pump types used in surface irrigation systems and their operation
- in accordance with enterprise policy and procedures

- calculating irrigation efficiency
- using records to review an irrigation system.

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this Unit	<p>The evidence required to demonstrate competency in this Unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following:</p> <ul style="list-style-type: none"> • develop procedures for system operation • troubleshoot faults and blockages • measure performance of the system • benchmark energy use and water efficiency of the system
Context of and specific resources for assessment	<p>Competency requires the application of work practices under work conditions. Selection and use of resources for some worksites may differ due to the regional or enterprise circumstances.</p>

Range Statement

The range statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Surface irrigation systems may include:

any systems that apply water across the surface of a levelled or contoured area. These include furrow, border and basin irrigation.

Unit Sector(s)

Irrigation