



Australian Government

Department of Education, Employment and Workplace Relations

SFIAQUA211C Undertake routine maintenance of water supply and disposal systems and structures

Release: 1

SFIAQUA211C Undertake routine maintenance of water supply and disposal systems and structures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency involves carrying out routine maintenance and minor repairs on a water supply and disposal system or structures and its various components. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	This unit covers closed and semi-enclosed systems only (i.e. not open water). It does not include activities associated with electrical systems or supply. All enterprise or workplace procedures and activities are carried out according to <i>relevant government regulations, licensing and other compliance requirements</i>, including <i>occupational health and safety (OHS) guidelines, food safety and hygiene regulations and procedures</i>, and <i>ecologically sustainable development (ESD) principles</i>. Equipment operation, maintenance, repairs and calibrations are undertaken in a safe manner that conforms to manufacturer instructions. Appropriate <i>personal protective equipment (PPE)</i> is selected, checked, used and maintained.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Instructions on required maintenance and repairs are taken and understood. 1.2. Basic tools/equipment and spare parts are collected, assessed as serviceable, and taken to site. 1.3. Identified tasks are reviewed at the work site against instructions, prioritised and, if necessary, clarified with the supervisor.
2. Undertake maintenance and repairs	2.1. Water supply or disposal system or structure is shut down or controlled, as instructed, and an alternative supply or disposal system enabled before beginning maintenance and repairs. 2.2. Mechanical equipment is serviced, under supervision, according to manufacturer guidelines. 2.3. Water supply or disposal system or structure is kept free of impediments and worn or damaged parts or areas are replaced or repaired, as instructed, using repair techniques appropriate for the task.
3. Follow up maintenance and repair activities	3.1. Water supply or disposal system or structure is returned to working order according to enterprise procedures. 3.2. Critical flow rates are measured and recorded. 3.3. Waste is disposed of appropriately. 3.4. Water supply and disposal system or structure are visually inspected for non-standard operation and observations reported.
4. Finalise and review maintenance and repair activities	4.1. Clean up of work area, including repairs and storage of equipment, is supervised, and condition report prepared. 4.2. Relevant maintenance and repair data is recorded legibly and accurately, and any out of range or unusual records are checked. 4.3. Compliance and other required reports are prepared and conveyed to senior personnel advising of the effectiveness of maintenance and repair, and recommendations made for improvements. 4.4. Feedback on own work performance is sought from supervisor and opportunities to improve identified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- applying repair techniques appropriate for the maintenance and repairs being undertaken
- communicating ideas on possible improvements
- communicating with supervisor on routine maintenance matters
- following electrical safety procedures and standards when carrying out repairs
- providing oral reports to supervisor on maintenance and repair tasks
- using hand and power tools safely for maintenance and repair tasks.

Literacy skills used for:

- interpreting flow meters and gauges
- interpreting maintenance schedules
- interpreting manufacturer operation and service manuals.

Numeracy skills used for:

- calculating volume and flow rate
- measuring length and depth.

Required knowledge

- basic design principles and components of specific water supply and disposal systems or structures
- consequences of disabled water supply and disposal systems or structures
- ESD principles
- enterprise OHS procedures for working on site
- enterprise procedures for undertaking maintenance and repairs and reporting non-standard operations
- general maintenance requirements for specific water supply and disposal systems or structures and their components
- general operating principles of specific types of pumps and treatment structures
- local council or government requirements for water supply and disposal systems or structures
- operation and maintenance of automatic or mechanised equipment
- techniques appropriate for the maintenance and repairs being undertaken.

Evidence Guide

EVIDENCE GUIDE

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.

Overview of assessment

Critical aspects for assessment evidence required to demonstrate competence in this unit

Assessment must confirm the ability to:

- maintain and repair water supply and disposal systems and structures, including safely shutting down and restarting water supply and disposal systems and structures with minimal stress or damage to stock.

Assessment must confirm knowledge of:

- general maintenance requirements for specific water supply and disposal systems or structures
- safe work practices
- techniques appropriate for the maintenance and repairs being undertaken.

Context of and specific resources for assessment

Assessment is to be conducted at the workplace or in a simulated work environment, maintaining and making minor repairs to pumps, aerators and filters typically used in aquaculture enterprises in the region.

Resources may include:

- hand and power tools and parts relevant to the water supply and disposal system or structure
- maintenance schedule and enterprise procedures
- manufacturer operation and service manuals
- water supply and disposal system or structure.

Method of assessment

The following assessment methods are suggested:

- demonstration
- practical exercises
- project work
- written or oral short-answer testing.

Guidance information for assessment

This unit may be assessed holistically with other units within a qualification.

Range Statement

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.

Relevant government regulations, licensing and other compliance requirements may include:

- biodiversity and genetically modified organisms
- biosecurity, translocation and quarantine
- business or workplace operations, policies and practices
- environmental hazard identification, risk assessment and control
- food safety/Hazard Analysis Critical Control Point (HACCP), hygiene and temperature control along chain of custody, and Australian Quarantine Inspection Service (AQIS) Export Control (Fish) orders
- health and welfare of aquatic animals
- Indigenous land rights and cultural activities, including fishing by traditional methods
- maritime operations, safety at sea and pollution control
- OHS hazard identification, risk assessment and control.

OHS guidelines may include:

- appropriate workplace provision of first aid kits and fire extinguishers
- codes of practice, regulations and/or guidance notes which may apply in a jurisdiction or industry sector
- enterprise-specific OHS procedures, policies or standards
- hazard and risk assessment of workplace, maintenance activities and control measures
- induction or training of staff, contractors and visitors in relevant OHS procedures and/or requirements to allow them to carry out their duties in a safe manner
- OHS training register
- safe lifting, carrying and handling techniques, including manual handling, and the handling

RANGE STATEMENT	
	and storage of hazardous substances • safe systems and procedures for outdoor work, including protection from solar radiation, fall protection, confined space entry and the protection of people in the workplace • systems and procedures for the safe maintenance of property, machinery and equipment, including hydraulics and exposed moving parts • the appropriate use, maintenance and storage of PPE.

RANGE STATEMENT	
<i>ESD principles</i> may include:	• applying animal welfare ethics and procedures • control of effluents, chemical residues, contaminants, wastes and pollution • control of weeds, pests, predators and diseases, and stock health maintenance • improving energy efficiency • increasing use of renewable, recyclable and recoverable resources • minimising noise, dust, light or odour emissions • preventing live cultured or held organisms from escaping into environment • reducing emissions of greenhouse gases • reducing energy use • reducing use of non-renewable resources • undertaking environmental hazard identification, risk assessment and control • undertaking facility quarantine, biosecurity and translocation of livestock and genetic material • using and recycling of water, and maintaining water quality.
<i>Food safety and hygiene regulations and procedures</i> may include:	• Australian Shellfish Sanitation program • equipment design, use, cleaning and maintenance • exporting requirements, including AQIS Export Control (Fish) orders • HACCP, food safety program, and other risk minimisation and quality assurance systems • location, construction and servicing of seafood premises • people, product and place hygiene and sanitation requirements • Primary Products Standard and the Australian Seafood Standard (voluntary) • product labelling, tracing and recall • receipt, storage and transportation of food, including seafood and aquatic products • requirements set out in Australian and New Zealand Food Authority (ANZFA) Food Standards Code and state and territory food regulations • temperature and contamination control along

RANGE STATEMENT	
	chain of custody.

RANGE STATEMENT	
<i>PPE</i> may include:	• buoyancy vest or personal floatation device (PFD) • hard hat or protective head covering • hearing protection (e.g. ear plugs and ear muffs) • non-slip and waterproof boots (gumboots) or other safety footwear • personal locator beacon or Emergency Position Indicating Radio Beacon (EPIRB) • protective eyewear, glasses and face mask • protective outdoor clothing for tropical conditions • respirator or face mask • safety harness • sun protection (e.g. sun hat, sunscreen and sunglasses) • uniforms or overalls • waterproof clothing (e.g. wet weather gear and waders).
<i>Instructions</i> may include:	• council and government regulations • maintenance schedules • manufacturer guidelines for maintenance • repair logs • verbal instructions.
<i>Basic tools/equipment</i> may include:	• cleaning rags • concrete • fibreglass and tools • glue, primer and sandpaper • oil and/or grease gun • plugs or repair patches • safety equipment (e.g. goggles, mask or breathing equipment) • screwdrivers, spanners or socket set, stilson, hack saw and heat guns • silicone or similar sealant • spade, shovel, pick and crowbar • thread/plumber's tape.
<i>Spare parts</i> may include:	• concrete • fibreglass webbing, gels and hardeners • fittings (e.g. joints, valves, mark boards, barrel unions and reducers)

RANGE STATEMENT	
	• pipe lengths • pipe saddles or clamps • protection strips • sand and gravel.

RANGE STATEMENT	
<i>Water supply and disposal system or structure</i> may include:	• channels, canals or trenches (e.g. earthen, concrete or plastic-lined) • depth gauges • float switches and solenoids • flow control devices (e.g. taps, valves, float valves, monks, dykes, weirs and gates) • flow meters and pressure gauges • header tank • hoses • intake structure support screens • non-return mechanisms • pipes (e.g. metal, PVC, rubber, concrete or polyethylene/polypropylene), pressure or sewage rating • pumps, bores and windmills • roaded banks • sediment dams • settlement tanks • sieves, filters, outlet screens or other mechanical, chemical or biological treatment structures • siphons, including reducing diameter pipes • spill ways/outlets • sprays • storage dams or reservoirs • sumps.
<i>Mechanical equipment</i> may include:	• aerator • filtration plant, including mechanical, chemical and biological • gravity flow system • ozonators • pumps: • airlift • axial • centrifugal • current/tide activated • dosing • fire • hydraulic ram • magnetic drive

RANGE STATEMENT	
	• piston • pressure • regenerative turbine • screw or helical drive • self-priming or non-priming • sludge or surge • submersible • venturi • windmills • pumps powered by: • battery • cable • diesel or petrol • electricity (single or 3-phase) • hydraulics • solar • wind • ultraviolet (UV) filter.

RANGE STATEMENT	
<i>Impediments</i> may include:	• dead plant or animal matter • fouling species • plant or weed growth • sediment and debris.
<i>Worn or damaged parts or areas</i> may include:	• chemical and biological filters • depth gauges • fittings, such as joints, valves and boards • flow control devices (e.g. taps, valves, float valves, monks, dykes, weirs and gates) • pipes • pumps and mechanical components • sides or bottoms of earthen, concrete, fibreglass or plastic-lined supply and disposal systems or structures • treatment structures and mechanical components (e.g. sieves, filters and aerators).
<i>Repair techniques</i> may include:	• applying plugs or patches • fibreglassing • fitting joints, valves and boards • laying and joining pipes (with or without glue or other fixatives) • metal welding • mixing, pouring and curing concrete • plastic welding • working and shaping earth.
<i>Waste</i> may include:	• dead plant or animal matter • sludge • structure and site debris • worn and damaged parts or tools.
<i>Relevant maintenance and repair data</i> may include:	• critical flow rates • inventory of spare parts • general observations on condition of systems • result of maintenance and repair.

Unit Sector(s)

Unit sector	Aquaculture operations
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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