



Australian Government

MSS024006 Perform sampling and testing of water

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS024006A Perform sampling and testing of water

Application

This unit of competency covers the ability to sample natural, polluted and process water for both chemical and microbiological parameters and perform field measurements on them.

This unit of competency is applicable to environmental technicians working in a range of industry sectors, such as environmental services (e.g. sampling and monitoring of water); clean water (e.g. catchments, supply and environmental flows); natural resource management; water treatment, storm and wastewater management; environmental compliance, auditing and inspection; solid and hazardous waste management; site remediation; management of contaminated sites; geotechnical services and civil engineering.

While no specific licensing or certification requirements apply to this unit at the time of publication, environmental monitoring and management activities are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Sampling and testing

Unit Sector

Environmental

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|---|----------------|-----|---|
| 1 | Confirm | 1.1 | Confirm the sampling location, number and type of |
|---|----------------|-----|---|

- sampling and testing requirements**
- 1.2 Check that all sampling and testing procedures are in accordance with client or workplace requirements, relevant standards and codes.
- 2 **Prepare for water sampling**
- 2.1 Identify site and sampling hazards and review workplace safety procedures.
- 2.2 Liaise with relevant personnel to arrange site access and all necessary clearances and/or permits.
- 2.3 Select sampling equipment and conditions to achieve representative samples and preserve sample integrity during collection, storage and transit.
- 2.4 Ensure all reagents, solutions, standards and blanks (as appropriate) are obtained and/or prepared ready for field use.
- 2.5 Select field test equipment/instruments and check operation and calibration, as required, in accordance with procedures and manufacturer instructions.
- 2.6 Assemble and check all sampling equipment, field test equipment, materials, containers and safety equipment.
- 2.7 Arrange suitable transport to, from and/or around site as required.
- 3 **Conduct sampling of water**
- 3.1 Locate sampling sites and, if required, services at the site.
- 3.2 Conduct representative sampling in accordance with sampling plan and defined procedures for field and/or laboratory testing, as required.
- 3.3 Ensure all controls, blanks and replicate samples are properly integrated into the sampling process.
- 3.4 Record all information and label samples in accordance with traceability requirements.
- 3.5 Record environmental conditions and any atypical observations made during sampling that may impact on

- sample representativeness or integrity.
- 3.6 Transport all samples back to base according to workplace procedures and relevant codes.
 - 3.7 Distribute samples/sub-samples to required destinations for testing, maintaining sample integrity, traceability and chain of custody requirements, as necessary.
- 4 **Conduct field testing of water**
- 4.1 Obtain sample or sub-sample for designated field test, or locate testing location for in-situ testing.
 - 4.2 Check equipment/instruments set-up and reagents and calibrate, as necessary, to ensure safe operation and valid results.
 - 4.3 Run quality control (QC) samples to check method validity.
 - 4.4 Operate equipment/instruments in accordance with test method requirements.
 - 4.5 Perform tests/procedures/observations on all samples, and standards, if appropriate, in accordance with specified methods.
 - 4.6 Record all field observations and results and ensure that they are accurately transferred to workplace information database.
- 5 **Maintain a safe work environment**
- 5.1 Use defined safe work practices and personal protective equipment to ensure personal safety and that of others.
 - 5.2 Minimise the generation of waste.
 - 5.3 Rehabilitate sampling site to render it safe and minimise environmental impacts.
 - 5.4 Clean all equipment, containers, work area and vehicles according to workplace procedures.
 - 5.5 Check serviceability of all equipment before storage.
 - 5.6 Ensure the safe collection of all hazardous wastes for appropriate disposal.

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:

- federal legislation, such as the Environment Protection and Biodiversity Conservation Act and National Environmental Protection Measures
- state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations
- legislation, standards and codes of practice for work health and safety (WHS)
- Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set, and the sampling and analysis of water, such as AS/NZS 2031, AS 3550 series, AS/NZS 4276 series, AS/NZS 5667 series
- industry methods and guidelines, such as US Environmental Protection Authority (EPA) Methods and guidance for the analysis of water; American Public Health Association (APHA) Standard methods for the examination of waters and wastewaters; ANZECC Guidelines for fresh and marine water quality; and Australian guidelines for water quality monitoring and reporting
- registration/licensing and/or accreditation requirements
- site-specific requirements; workplace procedures for sampling, monitoring and in-field testing; recording, processing, presenting and reporting data
- workplace documents, such as standard operating procedures (SOPs), work schedules, recording and

reporting procedures, equipment manuals and warranties, supplier catalogue and handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Common field test parameters include one or more of:

- pH
- electrical conductivity
- dissolved oxygen
- salinity
- temperature
- turbidity
- Secchi disk depth.

Laboratory and/or field test parameters include one or more of:

- total suspended solids
- volatile suspended solids
- nitrogen (nitrate, organic, ammonia and Kjeldahl)
- phosphorus (total and soluble reactive)
- chlorophyll and phaeophytin
- total organic carbon (TOC)
- biological oxygen demand (BOD)
- chemical oxygen demand (COD)
- silica
- metals (total and dissolved)
- organic and inorganic pollutants
- microorganisms.

Workplace procedures for field activities include one or more of:

- use of field notebooks or log books
- SOPs covering fieldwork, sampling and testing
- equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures
- emergency, first aid and survival procedures
- requirements related to protection of the environment
- incident/accident/injury report forms.

Equipment includes one or more of:

- navigation and communication equipment (e.g. compass, maps, global positioning system (GPS), two-way radio and mobile phone)
- survey equipment
- data loggers

- sampling equipment and containers, filters and sieves and animal cages
- parameter specific meter or multi-probes (e.g. dissolved oxygen, electrical conductivity, pH, turbidity, nitrates, phosphates and temperature)
- field test kits to determine such parameters as dissolved gases, chemical anions and cations, heavy metals, E. coli and BOD
- portable colorimeters and field microscopes
- soil monitoring kits
- first aid equipment.

Hazards include one or more of:

- solar radiation, dust and noise
- personnel getting lost
- accidents, emergencies and incidents, such as snake, insect or animal bites
- exposure to severe weather conditions
- manual handling of heavy objects
- vehicle and boat handling in rough/remote conditions.

WHS and environmental management requirements include:

- compliance with relevant federal/state/territory WHS legislation at all times
- assuming that samples are potentially hazardous and applying standard precautions
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998>