Australian Government

Assessment Requirements for MSS025012 Perform environmental microbiological tests

Release: 2

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Modification History

Release 1. Supersedes and is equivalent to MSS025012A Perform environmental microbiological tests.

Release 2. Prerequisite code updated. Equivalent outcome.

Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- performing each of the following environmental microbiological techniques/tests on at least two (2) occasions:
  - preparing specimen samples, such as thin smears, liquid films and concentrates for direct examination
  - using standard media selection, inoculation, incubation and subculturing techniques to grow cultures of environmentally significant microorganisms
  - conducting microscopic examination of samples to identify and count cells and colonies
  - conducting microbiological analyses (e.g. spectrometric, electronic, rapid detection, indicator organisms) to identify and/or enumerate environmentally significant microorganisms
- interpreting instructions, sampling/test methods, manuals, guidelines and applying workplace procedures
- logging, tracking and reporting microbiological samples from collection/receipt through to completion of a procedure
- setting up, cleaning and optimising the performance of light microscopes
- identifying artefacts or image aberrations attributable to misalignment or obstruction of light paths or condensers used in bright field, dark ground, phase and fluorescent microscopy, or with other steps in microscopic examinations
- identifying Gram reactions accurately
- accurately describing bacterial colony forms on common media used in bacteriological investigations
- performing reliable colony/cell/microorganism counts, estimations and calculations
- checking the quality and validity of data and recording/storing test results in accordance with workplace procedures
- comparing microbiological data with relevant assessment criteria to identify significant data trends and atypical results, possible causes or implications and risk/instances of non-compliance
- preparing documentation that is concise, accurate and meets workplace and/or legislative requirements

- using personal protective clothing, safety equipment and procedures to prevent contaminating oneself, other people, work area, equipment, samples, or media/reagents during manipulations involving transfer of cultures
- demonstrating safe sterilisation, disinfection, cleaning, spillage, decontamination and waste disposal techniques
- seeking advice when issues/problems are beyond scope of competence/responsibility
- preparing data and documentation that is accurate, concise and in accordance with workplace requirements
- working safely and reporting all incidents or accidents.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- microbiological terminology relevant to job role covering bacteriology, parasitology and mycology
- cell biology and chemistry related to laboratory phenomena, such as growth and isolation of organisms for identification
- microbial genetics
- microbial diversity
- microorganisms of importance in assessment of the natural environment
- diseases associated with air, water and soil-borne microorganisms
- transmission and infection mechanisms and vectors
- population growth curves for microorganisms
- anti-microbial agents and their suitability/efficacy in a variety of situations
- relevant disinfection and sterilisation procedures
- rationale for sample dilution when preparing materials for enumerating organisms and other pure culture work (e.g. most probable number (MPN) technique)
- need for accurate identification of sample source (e.g. field location)
- sampling procedures for the microbiological testing of drinking water which should conform to the guidelines published by the National Health and Medical Research Council (NHMRC), and the Australian Water Resources Council
- testing procedures for the microbiological content of air, water and soil which should be guided by advice of relevant national and state/territory environment protection agencies
- identification of indicator microorganisms to assist in determining the cause, time or nature of pollution
- use of microorganisms in wastewater treatment
- use of microorganisms in toxic spill recovery
- use of microorganisms in site remediation
- collection and disposal of waste, waste minimisation principles
- relevant hazards, controls and safety procedures – especially those associated with handling microorganisms.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace, or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process such as workbooks, written assessments or interviews (provided a record is kept in each case).
- Holistic assessment methods include:
  - inspection of media/samples/cultures and review of data, results and records prepared by the candidate
  - feedback from supervisors that the candidate can safely perform the environmental microbiological techniques/tests listed above and provide reliable results within the agreed timeframe
  - oral and/or written questions to assess the candidate's knowledge of safe handling, culturing, testing and examination of environmentally significant microorganisms, analysis of results and record keeping
  - integrated assessment with a case study focus, such as the isolation and identification of bacterial species in a specimen containing two or more species, by relating sample, cultural, morphological and biochemical data, and such from other relevant tests and procedures.
- Access is required to all instruments, equipment, materials, workplace documentation, procedures, and specifications associated with this unit including, but not limited to:
  - a standard microbiology laboratory with relevant equipment, test instruments, samples and reagents
  - workplace procedures, sampling/test methods, equipment manuals, safety procedures, safety equipment
  - under duty of care requirements, off-the-job training providers will only use biological samples and organisms of a risk category that is compatible with their laboratory as defined in *AS/NZS 2243.3 Safety in laboratories - Microbiological aspects and containment facilities.*
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competency and currency.
- Technical competence can be demonstrated through:
  - relevant VET or other qualification/Statement of Attainment AND/OR

- relevant workplace experience
- Currency can be demonstrated through:
  - performing the competency being assessed as part of current employment OR
  - having consulted with an organisation providing environmental monitoring, management or technology related services about performing the competency being assessed within the last twelve months.

Links

The MSS Sustainability Companion Volume implementation Guides are available from VETNet: - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998