



Australian Government

Department of Education, Employment and Workplace Relations

MSS027006A Coordinate water quality management activities

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the ability to oversee the day-to-day water quality management activities for a site, project or an ongoing program. Personnel are required to interpret and implement a water quality management plan, organise specified management activities, verify the quality of monitoring data and investigate and rectify unexpected or unacceptable results, monitor compliance with relevant water quality objectives or standards, and provide reports. They work under the supervision of an environmental scientist or engineer, site manager or enterprise environmental manager.

Application of the Unit

This unit of competency is applicable to environmental site coordinators, environmental managers and senior environmental officers working in a range of industry sectors, such as:

- environmental services involved with sampling, monitoring and/or management of surface water, groundwater, stormwater or wetlands
- environmental compliance, auditing and inspection.

Note that the term ‘manager’ is used to refer to management of a function, project and/or program and does not necessarily imply line management.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS024006A Perform sampling and testing of water

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

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| 1 | Confirm scope of water quality management activities with manager | 1.1 | Review legislative, regulatory and licensing requirements and approvals that apply to site/project/program |
| | | 1.2 | Review current water quality management plan, including objectives, known issues, specified management activities and any required changes |
| | | 1.3 | Review previous water quality records and reports, if available |
| | | 1.4 | Confirm that water quality monitoring sites, sampling and measurement methods, instrumentation and enterprise procedures are in accordance with relevant standards and guidelines |
| | | 1.5 | Clarify own scope of responsibility/authority for achieving specific outcomes and the roles of other key personnel |
| | | 1.6 | Identify resources available to conduct water quality management activities |
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| 2 | Organise water quality management activities | 2.1 | Develop a consolidated schedule to ensure all activities can be conducted efficiently with the available resources |
| | | 2.2 | Develop checklists/clear work instructions to enable personnel to perform assigned tasks efficiently and with minimal errors |
| | | 2.3 | Ensure that personnel who conduct monitoring and/or collect water samples are competent to undertake their assigned tasks |
| | | 2.4 | Ensure water quality monitoring equipment is regularly calibrated and maintained and that adequate stocks of consumables are available |
| | | 2.5 | Ensure water samples are handled in accordance with the sampling method and chain of custody |

- requirements and dispatched promptly for analysis
- 2.6 Conduct, or arrange for, regular site inspections to monitor the effectiveness of water quality management actions (if relevant to site/project/program)
 - 2.7 Advise relevant personnel when specified water quality management actions are not being implemented effectively (if relevant to site/project/program)
 - 2.8 Conduct, or arrange for, additional monitoring/inspections after atypical events, legitimate complaints or government requests
- 3 Verify water quality data
- 3.1 Identify relevant job instructions, data and technical records in enterprise information management system
 - 3.2 Confirm that technical records provide sufficient information to ensure traceability/chain of custody for the monitoring activities involved
 - 3.3 Compare monitoring data with expected values and identify any outliers
 - 3.4 Inspect data records to identify any gaps and to check the integrity of data entry, transfers, alterations and calculations
 - 3.5 Notify manager when data is incomplete or contains significant errors, and clarify what action to take
- 4 Determine if results are acceptable and within expectation
- 4.1 Compare results with expected and/or relevant guideline values and identify any significant differences or trends
 - 4.2 Check the reliability of results by examining data or results from repeat measurements and/or tests of duplicate samples or other monitoring stations
 - 4.3 Assess the significance of any recorded observations of atypical environmental or

- meteorological conditions
- 4.4 Check that all calculations are free from error
 - 4.5 Check that estimations of uncertainty are reasonable and consistent with the sampling method and relevant guidelines, if relevant
 - 4.6 Report results that meet enterprise data quality standards and are consistent with expectations
- 5 Investigate/rectify unexpected or unacceptable results
- 5.1 Examine records of pre-use checks and calibration performance to ensure that the sampling equipment and/or monitoring/test instruments used meet specifications and enterprise requirements
 - 5.2 Establish whether human, environmental and/or meteorological factors could have affected the reliability of results
 - 5.3 Check for obvious sources of interference that may have occurred during measurements or analysis of samples
 - 5.4 Retrieve stored samples (if available) and assess whether they are atypical or contaminated
 - 5.5 Arrange for control tests using the same or new samples to check unexpected results, if relevant
 - 5.6 Report unexpected results that meet enterprise data quality standards
 - 5.7 Identify possible root causes of unacceptable results and appropriate preventative/corrective actions
 - 5.8 Report investigation outcomes and recommendations for improvements in accordance with enterprise procedures
 - 5.9 Seek manager's advice when challenges are beyond own technical competence or when input from environmental specialists may be required

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| 6 | Keep management informed about water quality performance | 6.1 | Provide regular reports about water quality, including instances of potential/actual non-conformance, incidents and the actions taken in each case |
| | | 6.2 | Report opportunities and recommendations for improvements in water quality monitoring or management in accordance with enterprise procedures |
| 7 | Maintain water quality records | 7.1 | Ensure all water quality records are legible, accurate and satisfy enterprise/legislative requirements |
| | | 7.2 | Store water quality records to enable easy access and review by authorised personnel in accordance with enterprise procedures |
| | | 7.3 | Regularly review water quality records to identify any significant trends and impacts |
| | | 7.4 | Identify any problems with the maintenance and security of water quality records and resolve them promptly |

Required Skills and Knowledge

Required skills

Required skills include:

- accessing, interpreting and applying relevant legislative/regulatory requirements, standards, codes, guidelines and equipment manuals
- explaining relevant water quality standards, sampling/monitoring methods, equipment operating procedures and enterprise water quality management actions clearly and concisely
- verifying the accuracy and completeness of water quality data, results and technical records
- using statistical tests (e.g. to determine data acceptability, estimate uncertainties, examine trends and infer basic relationships)
- recognising unexpected or unacceptable data and results
- analysing records of sampling, monitoring and/or calibration activities to identify potential causes of unacceptable/unexpected data and results
- recommending appropriate preventative/corrective actions to control potential/actual non-conformances or incidents
- solving complex technical problems, including identifying and rectifying instrument faults
- responding effectively to complaints and requests for information
- seeking advice when issues/problems are beyond scope of competence/responsibility
- maintaining records and providing accurate, complete and timely reports
- working safely and monitoring the safety of others

Required knowledge

Required knowledge includes:

- water quality management terminology, concepts and principles
- legislative/regulatory requirements, standards, codes and guidelines dealing with water quality
- enterprise water quality management plans, procedures (and water quality issues, control measures and mitigation/management actions for site/project, if relevant)
- measurement parameters and for waters, sediments or biota (relevant to job role)
- detailed scientific and technical knowledge of the samples, sampling/monitoring methods, equipment, materials and instrumentation used to generate the water quality data, including calibration, fault-finding and troubleshooting
- expected values for water quality parameters, relevant ANZECC guidelines, and statutory environmental quality concentration limits or similar
- problem-solving techniques and cause analysis
- impacts of common human, environmental and/or meteorological factors on data quality
- sources of interference, uncertainty, limitations of methods and sources of variability

- enterprise procedures for identifying/assessing environmental risks/impacts, responding to complaints and environmental incidents, and record management and reporting water quality data
- interpersonal communication, negotiation and conflict resolution techniques
- relevant health, safety and workplace emergency response procedures

Evidence Guide

Overview of assessment	Competency must be demonstrated in the ability to perform consistently at the required standard.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • planning and implementing the day-to-day water quality management activities for a site, project or ongoing program • explaining water quality management plans, procedures, sampling/monitoring methods and operation of monitoring equipment clearly and accurately • verifying the accuracy and completeness of water quality data, results and technical records • investigating unexpected or unacceptable water quality results in a logical and efficient manner • reporting water quality results, performance and opportunities for improvements in accordance with enterprise procedures • maintaining water quality records in accordance with legislative/licensing/enterprise requirements.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or a simulated workplace environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. This unit of competency may be assessed with: • <i>MSS027011A Select, commission and maintain environmental monitoring instruments.</i> The competencies covered by this unit would be

	demonstrated by an individual working alone or as part of a team. Resources may include: • site/project/program history • relevant legislation, codes, standards, enterprise environmental management policies, plans, actions, procedures, checklists and equipment manuals • water quality data sets, records and reports • sampling methods and description of monitoring set-up, and access to monitoring, sampling and testing equipment • computer and relevant software or enterprise information management system.
Method of assessment	The following assessment methods are suggested: • review of water quality management data files, results and records verified by the candidate • feedback from managers and site personnel regarding the candidate's ability to safely coordinate day-to-day water quality management activities • review of reports and recommended improvements for water quality monitoring or management prepared by the candidate • questions to assess understanding of procedures governing the validation of data; acceptability of data/results; sources of water quality data variability, interferences and uncertainty; and relevant preventative or corrective actions • analysis of case studies/reports of relevant water quality management issues and incidents • observation of the candidate providing water quality management information and/or instruction to other personnel. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work-like

	environment.
Guidance information for assessment	

Range Statement

Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
Legislation, standards, codes, procedures and/or enterprise requirements	Legislation, standards, codes, procedures and/or enterprise requirements may include: • federal legislation, such as: • Environment Protection and Biodiversity Conservation Act 1999 • state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with: • land use, acquisition, planning and protection • environmental protection • pollution and contaminated sites • Australian and international standards, such as: • AS/NZS 2031:2001 Selection of containers and preservation of water samples for microbiological analysis • AS 3550 series - Water analysis • AS/NZS 4276 series - Water microbiology • AS/NZS 5667 series - Water quality - sampling • 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 • Australian Guidelines for water quality monitoring and reporting • enterprise sampling and monitoring protocols • equipment manuals and warranties, supplier catalogue and handbooks • government policy (e.g. environmental protection and impact assessment)

	• material safety data sheets (MSDS) • occupational health and safety (OHS) national standards and codes of practice • site-specific requirements
Water quality measurement parameters (field and laboratory)	Water quality measurement parameters may include: • physical and chemical tests, such as: • temperature • electrical conductivity • phosphorus (total and soluble reactive) • nitrogen (nitrate, organic, ammonia and Kjeldahl) • ratio of total phosphorus to total nitrogen • total organic carbon (TOC) • dissolved organic carbon (DOC) • biological oxygen demand (BOD) • chemical oxygen demand (COD) • true colour (Pt/Co units) • turbidity • Secchi disk depth • total suspended solids • volatile suspended solids • chlorophyll and phaeophytin • pH • silica • metals (total and dissolved) • organic and inorganic pollutants • microorganisms • ecotoxicological tests, such as: • toxicity tests (bioassays) using bacteria, algae, invertebrates and fish • use of biomarkers and bioaccumulation • ecological assessment (e.g. Australian River Assessment System (AUSRIVAS) for rapid assessment of health using macro invertebrates)
Sampling and field monitoring equipment	Sampling and field monitoring equipment may include: • bottle sampling containers (e.g. glass, polyethylene and plastic) • pumping systems for shallow depths, depth samplers, automatic samplers and integrating samplers • groundwater sampling systems • sediment sampling systems • samplers for aquatic organisms, such as nets, traps, cages, hose pipe, sticks and modified brushes

	• reagents, such as acid washes, electrode filling and storage solutions, and preservatives • filters, such as membrane, microfiber and paper • 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, field microscopes • data loggers and global positioning system (GPS)
Water quality reports	Water quality reports may include: • weekly and monthly environmental reports • non-conformance report form • contributions to regulatory agency reports as required by permit, approval or licence conditions
Water quality records	Water quality records may include: • digital photographs of water quality monitoring sites • data files • records required by permit, approval or licence conditions • records of monitoring equipment purchase, calibration, inspection, maintenance and service • records of complaints and government requests • records of water quality non-conformances, incidents or significant impacts • contractor and supplier information • internal quality/environmental audit reports • electronic/hard copy correspondence • records of approved expenditure and orders
Water quality management actions	Water quality management actions will vary greatly with the type of site and industrial processes involved and may include: • correct handling and storage of chemicals and fuels to prevent spills to wetlands and stormwater system • minimising water consumption through substitution, water efficient devices and recycling/reuse • scheduling of works to enable disturbed areas to be promptly re-vegetated or stabilised progressively • regular inspection and maintenance of sediment control structures and stormwater drainage pits • keeping stormwater run-off free of litter, gross

	pollutants and contaminants • diversion of clean run-off away from disturbed areas • use of vegetated swale drains and filter strips • use of erosion control structures, such as silt fences, sand bags and geofabric wrapped hay bales • checking water for contaminants before disposal • controlling the timing, frequency and magnitude of water releases from the site • controlling access of feral/stock and domestic animals to wetlands • limiting disturbance of wetlands, riparian areas and drainage channels by vehicles and/or boats
OHS and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Environmental

Custom Content Section

Not applicable.