



Australian Government

MSS024009 Assist with assessing and monitoring stormwater systems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS024009A Assist with assessing and monitoring stormwater systems

Application

This unit of competency covers the ability to inspect and/or monitor small-scale urban or semi-urban drainage systems. Personnel will plan and conduct survey, inspection and/or audit activities; collect and interpret information about the characteristics and condition of the catchment; and identify environmental issues and possible causes. This work assists engineers and planners to develop stormwater management plans and/or assess the environmental impacts of existing conditions or activities.

This unit of competency is applicable to environmental technicians working in a range of industry sectors, such as stormwater management, clean water (e.g. catchments, supply and environmental flows); environmental services (e.g. monitoring of water quality), environmental compliance, auditing and inspection.

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

Environmental monitoring

Unit Sector

Environmental

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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|---|---|---|
| 1 | Confirm details of assigned activities with supervisor | <p>1.1 Clarify the scope and objectives of the assessment, constraints, stormwater components involved and stormwater management techniques already in use.</p> <p>1.2 Identify regulations, standards, guidelines and workplace procedures that apply to assigned activities.</p> <p>1.3 Clarify the required outputs, timeframe, available resources and stakeholder involvement.</p> |
| 2 | Source and assess available stormwater system data | <p>2.1 Locate and obtain existing stormwater system information and review its relevance and accuracy.</p> <p>2.2 Locate external sources of relevant data sets and assess their availability, price, value and limitations.</p> <p>2.3 Obtain selected data sets in accordance with workplace procedures.</p> <p>2.4 Use available data to identify (sub)catchment boundaries and modifications, 'hydrologic range', major land use categories, areas of potential pollution and environmental issues relevant to the study.</p> <p>2.5 Locate and obtain existing stormwater system information and review its relevance and accuracy.
Identify any significant information gaps.</p> |
| 3 | Plan and organise assigned field activities | <p>3.1 Confirm data collection points and data quality requirements.</p> <p>3.2 Analyse field activities to identify related tasks and plan efficient sequences.</p> <p>3.3 Identify risks, safety and environmental requirements associated with field activities.</p> <p>3.4 Assemble required field equipment and materials and check that they are fit for purpose.</p> |

- 3.5 Liaise with relevant personnel to explain the scope and purpose of field activities, organise site access and obtain permits, as necessary.
 - 3.6 Review work plan in response to new information, changed circumstances or instructions from appropriate personnel.
 - 3.7 Update work plan and communicate changes to appropriate personnel, as necessary.
- 4 **Safely collect global positioning system (GPS) and environmental data**
 - 4.1 Set up/optimize GPS equipment with correct datum and projection settings.
 - 4.2 Set up measuring instruments on site and perform pre-use/calibration checks.
 - 4.3 Operate GPS equipment/measuring instruments in accordance with manufacturer specifications and workplace procedures.
 - 4.4 Collect point positional data and attribute environmental data for each location in accordance with data collection plan.
 - 4.5 Verify GPS/environmental data, identify atypical results and review procedures/troubleshoot equipment, as necessary.
- 5 **Perform field work**
 - 5.1 Visually inspect stormwater systems to determine the degree of erosion/sediment transport along drainage channels.
 - 5.2 Assess the apparent effectiveness of current stormwater control devices.
 - 5.3 Assess the state of riparian vegetation associated with earth formed channels, ponds and basins.
 - 5.4 Assess the diversity of vertebrate and invertebrate fauna in stormwater channels and receiving bodies.
 - 5.5 Collect representative water, soil and/or sediment samples using specified sampling methods and equipment.

- 5.6 Obtain valid and reliable in-situ measurements using specified test methods and equipment.
- 5.7 Identify litter generation areas and visually inspect the effectiveness of gross pollutant traps.
- 5.8 Identify and promptly report any illegal discharge to the stormwater system.
- 5.9 Inspect the condition of flood mitigating structures along drainages.
- 6 **Finalise field work**
- 6.1 Pack and safely transport all samples, equipment and supplies back to home base.
- 6.2 Ensure all samples and data are stored safely.
- 6.3 Ensure dispatch of collected samples for subsequent analysis.
- 6.4 Clean and test equipment before storage.
- 7 **Report current stormwater system conditions**
- 7.1 Review field measurements and/or results of laboratory analyses to identify significant trends and/or problems with data.
- 7.2 Analyse data relating to catchment characteristics, existing conditions and management values, as required.
- 7.3 Identify environmental issues that may impact on current stormwater management objectives/practices.
- 7.4 Report findings using a format and style that suits the intended use and in accordance with workplace guidelines.
- 7.5 Communicate results within the specified time and in accordance with workplace confidentiality and security guidelines.
- 8 **Maintain a safe work environment**
- 8.1 Use safe work procedures and protective equipment to ensure personal safety and that of others.
- 8.2 Minimise environmental impacts of testing/sampling and

generation of waste.

- 8.3 Collect and/or dispose of all waste in accordance with environmental requirements and workplace procedures.

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, acquisition and planning; environmental protection; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites
- legislation, standards and codes of practice for work health and safety (WHS), handling of dangerous goods
- Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set; 2007 Environmental Management Basic Set; AS/NZS 5667 Set Water quality
- industry guidelines and manuals, such as:
 - state/territory Environmental Protection Agency (EPA) guidelines and manuals
 - Managing urban stormwater: Council handbook (NSW EPA)
 - Water quality sampling manual (QLD EPA)
 - Regulatory monitoring and testing: Water and wastewater sampling (EPA SA)
- registration/licensing and/or accreditation requirements
- workplace or regulator's procedures for sampling and in-field testing
- workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Stormwater survey, inspection and audit activities include one or more of:

- broad scale, 'whole of catchment' assessment of catchment health
- assessment of environmental conditions or risk in a smaller, localised study area or individual premises.

Stormwater management plan includes one or more of:

- existing and future values of a catchment
- stormwater management objectives to protect these values
- problems and issues that may compromise these objectives
- agreed stormwater management practices (non-structural/structural) to mitigate existing impacts and minimise future impacts.

Stormwater management techniques include one or more of:

- retention and restoration of existing watercourses and wetlands and riparian/foreshore vegetation, and aquatic habitats
- control of source water quality and quantity through minimising impervious areas, stormwater re-use and infiltration, limiting development of flood plains, community education, small on-site treatment measures
- ‘end of pipe’ techniques, such as use of retarding basins, gross pollutant traps, channel stabilisation/design, erosion and sediment control, and large off-site treatment.

Stormwater system information includes one or more of:

- terrain models
- stormwater drainage plans
- flood and drainage studies
- water and sediment quality studies
- contaminated site reports
- aquatic ecology and riparian vegetation studies
- land use information, such as topographical maps, aerial photos, satellite imagery and land use/zoning maps
- reports of consultations with the scientific community, local environmental groups and industry associations, catchment management committees and councils
- history of engineering works and modifications.

Field equipment and materials include one or more of:

- stormwater drainage maps, topographic maps, aerial photos, compass, survey point markers and drivers, GPS, tape measure, flagging tape and binoculars
- data recording sheets, palm pilot, laptop, data logger and digital camera
- sampling equipment, such as bottles, bags, biological specimen containers, secateurs, scoop nets, esky, preservatives, water pumps and tubing
- automatic water samplers
- portable water quality probe that measures dissolved oxygen, temperature, turbidity, pH, conductivity and field

test reagents

- tipping bucket rain gauge and data logger
- flow meters
- soil infiltration test rigs
- personal protective equipment (PPE)
- appropriate clothing and footwear
- phone
- first aid kit
- insect repellent.

**Laboratory analyses
include one or more of:**

- suspended solids
- total phosphorus
- filterable reactive phosphorus
- total nitrogen
- total Kjeldahl nitrogen
- oxidised nitrogen
- faecal Coliforms
- soil permeability.

**Catchment characteristics
and existing conditions
include one or more of:**

- physical characteristics, such as:
 - soils and sediments
 - topography, including slope characteristics
 - climate, including rainfall, evaporation
 - bridge and culvert crossings, major utility services that may impact on management practices
 - point sources of pollution (e.g. sewage treatment)
 - major sewer outflows
 - existing stormwater management structures (e.g. retarding basins and constructed wetlands)
- social characteristics, such as:
 - recreational areas
 - land use and land use zoning
- waterway characteristics, such as:
 - stormwater transport via piped, lined or natural channels
 - characteristics of receiving water bodies (e.g. lakes, reservoirs, wetlands and estuaries)
 - erosion/sediment transport processes for natural/modified stormwater systems
 - surface hydrology (e.g. flooding and low flow)

- water quality in stormwater transport systems and receiving bodies (dry/wet conditions)
- ecological characteristics, such as:
 - aquatic fauna and flora in stormwater transport systems and receiving bodies
 - riparian zone fauna and flora
 - areas of urban bushland.

Catchment values include one or more of:

- aquatic fauna habitats, such as appropriate substrate, woody debris and aquatic plants
- terrestrial fauna habitats, such as riparian zone vegetation
- aquatic flora (e.g. macrophytes) habitats, such as appropriate sediment, stream flow and water quality
- terrestrial flora habitats, such as morphology of banks/floodplain, prevailing stream flow and groundwater conditions
- avifauna (e.g. land-based and water birds) habitats, such as riparian zone, stormwater transport system and receiving water bodies
- public health and safety (e.g. risk of bacterial pollution in stormwater run-off)
- recreational values
- visual amenity of stormwater systems and riparian zone
- use of surface or groundwater as a water source
- aquaculture and other commercial fishing
- reuse of stormwater for (non)potable use
- value of properties adjacent to visually attractive constructed wetlands and natural channels.

Environmental issues and possible causes include one or more of:

- poor water quality in waterways (wet/dry conditions) due to excess fertiliser application, washing of cars in streets, sewer overflows, domestic animal droppings and atmospheric deposition
- inappropriate stream flow regime (flooding, base flows) due to increased run-off from impervious areas and insufficient stormwater reuse
- degraded aquatic habitats due to increased sediment deposition, removal of riparian vegetation
- barriers to aquatic fauna migration weirs
- degraded riparian vegetation due to introduction of exotic species and vegetation removal
- channel erosion and sedimentation due to increased flood flows following urbanisation and vegetation removal

- litter in watercourses due to insufficient number/emptying of rubbish bins and commercial waste
- weed growth in urban bushland due to stormwater nutrients, weeds from residential gardens, and removal of canopy vegetation
- degradation of ecologically sensitive water bodies
- health risks associated with recreational use of polluted waters
- low visual amenity and landscape value due to litter along watercourses and concrete lined channels.

- WHS 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

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>