



Australian Government

Department of Education, Employment and Workplace Relations

AHCNRM504A Interpret and report on catchment hydrology

Release: 1

AHCNRM504A Interpret and report on catchment hydrology

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the interpretation of catchment hydrology and reporting on water quantity and quality within a catchment. It requires knowledge of hydrogeology, geology, geomorphology, hydrology and contemporary water allocation issues. It requires skills in interpreting geological maps and hydrological data, predicting water movement in catchments, identifying processes that have a negative impact on water quality and quantity and the use of software in hydrological data reporting. 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 is applicable to a person employed in a technical capacity to collect, collate, analyse and report on hydrological data for use in floodplain management, asset protection and water allocation.
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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. Collate and evaluate catchment information	1.1.Data collection priorities are determined in consultation with supervisor or team where appropriate. 1.2.Sources of information are used to access catchment information. 1.3.The accuracy and currency of information is evaluated and additional data requirements are identified. 1.4.Land uses within the catchment are identified. 1.5.Management units within the catchment are determined.
2. Analyse the hydrological processes of a catchment using available data	2.1.Natural ground and surface water processes within the catchment are analysed. 2.2.Man-made ground and surface water movement within a catchment are identified. 2.3.Man-made impacts on water quantity within the catchment are determined and analysed. 2.4.Appropriate representative sites for field surveys are identified for the collection of additional data where required.
3. Design and implement field surveys and assess findings	3.1.Objectives, locations and resource requirements for site assessments are determined in consultation with supervisor or team. 3.2.Physical entities and processes, including threats, within representative management units are assessed. 3.3.Site data is collected according to enterprise policies, practices and guidelines.
4. Report on catchment hydrology	4.1.A written overview on catchment hydrological behaviour is prepared, according to enterprise guidelines and templates. 4.2.A visual overview of catchment hydrological behaviour is presented to meet the needs of stakeholders. 4.3.Advice and guidance on remediation measures consistent with catchment management objectives is outlined.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- access and collate existing hydrological information
- analyse surface and groundwater hydrological processes in catchments
- undertake field site assessments for the collection of hydrological data
- identify and evaluate non-sustainable practices in catchments
- estimate and assess the impact of hydrological events
- present and interpret hydrological data in an appropriate form
- use oral communication skills/language competence to fulfil the job role as specified by the organisation including questioning, active listening, asking for clarification, negotiating solutions and responding to a range of views
- use interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities.

Required knowledge

- hydrological cycle
- chemical and physical properties of water
- rock and soil types including weathering processes
- fluvial geomorphology including:
 - drainage basin function
 - factors influencing stream flow rates
 - interactions between ground and surface water
 - stream hierarchy and ordering
 - human impacts on surface water quality and quantity
- hydrogeology including:
 - aquifer types and properties
 - aquifer discharge and recharge
 - rates of water movement through aquifers
 - human impacts on groundwater quality and quantity
- sustainable use of ground and surface water including:
 - uses of water in catchments
 - water allocation
 - policies and strategies determining water use.

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 and evidence required to demonstrate competency in this unit	The candidate must be able to locate, collect and assess a wide range of hydrological data. This data must then be interpreted and presented according to the requirements of the task. The candidate must be capable of determining the movement of water within a catchment from existing data and report on the impacts of environmental change on water quantity and quality in a catchment
Context of and specific resources for assessment	For valid assessment to take place candidates should have access to: • equipment used to analyse water quality and quantity • hydrological data in electronic form • geological maps and appropriate remotely sensed data • water management plans.

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.	
Sources of information may include:	• hydrological information • previous monitoring studies • geological data • hydrogeological data • land use studies • aerial photography

RANGE STATEMENT	
	• satellite imagery • maps • water quality and or irrigation data • environmental management studies • anecdotal information from land owners.
Field surveys may include:	• slope analysis • land uses • soil surveys • occurrence of erosion and sedimentation • bed and bank stability • water quality and quantity.
Management objectives may include:	• erosion control • water quality • salinity reduction • sustainable irrigation and environmental flows • flood protection • ground water usage.
Threats may include:	• erosion and sedimentation • pest plant and animal infestation • loss of biodiversity • salinity • poor land use practices • point and diffuse sources of pollution • nutrient management issues.
Remediation measures may include:	• fencing • revegetation • installation of sediment control structures • flood control structures • pest plant control • implementation of nutrient management strategies • changes to agricultural practices • community awareness programs.
Management objectives may include:	• erosion control • water quality improvement • salinity reduction • sustainable irrigation environmental flows • flood protection • ground water usage.

Unit Sector(s)

Unit sector	Natural resource management
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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