



Australian Government

Department of Education, Employment and Workplace Relations

MSS024007A Collect and evaluate meteorological data

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the ability to site and set up basic ‘ground level’ meteorological equipment and collect and record reliable data. It also includes the ability to assess data quality, interpret significant data features and use the data to ensure the validity of air and noise monitoring measurements.

Application of the Unit

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 air quality, water, soil and noise)
- environmental compliance, auditing and inspection
- solid and hazardous waste management, and site remediation
- management of contaminated sites
- geotechnical services and civil engineering
- natural resource management.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

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| 1 | Prepare for field work | 1.1 | Review job request to identify the equipment required and the appropriate meteorological parameters to be measured |
| | | 1.2 | Identify hazards and enterprise safe work procedures associated with the site, test methods and equipment used |
| | | 1.3 | Confirm site location, access, timing and any client requirements |
| | | 1.4 | Assemble all required equipment/materials and check that they are fit for purpose |
| | | 1.5 | Stow equipment/materials to ensure their safe transport, as necessary |
| | | 1.6 | Arrange transport to site, as necessary |
| | | 1.7 | Liaise with appropriate personnel on arrival at site to ensure safety and minimise disruption to others, as necessary |
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| 2 | Perform basic meteorological measurements | 2.1 | Select an appropriate location for the meteorological equipment at the site to ensure valid readings for the required parameters are achievable |
| | | 2.2 | Install and check instrumentation and any recording/data logging equipment to ensure it is functioning correctly |
| | | 2.3 | Confirm calibration status of meteorological equipment |
| | | 2.4 | Perform measurements using 'ground level' meteorological equipment |
| | | 2.5 | Collect meteorological data using physical or electronic methods |
| | | 2.6 | Ensure wind direction sensors are aligned or corrected to true north rather than magnetic north |

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| 3 | Verify meteorological data | 3.1 | Ensure that quality requirements for data are met |
| | | 3.2 | Perform any required corrections, calculations and data manipulations and identify significant trends in data |
| | | 3.3 | Check for anomalous data and take appropriate corrective action |
| | | 3.4 | Verify that processed data meets requirements |
| | | | |
| 4 | Interpret and apply meteorological information | 4.1 | Relate meteorological data to weather maps and other sources of meteorological data |
| | | 4.2 | Associate meteorological conditions with related weather maps |
| | | 4.3 | Compare weather patterns and data for different time periods and geographic locations |
| | | 4.4 | Interpret meteorological data in terms of local atmospheric conditions |
| | | 4.5 | Use meteorological data to interpret and/or assist with processing air and/or noise monitoring data |
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| 5 | Maintain a safe work environment | 5.1 | Use safe work procedures and protective equipment to ensure personal safety and that of others |
| | | 5.2 | Minimise environmental impacts of meteorological measurements and generation of waste |
| | | 5.3 | Collect and/or dispose of all waste in accordance with environmental/quarantine requirements and enterprise procedures |
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| 6 | Report data and finalise documentation | 6.1 | Report field data in the required formats and expected timeframe |
| | | 6.2 | Complete all required documentation |
| | | 6.3 | Maintain the security and confidentiality of data |

and documentation in accordance with enterprise requirements

Required Skills and Knowledge

Required skills

Required skills include:

- planning and organising resources for field work
- following legislative requirements, standard methods, enterprise procedures and instructions governing meteorological measurement
- reading maps and aerial photos
- collecting, collating and recording simple meteorological information for a site
- applying meteorological data to results from other environmental monitoring programs
- using and maintaining equipment to obtain reliable measurements for required parameters
- identifying and rectifying basic instrument faults
- preparing brief oral/written reports
- seeking advice when issues/problems are beyond scope of competence/responsibility
- working safely for the protection of self and others

Required knowledge

Required knowledge includes:

- distinction between weather and climate and an awareness of climate change science
- composition and structure of the atmosphere, especially the lower atmosphere
- solar energy spectrum and link to atmospheric conditions
- seasonality, effects of latitude and continental geography
- atmospheric motion (horizontal and vertical)
- lifting (orographic, convective and frontal)
- basic pressure/temperature/volume principles
- high and low pressure cell formation
- weather effects (e.g. precipitation, temperature and wind strength/direction) and interpretation of maps
- local wind effects (e.g. sea breeze, city breeze, katabatic winds and anabatic winds)
- forms of atmospheric moisture and humidity
- atmospheric conditions related to wind direction
- measurement of atmospheric conditions (e.g. precipitation, temperature, humidity, wind speed and direction)
- weather maps (e.g. symbols used, terminology, interpretation and forecasts)
- historical and geographic comparison of weather data
- operation, calibration and maintenance of meteorological equipment
- scalar and vector wind speed and direction calculations

- wind run
- influence of different sampling intervals and averaging times

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	<p>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:</p> <ul style="list-style-type: none"> • explaining the purpose and objectives of the meteorological monitoring, including: • information and analysis required • end users of information • significance of outcomes for broader programs • planning and preparing for field work • interpreting and applying relevant enterprise procedures and standard methods • setting up, checking and operating meteorological equipment to obtain sufficient measurements to ensure reliable data • accurately recording field data • assessing data quality and interpreting significant features and anomalies • using data to ensure validity of air and noise monitoring programs • working safely.
Context of and specific resources for assessment	<p>This unit of competency is to be assessed in the workplace or a simulated workplace environment.</p> <p>Assessment should emphasise a workplace context and procedures found in the candidate's workplace.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> • <i>MSS024003A Apply an understanding of environmental principles to a site</i> • <i>MSS025000A series units associated with the monitoring of air, odour and noise</i>

	<ul style="list-style-type: none"> • <i>MSL974009A Undertake field-based remote-sensing monitoring.</i> <p>The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.</p> <p>Resources may include:</p> <ul style="list-style-type: none"> • access to suitable sites and vehicle • enterprise procedures governing siting and operation of meteorological measurements • maps and aerial photos • suitable meteorological measuring equipment.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • review of meteorological data, results and measurement records prepared by the candidate • feedback from peers and supervisors that the candidate consistently follows enterprise procedures and works safely • oral/written questioning associated with basic meteorology and in-field measurement of meteorological parameters • observation of work carried out in the field with a focus on: • identification of monitoring site according to defined criteria • safe, reliable set-up and operation of equipment • recording, storing, analysing and presenting basic meteorological data. <p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>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.</p>
Guidance information for assessment	

Range Statement

<p>Codes of practice</p>	<p>Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used</p>
<p>Legislation, standards, codes, procedures and/or enterprise requirements</p>	<p>Legislation, standards, codes, procedures and/or enterprise requirements may include:</p> <ul style="list-style-type: none"> • federal legislation, such as: <ul style="list-style-type: none"> • Environment Protection and Biodiversity Conservation Act 1999 • Australian Heritage Council Act 2003 • Native Title Act 1993 • state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with: <ul style="list-style-type: none"> • land use, acquisition, planning and protection • environmental protection • cultural/heritage protection • vegetation management • nature conservation and wildlife/plant protection • water and water management • soil conservation • pollution and contaminated sites • fisheries, forestry and mining operations • Australian and international standards, such as: <ul style="list-style-type: none"> • AS/NZS ISO 14000 Set:2005 Environmental management standards set • AS 2923:1987 Ambient air - Guide for measurement of horizontal wind for air quality applications • Australian Bureau of Meteorology Observation Specification 2013.1 Guidelines for the siting and exposure of meteorological instruments and observing facilities • National Environment Protection (Ambient Air Quality) Measure Technical Paper No 6: Meteorological Measurements • World Meteorological Organisation - No. 8: Guide to meteorological instruments and methods of observation • enterprise or regulator procedures for sampling and in-field testing

	<ul style="list-style-type: none"> • material safety data sheets (MSDS) • safe work procedures
Hazards may include	<p>Hazards may include:</p> <ul style="list-style-type: none"> • sunlight, dust, noise and heat • extreme weather conditions (e.g. fire, flood and storms) • manual/handling of heavy equipment or materials • crushing, entanglement and cuts associated with moving machinery • vehicular traffic on roads and sites • injuries caused by falling objects and working conditions, such as uneven surfaces, heights, slopes and wet surfaces • biohazards (e.g. microbiological organisms in soils) • chemical hazards/contaminants in soils
Siting and installation considerations for meteorological instrumentation	<p>Siting and installation considerations for meteorological instrumentation may include:</p> <ul style="list-style-type: none"> • topography • vegetation and built structures • exposure • availability of services • site security
Meteorological instrumentation	<p>Meteorological instrumentation may include:</p> <ul style="list-style-type: none"> • thermometers: • liquid in glass • thermocouples • Pt resistance • thermistors • hygrometers and psychrometers • barometers: • aneroid • mercury • anemometers: • rotational • pressure tube • Doppler • rain gauges: • manual • tipping bucket • automatic weather stations (AWS) • radiometers

	<ul style="list-style-type: none"> • net pyranometer • total solar radiometer
Meteorological parameters	<p>Meteorological parameters may include:</p> <ul style="list-style-type: none"> • temperature and temperature gradient • atmospheric pressure • humidity • precipitation • wind speed and direction (vector and scalar) • vertical wind speed • insolation and net radiation • evaporation
Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • 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.