



Australian Government

MSS024004 Process and present environmental data

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS024004A Process and present environmental data

Application

This unit of competency covers the ability to retrieve environmental data; evaluate formulae and perform scientific calculations; present and interpret information in tables, graphs and simple maps; and keep accurate records. The unit requires personnel to solve problems of limited complexity where the information may not be obvious, but not contradictory, and can be determined by direct reasoning.

This unit of competency is applicable to environmental technicians working in all industry sectors.

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

Data

Unit Sector

Environmental

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Retrieve and check environmental data	1.1	Store and retrieve data using appropriate files and/or application software.
		1.2	Verify the quality of data using workplace procedures.
		1.3	Rectify errors in data using workplace procedures.

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| 2 | Calculate scientific quantities | <div>2.1 Calculate statistical values for given data.</div> <div>2.2 Calculate scientific quantities using given formulae and data and estimate uncertainties.</div> <div>2.3 Ensure calculated quantities are consistent with estimations and expectations.</div> <div>2.4 Report all calculated quantities using the appropriate units and correct number of significant figures.</div> |
| 3 | Present data | <div>3.1 Present data in clearly labelled tables, charts and/or simple maps.</div> <div>3.2 Graph data using appropriate scales to span the range of data or display trends.</div> <div>3.3 Report all data using the appropriate units and number of significant figures.</div> |
| 4 | Interpret data variations and trends | <div>4.1 Compare data with reference values or expected ranges.</div> <div>4.2 Recognise and report significant variations and trends in data.</div> <div>4.3 Interpret significant features of graphs, such as gradients, intercepts, maximum and minimum values, and limit lines.</div> |
| 5 | Keep accurate records and maintain confidentiality | <div>5.1 Transcribe information accurately.</div> <div>5.2 Verify the accuracy of records following workplace procedures.</div> <div>5.3 File and store workplace records in accordance with workplace procedures.</div> <div>5.4 File all reference documents logically and keep them up-to-date and secured.</div> <div>5.5 Observe workplace confidentiality standards.</div> |

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.

Standards, codes, and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering: environmental management such as AS/NZS ISO 14000 Basic Set; 2007 Environmental Management Basic Set; ISO 5725 Accuracy (trueness and precision) of measurement methods and results, and ISO/IEC Guide covering uncertainty in measurement
- registration/licensing and/or accreditation requirements
- sampling/testing methods, procedures, guidelines provided by workplace or regulator
- validation of equipment and associated software; validation of spreadsheets developed in-house for routine calculations where applicable
- workplace documents, such as standard operating procedures (SOPs), work schedules, quality manual, recording and reporting procedures, equipment manuals, supplier catalogues, handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Concepts of metrology include one or more of:

- all measurements are estimates
- repeated measurements belong to a sample of the measured parameter
- repeatability, precision, accuracy and significant figures
- sources of error and uncertainty
- traceability.

Environmental data include one or more of:

- records, such as:
 - worksheets and spreadsheets
 - databases linked to information management systems
- results, such as:
 - observations

- field tests and measurements
- population surveys (type, species, age, sex and weight)
- vegetation surveys (type, species, height, density and canopy)
- dilution of working solutions and gases (odours)
- laboratory analyses
- quality assurance and control assessments
- data presented in forms, such as:
 - graphs, tables, histograms, pie charts, bar charts
 - semi-quantitative observations and be expressed on a scale (e.g. 1 to 4 or + to ++++)
 - photographs.

Calculations include one or more of:

- calculations performed with or without a calculator
- calculations performed using computer software, spreadsheets, databases and statistical packages

Calculations of scientific quantities include one or more of:

- converting units involving multiples and submultiples
- significant figures, rounding off, estimating and approximating
- transposing and evaluating formulae
- fractions, decimals, proportions and percentages
- percentage and absolute uncertainties in measurements and test results
- statistical values of data, such as mean, median, mode and standard deviation
- perimeters and angles, areas (m²) and volumes (mL, L, m³) of regular shapes
- sampling times
- dose (mg), average mass, mass percentage, density, specific gravity, moisture, relative and absolute humidity, viscosity and permeability
- ratios, such as mass to mass, mass to volume and volume to volume percentages
- concentration, such as molarity, g/100mL, mg/L, mg/□L, ppm, ppb, dilution mL/L
- average count, colonies per swab surface and cell counts, such as live and dead/total
- variables, such as pressure, gauge pressure, velocity and flow rates
- biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbons (TOC)

- % content of moisture, sulphur dioxide and trace metals, such as calcium or zinc.

Records include one or more of:

- purchase orders for equipment and materials
- equipment service records
- safety procedures
- history of calibration and test results.

Work health and safety (WHS) and environmental management 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

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998>

Assessment Requirements for MSS024004 Process and present environmental data

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Performance Evidence

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

- retrieving, coding, recording and checking data
 - calculating scientific and statistical quantities with or without a calculator/computer software, including at least eight (8) of the following items:
 - converting units involving multiples and submultiples
 - scientific notation, significant figures, round off, estimate and approximate
 - transposing and evaluating formulae
 - fractions, decimals, proportions and percentages
 - percentage and absolute uncertainties in measurements and test results
 - statistical values of data, including mean, median, mode and standard deviation
 - perimeters, angles, areas (m^2) and volumes (mL , L , m^3) of regular shapes
 - dose (mg), average mass, mass percentage, density, specific gravity, moisture, relative and absolute humidity, viscosity and permeability
 - ratios, such as mass to mass, mass to volume and volume to volume percentages
 - concentration, such as molarity, $g/100mL$, mg/L , mg/L , ppm , ppb , dilution mL/L
 - average count, colonies per swab surface and cell counts, such as live and dead/total
 - variables, such as pressure, gauge pressure, velocity and flow rates
 - biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbons (TOC)
 - % content of moisture, sulphur dioxide and trace metals, such as calcium or zinc
- presenting accurate results in the required format (e.g. significant figures, uncertainty, units)
- preparing and presenting data in forms, such as:
 - tables, graphs, histograms, pie charts, bar charts
 - maps
- recognising significant data points and anomalies
- comparing data with reference values and interpreting variations and trends in data (e.g. seasonal, diurnal, location and non-conformance)
- maintaining the confidentiality of data in accordance with workplace and regulatory requirements
- keeping accurate records that are up-to-date and secure

- seeking advice when issues/problems are beyond scope of competence/responsibility.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- scientific and technical terminology relevant to job role
- procedures for coding, entering, storing, retrieving and communicating data
- international system of units (SI)
- concepts of metrology, including:
 - all measurements are estimates
 - repeated measurements belong to a sample of the measured parameter
 - repeatability, precision, accuracy, significant figures
 - sources of error, uncertainty associated with measurement steps
 - traceability
- procedures for verifying data and rectifying mistakes
- procedures for maintaining and filing records, and maintaining security of data.

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:
 - review of data worksheets, calculations, computer files (such as spreadsheets, databases and statistical analysis), graphs, tables, charts and/or simple maps prepared by the candidate
 - review of records transcribed, maintained or stored by the candidate
 - feedback from supervisors about the candidate's ability to present accurate, reliable data within the agreed timeframe
 - oral and/or written questions to assess the candidate's understanding of calculations, relevant procedures and their interpretation of data.

- Access is required to all instruments, equipment, materials, workplace documentation, procedures, and specifications associated with this unit, including, but not limited to:
 - calculator, computer and relevant software or laboratory information system
 - environmental data sets and records
 - documentation, including user manuals; workplace procedures for recording, processing, storing and reporting environmental data; and test/survey methods.
- 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.

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