



TECHNICAL &
VOCATIONAL
EDUCATION &
TRAINING
AUTHORITY

National Competency Standard for Utility Laboratory Technician

Standard Code: **xxxxxxx**

[Endorsed by the MALDIVES QUALIFICATIONS AUTHORITY (MQA)]

Standard Development Process

To begin with, Utility Laboratory Technician occupations were profiled through study of the occupation across Maldivian workplaces. During the study, utility enterprises and their relevant occupations were reviewed and the job descriptions were further studied. In addition to that, current trends of occupations internationally were also reviewed. These processes led to the development of the Draft Occupational Standard.

Referred draft occupational standard will be submitted through the TVETA to a team of Technical Panel (TP) selected from the Maldivian workplaces to review the Utility Laboratory Technician. Members of the TP will provide technical support by recommending changes to the Utility Laboratory Technician Standard through incorporation of units of competencies and editing of the already included competency units. Purpose of this process is to develop a standard that reflects authentic work practices of Utility Laboratory Technician across the utility enterprises of the Maldives. Technical Panel meetings will continue in reviewing the Utility Laboratory Technician Standard until the Final Draft is drawn which is agreed and accepted by all the participating members.

Final Draft of Utility Laboratory Technician Standard approved by the TP will then be submitted to the Construction Employment Sector Council for endorsement and validation. A brief report on how the National Occupational Standard of Utility Laboratory Technician reflecting the process of compilation will be presented to the Construction Employment Sector Council together with the standard. Council members will further review and If Construction ESC recommends any change, MIT is required to bring those changes and once agreeable, Utility Laboratory Technician Standard will be endorsed by the Council.

With the endorsement from the Construction Employment Sector Council, final document of the National Occupational Standard of Utility Laboratory Technician will be submitted to the Maldives Qualification Authority (MQA) for final approval. With approval from MQA, the National Occupational Standard of Utility Laboratory Technician will be published on TVETA website, to be used by training providers in delivering Utility Laboratory Technician programs across the Maldives.

Description of “Utility Laboratory Technician”

Lab Technicians play an important role within the Public Utility Sector of the Maldives as they undertake testing of treated water by the different utility providers. Referred occupations is vital to ensure water produced by the various public and private utility enterprises remained to be of highest quality and pass the standards set by the Environment Protection Agency (EPA) of the Maldives. National Certificate-3 in Utility Laboratory Technician is mapped and organized in such a way to ensure those competent in the referred qualification will have the knowledge and skills to contribute positively to the local construction industry.

Prospective Job opportunities

Upon successful completion of the National certificate-3 in for Utility Laboratory Technician students can work in the following jobs.

- Assistant Laboratory Technician
- Laboratory Assistant

KEY FOR CODING

Coding Competency Standards and Related Materials

DESCRIPTION	REPRESENTED BY
Industry Sector as per ESC (Three letters)	Construction Sector (CON) Fisheries and Agriculture (FNA) Information, Communication and Technology (ICT) Transport Sector (TRN) Tourism Sector (TOU) Social Sector (SOC) Foundation (FOU)
Competency Standard	S
Occupation with in an industry sector	Two digits 01-99
Unit	U
Common Competency	CR
Core Competency	CM
Optional / Elective Competency	OP
Assessment Resources Materials	A
Learning Resources Materials	L
Curricular	C
Qualification	Q1, Q2 etc.
MNQF level of qualification	L1, L2, L3, L4 etc.
Version Number	V1, V2 etc.
Year of Last Review of standard, qualification	By "/" followed by two digits responding to the year of last review, example /20 for the year 2020

1. Endorsement Application for Qualification 01

2. NATIONAL CERTIFICATE III IN UTILITY LABORATORY TECHNICIAN

3. Qualification code:	Total Number of Credits: 55
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4. Purpose of the qualification

The Certificate III in Utility Laboratory Technician provides comprehensive training for Laboratory technicians perform straightforward laboratory work. They follow set procedures and recipes, and apply well developed technical skills and basic scientific knowledge. Utility Laboratory Technician generally work inside a laboratory but may also perform technical tasks in the field or within production plants. They may also perform a range of laboratory maintenance and office tasks.

5. Regulations for the qualification

6. Schedule of Units

Unit No	Unit Title	Code
Common Competencies		
01	Apply Occupational Health and Safety requirements	
02	Apply work ethics and optimize professionalism	
03	Practice effective workplace communication	
04	Perform computer operations	
05	Provide first aid	
06	Respond to fire	
Core Competencies		
07	Apply science in water testing	
08	Apply mathematics in water testing	
09	Handle dangerous goods/hazardous substances	
10	Work safely with instruments	
11	Record and present data	
12	Perform calibration and maintenance of laboratory equipment	
13	Sampling and prepare samples for testing	
14	Prepare working solutions	
15	Perform basic tests	
7. Accreditation requirements		
8. Recommended sequencing of units		

Units Details

#	Unit	Code	Level	No of credits
01	Apply Occupational Health and Safety requirements		III	04
02	Apply work ethics and optimize professionalism		III	03
03	Practice effective workplace communication		III	03
05	Perform computer operations		III	03
06	Provide first aid		III	05
07	Respond to fire		III	03
08	Apply science in water testing		III	03
09	Apply mathematics in water testing		III	03
10	Handle dangerous goods/hazardous substances		III	04
11	Work safely with instruments		III	03
12	Record and present data		III	04
13	Perform calibration and maintenance of laboratory equipment		III	04
14	Sampling and prepare samples for testing		III	06
15	Prepare working solutions		III	03
16	Perform basic tests		III	04

Packaging of National Qualifications:

National Certificate III in Utility Laboratory Technician will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16

Qualification Code

Competency Standard for Utility Laboratory Technician

UNIT TITLE Apply Occupational Health and Safety requirements					
DESCRIPTOR	This unit of competency describes the skills and knowledge to clean laboratory work surfaces, clean and store laboratory equipment and monitor laboratory stocks under direct supervision.				
CODE		LEVEL	III	CREDIT	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Clean work preparation areas	1.1. Clean preparation areas using appropriate cleaning agents and equipment according to workplace procedures 1.2. Remove spillages using appropriate agents, personal protective equipment (PPE) and workplace procedures 1.3. Collect and segregate wastes in accordance with workplace procedures, relevant codes and regulations
2. Clean and store equipment	2.1. Collect used equipment, inspect for faults and, where necessary, remove from service 2.2. Use appropriate agents, apparatus and techniques to clean equipment 2.3. Store clean equipment in the designated locations and manner
3. Monitor stocks of materials and equipment	3.1 Perform stock checks and maintain records of usage as directed 3.2 Store labelled stocks for safe and efficient retrieval 3.3 Inform appropriate personnel of impending stock shortages to maintain continuity of supply
4. Maintain a safe work environment	4.1 Participate in OHS activities within scope of responsibilities 4.2 Use established safe work practices and PPE to ensure personal safety and that of other personnel 4.3 Report potential hazards and/or maintenance issues in own work area to designated personnel 4.4 Minimise the generation of waste and environmental impacts 4.5 Dispose of waste in accordance with workplace procedures, relevant codes and regulations
5. Follow incident and emergency response procedures	5.1 Identify incident and emergency situations 5.2 Report and record incident and emergency situations according to workplace procedures 5.3 Follow incident and emergency procedures as appropriate to the nature of emergency using emergency equipment according to workplace procedures
6. Determine Occupational Health and Safety (OH&S) issues relating to immediate work environment	6.1. Occupational Health and Safety issues in the immediate workplace are assessed and action to rectify the problem is taken or reported to supervisor

	<p>6.2. Understand the aspects of First aid</p> <p>6.3. Understand the aspects of Fire Respond</p> <p>6.4. Workplace and OH&S procedures are followed to ensure safe working environment</p> <p>6.5. Occupational Health and Safety documents are provided to all work stations, this should include a list of personal safety items based on the line of work.</p>
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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.

Risk assessment

- ✓ identifying and analyzing the risk, and considering potential consequences in terms of exposure and hazard and likelihood of each
- ✓ assessing the effectiveness of existing controls
- ✓ determining level of risk, comparing with pre-established criteria for tolerance (or as low as reasonably achievable) and ranking of risks requiring control

Incidents and emergencies

- ✓ workplace injury and accidents
- ✓ biological and chemical spills
- ✓ leakage of radioactivity
- ✓ fire, bomb and security threats

Tools, equipment and materials required may include:

- ✓ Relevant cleaning equipment and consumables required
- ✓ Safety equipment
- ✓ Workplace safety and maintenance standards

ASSESSMENT GUIDE

Forms of assessment

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 competency Standard.

Critical aspects (for assessment)

As part of the assessment planned for this unit, it is important that work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment.

Assessment conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- ✓ use of suitable facilities, equipment and resources, including work preparation areas, stocks, materials and equipment, cleaning, decontamination and/or disinfection agents and equipment and personal protective equipment (PPE) and other safety devices and materials.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learnt:</p> <ul style="list-style-type: none"> ✓ managing the day-to-day running of science teaching laboratories and preparing practical experiments, demonstrations and field trips ✓ working with teaching staff and students to assess risks, develop and implement controls and monitor their effectiveness ✓ working with teaching staff and students to ensure all practical activities are performed safely (through demonstrations and monitoring of practical activities) ✓ developing operational plans, work schedules, job cards and budgets ✓ clarifying and designing practical activities and assessing resource needs ✓ preparing laboratory experiments and demonstrations on time with the correct materials and equipment ✓ managing contingencies and resources within level of responsibility ✓ maintaining the laboratory fit for purpose ✓ obtaining stocks of materials and equipment using workplace procedures ✓ organising quotes and bookings using workplace procedures ✓ working effectively with students and staff who may have diverse work styles, cultures and perspectives. 	<p>Skills to be developed:</p> <ul style="list-style-type: none"> ✓ principles of risk assessment, risk management and hierarchy of control ✓ principles of small scale budgeting, operational planning and efficient resource use ✓ scientific terminology and technical details of sampling, testing, equipment and instrumentation used in the education program's practical activities ✓ relevant legislation, regulations and codes governing practical activities ✓ workplace procedures for the purchase, handling, storage and transport of materials and equipment ✓ relevant work health and safety (WHS) and environment requirements.

UNIT TITLE Apply work ethics and optimize professionalism					
DESCRIPTOR	This module covers the knowledge, skills and attitudes required in demonstrating proper work values and professionalism while working as a Plant operator. Besides ethical values, knowledge and skills also developed on maintaining integrity at work.				
	CODE		LEVEL	III	CREDIT

ELEMENTS OF COMPETENCIES		PERFORMANCE CRITERIA
1. Define the purpose of work		1.1 One's unique sense of purpose for working and the whys of work are identified, reflected on and clearly defined for one's development as a person and as a member of society. 1.2 Personal mission is in harmony with company's values.
2. Apply work values/ethics		2.1 Work values/ethics/concepts are identified and classified in accordance with companies' ethical standard guidelines. 2.2 Work policies are undertaken in accordance with company's policies, guidelines on work ethical standard. 2.3 Resources are used in accordance with company's policies and guidelines. 2.4 Punctuality, absence from work, sick, family and annual leave is maintained alignment to the Employment Act of the Maldives
3. Deal with ethical problems		3.1 Company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior are followed. 3.2 Work incidents/situations are reported according to company protocol/guidelines. 3.3 Resolution and/or referral of ethical problems identified are reported/documented based on standard operating procedure
4. Maintain integrity of conduct in the workplace		4.1 Personal behavior and relationships with co-workers and/or clients are demonstrated consistent with ethical standards, policy and guidelines. 4.2 Work practices are satisfactorily demonstrated and consistent with industry work ethical standards, organizational policy and guidelines. 4.3 Instructions to co-workers are provided based on ethical lawful and reasonable directives
5. Contribute to workplace efficiency and delivery of quality service		5.1 Prioritize work load according to level of responsibility 5.2 Advise supervisor if additional resources or

	<p>support are required to improve performance</p> <p>5.3 Undertake duties in a positive manner to enhance workplace cooperation and efficiency</p> <p>5.4 Monitor and adjust work practices to ensure that quality of outputs is maintained</p> <p>5.5 Identify and report opportunities for improvements in procedures, processes and equipment in work area</p>
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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.

Tools, equipment and material used in this unit may include:

For the purpose of delivering the assignment, students need to be familiarized with the following.

- ✓ Employment act of Maldives

ASSESSMENT GUIDE

Forms of assessment

Assessment for the unit needs to be holistic and must include real or simulated workplace activities.

Assessment context

Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of practices.

Critical aspects (for assessment)

It is critical that the assessment undertaken for this module be holistic and involve the following.

- ✓ Group discussion
- ✓ Role play
- ✓ Self-paced learning
- ✓ Written
- ✓ Demonstration
- ✓ Observation
- ✓ Interviews/questioning

Assessment conditions

Assessment must reflect both events and processes over a period of time.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> ✓ Work responsibilities/job functions ✓ Company code of conduct/values ✓ Concept of work values/ethics ✓ Company policies and guidelines 	<ul style="list-style-type: none"> ✓ Purpose for working and the why's of work are identified, reflected and linked to self-development ✓ Work values/ethics/concepts are identified

<ul style="list-style-type: none"> ✓ Work ethical standard ✓ Company's identified ethical problems ✓ Work incidents/situation ✓ Standard operating procedures ✓ Report writing and documentation ✓ Fundamental rights at work including gender sensitivity ✓ Corporate social responsibilities ✓ Human and interpersonal Relations ✓ Value Formation ✓ Professional Code of Conduct and Ethics 	<p>and classified in accordance with companies' ethical standard</p> <ul style="list-style-type: none"> ✓ Work policies are undertaken in accordance with company's policies. ✓ Resources are used in accordance with company's policies and guidelines. ✓ Work incidents/situations are reported according to company guidelines ✓ Personal behavior and relationships with co-workers and clients are within ethical standard ✓ Work practices are satisfactorily demonstrated and consistent. ✓ Instructions to co-workers are provided based on ethical lawful and reasonable directives
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UNIT TITLE Practice effective workplace communication					
DESCRIPTOR	This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements. Understanding the prominence of fluently speaking in both English and Dhivehi during operational level. Correspondingly, participate in group meetings and discussion and accordingly handling the documentation related tasks.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from appropriate sources 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate medium is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and storage of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Speak English and Dhivehi at an operational level	2.1 Workplace interactions with colleagues appropriately made 2.2 Verbal instructions or requests are responded to at an operational level 2.3 Appropriate non-verbal communication used 2.4 Simple requests are made 2.5 Routine procedures are described 2.6 Different forms of expression in English and Dhivehi is identified and used as appropriate
3. Participate in workplace meetings and discussions	3.1 Team meetings are attended on time 3.2 Own opinions are clearly expressed and those of others are listened to without interruption 3.3 Meeting inputs are consistent with the meeting purpose and established protocols 3.4 Workplace interactions are conducted in a courteous manner 3.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to 3.6 Meetings outcomes are interpreted and

	implemented
4. Complete relevant work-related documents	<p>4.1 Range of forms relating to conditions of employment are completed accurately and legibly</p> <p>4.2 Workplace data is recorded on standard workplace forms and documents</p> <p>4.3 Basic mathematical processes are used for routine calculations</p> <p>4.4 Errors in recording information on forms/documents are identified and properly acted upon</p> <p>4.5 Reporting requirements to supervisor are completed according to organizational guidelines</p>
5. Manage workplace calls and messages	<p>5.1. Operate workplace phones</p> <p>5.2. Attend and manage phone calls</p> <p>5.3. Read and respond to texts and messages</p> <p>5.4. Perform communication in both English and Dhivehi</p>

RANGE STATEMENT

Appropriate sources:

- ✓ Team members
- ✓ Suppliers
- ✓ Trade personnel
- ✓ Local government
- ✓ Industry bodies

Medium:

- ✓ Memorandum
- ✓ Circular
- ✓ Notice
- ✓ Information discussion
- ✓ Follow-up or verbal instructions
- ✓ Face to face communication

Storage:

- ✓ Manual filing system
- ✓ Computer-based filing system

Forms:

- ✓ Personnel forms, telephone message forms, safety reports

Workplace interactions:

- ✓ Face to face
- ✓ Telephone
- ✓ Electronic and two-way radio
- ✓ Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams

Protocols:

- ✓ Observing meeting
- ✓ Compliance with meeting decisions
- ✓ Obeying meeting instructions.

ASSESSMENT GUIDE

Forms of assessment

Assessment for the unit needs to be continuous and holistic and must include real or simulated workplace activities.

- ✓ Direct Observation
- ✓ Oral interview and written test

Assessment context

Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of opportunities for communication

Critical aspects (for assessment)

Assessment requires evidence that the candidate:

- ✓ Prepared written communication following standard format of the organization
- ✓ Accessed information using communication equipment
- ✓ Spoken English at a basic operational level
- ✓ Made use of relevant terms as an aid to transfer information effectively
- ✓ Conveyed information effectively adopting the formal or informal communication

Assessment conditions

It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying circumstances.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none">✓ General knowledge of English and Divehi grammar✓ General knowledge of common telephone equipment✓ General knowledge on effective communication✓ Different modes of communication✓ Written communication✓ Organizational policies✓ Communication procedures and systems	Skills to be developed: <ul style="list-style-type: none">✓ Undertake effective customer relation communications✓ Competent in communicating basic with customers✓ Fluency in English and Dhivehi language usage

UNIT TITLE Perform computer operations					
DESCRIPTOR	This unit describes the performance outcomes, skills and knowledge required to start up a personal computer or business computer terminal; to correctly navigate the desktop environment; and to use a range of basic functions.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Start computer, system information and features	1.1. Adjust workspace, furniture and equipment to suit user ergonomic requirements 1.2. Ensure work organization meets organizational and occupational health and safety (OHS) requirements for computer operation 1.3. Start computer or log on according to user procedures 1.4. Identify basic functions and features using system information 1.5. Customize desktop configuration, if necessary, with assistance from appropriate persons 1.6. Use help functions as required
2. Organize files using basic directory and folder structures	2.1 Create folders/subfolders with suitable names 2.2 Save files with suitable names in appropriate folders 2.3 Rename and move folders/subfolders and files as required 2.4 Identify folder/subfolder and file attributes 2.5 Move folders/subfolders and files using cut and paste, and drag and drop techniques 2.6 Save folders/subfolders and files to appropriate media where necessary 2.7 Search for folders/subfolders and files using appropriate software tools 2.8 Restore deleted folder/subfolders and files as necessary
3. Print information	3.1 Print information from installed printer 3.2 View progress of print jobs and delete as required 3.3 Change default printer if installed and required
4. Apply web browsing skills	4.1 Introduction to WWW 4.2 Acknowledge to gather relevant information from reliable sources 4.3 Use of search engines 4.4 Basic interaction of browser 4.5 Creating bookmarks in browser

	4.6 Upload and download files 4.7 Navigation of hyperlink
5. Shut down computer	4.8 Close all open applications 4.9 Shut-down computer according to user procedures
6. Basic Microsoft Word and Excel skills	6.1. Ensure data is entered, checked and amended in accordance with organizational and task requirements, to maintain consistency of design and layout 6.2. Format spreadsheet using software functions; to adjust page and cell layout to meet information requirements, in accordance with organizational style and presentation requirements 6.3. Ensure formulae are used and tested to confirm output meets task requirements, in consultation with appropriate personnel as required 6.4. Use manuals, user documentation and online help to overcome problems with spreadsheet design and production 6.5. Format document using appropriate software functions to adjust page layout to meet information requirements, in accordance with organizational style and presentation requirements 6.6. Use system features to identify and manipulate screen display options and controls 6.7. Use manuals, user documentation and online help to overcome problems with document presentation and production

RANGE STATEMENT

This unit covers computer hardware to include personal computers used independently or within networks, related peripherals, such as printers, scanners, keyboard and mouse, and storage media such as disk drives and other forms of storage. Software used must include but not limited to word processing, spreadsheets, database and billing software packages and Internet browsing software.

Tools, equipment and materials required may include:

- ✓ Storage device
- ✓ Different software and hardware
- ✓ Personal computers system
- ✓ Laptop computer
- ✓ Printers
- ✓ Scanner
- ✓ Keyboard
- ✓ Mouse
- ✓ Disk drive /CDs, DVDs, compressed storage device

ASSESSMENT GUIDE

The assessment guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this occupational standard

Forms of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- ✓ direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate
- ✓ demonstration of techniques
- ✓ oral or written questioning to assess knowledge of computer operations and functions
- ✓ review of shortcuts created
- ✓ review of folders/subfolders created.

Critical aspects (for assessment)

Evidence of the following is essential:

- ✓ navigation and manipulation of the desktop environment within the range of assigned workplace tasks
- ✓ knowledge of organizational requirements for simple documents and filing conventions
- ✓ application of simple keyboard functions to produce documents with a degree of speed and accuracy relevant to the level of responsibility required.

Assessment conditions

- ✓ Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.
- ✓ Assessment must include direct observation of tasks.
- ✓ Where assessment of competency includes third-party evidence, individuals must provide evidence
- ✓ Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none"> ✓ Basic ergonomics of keyboard and computer use ✓ Main types of computers and basic features of different operating systems ✓ Main parts of a computer ✓ Storage devices and basic categories of memory ✓ Relevant software 	Skills to developed: <ul style="list-style-type: none"> ✓ communication skills to identify lines of communication, to request advice, to effectively question, to follow instructions and to receive feedback ✓ problem-solving skills to solve routine problems in the workplace, while under direct supervision ✓ technology skills to use equipment safely while under direction, basic keyboard and

✓ General security and computer Viruses	mouse skills and procedures relating to logging on and accessing a computer ✓ basic typing techniques and strategies.
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UNIT TITLE Provide first aid					
DESCRIPTOR	This unit deals with the skills and knowledge required for the provision of essential first aid in recognizing and responding to emergency using basic life support measures. The person providing first aid is not expected to deal with complex casualties or incidents, but to provide an initial response where first aid is required.				
CODE		LEVEL	III	CREDIT	05

ELEMENTS OF COMPETENCIES		PERFORMANCE CRITERIA			
1.	Assess the situation	1.1.	Physical hazards and risks to self and others' health and safety identified		
		1.2.	Immediate risks to self and casualty's health and safety minimized by controlling hazards in accordance with occupational health and safety requirements		
		1.3.	The situation assessed and prompt decision taken on actions required		
		1.4.	Assistance sought from relevant persons/authority, as required and at the appropriate time		
2.	Apply basic first aid techniques	2.1.	Casualty's physical condition assessed by visible vital signs		
		2.2.	First aid provided to stabilize the patient's physical and mental condition in accordance with enterprise policy on provision of first aid and recognized first aid procedures		
		2.3.	Available first aid equipment used as appropriate		
3.	Monitor the situation	3.1.	Back-up services appropriate to the situation identified and notified promptly		
		3.2.	Information about the patient's condition reported accurately and clearly to emergency services personnel or health professionals		
4.	Prepare documentation	4.1.	Documented emergency situations according to enterprise procedures		
	required	4.2.	Clear and accurate reports are provided within required time frames		

RANGE STATEMENT

This unit applies to all utilities sectors. The following explanations identify how this unit may be applied in different workplaces, sectors and circumstances. First aid treatment is that defined in Common Law as emergency assistance provided to a second party in the immediate absence of medical or paramedical care.

Established first aid principles include:

- ✓ Checking and maintaining the casualty's airway, breathing and circulation
- ✓ Checking the site for danger to self, casualty and others, and minimizing the danger.

Physical and personal hazards may include:

- ✓ Workplace hazards such as fire, floods, violent persons
- ✓ Environmental hazards such as electrical faults, chemical spills, fires, slippery surfaces, floods, wild animals, fumes,
- ✓ Proximity of other people
- ✓ Hazards associated with the casualty management processes

Risks may include:

- ✓ Worksite equipment, machinery and substances
- ✓ Bodily fluids
- ✓ Risk of further injury to the casualty
- ✓ Risks associated with the proximity of other workers and bystanders

First aid management will need to account for:

- ✓ Location and nature of the work environment
- ✓ Environmental conditions and situations, such as electricity, biological risks, weather and terrain, motor vehicle accidents,
- ✓ The level of knowledge, skills, training and experience of the person administering first aid
- ✓ Familiarity with particular injuries
- ✓ Legal issues that affect the provision of first aid in different industry sectors
- ✓ The characteristics of the site where the injury occurs
- ✓ The nature of the injury and its cause
- ✓ Infection control procedures
- ✓ Availability of first aid equipment, medications and kits or other suitable alternative aids
- ✓ Proximity and availability of trained paramedical and medical/health professional assistance
- ✓ The patient's cardio-vascular condition as indicated by vital signs such as body temperature, pulse rate and breathing rates
- ✓ Unresolved dangers such as fire, chemical contamination or fume toxicity of the area where the injury occurs

Vital signs include:

- ✓ Breathing
- ✓ Circulation
- ✓ Consciousness

Injuries may include:

- ✓ Abdominal trauma
- ✓ Allergic reactions
- ✓ Bleeding
- ✓ Chemical contamination
- ✓ Choking
- ✓ Cold injuries

- ✓ Cardio-vascular failure
- ✓ Dislocations and fractures
- ✓ Drowning
- ✓ Poisoning and toxic substances
- ✓ Medical conditions including epilepsy, diabetes, asthma
- ✓ Eye injuries
- ✓ Head injuries
- ✓ Minor skin injuries
- ✓ Neck and spinal injuries
- ✓ Needle stick injuries
- ✓ Puncture wounds and cuts
- ✓ Crush injuries
- ✓ Shock
- ✓ Smoke inhalation
- ✓ Sprains and strains
- ✓ Substance abuse
- ✓ Unconsciousness
- ✓ Infections
- ✓ Inhalation of toxic fumes and airborne dusts
- ✓ Bone and joint injuries
- ✓ Eye injuries
- ✓ Burns and scalds, thermal, chemical, friction and electrical

Injuries may involve:

- ✓ Unconsciousness
- ✓ Confusion
- ✓ Tremors
- ✓ Rigidity
- ✓ Numbness
- ✓ Inability to move body parts
- ✓ Pain
- ✓ Delirium
- ✓ External bleeding
- ✓ Internal bleeding
- ✓ Heat exhaustion
- ✓ Hypothermia
- ✓ Pre-existing illness

Appropriate persons/authority from whom assistance may be sought may include:

- ✓ Emergency services personnel
- ✓ Health professionals
- ✓ Colleagues
- ✓ Customers
- ✓ Passers by

Assistance may include, as appropriate to emergency situations:

- ✓ Maintaining site safety and minimizing the risk of further injury or injury to others
- ✓ Making the casualty comfortable and ensuring maximum safety
- ✓ Assessment of injury situations
- ✓ Providing first aid including managing bleeding through the application of tourniquets, pressure and dressings
- ✓ Giving CPR and mouth-to-mouth resuscitation
- ✓ Giving reassurance and comfort
- ✓ Raising the alarm with emergency services or health professionals
- ✓ Removing debris

Tools, equipment and material used in this unit may include:

- ✓ First aid kit
- ✓ Pressure and other bandages
- ✓ Thermometers
- ✓ Eyewash
- ✓ Pocket face masks
- ✓ Rubber gloves
- ✓ Dressings
- ✓ Flags and flares
- ✓ Fire extinguishers
- ✓ Communication equipment such as mobile phones

ASSESSMENT GUIDE

Forms of assessment

Assessment methods must be chosen to ensure that application of accepted first aid techniques can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- ✓ Practical demonstration of the use of commonly-used equipment and first aid supplies
- ✓ Explanation about management of a variety of common simulated injury situations
- ✓ Questions to test knowledge of injury situations, types of injury and management of injury situations
- ✓ Review of portfolios of evidence and third-party reports of performance of first aid by the candidate

Assessment context

This unit may be assessed in a simulated environment

Critical aspects (for assessment)

Assessment must ensure:

- ✓ Use of real first aid equipment
- ✓ Ability to assess situations requiring first aid and to decide on a plan of action including seeking help
- ✓ Ability to apply established first aid principles including:
 - Checking and maintaining the casualty's airway, breathing and circulation
 - Checking the site for danger to self, casualty and others and minimizing the danger

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none">✓ Basic anatomy and physiology✓ Resuscitation✓ Bleeding control✓ Care of the unconscious✓ Airway management✓ Basic infection control principles and procedures✓ Legal requirements✓ Duty of care✓ Reporting requirements	Skills to be developed: <ul style="list-style-type: none">✓ Assertiveness skills✓ Communication skills✓ Decision making✓ Report preparation✓ Provide first aid✓ Provide various types of treatments✓ Demonstrate the four-step process providing basic first aid

UNIT TITLE		Respond to Fire			
DESCRIPTOR	This unit covers the competency required to carry out initial response to suppress a fire and response to chemical Spills. It also includes the ability to identify the nature and classification of the fire, report the fire and carry out evacuation procedures. The unit does not cover the competencies needed to become a professional firefighter and will be covered in other related units in relevant standards.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for fire	1.1 Procedures related to a fire emergency are accessed, interpreted and rehearsed 1.2 Location of firefighting equipment is identified and the equipment is checked in accordance with organizational procedures and referred for maintenance/replacement as required
2. Carry out initial notification and assessment	2.1 Nature and scope of the fire is identified, confirmed and reported to appropriate personnel 2.2 Fire situation is assessed and appropriate course of action is determined in keeping with requirements for personal safety 2.3 Notification of fire threat is undertaken in accordance with authorized procedures 2.4 Emergency evacuation procedures are followed, where appropriate, and in accordance with organizational procedures
3. Extinguish fires	3.1 Fires are extinguished using the appropriate equipment, materials and procedures 3.2 Extinguisher is applied to ensure fast knockdown of fire 3.3 Extinguisher is used at the appropriate range and time 3.4 Extinguisher is used to minimize damage to equipment and facilities and to minimize risk of injury to personnel

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.

Firefighting equipment may include,

- ✓ Extinguishers
- ✓ Fire blankets
- ✓ Fire hose reels
- ✓ Fire hydrants
- ✓ Firefighting vehicles
- ✓ Universal Spill Absorbent Kit
- ✓ Toolbox/ PPE Spill Kit
- ✓ Personal protection equipment (PPE)

Tools, equipment and material used in this unit may include:

All relevant equipment to develop the competency of providing fire skills relevant.

ASSESSMENT GUIDE

Forms of assessment

Assessment methods must be chosen to ensure that application of firefighting can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

Assessment context

This unit may be assessed in a simulated environment

Critical aspects (for assessment)

Assessment must ensure:

- ✓ Use of real fire related equipment
- ✓ Ability to assess situations requiring responding to fire and to decide on a plan of action including seeking help

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: <ul style="list-style-type: none">✓ composition of teams, and roles and responsibility of team members✓ fire alarm systems✓ local area emergency procedures✓ principles of teamwork, team aims and objectives✓ site emergency plan✓ techniques for supporting others/team members✓ types, operations and application of firefighting equipment including extinguishers, hose reels and, where appropriate, monitors✓ verbal and non-verbal communication techniques including language, language style, active listening	Skills to be development: <ul style="list-style-type: none">✓ access, read and interpret local emergency procedures✓ apply evacuation procedures✓ assess fire situation and notify authorities✓ carry out periodic checks on firefighting equipment✓ identify emergency alarms and match with response requirement✓ identify, select and use firefighting equipment✓ participate in a team✓ use a variety of verbal and non-verbal communication techniques

UNIT TITLE Apply science in water testing					
DESCRIPTOR	This unit of competency covers the ability to manage the day-to-day running of science teaching laboratories and the preparation of practical experiments, demonstrations and field trips.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Develop basics of water science	1.1 Introduction to water science 1.2 General and Physical Chemistry 1.3 Chemical Processes, 1.4 Fluid Dynamics, 1.5 Water Quantity and Quality, 1.6 Soil and Water 1.7 General and Environmental Microbiology.
2. Interpret Water Quality and treatment processes	2.1 Familiarize with water quality suitable for human consumption 2.2 Explain waterborne diseases 2.3 Identify various water treatment processes 2.4 Interpret chemistry related to water treatment
3. Apply water science to determine quality of water	3.1 identify chemical structure of water prior and after treatment 3.2 Perform simple tests to determine change of chemical structure 3.3 Interpret water standards from international organizations, especially WHO.
4. Compile and present documentation	4.1 Assignments and reports compiled submitted by the students 4.2 Logs of the activities and other documents are compiled

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.

Hazards

- ✓ electric shock
- ✓ microbiological organisms and agents associated with soil, air, water, blood and blood
- ✓ chemicals, such as acids, heavy metals, pesticides and hydrocarbons
- ✓ radiation, such as alpha, beta, gamma and X-ray
- ✓ cryogenics, such as dry ice and liquid nitrogen
- ✓ fluids under pressure, such as steam, hydrogen in gas liquid chromatography and

Tools, equipment and materials required may include:

- ✓ Lab equipment to undertake water testing
- ✓ Consumables required for water testing

Typical materials

- ✓ live flora and fauna, such as plant specimens
- ✓ animals, such as rats, bacteria, algae, insects and fungi
- ✓ blood and blood products, human or animal tissue and fluids

- ✓ distilled water, reagents, chemicals, disinfectants, detergents, agar media and plates
- ✓ consumable items, such as syringes, pipette tips and weigh boats
- ✓ oils/lubricants, fuels, industrial gases and cryogenics, such as dry ice and liquid nitrogen
- ✓ equipment spares, such as fuses, bulbs and batteries
- ✓ teaching aids, such as textbooks and videos
- ✓ reference samples and standards

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

Assessors should ensure that candidates can interpret all the fundamental knowledge and practical related to this unit.

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. The timeframe must allow for assessment of operation under all normal and a range of abnormal conditions. This unit of competency is to be assessed in the workplace or a simulated workplace environment.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none"> ✓ scientific terminologies related to water and water treatment ✓ Introduction to water science ✓ General and Physical Chemistry related to water ✓ Different Chemical Processes related to water treatment ✓ Basic of fluid dynamics ✓ Characteristics Water Quantity and Quality, ✓ Basics of Soil and Water ✓ Introduction to general and environmental Microbiology. 	Skills to be developed: <ul style="list-style-type: none"> ✓ using problem solving techniques and contingency planning ✓ clarifying/designing practical activities and assessing resource needs ✓ working with teaching staff and students to assess risks, develop and implement controls and monitor their effectiveness ✓ preparing laboratory experiments and demonstrations on time with the correct materials and equipment ✓ maintaining the laboratory fit for purpose ✓ obtaining stocks of materials and equipment

UNIT TITLE Apply mathematics in water testing					
DESCRIPTOR	This unit of competency describes the outcomes required to perform calculations for water industry related operations. This unit includes producing and interpreting charts and graphs.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify and Interpret formulae for process calculations	1.1. Required calculation method is identified to suit the application, including selection of relevant arithmetic operations and/or formulae. 1.2. Units of measurement are identified and used correctly.
2. Interpret and present graphical representations of mathematical information	2.1 Information presented in mathematical symbols, graphs and charts is correctly interpreted 2.2 Information is presented clearly using mathematical symbols, graphs and charts
3. Perform calculations	3.1 Formulae are used correctly to perform calculations. 3.2 Use electronic calculators or spreadsheets to perform water industry calculations.

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. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs if the candidate, accessibility of the item, and local industry and regional contexts.

Arithmetic operations may include:

- ✓ addition, subtraction, multiplication and division
- ✓ manipulation of decimals, fractions and mixed numbers
- ✓ percentages
- ✓ proportions and ratios

Units of measurement may include:

- ✓ time - second
- ✓ length - metre
- ✓ mass – kilogram
- ✓ volume – cubic metre
- ✓ pressure - Pascal

Calculations may include:

- ✓ areas and volumes
- ✓ perimeter and circumference
- ✓ detention time
- ✓ flow rate
- ✓ loading rates
- ✓ chemical dosages
- ✓ laboratory results

Graphs and charts may include:

- ✓ bar and line graphs
- ✓ multi parameter graphs
- ✓ pie charts
- ✓ control charts

Tools, equipment and materials required may include:

Nil

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

The candidate should demonstrate the ability to:

- ✓ select appropriate mathematical processes for workplace tasks
- ✓ select and use appropriate electronic aids including calculators or computers
- ✓ carry out calculations
- ✓ estimate answers
- ✓ interpret graphical representations of mathematical information

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. The timeframe must allow for assessment of operation under all normal and a range of abnormal conditions. 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.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none">✓ basic arithmetic operations✓ BODMAS principle – order of operation✓ metric units and conversions✓ percentages✓ ratio and proportions✓ averages✓ decimals and fractions✓ rounding off and estimations✓ reasons for ensuring that the units of each term are consistent with the formulae selected✓ techniques for estimating approximate answers✓ graphical representation of data✓ procedures for drawing "lines of best fit"✓ trends indicated by graphs or charts drawn including upper and lower limits	Skills to be developed: <ul style="list-style-type: none">✓ perform calculations using the basic arithmetic operations - addition, subtraction, multiplication and division✓ use electronic calculators or spreadsheets to perform calculations✓ select and use the appropriate formulae for a given application✓ check calculated answer for accuracy✓ estimate answers✓ produce simple charts or graphs from given information or observations made✓ interpret graphical information

UNIT TITLE		Handle dangerous goods/hazardous substances			
DESCRIPTOR	This unit involves the skills and knowledge required to handle dangerous goods and hazardous substances in accordance with relevant work health safety (WHS)/occupational health and safety (OHS) regulations concerning the safe handling of dangerous goods and hazardous substances, within the transport and logistics industry.				
CODE		LEVEL	III	CREDIT	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify requirements for working with dangerous goods and/or hazardous substances	1.1 Dangerous goods/hazardous substances are identified from information including class labels, manifests and other documentation 1.2 Job hazards are identified and required action is taken to minimise, control or eliminate identified hazards 1.3 Storage requirements for dangerous goods/hazardous substances are identified and applied 1.4 Legislative requirements for dangerous goods/hazardous substances are used to plan work activities 1.5 Handling procedures for different classes and characteristics of goods are observed 1.6 Confirmation is sought from relevant personnel where dangerous goods/hazardous materials do not appear to be appropriately marked
2. Confirm site incident procedures	2.1 Incident reporting processes are identified 2.2 Emergency equipment is located and checked in accordance with workplace procedures and statutory regulations 2.3 Emergency procedures are identified and confirmed
3. Select handling techniques	3.1 Load handling and shifting procedures are selected in accordance with identified requirements for particular goods 3.2 Handling equipment is checked for conformity with workplace requirements and manufacturer guidelines 3.3 Suitable signage or placards are checked for compliance with workplace procedures, as required
4. Dispose of dangerous wastes	4.1 Identify different types of dangerous wastes 4.2 Select proper disposal procedures 4.3 Dispose the wastes accordingly

RANGE STATEMENT

As per the range of mathematics and drawing, students need to undertake the following.

- ✓ Use calculations to solve simple workshop problems.
- ✓ Make sketches of simple first and third angle orthographic projections from actual objects and pictorial views.
- ✓ Make sketches of simple sectional views.
- ✓ Develop patterns of three-dimensional figures and their frustums between parallel planes.
- ✓ Construct plane figures from given data

Tools, equipment and materials required may include:

Tools, equipment and materials used for this unit may include but not limited to the following.

- ✓ Calculator
- ✓ Drawing tools
- ✓ Drawing table
- ✓ Note pads
- ✓ Pens/pencils

ASSESSMENT GUIDE

Forms of assessment

Assessment for the unit needs to be continuous and holistic and must include real or simulated workplace activities.

Critical aspects (for assessment)

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of mathematics and drawing. This unit may be assessed in conjunction with all and units which form part of the normal job role.

Assessment conditions

It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying circumstances.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none">✓ equipment applications, capacities, configurations, safety hazards and control mechanisms✓ housekeeping standards and procedures✓ permit and license requirements✓ problems that may arise when handling of dangerous goods and hazardous substances and actions that should be taken to prevent or solve these problems✓ relevant regulations and codes concerning handling dangerous goods/hazardous substances	Skills to be developed: <ul style="list-style-type: none">✓ identifying and selecting safety requirements for handling dangerous goods/hazardous substances✓ identifying containers and goods coding, markings and emergency information panels for mode of transport storage selected✓ maintaining workplace records and documentation✓ modifying activities depending on operational contingencies, risk situations and environments✓ monitoring and prioritising work activities in terms of planned schedule, predicting

<ul style="list-style-type: none"> ✓ risks when handling dangerous goods/hazardous substances and related precautions to control risk ✓ workplace procedures for handling and storing dangerous goods/hazardous substances. ✓ Operation of electronic communications ✓ Equipment to required protocol ✓ estimating weight and dimensions of load and any special requirements 	<ul style="list-style-type: none"> consequences and identifying improvements ✓ operating and adapting to differences in equipment in accordance with standard operating procedures ✓ reading, interpreting and following relevant instructions, procedures, regulations, information and signs ✓ reporting and/or rectifying identified problems, faults or malfunctions promptly, in accordance with regulatory requirements and workplace procedures
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UNIT TITLE Work safely with instruments					
DESCRIPTOR	This unit of competency covers the ability to safely store, transport and operate laboratory instruments following established safe work practices and in accordance with laboratory procedures and licensing requirements.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES		PERFORMANCE CRITERIA			
1. Store instruments safely and securely		1.1.	Identify requirements for storage facilities and associated document processes		
		1.2.	Store instruments in accordance with requirements and documented procedures		
		1.3.	Secure instruments to prevent unauthorized access		
		1.4.	Record instruments' movements and usage in accordance with documented procedures		
2. Transport instruments safely and securely		2.1	Select vehicle suitable for the purpose		
		2.2	Attach regulation signage in accordance with state or territory requirements to indicate that radioactive sources are being carried		
		2.3	Ensure that instruments are properly located and fixed securely in place		
		2.4	Ensure security of instruments when the vehicle is unattended		
3. Use instruments safely and maintain security		3.1.	Follow safe working practices to minimise own exposure to radiation		
		3.2.	Use radiation dosimeter to monitor own exposure to radiation		
		3.3.	Follow safe work practices to minimise exposure of others to radiation		
		3.4.	Follow safe work practices to protect the instrument from damage		
		3.5.	Maintain instrument security		
4. Maintain records		4.1.	Record observations, data and results in accordance with workplace procedures		
		4.2.	Maintain confidentiality of workplace information		
5. Perform emergency procedures		5.1.	Identify potential emergency situations		
		5.2.	Respond to emergencies in accordance with documented procedures		
		5.3.	Report emergency situations to appropriate personnel		

RANGE STATEMENT

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.

Tools, equipment and materials required may include:

Instruments include, but are not limited to, one or more of:

- ✓ Beakers

- ✓ Erlenmeyer flasks, AKA conical flasks
- ✓ Florence flasks, AKA boiling flasks
- ✓ Test tubes, tongs, and racks
- ✓ Watch glasses
- ✓ Crucibles
- ✓ Funnels
- ✓ Graduated cylinders
- ✓ Volumetric flasks
- ✓ Droppers
- ✓ Pipettes
- ✓ Burets
- ✓ Ring stands, rings, and clamps
- ✓ Tongs and forceps
- ✓ Spatulas and scoopulas
- ✓ Thermometers
- ✓ Bunsen Burners
- ✓ Balances

Atypical conditions and problems include, but are not limited to, one or more of:

- ✓ incidents during transportation
- ✓ on-site accidents and fire
- ✓ jamming of the source rod in the exposed position
- ✓ keeping other personnel clear of instrument
- ✓ instrument breakdown Crystallisers
- ✓ Precipitators
- ✓ Absorbers/adsorbers

WHS and environmental management requirements include:

- ✓ Complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- ✓ applying standard precautions relating to the potentially hazardous nature of samples

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

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.

Assessment conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- ✓ observation of candidate safely handling, storing, transporting and using the instrument
- ✓ feedback from peers and supervisors about the candidate's consistent ability to safely use instruments
- ✓ review of the candidate's response to suitable emergency simulations, case studies or scenarios

- ✓ oral or written questioning to check required knowledge of radiation concepts and principles and the safe use of instruments.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learned:</p> <ul style="list-style-type: none"> ✓ Standard codes of practice for use of laboratory instruments ✓ function of key components, pre-use and calibration status checks and safe operating procedures for the instrument used ✓ work health and safety (WHS) and emergency procedures for safe handling of equipment and working with the instrument used ✓ critical elements of chemical safety 	<p>Skills to be developed:</p> <ul style="list-style-type: none"> ✓ safely handling, storing and transporting at least one (1) instrument in accordance with established safe work practices, laboratory procedures. ✓ safely checking the operation and calibration status of at least one (1) instrument ✓ maintaining instrument security ✓ recording and reporting instrument condition and use, observations, data and survey results in accordance with workplace procedures ✓ recognising and reporting atypical conditions and problems to appropriate personnel promptly

UNIT TITLE Record and present data					
DESCRIPTOR	This unit of competency covers the ability to record and store data, perform simple calculations of scientific quantities and present information in tables and graphs. The unit of competency requires personnel to solve predictable problems using clear information or known solutions. Where alternatives exist, they are limited or apparent.				
CODE		LEVEL	III	CREDIT	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Record and check data	1.1. Enter data into laboratory information system or record sheets as directed 1.2. Check data to identify transcription errors or atypical entries 1.3. Rectify errors in data using enterprise procedures
2. Calculate simple scientific quantities	2.1 Calculate simple scientific quantities using given formulae and data 2.2 Ensure calculated quantities are consistent with estimations and expectations 2.3 Report all calculated quantities with appropriate precision and units
3. Present data in tables, charts and graphs	3.1. Present data accurately in tables and charts using given formats and scales 3.2. Recognise and report obvious features and trends in data
4. Store and retrieve data	4.1. File and store data in accordance with enterprise procedures 4.2. Maintain enterprise confidentiality standards

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.

Concepts of metrology may include:

- ✓ that all measurements are estimates
- ✓ measurements belong to a population of measurements of the measured parameters
- ✓ repeatability
- ✓ precision
- ✓ accuracy
- ✓ significant figures
- ✓ sources of error
- ✓ uncertainty
- ✓ traceability

Data may be recorded on:

- ✓ worksheets
- ✓ spreadsheets or databases linked to information management systems

Data may include results of:

- ✓ observations
- ✓ tests and measurements
- ✓ surveys

Data may be presented in the form of:

- ✓ Graphs
- ✓ tables
- ✓ control charts
- ✓ semi-quantitative observations expressed on a scale (for example, 1 to 4 or + to +++)

Simple calculations:

Simple calculations may be performed with or without a calculator or computer software and may include scientific quantities such as:

- ✓ decimals, fractions, ratios, proportions and percentages
- ✓ perimeters, areas, volumes and angles
- ✓ concentration
- ✓ unit conversion, multiples and submultiples
- ✓ use of significant figures, rounding off, estimation and approximation
- ✓ substitution of data in formulae
- ✓ conversions between SI units
- ✓ areas (m²) and volumes (mL, L, m³) of regular shapes (e.g. packaging and moulds)
- ✓ average mass, mass %, density, specific gravity, moisture, relative and absolute humidity
- ✓ ratios, such as mass to mass, mass to volume and volume to volume percentages
- ✓ industry specific ratios, such as g/cm² , kg/m²
- ✓ concentration (for example, g/100mL, mg/L, mg/(L, dilution mL/L)
- ✓ statistical values such as mean, median, mode and standard deviation
- ✓ average count, colonies per swab surface and cell counts (live and dead/total)
- ✓ process variables, such as pressure, velocity and flow rates
- ✓ % content of moisture, ash, fat, protein, alcohol, sulphur dioxide and trace metals, such as calcium or zinc
- ✓ food properties, such as % concentration (dry), friability, bitterness, brix, free amino nitrogen, diastatic power, calorific content and yeast viability

Tools, equipment and materials required may include:

All the relevant gadgets and equipment need to be supplied prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard. 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.

Critical aspects (for assessment)

Assessors should ensure that candidates can:

- ✓ accurately code, check and record data in the required format
- ✓ calculate simple scientific quantities
- ✓ recognise obvious trends in data
- ✓ Maintain the confidentiality of data.

Assessment conditions

Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:

- ✓ data sets and records
- ✓ computer and relevant software or laboratory information system
- ✓ Relevant workplace procedures.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learned:</p> <ul style="list-style-type: none">✓ concepts of metrology✓ the international system of units (SI)✓ relevant scientific and technical terminology✓ procedures for coding, entering, storing, retrieving and communicating data✓ procedures for verifying data and rectifying mistakes✓ conversion of units involving multiples and submultiples✓ significant figures, estimation, approximation, rounding off✓ substitution of data in formulae✓ calculations involving fractions, decimals, proportions and percentages✓ procedures for maintaining and filing records, security of data	<p>Skills to be developed:</p> <ul style="list-style-type: none">✓ performing simple calculations✓ preparing and interpreting straightforward tables, graphs and charts✓ applying calculations in the workplace✓ coding, recording and checking data accurately✓ presenting accurate results in the required format✓ recognising obvious trends in data✓ maintaining the confidentiality of data in accordance with workplace and regulatory requirements

UNIT TITLE Perform calibration and maintenance of laboratory equipment					
DESCRIPTOR	This unit of competency covers the ability to perform setup, pre-use and in-house calibration checks on equipment and assist with its maintenance. Moreover, maintaining of record keeping of the faulty equipment				
CODE		LEVEL	III	CREDIT	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Perform setup and pre-use checks of laboratory equipment	1.1. Perform laboratory equipment setup and pre-use checks in accordance with enterprise procedures 1.2. Perform safety checks in accordance with relevant enterprise and instrumental procedures 1.3. Identify faulty or unsafe components and equipment and report to appropriate personnel 1.4. Complete instrument log books/records to meet enterprise requirements
2. Perform calibration checks	2.1. Startup equipment according to operating procedures 2.2. Use specified standards for calibration check 2.3. Check equipment as per calibration procedures and schedules 2.4. Record all calibration data accurately and legibly 2.5. Compare data with specifications and/or previous records to identify non-compliant equipment 2.6. Quarantine out of calibration equipment
3. Assist with equipment maintenance	3.1. Ensure all equipment work areas are clean during and after equipment use 3.2. Perform basic maintenance in accordance with enterprise procedures 3.3. Clean and store equipment according to enterprise and/or manufacturer's specifications/procedures 3.4. Identify and replace, repair or dispose of damaged/worn equipment as appropriate
4. Maintain records	4.1. Record and report information on unsafe or faulty equipment according to enterprise procedures

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.

Tools, equipment and materials required may include:

Typical equipment and instruments may include:

- ✓ balances, pipettes, burettes and volumetric glassware
- ✓ colorimeters/spectrometers and polarimeters
- ✓ compaction rammers and soil classification equipment
- ✓ conductivity meters and pH meters
- ✓ disintegration apparatus, thermometers, incubators and water baths

- ✓ instrument chart recorders, penetrometers, force measuring equipment and tensiometer
- ✓ melting point apparatus, viscometers and hardness testing equipment
- ✓ mixing and separating equipment such as centrifuges, riffles and splitters, and mixers
- ✓ noise meters and blasting meters
- ✓ optical microscopes

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard. This unit of competency is to be assessed in the workplace or a simulated workplace environment, and assessment evidence must be relevant to the particular workplace context.

Critical aspects (for assessment)

Assessors should ensure that candidates can:

- ✓ perform setup pre-use checks and shutdown procedures
- ✓ perform calibration checks of basic equipment using standard procedures
- ✓ obtain readings of the required accuracy and precision
- ✓ recognise non-standard behaviour of instruments
- ✓ assist with maintaining equipment in working order by performing basic maintenance tasks
- ✓ follow all relevant OHS requirements
- ✓ follow enterprise recording and reporting procedures.

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. Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be learned: <ul style="list-style-type: none"> ✓ operational principles and methods for equipment use ✓ basic sources of error in equipment operation and their control ✓ role and importance of correct calibration ✓ basic equipment maintenance procedures ✓ enterprise communication and reporting procedures ✓ relevant OHS and environment requirements 	Skills to be developed: <ul style="list-style-type: none"> ✓ performing setup, pre-use checks and shutdown procedures ✓ performing calibration checks of basic equipment using standard procedures ✓ obtaining readings of the required accuracy and precision ✓ identifying non-compliant equipment from specifications and/or previous checks ✓ recognising non-standard behaviour of instruments ✓ assisting with maintaining equipment in working order by performing basic maintenance tasks ✓ following all relevant occupational health and safety (OHS) requirements ✓ following enterprise recording and reporting procedures

UNIT TITLE Sampling and prepare samples for testing					
DESCRIPTOR	This unit of competency covers the ability to log samples, check sample documentation, schedule and prepare samples for testing in accordance with enterprise procedures. This unit does not include testing, tissue processing or similar techniques.				
CODE		LEVEL	III	CREDIT	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Sampling	1.1. Locate sampling points 1.2. Sampling frequency and Sampling methods 1.3. Make sampling procedure
2. Log samples	2.1. Record date (and time of arrival, if required) of samples at enterprise 2.2. Check and match samples with request forms before they are accepted 2.3. Enter samples into the laboratory information management system (LIMS) 2.4. Apply required document tracking mechanisms 2.5. Process 'urgent' test requests according to enterprise requirements 2.6. Ensure security and traceability of all information, laboratory data and records
3. Address customer service issues	2.1 Report to referring client/supervisor when samples and request forms do not comply with workplace requirements 2.2 Maintain confidentiality of all client/workplace data and information 2.3 Ensure that information provided to customers is accurate, relevant and authorized for release 2.4 Deal with customers politely and efficiently and in accordance with workplace procedures
4. Prepare samples for testing	4.1. Perform physical separation of the samples, as required 4.2. Prepare the required number of sub-samples 4.3. Perform chemical separation of the samples, as required 4.4. Place samples in appropriate transport media, as required 4.5. Monitor and control sample conditions before, during and after processing
5. Distribute samples	5.1. Group samples requiring similar testing requirements 5.2. Distribute samples to workstations maintaining sample integrity 5.3. Distribute request forms for data entry or filing in accordance with workplace procedures 5.4. Check that samples and relevant request forms have been received by laboratory personnel
6. Maintain a safe work area and environment	6.1. Apply safe work practices to ensure personal safety and that of other laboratory personnel 6.2. Use appropriate personal protective equipment (PPE) to ensure personal safety when sampling,

	processing, transferring or disposing of samples 6.3. Report all accidents and spillages to supervisor 6.4. Clean up splashes and spillages immediately using appropriate techniques and precautions 6.5. Minimise the generation of wastes and environmental impacts 6.6. Ensure the safe disposal of hazardous materials and other laboratory wastes
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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.

Samples received

Samples received may include:

- ✓ gas or air samples
- ✓ liquid samples, such as water and waste water, stormwater, sludges and complex mixtures and sewage
- ✓ solid samples, such as soils and sediments, rocks/minerals, concrete, quarry or mining products
- ✓ solid wastes, such as hazardous, non-hazardous, domestic, commercial, industrial, mining and agricultural
- ✓ biological specimens such as tissue and blood
- ✓ raw materials, start, middle, end of production run samples and final products

Hazards may include:

- ✓ biohazards, such as micro-organisms and agents associated with soil, air, water, blood and blood products, and human or animal tissue and fluids
- ✓ dust and noise
- ✓ chemicals, such as acids and hydrocarbons
- ✓ aerosols
- ✓ sharps and broken glassware
- ✓ manual handling of heavy sample bags and containers
- ✓ crushing, entanglement and cuts associated with moving machinery

Safe work practices may include:

- ✓ use of MSDS
- ✓ use of personal protective equipment, such as hard hats, hearing protection, gloves, safety glasses, goggles, face guards, coveralls, gowns, body suits, respirators and safety boots
- ✓ use of biohazard containers and laminar flow cabinets
- ✓ correct labelling of reagents and hazardous materials
- ✓ handling, and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer's instructions, and enterprise procedures and regulations
- ✓ regular cleaning and/or decontamination of equipment and work areas

Tools, equipment and material used in this unit may include:

All relevant equipment to develop the competency of preparing sampling skills relevant.

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

Assessors should ensure that candidates can:

- ✓ safely receive and log samples in accordance with enterprise procedures
- ✓ apply knowledge of the relationship between sample preparation requirements and associated tests
- ✓ deal with customers politely and efficiently
- ✓ recognise and deal with problems according to enterprise procedures
- ✓ maintain sample integrity and traceability.

Assessment conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- ✓ use of suitable facilities, equipment and resources, including:
 - a laboratory information management system (LIMS) system (or simulated to reflect an actual LIMS), and workplace procedures covering the receipt and preparation of samples for testing
 - sample containers, tubes, request forms and sample documentation
 - simulated samples when authentic samples are unavailable or inappropriate.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learned:</p> <ul style="list-style-type: none">✓ enterprise procedures for the receipt, documentation, distribution and storage of samples✓ potentially hazardous and unstable nature of samples✓ requirement of specified sample types for specific tests✓ importance of maintaining effective customer relations✓ sample storage and transport requirements✓ relevant health, safety and environment requirements <p>Specific industry</p> <ul style="list-style-type: none">✓ Additional knowledge requirements may apply for different industry sectors. For example: Biomedical laboratories:✓ potentially infective nature of all biological materials✓ nature of unstable solutions, such as anti-coagulated whole blood✓ non-conformance of clotted samples for procedures, such as routine haematological tests	<p>Skills to be developed:</p> <ul style="list-style-type: none">✓ receipt and logging in of samples✓ checking of samples for history and acceptable transport conditions✓ preparing and sub-sampling of samples✓ labelling samples accurately and completely✓ using standard precautions when dealing with potentially hazardous materials✓ applying knowledge of the relationship between specific sample preparation and associated tests✓ clarifying specific client requirements with appropriate personnel promptly✓ labelling and storing samples in a way which maintains sample integrity and traceability✓ disposing of samples following required procedures✓ maintaining equipment and the workspace

UNIT TITLE Prepare working solutions					
DESCRIPTOR	This unit of competency covers the ability to prepare working solutions and to check that existing stocks of solutions are suitable for use. Working solutions include those required to perform laboratory tests. Personnel are required to calculate quantities and make dilutions.				
CODE		LEVEL	III	CREDIT	03

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Make up working solutions	1.1. Identify the relevant standard methods for solution preparation 1.2. Assemble specified laboratory equipment 1.3. Select and prepare materials and solvent of specified purity 1.4. Measure appropriate quantities of reagents for solution preparation and record data 1.5. Prepare labels and log solution details in laboratory register 1.6. Transfer solutions to appropriately labelled containers
2. Check existing stock of solutions	2.1 Monitor shelf life of working solutions and identify those that are unfit for use according to laboratory procedures 2.2 Replace out-of-date or reject solutions according to laboratory procedures
3. Maintain a safe work environment	3.1 Use appropriate safety procedures and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel 3.2 Store reagents and clean/store glassware and equipment in accordance with workplace procedures 3.3 Minimise generation of waste and environmental impacts 3.4 Clean up spills using appropriate techniques 3.5 Ensure the safe collection of laboratory and hazardous waste for subsequent disposal

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.

Working solutions

- ✓ solutions required for diagnostic/analytical and limit tests in food and chemical laboratories, such as sulphates, chlorides and heavy metals
- ✓ staining solutions for standard diagnostic/analytical procedures in biomedical/environmental laboratories, such as cell staining, fixation of cells and tissues, suspension of cells and titrimetric indicators
- ✓ solutions required for laboratory maintenance and disinfection, such as 70% ethanol and hypochlorite

Safety procedures

- ✓ use of PPE, such as safety glasses, gloves and coveralls
- ✓ correctly labelling reagents and hazardous materials
- ✓ handling and storing hazardous material and equipment in accordance with labels, MSDS, manufacturer instructions and workplace procedures and regulations
- ✓ regular cleaning and/or decontamination of equipment
- ✓ prompt clean-up of spills in accordance workplace procedures

WHS and environmental management requirements

- ✓ complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- ✓ applying standard precautions relating to the potentially hazardous nature of samples

Tools, equipment and material used in this unit may include:

All relevant equipment to develop the competency of preparing working solutions relevant.

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

Assessors should ensure that candidates can:

- ✓ inspection of working solutions prepared, labelled and stored by the candidate
- ✓ review of solution records and workplace documentation completed by the candidate
- ✓ feedback from peers and supervisors
- ✓ observation of the candidate preparing working solutions
- ✓ review of calculations for concentration and dilutions completed by the candidate
- ✓ oral or written questioning about solution preparation steps, calculations, common hazards and safety procedures.

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. The timeframe must allow for assessment of operation under all normal and a range of abnormal conditions.
- ✓ 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).

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learned:</p> <ul style="list-style-type: none"> ✓ safely preparing at least five (5) examples of correctly labelled working solutions, including calculation of the quantities involved and any dilutions required ✓ checking that existing stocks of working solutions and identifying those unfit for use, including: <ul style="list-style-type: none"> • noting turbidity to exclude absorption of moisture • noting deposits to exclude microbial contamination or chemical degradation • noting crystals to exclude evaporation • noting colour changes indicating a pH shift with solutions containing indicators ✓ checking expiry dates on solution containers ✓ following workplace procedures for the safe use of hazardous chemicals, laboratory glassware and equipment ✓ accurately labelling and storing solutions in accordance with workplace procedures ✓ safely cleaning up spills and collecting/disposing of waste in accordance workplace procedures ✓ recording and presenting data accurately and legibly. 	<p>Skills to be developed:</p> <ul style="list-style-type: none"> ✓ concepts of metrology, including: <ul style="list-style-type: none"> • all measurements are estimates • measurements belong to a population of measurements of the measured parameters • precision, accuracy and significant figures • sources of error, uncertainty and repeatability • traceability ✓ international system of units (SI) ✓ concentration terms, such as % w/w, % w/v, % v/v, ppm (mg/L) and molarity ✓ basic theory of acids, bases, salts, buffers and neutralisation ✓ what affects solubility ✓ difference between aqueous and organic solutions ✓ periodic table, symbols of the elements, atomic weights, and difference between elements and compounds ✓ chemical formulae ✓ workplace procedures for preparing solutions ✓ calculations required to prepare specified amounts of solutions of specified concentration

UNIT TITLE Perform basic tests					
DESCRIPTOR	This unit of competency covers the ability to prepare samples and perform tests and measurements using standard methods with access to readily available advice from supervisors.				
CODE		LEVEL	III	CREDIT	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Interpret test requirements	1.1. Review test request to identify samples to be tested, test method and equipment involved 1.2. Identify hazards and workplace controls associated with the sample, preparation methods, reagents and/or equipment
2. Prepare sample	2.1 Record sample description, compare with specification, record and report discrepancies 2.2 Prepare sample in accordance with appropriate standard methods
3. Check equipment before use	3.1 Set up test equipment in accordance with test method 3.2 Perform pre-use and safety checks in accordance with workplace procedures and manufacturer instructions 3.3 Identify faulty or unsafe equipment and report to appropriate personnel 3.4 Check calibration status of equipment and report any out-of-calibration items to appropriate personnel
4. Perform tests on samples	4.1. Identify, prepare and weigh or measure sample and standards to be tested 4.2. Conduct tests in accordance with workplace procedures 4.3. Record data in accordance with workplace procedures 4.4. Perform calculations on data as required 4.5. Identify and report out of specification or atypical results promptly to appropriate personnel 4.6. Shut down equipment in accordance with operating procedures
5. Maintain a safe work environment	5.1. Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel 5.2. Minimise the generation of wastes and environmental impacts 5.3. Ensure safe disposal of laboratory and hazardous wastes 5.4. Clean, care for and store equipment and reagents as required

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.

Undertake Basic Water Tests aligned to the daily tests stipulated by EPA include of:

- ✓ Free Chlorine
- ✓ pH
- ✓ Physical Appearance
- ✓ Electrical Conductivity
- ✓ Total Coliform
- ✓ Fecal Coliform
- ✓ Turbidity
- ✓ Total Dissolved Solids

Sample preparation processes include one or more of:

- ✓ sub-sampling or splitting using procedures, such as riffing, coning and quartering, manual and mechanical splitters
- ✓ diluting samples
- ✓ physical treatments, such as ashing, dissolving, filtration, sieving, centrifugation and comminution
- ✓ moulding, casting or cutting specimens

Typical basic tests carried out by laboratory/field assistants

- ✓ visual/optical tests of appearance, such as colour, texture, identity, turbidity and refractive index (alcohol content and Baume/Brix)
- ✓ physical tests, such as:
 - ✓ density, specific gravity and compacted density
 - ✓ moisture content and water activity
 - ✓ particle size, particle shape and size distribution
- ✓ chemical tests, such as:
 - ✓ gravimetric, colorimetric, electrical conductivity (EC) and pH
 - ✓ specific ions using dipsticks and kits
 - ✓ nutrients (e.g. nitrates and orthophosphates) using kits
 - ✓ ashes, including sulphated ashes
- ✓ biological/environmental tests, such as:
 - ✓ pH, oxygen reduction potential (ORP), dissolved oxygen (DO) and EC
 - ✓ E coli using test kits, and surface hygiene/presence of microbes
- ✓ packaging tests, such as:
 - ✓ tearing resistance, bursting strength and impact resistance
 - ✓ permeability and/or leakage
- ✓ mechanical tests, such as:
 - ✓ Emerson class
 - ✓ concrete slump

Measurements

- ✓ simple ground surveys
- ✓ meteorological parameters, such as wind direction/strength, rainfall, maximum/minimum temperature, humidity and solar radiation
- ✓ simple background radiation survey
- ✓ production/process parameters, such as temperature, flow and pressure
- ✓ gas levels in a confined space

Tools, equipment and material used in this unit may include:

All relevant equipment to develop the competency of developing basic tests relevant.

ASSESSMENT GUIDE

Forms of assessment

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 Competency Standard

Critical aspects (for assessment)

Assessors should ensure that candidates can review of the quality of test data/results achieved by the candidate over time, inspection of records and workplace documentation completed by the candidate, observation of the candidate performing a range of basic tests, feedback from peers and supervisors and oral or written questioning to check required knowledge of basic test procedures.

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. The timeframe must allow for assessment of operation under all normal and a range of abnormal conditions. This unit of competency is to be assessed in the workplace or a simulated workplace environment.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<p>Knowledge to be learned:</p> <ul style="list-style-type: none"> ✓ accurately interpreting workplace procedures and standard methods ✓ preparing samples using at least three (3) different processes ✓ performing at least five (5) basic tests or measurements using standard methods and procedures ✓ checking test equipment before use ✓ completing all tests within the required timeline without sacrificing safety, accuracy or quality ✓ demonstrating close attention to the accuracy and precision of measurements and the data obtained ✓ calculating simple quantities using appropriate equations, units, uncertainties and precision ✓ recording and presenting results accurately and legibly ✓ maintaining the security, integrity and traceability of all samples, data/results and documentation ✓ following procedures for working safely and minimising environmental impacts 	<p>Skills to be developed:</p> <ul style="list-style-type: none"> ✓ concepts of metrology, including: <ul style="list-style-type: none"> • all measurements are estimates • measurements belong to a population of measurements of the measured parameters • precision, accuracy and significant figures • sources of error, uncertainty and repeatability • traceability ✓ international system of units (SI) ✓ purpose of tests performed as part of job role and principles of the standard methods/specifications used ✓ function of key components of the test equipment, pre-use equipment and safety checks ✓ sources of uncertainty in measurement and methods for control ✓ workplace and/or legal traceability requirements ✓ interpretation and recording of test result, including simple calculations ✓ procedures for recognising and reporting of unexpected or unusual results ✓ relevant hazards, work health safety (WHS) and environment requirements