Australian Government

MSL975026A Perform physical examination of forensic samples

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MSL975026A Perform physical examination of forensic samples

Modification History

New unit

Unit Descriptor

This unit of competency covers the ability to perform physical examination and testing of samples that may be used as forensic evidence. Competency includes the ability to establish client needs for routine and non-routine forensic samples, select suitable techniques and methods and modify them if required, obtain valid and reliable data and report test results. Personnel are required to recognise atypical test data/results, troubleshoot common analytical procedure and equipment problems and ensure all testing and reporting meets judicial requirements.

Application of the Unit

This unit of competency is applicable to technical officers working in all industry sectors and government agency laboratories, for example, in chemical, food, forensic, medical and environmental laboratories. The term forensic is used to describe tests which may have legal implications, for example, testing paint scrapings to verify claims for insurance companies or examining passports for forgery and tampering.

Examination of forensic physical samples is non-routine and may require the development of new or modified methods. The testing requires a high degree of analytical skill and knowledge and practical experience to perform the analysis and interpret the results. Physical (from a non-living origin) forensic samples include fingerprints, tyre marks, footprints, building materials, soil samples, glass particles, paint scrapings, documents and textile fibres.

All operations and analytical methods must comply with relevant standards, appropriate procedures and/or enterprise requirements. Although a supervisor may not always be present, the technical officer will follow standard operating procedures (SOPs) that clearly describe the scope of permitted practice including varying enterprise/test procedures and communicating results to people outside the laboratory.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	**Establish client needs and schedule analysis**	1.1	Obtain evidential material/samples following accepted chain of custody procedures
		1.2	Record sample description, compare with specification and record and report discrepancies and evaluate to determine if further samples are required
		1.3	Evaluate samples and select appropriate laboratory procedure from accepted standard forensic techniques and validated scientific methods
		1.4	Identify the possible need to modify enterprise techniques or methods, for example, to ensure recovery of sample materials
		1.5	Seek advice from supervisor about any proposed variations and document all approved changes according to the enterprise quality system and judicial requirements
		1.6	Schedule analysis using enterprise procedures
2	**Prepare samples and standards**	2.1	Obtain a representative analytical portion of the sample to examine or test
		2.2	Prepare sample and store remaining sample in accordance with testing requirements
		2.3	Prepare validation checks and/or calibration standards for analytical portions

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3	**Perform analysis**	3.1	Perform laboratory examination in accordance with validated technique or method on standards, validation checks and samples
		3.2	Conduct sufficient testing to obtain reliable data
		3.3	Perform tests in appropriate timeframes and at appropriate cost
		3.4	Troubleshoot technique or method problems which have led to atypical data or results
4	**Process and analyse data**	4.1	Confirm data is the result of valid measurements
		4.2	Perform any required calculations and ensure results are consistent with standards or estimations and expectations
		4.3	Record results with the appropriate accuracy, precision, uncertainty and units
		4.4	Draw conclusions from examination of results according to accepted forensic practices and documented requirements
		4.5	Review laboratory methodology and test results
5	**Maintain a safe work environment**	5.1	Identify risks, hazards, safety equipment and control measures associated with sample handling, preparation and analytical method
		5.2	Use personal protective equipment and safety procedures specified for test method and materials to be tested
		5.3	Minimise the generation of wastes and environmental impacts
		5.4	Ensure the safe disposal of laboratory wastes
		5.5	Clean, care for and store equipment and consumables in accordance with enterprise procedures

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6	**Maintain laboratory records and report results**	6.1 Enter approved data and results into laboratory information management system (LIMS) according to enterprise quality system and judicial requirements
		6.2 Maintain equipment logs in accordance with enterprise procedures
		6.3 Maintain security, integrity and traceability of samples and documentation
		6.4 Prepare reports for presentation of evidence and communicate results to appropriate personnel

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Required Skills and Knowledge

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

Required skills include:

- establishing client needs for routine and non-routine forensic samples
- completing chain of custody forms according to judicial and enterprise requirements
- prioritising the evaluation of items of evidence to ensure sample integrity is maintained
- communicating with supervisors and industry professionals using current and appropriate terminology
- maintaining integrity and security of all items of evidence/samples
- using problem solving/research skills, for example, in troubleshooting equipment problems
- applying theoretical knowledge and deductive processes to draw conclusions from test results, for example, by deciding if the results provide evidence that a document has been tampered with

Required knowledge includes:

- legal, regulatory, policy and quality system context in which forensic examinations and analyses are conducted
- legal, policy, procedural and quality system requirements for the collection, preservation, security, continuity and disposal of samples and evidence (exhibits)
- terminology and principles of locating, recording, collecting, storing, transporting testing and reporting forensic samples/evidence
- principles and concepts related to physical testing techniques and methods
- potential limitations of own specialist knowledge and when to seek advice from other services
- services available to assist laboratory examination and interpretation of physical evidence
- peer review processes for examination of test findings
- relevant work health and safety (WHS), and environmental requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the

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performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors should ensure that candidates can: • interpret client request, select test methods and perform test methods to a standard acceptable in judicial procedures • sequence and select forensic sample techniques and methods to maximise recovery of sample materials • interpret and draw conclusions from examination and testing results • communicate any problems to a supervisor or industry professional using current and appropriate terminology • maintain security, integrity and traceability of forensic samples/evidence, sub-samples, test data/results and documentation • report results of forensic tests according to judicial and enterprise protocols.

Context of and specific resources for assessment	• This unit of competency is to be assessed in the workplace or simulated workplace environment.
	• This unit of competency may be assessed with:
	  • MSL977003A Contribute to the validation of test methods
	  • MSL975024A Locate record and collect forensic samples.
	• Resources may include:
	  • standard laboratory with testing equipment and analytical instruments
	  • laboratory reagents and equipment
	  • enterprise procedures and standard methods.

Method of assessment	• The following assessment methods are suggested:
	  • review of test data/results obtained by the candidate over a period of time to check accuracy, consistency and timeliness of results
	  • review of workplace documentation and reports completed by the candidate
	  • observation of candidate examining and testing a range of forensic samples/evidence
	  • feedback from clients, peers, supervisors and industry professionals
	  • oral or written questioning of required knowledge.

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	• In all cases, practical assessment should be supported by questions to assess required knowledge and those aspects of competency which are difficult to assess directly. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. • The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work place environment.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected that the latest version be used

Standards, codes, procedures and/or enterprise requirements	• Standards, codes, procedures and/or enterprise requirements may include:
	• Australian and international standards, such as:
	  • AS ISO 1000-1998 The international system of units (SI) and its application
	  • AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
	  • AS/NZS 2243 Set:2006 Safety in laboratories set
	  • AS/NZS ISO 9000 Set:2008 Quality management systems set
	  • AS 2830.1 Good laboratory practice – Chemical analysis

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	• ISO/IEC Guide 98-3:2008 Uncertainty of measurement – Part 3 Guide to the expression of uncertainty in measurement (GUM) • Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement • calibration and maintenance schedules • cleaning, hygiene and personal hygiene requirements • data quality procedures • enterprise procedures, SOPs and operating manuals • enterprise recording and reporting procedures • equipment startup, operation and shutdown procedures • incident and accident/injury reports • judicial and enterprise protocols • material safety data sheets (MSDS) • national measurement regulations and guidelines • principles of good laboratory practice (GLP) • production and laboratory schedules • quality manuals, equipment and procedure manuals • quality system and continued improvement processes • safety requirements for equipment, materials or products • forensic sampling procedures (labelling, preparation, storage, transport, storage and disposal) • schematics, work flows and laboratory layouts • statutory and enterprise WHS requirements • stock records and inventory • test procedures (validated and authorised) • training program contents • waste minimisation, containment, processing and disposal procedures

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Physical examination and testing samples	Physical examination and testing may be of: • fingerprints • firearms and tool marks • ammunition • ballistics • vehicles • documents and handwriting
Physical tests and examination	Physical tests and examinations may include: • precise measurement of position, orientation and dimensions (e.g. particle size) • mass, density and specific gravity (e.g. compaction) • thermal tests (e.g. combustion properties) • optical tests (e.g. colour matching) • acoustic tests (e.g. loudness) • electrical tests (e.g. insulation) • magnetic tests (e.g. intrinsic induction)
Validation checks and/or calibration standards	Validation checks and/or calibration standards may include: • positive and known positive controls • negative controls (e.g. substrate blanks) • recovery check controls • certified reference materials
Selecting appropriate testing procedures	Selecting appropriate testing procedures may include consideration of: • the range, reliability and validity of available techniques and methods • the physical characteristics of the evidence • availability of further samples • available resources • time and cost constraints • selection of non-destructive techniques where possible or appropriate • minimisation of sample size for destructive techniques • sequence of forensic techniques • the need for possible further analysis by other forensic disciplines
Reviewing laboratory methodology and test results	Reviewing laboratory methodology and test results may include:

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	• assessing the methodology for appropriate application to evidence • assessing chain of custody and sample handling to ensure integrity • assessing testing procedures for compliance with quality system and judicial requirements • evaluating interpretation of test results for validity
Hazards	Hazards may include: • electric shock • radiation (alpha, beta, gamma, X-ray and neutron) • sharps, broken glass and hand tools • flammable liquids and gases • sources of ignition • burners and ovens • crushing, entanglement and cuts associated with moving machinery • disturbance or interruption of services
Hazard control measures	Hazard control measures may include: • ensuring access to shut off points • recognising and observing hazard warnings and safety signs • use of MSDS • labelling of samples and hazardous materials • cleaning equipment and work areas • following established manual handling procedures • personal protective equipment (e.g. gloves, safety glasses and coveralls) • use of fumehoods and direct extraction of vapours or gases • handling and storage of all hazardous materials and equipment in accordance with labelling, MSDS and manufacturer instructions • minimising exposure to radiation ionising, such as lasers, electromagnetic and ultraviolet (UV) radiation • reporting abnormal emissions, discharges and airborne contaminants, such as noise, light, solids, liquids, waste/wastewater, gases, smoke, vapour, fumes, odour and particulates to appropriate personnel
WHS and environmental management requirements	WHS and environmental management requirements: • all operations must comply with enterprise WHS

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	and environmental management requirements, which may be imposed through state/territory or federal legislation – these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Not applicable.

Custom Content Section

Not applicable.

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