MSL09 Laboratory Operations Training Package

Release: 1.2

CONTENTS

Modification History

Version Modification History

The version details of this endorsed Training Package are in the table below. The latest information is at the top of the table.

Version	Release Date	Comments
1.2	January 2011	Importation allowance added to one qualification and error corrected in packaging rules (MSL70109).
1.1	July 2010	ISC updates to comply with flexibility requirements: MSL20109, 30109, 40109, 50109 and 60109. Imported units updated: MSAENV272B, MSAENV472B and MSAENV672B Prerequisites corrected in MSL975007A and MSL975016A (qualifications affected – MSL40109, 50109 and 60109)
1	January 2010	Initial version

Manufacturing Skills Australia

Imprint

MSL09 Laboratory Operations Training Package

Preliminary Information

Important Note to Users

Training Packages are not static documents; they are amended periodically to reflect the latest industry practices and are version controlled. It is essential that the latest version is always used.

Check the version number before commencing training or assessment

This Training Package is Version - check whether this is the latest version by going to the National Training Information Service (www.ntis.gov.au) and locating information about the Training Package. Alternatively, contact Manufacturing Industry Skills Council at http://www.mskills.com.au to confirm the latest version number.

Explanation of version number conventions

The primary release Training Package is Version 1. When changes are made to a Training Package, sometimes the version number is changed and sometimes it is not, depending on the extent of the change. When a Training Package is reviewed it is considered to be a new Training Package for the purposes of version control, and is Version 1. Do not confuse the version number with the Training Packages national code (which remains the same during its period of endorsement).

History

History
MSL09 Laboratory Training Package replaces and supersedes PML04 Laboratory Operations Training Package.

List of AQF Qualifications

List of AQF Qualifications

Qualification Code	Title
MSL20109	Certificate II in Sampling and Measurement
MSL30109	Certificate III in Laboratory Skills
MSL40109	Certificate IV in Laboratory Techniques
MSL50109	Diploma of Laboratory Technology
MSL60109	Advanced Diploma of Laboratory Operations

Qualification Code	Title
MSL70109	Vocational Graduate Certificate in Instrumental Analysis

List of ALL Units within Training Package

List of ALL Units within Training Package

Code	Name	Volume
MSL904001A	Perform standard calibrations	2
MSL905001A	Perform non-standard calibrations	2
MSL905002A	Create or modify calibration procedures	2
MSL905003A	Create or modify automated calibration procedures	2
MSL912001A	Work within a laboratory/field workplace (induction)	2
MSL913001A	Communicate with other people	2
MSL913002A	Plan and conduct laboratory/field work	2
MSL914001A	Prepare practical science classes and demonstrations	2
MSL915001A	Provide information to customers	2
MSL915002A	Schedule laboratory work for a small team	2
MSL916001A	Develop and maintain laboratory documentation	2
MSL916002A	Manage and develop teams	2
MSL916003A	Supervise laboratory operations in work/functional area	2
MSL916004A	Maintain registration and statutory or legal compliance in work/functional area	2
MSL916005A	Manage complex projects	2
MSL922001A	Record and present data	2
MSL924001A	Process and interpret data	2

Code	Name	Volume
MSL924002A	Use laboratory application software	2
MSL925001A	Analyse data and report results	2
MSL925002A	Analyse measurements and estimate uncertainties	2
MSL933001A	Maintain the laboratory/field workplace fit for purpose	2
MSL933002A	Contribute to the achievement of quality objectives	2
MSL933003A	Apply critical control point requirements	2
MSL933004A	Perform calibration checks on equipment and assist with its maintenance	2
MSL934001A	Contribute to the ongoing development of HACCP plans	2
MSL934002A	Apply quality system and continuous improvement processes	2
MSL934003A	Maintain and control stocks	2
MSL935001A	Monitor the quality of test results and data	2
MSL935002A	Assist in the maintenance of reference materials	2
MSL935003A	Authorise the issue of test results	2
MSL935004A	Maintain instruments and equipment	2
MSL936001A	Maintain quality system and continuous improvement processes within work/functional area	2
MSL936002A	Conduct an internal audit of the quality system	2
MSL943001A	Work safely with instruments that emit ionising radiation	2
MSL943002A	Participate in laboratory/field workplace safety	2
MSL944001A	Maintain laboratory/field workplace safety	2
MSL946001A	Implement and monitor OHS and environmental management systems	2
MSL952001A	Collect routine site samples	2

Code	Name	Volume
MSL952002A	Handle and transport samples or equipment	2
MSL953001A	Receive and prepare samples for testing	2
MSL953002A	Operate a robotic sample preparation system	2
MSL954001A	Obtain representative samples in accordance with sampling plan	2
MSL954002A	Prepare mineral samples for analysis	2
MSL955001A	Supervise a robotic sample preparation system	2
MSL963001A	Operate basic handblowing equipment	2
MSL963002A	Repair glass apparatus using simple glassblowing equipment	2
MSL965001A	Design and manufacture glass apparatus and glass systems	2
MSL965002A	Perform glass coating, grinding and finishing operations	2
MSL965003A	Construct, modify and maintain high vacuum systems	2
MSL972001A	Conduct routine site measurements	2
MSL973001A	Perform basic tests	2
MSL973002A	Prepare working solutions	2
MSL973003A	Prepare culture media	2
MSL973004A	Perform aseptic techniques	2
MSL973005A	Assist with fieldwork	2
MSL973006A	Prepare trial batches for evaluation	2
MSL973007A	Perform microscopic examination	2
MSL973008A	Perform histological procedures	2
MSL973009A	Conduct field-based acceptance tests for construction materials	2

Code	Name	Volume
MSL973010A	Conduct laboratory-based acceptance tests for construction materials	2
MSL973011A	Perform fire pouring techniques	2
MSL973012A	Assist with geotechnical site investigations	2
MSL974001A	Prepare, standardise and use solutions	2
MSL974002A	Conduct geotechnical site investigations	2
MSL974003A	Perform chemical tests and procedures	2
MSL974004A	Perform food tests	2
MSL974005A	Perform physical tests	2
MSL974006A	Perform biological procedures	2
MSL974007A	Undertake environmental field-based monitoring	2
MSL974008A	Capture and manage scientific images	2
MSL974009A	Undertake field-based, remote-sensing monitoring	2
MSL974010A	Perform mechanical tests	2
MSL974011A	Prepare tissue and cell cultures	2
MSL974012A	Perform tests to determine the properties of construction materials	2
MSL974013A	Monitor performance of structures	2
MSL975001A	Perform microbiological tests	2
MSL975002A	Perform haematological tests	2
MSL975003A	Perform histological tests	2
MSL975004A	Perform chemical pathology tests	2
MSL975005A	Conduct sensory analysis	2
MSL975006A	Perform immunohaematological tests	2
MSL975007A	Supervise sampling, inspections and testing at	2

Code	Name	Volume
	construction sites	
MSL975008A	Apply electrophoretic techniques	2
MSL975009A	Apply routine chromatographic techniques	2
MSL975010A	Perform fire assay techniques	2
MSL975011A	Design and supervise complex environmental field surveys	2
MSL975012A	Provide input to production trials	2
MSL975013A	Perform tissue and cell culture techniques	2
MSL975014A	Perform molecular biology tests and procedures	2
MSL975015A	Prepare animal and plant material for display	2
MSL975016A	Perform complex tests to measure engineering properties of materials	2
MSL975017A	Perform laboratory-based ecological techniques	2
MSL975018A	Perform complex tests to measure chemical properties of materials	2
MSL975019A	Apply complex instrumental techniques	2
MSL975020A	Apply routine spectrometric techniques	2
MSL975021A	Apply routine electrometric techniques	2
MSL975022A	Perform food analyses	2
MSL975023A	Supervise geotechnical site investigations	2
MSL976001A	Classify building sites	2
MSL976002A	Prepare plans and quality assurance procedures for environmental field activities	2
MSL976003A	Evaluate and select appropriate test methods and/or procedures	2
MSL977001A	Contribute to the development of products and applications	2

Code	Name	Volume
MSL977002A	Troubleshoot equipment and/or production processes	2
MSL977003A	Contribute to the validation of test methods	2
MSL977004A	Develop or adapt analyses and procedures	2
MSL977005A	Integrate data acquisition and interfacing systems	2
MSL977006A	Apply specialised knowledge of gas chromatography techniques to analysis	2
MSL977007A	Apply specialised knowledge of liquid chromatography techniques to analysis	2
MSL977008A	Apply specialised knowledge of inductively coupled plasma spectroscopy to analysis	2
MSL977009A	Apply advanced ultraviolet, visible and near infra red spectroscopic techniques to analysis	2
MSL977010A	Apply advanced infra red spectroscopic techniques to analysis	2
MSL977011A	Contribute to the selection, commissioning and maintenance of analytical instruments	2
	Imported units	2
HLTPAT317A	Operate effectively within a pathology testing environment	2
HLTPAT419A	Perform pathology tests	2
MSAENV272B	Participate in environmentally sustainable work practices	2
MSAENV472B	Implement and monitor environmentally sustainable work practices	2
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	2
TAADEL301C	Provide training through instruction and demonstration of work skills	2

Mapping to Previous Training Package

Mapping to Previous Training Package

Mapping of qualifications – MSL09v1.1/1.2 to MSL09v1 (ISC updates)

MSL09v1.1 qualifications	MSL09v1 qualifications	Comment – all equivalent
MSL20109 Certificate II in Sampling and Measurement	MSL20109 Certificate II in Sampling and Measurement	Accredited courses included in importation allowance, updated sustainability unit.
MSL30109 Certificate III in Laboratory Skills	MSL30109 Certificate III in Laboratory Skills	Accredited courses included in importation allowance, updated sustainability unit.
MSL40109 Certificate IV in Laboratory Techniques	MSL40109 Certificate IV in Laboratory Techniques	Accredited courses included in importation allowance, updated sustainability units, prerequisites corrected for MSL975007A and 5016A.
MSL50109 Diploma of Laboratory Technology	MSL50109 Diploma of Laboratory Technology	Accredited courses included in importation allowance, updated sustainability units, prerequisites corrected for MSL975007A and 5016A.
MSL60109 Advanced Diploma of Laboratory Operations	MSL60109 Advanced Diploma of Laboratory Operations	Accredited courses included in importation allowance, updated sustainability units, prerequisites corrected for MSL975007A and 5016A.
MSL70109 Vocational Graduate Certificate in Instrumental Analysis	MSL70109 Vocational Graduate Certificate in Instrumental Analysis	Reformatted June 2010. Included importation allowance and corrected error in number of electives. No actual change to packaging.

Mapping of qualifications – MSL09 to PML04

MSL09 qualifications	PML04 qualifications	Comment
MSL20109 Certificate II in	PML20104 Certificate II in Sampling and	Sustainability unit added to

Sampling and Measurement	Measurement	mandatory units – not equivalent.
MSL30109 Certificate III in Laboratory Skills	PML30104 Certificate III in Laboratory Skills	Sustainability unit added to mandatory units – not equivalent
MSL40109 Certificate IV in Laboratory Techniques	PML40104 Certificate IV in Laboratory Techniques	Sustainability unit added to mandatory units and additional electives - not equivalent
MSL50109 Diploma of Laboratory Technology	PML50104 Diploma of Laboratory Technology	Sustainability unit added to mandatory units – not equivalent
MSL60109 Advanced Diploma of Laboratory Operations	PML60104 Advanced Diploma of Laboratory Operations	Sustainability unit added to mandatory units and additional electives – not equivalent
New qualification		
MSL70109 Vocational Graduate Certificate in Instrumental Analysis		New qualification

Mapping of Units

MSL09v1.1 to MSL09v1 – changes to imported units

MSL09v1.1		**MSL09v1**		**Comment**
MSAENV272B	Participate in environmentally sustainable work practices	MSAENV272A	Participate in environmentally sustainable work practices	Terminology clarified and range expanded. Equivalent.
MSAENV472B	Implement and monitor environmentally sustainable work practices	MSAENV472A	Implement and monitor environmentally sustainable work practices	Terminology clarified and range expanded. Equivalent.
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	MSAENV672A	Develop workplace policy and procedures for sustainability	Terminology clarified and range expanded. Title corrected to include 'environmental'.

				Equivalent.

Mapping of units in MSL09, including pre-requisite requirements

PML04 to MSL09

Legend – sector competency field codes

CAL   90
COM/ORG   91
DATA   92
MAIN   93
OHS   94
SAMP   95
SCIG   96
TEST   97

118 units (20 new, 92 revised and 6 imported)

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLCAL400A	MSL904001A	Perform standard calibrations	E	
PMLCAL500A	MSL905001A	Perform non-standard calibrations	E	MSL904001A
PMLCAL501A	MSL905002A	Create or modify calibration procedures	E	MSL905001A , MSL904001A
PMLCAL502A	MSL905003A	Create or modify automated calibration procedures	E	MSL905002A , MSL905001A , MSL904001A
PMLCOM300B	MSL913001A	Communicate with other people	E	
PMLCOM500B	MSL915001A	Provide information to customers	E	
PMLCOM600B	MSL916001A	Develop and maintain laboratory documentation	E	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLDATA200A	MSL922001A	Record and present data	E	
PMLDATA400A	MSL924001A	Process and interpret data	E	
PMLDATA500B	MSL925001A	Analyse data and report results	E	MSL924001A
PMLDATA501B	MSL924002A	Use laboratory application software	E	
PMLMAIN300B	MSL933001A	Maintain the laboratory/field workplace fit for purpose	E	
PMLMAIN400A	MSL934003A	Maintain and control stocks	E	
PMLMAIN501B	MSL935002A	Assist in the maintenance of reference materials	E	
PMLMAIN502A	MSL935004A	Maintain instruments and equipment	E	
PMLOHS301B	MSL943001A	Work safely with instruments that emit ionising radiation	E	
PMLOHS302A	MSL943002A	Participate in laboratory/field workplace safety	E	
PMLOHS400A	MSL944001A	Maintain laboratory/field workplace safety	E	
PMLOHS601A	MSL946001A	Implement and monitor OHS and environmental management systems	E	
PMLORG200A	MSL912001A	Work within a laboratory/field	E	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
		workplace (induction)		
PMLORG301A	MSL913002A	Plan and conduct laboratory/field work	E	
PMLORG400A	MSL914001A	Prepare practical science classes and demonstrations	E	
PMLORG500B	MSL915002A	Schedule laboratory work for a small team	E	
PMLORG600B	MSL916003A	Supervise laboratory operations in work/functional area	E	
PMLORG601B	MSL916004A	Maintain registration and statutory or legal compliance in work/functional area	E	
PMLORG602B	MSL916005A	Manage complex projects	E	
PMLQUAL300 B	MSL933002A	Contribute to the achievement of quality objectives	E	
PMLQUAL301 B	MSL933003A	Apply critical control point requirements	E	
PMLQUAL400 B	MSL934001A	Contribute to the ongoing development of HACCP plans	E	
PMLQUAL401 B	MSL934002A	Apply quality system and continuous improvement processes	E	
PMLQUAL500 A	MSL935001A	Monitor the quality of test results and data	E	MSL924001A
PMLQUAL600 B	MSL936001A	Maintain quality system and continuous improvement	E	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
		processes within work/functional area		
PMLQUAL601B	MSL936002A	Conduct an internal audit of the quality system	E	
PMLSAMP200A	MSL952001A	Collect routine site samples	E	
PMLSAMP201A	MSL952002A	Handle and transport samples or equipment	E	
PMLSAMP302A	MSL953001A	Receive and prepare samples for testing	E	
PMLSAMP400B	MSL954001A	Obtain representative samples in accordance with sampling plan	E	
PMLSAMP401A	MSL954002A	Prepare mineral samples for analysis	E	
PMLSCIG300B	MSL963001A	Operate basic handblowing equipment	E	
PMLSCIG301B	MSL963002A	Repair glass apparatus using simple glassblowing equipment	E	MSL963001A
PMLSCIG501B	MSL965001A	Design and manufacture glass apparatus and glass systems	E	MSL963001A, MSL963002A
PMLSCIG502B	MSL965002A	Perform glass coating, grinding and finishing operations	E	MSL963001A, MSL963002A
PMLSCIG503B	MSL965003A	Construct, modify and maintain high vacuum systems	E	MSL963001A, MSL963002A
PMLTEAM600	MSL916002A	Manage and develop	E	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
B		teams		
PMLTEST200 A	MSL972001A	Conduct routine site measurements	E	
PMLTEST300B	MSL973001A	Perform basic tests	E	
PMLTEST303B	MSL973002A	Prepare working solutions	E	
PMLTEST304B	MSL973003A	Prepare culture media	E	
PMLTEST305B	MSL973004A	Perform aseptic techniques	E	
PMLTEST306B	MSL973005A	Assist with fieldwork	E	
PMLTEST307B	MSL973006A	Prepare trial batches for evaluation	E	
PMLTEST308 A	MSL973007A	Perform microscopic examination	E	
PMLTEST310 A	MSL973008A	Perform histological procedures	E	
PMLTEST402B	MSL974001A	Prepare, standardise and use solutions	E	
PMLTEST403B			Not carried forward – replaced by MSL973012A and MSL974002A . No equivalent unit.	
PMLTEST404 A	MSL974003A	Perform chemical tests and procedures	E	
PMLTEST405 A	MSL974004A	Perform food tests	E	
PMLTEST406	MSL974005A	Perform physical tests	E	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
A				
PMLTEST407A	MSL974006A	Perform biological procedures	E	MSL973004A, MSL973007A
PMLTEST408A	MSL974007A	Undertake environmental field-based monitoring	E	
PMLTEST409A	MSL974008A	Capture and manage scientific images	E	
PMLTEST410A	MSL974009A	Undertake field-based, remote-sensing monitoring	E	
PMLTEST411A	MSL974010A	Perform mechanical tests	E	
PMLTEST412A	MSL974011A	Prepare tissue and cell cultures	E	MSL973004A
PMLTEST501B	MSL975001A	Perform microbiological tests	E	MSL974006A, MSL973004A, MSL973007A
PMLTEST502B	MSL975002A	Perform haematological tests	E	MSL974006A, MSL973004A, MSL973007A
PMLTEST503B	MSL975003A	Perform histological tests	E	MSL974006A, MSL973004A, MSL973007A
PMLTEST504B	MSL975004A	Perform chemical pathology tests	E	MSL974006A, MSL973004A, MSL973007A

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLTEST505B	MSL975005A	Conduct sensory analysis	E	
PMLTEST509B	MSL975006A	Perform immunohaematological tests	E	MSL974006A, MSL973004A, MSL973007A
PMLTEST511B	MSL975007A	Supervise sampling, inspections and testing at construction sites	Not equivalent	MSL974002A, MSL973012A MSL954001A, MSL973009A
PMLTEST512A	MSL975008A	Apply electrophoretic techniques	E	MSL973002A OR MSL974001A, MSL974003A
PMLTEST513A	MSL975009A	Apply routine chromatographic techniques	E	MSL974003A OR MSL974004A OR MSL974006A, MSL973004A, MSL973007A AND MSL973002A OR MSL974001A
PMLTEST514A	MSL975010A	Perform fire assay techniques	E	MSL973011A or MSL954002A

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLTEST515 A	MSL975011A	Design and supervise complex environmental field surveys	E	MSL974007A
PMLTEST516 A	MSL975012A	Provide input to production trials	E	MSL974003A OR MSL974004A OR MSL974005A OR MSL974010A
PMLTEST517 A	MSL975013A	Perform tissue and cell culture techniques	E	MSL974006A , MSL973004A , MSL973007A
PMLTEST518 A	MSL975014A	Perform molecular biology tests and procedures	E	MSL974006A , MSL973004A MSL973007A
PMLTEST519 A	MSL975015A	Prepare animal and plant material for display	E	MSL974006A , MSL973004A MSL973007A
PMLTEST520 A	MSL975016A	Perform complex tests to measure engineering properties of materials	E	MSL974012A AND MSL973001A OR MSL973010A
PMLTEST521 A	MSL975017A	Perform laboratory-based ecological techniques	E	MSL974006A , MSL973004A , MSL973007A

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLTEST522A	MSL975018A	Perform complex tests to measure chemical properties of materials	E	MSL975009A OR MSL975020A AND MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
PMLTEST523A	MSL975019A	Apply complex instrumental techniques	E	MSL975009A OR MSL975020A AND MSL974003A OR MSL974004A OR MSL974006A , MSL973004A and MSL973007A AND MSL973002A OR

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
				MSL974001A
PMLTEST524A	MSL975020A	Apply routine spectrometric techniques	E	MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
PMLTEST525A	MSL975021A	Apply routine electrometric techniques	E	MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
PMLTEST526A	MSL975022A	Perform food analyses	E	MSL974004A OR MSL974006A , MSL973004A , MSL973007A

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Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
PMLTEST601B	MSL976001A	Classify building sites	E	MSL975023A OR MSL975007A AND MSL954001A , MSL973009A
PMLTEST602A	MSL976002A	Prepare plans and quality assurance procedures for environmental field activities	E	MSL975011A , MSL974007A
PMLTEST603A	MSL976003A	Evaluate and select appropriate test methods and/or procedures	E	
PMLTEST700B	MSL977001A	Contribute to the development of products and applications	E	MSL976003A
PMLTEST701B	MSL977002A	Troubleshoot equipment and/or production processes	E	MSL976003A
PMLTEST702B	MSL977003A	Contribute to the validation of test methods	E	MSL976003A
PMLTEST703B	MSL977004A	Develop or adapt analyses and procedures	E	MSL976003A
PMLTEST704B	MSL977005A	Integrate data acquisition and interfacing systems	E	MSL924002A
	HLTPAT317A	Operate effectively within a pathology testing environment	n/a	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
	HLTPAT419A	Perform pathology tests	n/a	
	MSAENV272A	Participate in environmentally sustainable work practices	n/a	
	MSAENV472A	Implement and monitor environmentally sustainable work practices	n/a	
	MSAENV672A	Develop workplace policy and procedures for sustainability	n/a	
	MSL925002A	Analyse measurements and estimate uncertainties	n/a	MSL924001A
	MSL933004A	Perform calibration checks on equipment and assist with its maintenance	n/a	
	MSL935003A	Authorise the issue of test results	n/a	MSL925001A, MSL924001A
	MSL953002A	Operate a robotic sample preparation system	n/a	
	MSL955001A	Supervise a robotic sample preparation system	n/a	MSL953002A
	MSL973009A	Conduct field-based acceptance tests for construction materials	n/a	
	MSL973010A	Conduct laboratory-based acceptance tests for	n/a	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
		construction materials		
	MSL973011A	Perform fire pouring techniques	n/a	
	MSL973012A	Assist with geotechnical site investigations	MSL973012A and MSL974002A replace PMLTEST403B – no equivalent unit equivalent	
	MSL974002A	Conduct geotechnical site investigations	MSL973012A and MSL974002A replace PMLTEST403B – no equivalent unit	MSL973012A
	MSL974012A	Perform tests to determine the properties of construction materials	n/a	MSL973001A **OR** MSL973010A
	MSL974013A	Monitor performance of structures	n/a	MSL973009A
	MSL975007A	Supervise sampling, inspections and testing at construction sites	Replaces PMLTEST511B – not equivalent	MSL954001A, MSL973009A
	MSL975023A	Supervise geotechnical site investigations	n/a	MSL974002A, MSL973012A
	MSL977006A	Apply specialised knowledge of gas chromatography techniques to analysis	n/a	

Unit code PML04	Unit code MSL09	Unit title	Equivalence	Pre requisite
	MSL977007A	Apply specialised knowledge of liquid chromatography techniques to analysis	n/a	
	MSL977008A	Apply specialised knowledge of inductively coupled plasma spectroscopy to analysis	n/a	
	MSL977009A	Apply advanced ultraviolet, visible and near infra red spectroscopic techniques to analysis	n/a	
	MSL977010A	Apply advanced infra-red spectroscopic techniques to analysis	n/a	
	MSL977011A	Contribute to the selection, commissioning and maintenance of analytical instruments	n/a	
	TAADEL301 C	Provide training through instruction and demonstration of work skills	n/a	

MSL09 to PML04

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
HLTPAT317A	Operate effectively within a pathology testing environment	New	n/a	
HLTPAT419A	Perform pathology	New	n/a	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
	tests			
MSAENV272A	Participate in environmentally sustainable work practices	New	N/A	
MSAENV472A	Implement and monitor environmentally sustainable work practices	New	N/A	
MSAENV672A	Develop workplace policy and procedures for sustainability	New	N/A	
MSL904001A	Perform standard calibrations	PMLCAL400A	E	
MSL905001A	Perform non-standard calibrations	PMLCAL500A	E	MSL904001A
MSL905002A	Create or modify calibration procedures	PMLCAL501A	E	MSL905001A , MSL904001A
MSL905003A	Create or modify automated calibration procedures	PMLCAL502A	E	MSL905002A , MSL905001A , MSL904001A
MSL912001A	Work within a laboratory/field workplace (induction)	PMLORG200A	E	
MSL913001A	Communicate with other people	PMLCOM300B	E	
MSL913002A	Plan and conduct laboratory/field work	PMLORG301A	E	
MSL914001A	Prepare practical science classes and demonstrations	PMLORG400A	E	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL915001A	Provide information to customers	PMLCOM500B	E	
MSL915002A	Schedule laboratory work for a small team	PMLORG500B	E	
MSL916001A	Develop and maintain laboratory documentation	PMLCOM600B	E	
MSL916002A	Manage and develop teams	PMLTEAM600B	E	
MSL916003A	Supervise laboratory operations in work/functional area	PMLORG600B	E	
MSL916004A	Maintain registration and statutory or legal compliance in work/functional area	PMLORG601B	E	
MSL916005A	Manage complex projects	PMLORG602B	E	
MSL922001A	Record and present data	PMLDATA200A	E	
MSL924001A	Process and interpret data	PMLDATA400A	E	
MSL924002A	Use laboratory application software	PMLDATA501B	E	
MSL925001A	Analyse data and report results	PMLDATA500B	E	MSL924001A
MSL925002A	Analyse measurements and estimate uncertainties	New	n/a	MSL924001A
MSL933001A	Maintain the laboratory/field workplace fit for purpose	PMLMAIN300B	E	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL933002A	Contribute to the achievement of quality objectives	PMLQUAL300B	E	
MSL933003A	Apply critical control point requirements	PMLQUAL301B	E	
MSL933004A	Perform calibration checks on equipment and assist with its maintenance	New	n/a	
MSL934001A	Contribute to the ongoing development of HACCP plans	PMLQUAL400B	E	
MSL934002A	Apply quality system and continuous improvement processes	PMLQUAL401B	E	
MSL934003A	Maintain and control stocks	PMLMAIN400A	E	
MSL935001A	Monitor the quality of test results and data	PMLQUAL500A	E	MSL924001A
MSL935002A	Assist in the maintenance of reference materials	PMLMAIN501B	E	
MSL935003A	Authorise the issue of test results	New	n/a	MSL925001A, MSL924001A
MSL935004A	Maintain instruments and equipment	PMLMAIN502A	E	
MSL936001A	Maintain quality system and continuous improvement processes within work/functional area	PMLQUAL600B	E	
MSL936002A	Conduct an internal audit of the quality	PMLQUAL601	E	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
	system	B		
MSL943001A	Work safely with instruments that emit ionising radiation	PMLOHS301B	E	
MSL943002A	Participate in laboratory/field workplace safety	PMLOHS302A	E	
MSL944001A	Maintain laboratory/field workplace safety	PMLOHS400A	E	
MSL946001A	Implement and monitor OHS and environmental management systems	PMLOHS601A	E	
MSL952001A	Collect routine site samples	PMLSAMP200A	E	
MSL952002A	Handle and transport samples or equipment	PMLSAMP201A	E	
MSL953001A	Receive and prepare samples for testing	PMLSAMP302A	E	
MSL953002A	Operate a robotic sample preparation system	New	n/a	
MSL954001A	Obtain representative samples in accordance with sampling plan	PMLSAMP400B	E	
MSL954002A	Prepare mineral samples for analysis	PMLSAMP401A	E	
MSL955001A	Supervise a robotic sample preparation system	New	n/a	MSL953002A
MSL963001A	Operate basic handblowing equipment	PMLSCIG300B	E	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL963002A	Repair glass apparatus using simple glassblowing equipment	PMLSCIG301B	E	MSL963001A
MSL965001A	Design and manufacture glass apparatus and glass systems	PMLSCIG501B	E	MSL963001A, MSL963002A
MSL965002A	Perform glass coating, grinding and finishing operations	PMLSCIG502B	E	MSL963001A, MSL963002A
MSL965003A	Construct, modify and maintain high vacuum systems	PMLSCIG503B	E	MSL963001A, MSL963002A
MSL972001A	Conduct routine site measurements	PMLTEST200A	E	
MSL973001A	Perform basic tests	PMLTEST300B	E	
MSL973002A	Prepare working solutions	PMLTEST303B	E	
MSL973003A	Prepare culture media	PMLTEST304B	E	
MSL973004A	Perform aseptic techniques	PMLTEST305B	E	
MSL973005A	Assist with fieldwork	PMLTEST306B	E	
MSL973006A	Prepare trial batches for evaluation	PMLTEST307B	E	
MSL973007A	Perform microscopic examination	PMLTEST308A	E	
MSL973008A	Perform histological procedures	PMLTEST310A	E	
MSL973009A	Conduct field-based acceptance tests for construction materials	New	n/a	

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL973010A	Conduct laboratory-based acceptance tests for construction materials	New	n/a	
MSL973011A	Perform fire pouring techniques	New	n/a	
MSL973012A	Assist with geotechnical site investigations	New	MSL973012A and MSL974002A replace PMLTEST403B – no equivalent unit	
MSL974001A	Prepare, standardise and use solutions	PMLTEST402B	E	
MSL974002A	Conduct geotechnical site investigations	New	MSL973012A and MSL974002A replace PMLTEST403B – no equivalent unit	MSL973012A
MSL974003A	Perform chemical tests and procedures	PMLTEST404A	E	
MSL974004A	Perform food tests	PMLTEST405A	E	
MSL974005A	Perform physical tests	PMLTEST406A	E	
MSL974006A	Perform biological procedures	PMLTEST407A	E	MSL973004A, MSL973007A
MSL974007A	Undertake environmental field-based monitoring	PMLTEST408A	E	

      Manufacturing Skills Australia

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL974008A	Capture and manage scientific images	PMLTEST409A	E	
MSL974009A	Undertake field-based, remote-sensing monitoring	PMLTEST410A	E	
MSL974010A	Perform mechanical tests	PMLTEST411A	E	
MSL974011A	Prepare tissue and cell cultures	PMLTEST412A	E	MSL973004A
MSL974012A	Perform tests to determine the properties of construction materials	New	n/a	MSL973001A OR MSL973010A
MSL974013A	Monitor performance of structures	New	n/a	MSL973009A
MSL975001A	Perform microbiological tests	PMLTEST501B	E	MSL974006A, MSL973004A, MSL973007A
MSL975002A	Perform haematological tests	PMLTEST502B	E	MSL974006A, MSL973004A, MSL973007A
MSL975003A	Perform histological tests	PMLTEST503B	E	MSL974006A, MSL973004A, MSL973007A
MSL975004A	Perform chemical pathology tests	PMLTEST504B	E	MSL974006A, MSL973004A, MSL973007A

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL975005A	Conduct sensory analysis	PMLTEST505B	E	
MSL975006A	Perform immunohaematological tests	PMLTEST509B	E	MSL974006A, MSL973004A, MSL973007A
MSL975007A	Supervise sampling, inspections and testing at construction sites	New	Replaces PMLTEST511B – not equivalent	MSL974002A, MSL973012A MSL954001A, MSL973009A
MSL975008A	Apply electrophoretic techniques	PMLTEST512A	E	MSL973002A OR MSL974001A, MSL974003A
MSL975009A	Apply routine chromatographic techniques	PMLTEST513A	E	MSL974003A OR MSL974004A OR MSL974006A, MSL973004A, MSL973007A AND MSL973002A OR MSL974001A
MSL975010A	Perform fire assay techniques	PMLTEST514A	E	MSL973011A OR MSL954002A

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Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL975011A	Design and supervise complex environmental field surveys	PMLTEST515 A	E	MSL974007A
MSL975012A	Provide input to production trials	PMLTEST516 A	E	MSL974003A OR MSL974004A OR MSL974005A OR MSL974010A
MSL975013A	Perform tissue and cell culture techniques	PMLTEST517 A	E	MSL974006A , MSL973004A , MSL973007A
MSL975014A	Perform molecular biology tests and procedures	PMLTEST518 A	E	MSL974006A , MSL973004A MSL973007A
MSL975015A	Prepare animal and plant material for display	PMLTEST519 A	E	MSL974006A , MSL973004A MSL973007A
MSL975016A	Perform complex tests to measure engineering properties of materials	PMLTEST520 A	E	MSL974012A AND MSL973001A OR MSL973010A
MSL975017A	Perform laboratory-based ecological techniques	PMLTEST521 A	E	MSL974006A , MSL973004A , MSL973007A

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL975018A	Perform complex tests to measure chemical properties of materials	PMLTEST522A	E	MSL975009A or MSL975020A AND MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
MSL975019A	Apply complex instrumental techniques	PMLTEST523A	E	MSL975009A OR MSL975020A AND MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
MSL975020A	Apply routine spectrometric techniques	PMLTEST524A	E	MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
MSL975021A	Apply routine electrometric techniques	PMLTEST525A	E	MSL974003A OR MSL974004A OR MSL974006A , MSL973004A , MSL973007A AND MSL973002A OR MSL974001A
MSL975022A	Perform food analyses	PMLTEST526A	E	MSL974004A OR MSL974006A , MSL973004A , MSL973007A
MSL975023A	Supervise	New	n/a	MSL974002A

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
	geotechnical site investigations			, MSL973012A
MSL976001A	Classify building sites	PMLTEST601B	E	MSL975023A OR MSL975007A AND MSL954001A , MSL973009A
MSL976002A	Prepare plans and quality assurance procedures for environmental field activities	PMLTEST602A	E	MSL975011A , MSL974007A
MSL976003A	Evaluate and select appropriate test methods and/or procedures	PMLTEST603A	E	
MSL977001A	Contribute to the development of products and applications	PMLTEST700B	E	MSL976003A
MSL977002A	Troubleshoot equipment and/or production processes	PMLTEST701B	E	MSL976003A
MSL977003A	Contribute to the validation of test methods	PMLTEST702B	E	MSL976003A
MSL977004A	Develop or adapt analyses and procedures	PMLTEST703B	E	MSL976003A
MSL977005A	Integrate data acquisition and interfacing systems	PMLTEST704B	E	MSL924002A
MSL977006A	Apply specialised	New	n/a	

Manufacturing Skills Australia

Unit code MSL09	Unit title	Unit code PML04	Equivalence	Pre requisite
	knowledge of gas chromatography techniques to analysis			
MSL977007A	Apply specialised knowledge of liquid chromatography techniques to analysis	New	n/a	
MSL977008A	Apply specialised knowledge of inductively coupled plasma spectroscopy to analysis	New	n/a	
MSL977009A	Apply advanced ultraviolet, visible and near infra red spectroscopic techniques to analysis	New	n/a	
MSL977010A	Apply advanced infra red spectroscopic techniques to analysis	New	n/a	
MSL977011A	Contribute to the selection, commissioning and maintenance of analytical instruments	New	n/a	
TAADEL301 C	Provide training through instruction and demonstration of work skills	New	n/a	

Overview

What is a Training Package?

A Training Package is an integrated set of nationally endorsed competency standards, assessment guidelines and Australian Qualifications Framework (AQF) qualifications for a specific industry, industry sector or enterprise.
Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing peoples skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training which suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?

The National Skills Framework applies nationally, is endorsed by the Ministerial Council for Vocational and Technical Education, and comprises the Australian Quality Training Framework 2010 (AQTF 2010), and Training Packages endorsed by the National Quality Council (NQC).

How are Training Packages developed?

Training Packages are developed by Industry Skills Councils or enterprises to meet the identified training needs of specific industries or industry sectors. To gain national endorsement of Training Packages, developers must provide evidence of extensive research, consultation and support within the industry area or enterprise.

How do Training Packages encourage flexibility?

Training Packages describe the skills and knowledge needed to perform effectively in the workplace without prescribing how people should be trained. Training Packages acknowledge that people can achieve vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it. For example, some experienced workers might be able to demonstrate competency against the units of competency, and even gain a qualification, without completing a formal training program.
With Training Packages, assessment and training may be conducted at the workplace, off-the-job, at a training organisation, during regular work, or through work experience, work placement, work simulation or any combination of these.

**Who can deliver and assess using Training Packages?**

Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2010.

Training Package Components

Training Packages are made up of mandatory components endorsed by the NQC, and optional support materials.

Training Package Endorsed Components

The nationally endorsed components include the Competency Standards, Assessment Guidelines and Qualifications Framework. These form the basis of training and assessment in the Training Package and, as such, they must be used.
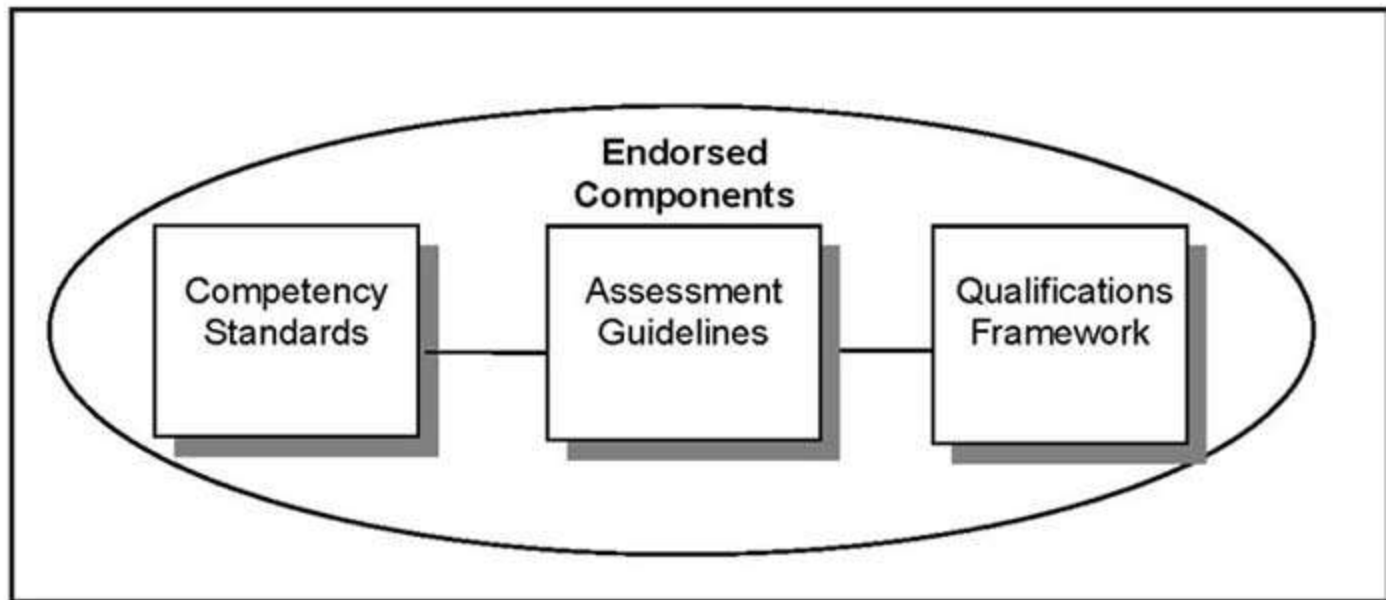
Competency Standards

Each unit of competency identifies a discrete workplace requirement and includes the knowledge and skills that underpin competency as well as language, literacy and numeracy; and occupational health and safety requirements. The units of competency must be adhered to in training and assessment to ensure consistency of outcomes.

Assessment Guidelines

The Assessment Guidelines provide an industry framework to ensure all assessments meet industry needs and nationally agreed standards as expressed in the Training Package and the AQTF 2010. The Assessment Guidelines must be followed to ensure the integrity of assessment leading to nationally recognised qualifications.

Qualifications Framework

Each Training Package provides details of those units of competency that must be achieved to award AQF qualifications. The rules around which units of competency can be combined to make up a valid AQF qualification in the Training Package are referred to as the "packaging rules". The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Training Package Support Materials

The endorsed components of Training Packages are complemented and supported by optional support materials that provide for choice in the design of training and assessment to meet the needs of industry and learners.

Training Package support materials can relate to single or multiple units of competency, an industry sector, a qualification or the whole Training Package. They tend to fall into one or more of the categories illustrated below.
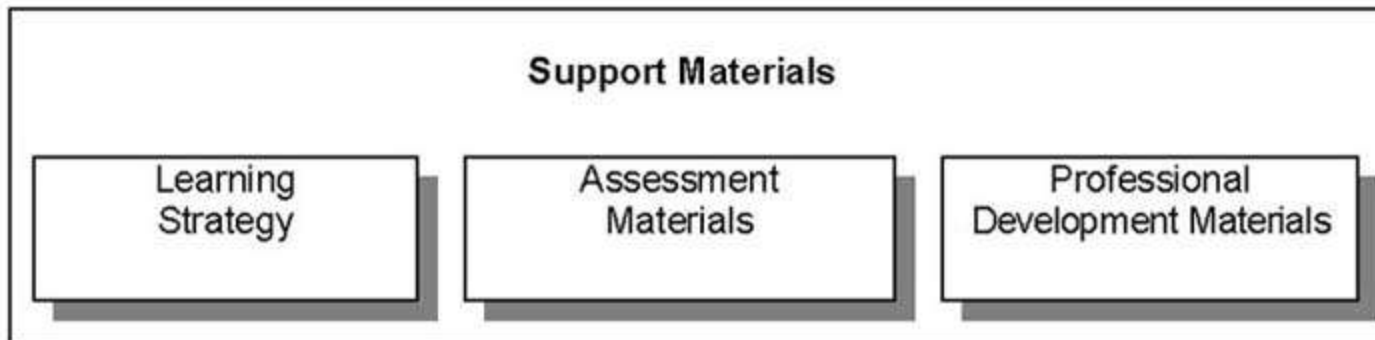
Training Package support materials are produced "by a range of stakeholders such as RTOs, individual trainers and assessors, private and commercial developers and Government agencies.

Where such materials have been quality assured through a process of "noting" by the NQC, they display the following official logo. Noted support materials are listed on the National Training Information Service (NTIS), together with a detailed description and information on the type of product and its availability < www.ntis.gov.au>.

It is not compulsory to submit support materials for noting; any resources that meet the requirements of the Training Package can be used.

Training Package, Qualification and Unit of Competency Codes

There are agreed conventions for the national codes used for Training Packages and their components. Always use the correct codes, exactly as they appear in the Training Package, and with the code always before the title.

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example MSL09. The first three characters are letters identifying the Training Package industry coverage and the last two characters are numbers identifying the year of endorsement.

Qualification Codes

Within each Training Package, each qualification has a unique eight-character code, for example MSL20109. Qualification codes are developed as follows:

- the first three letters identify the Training Package;
- the first number identifies the qualification level (noting that, in the qualification titles themselves, arabic numbers are not used);
- the next two numbers identify the position in the sequence of the qualification at that level; and
- the last two numbers identify the year in which the qualification was endorsed. (Where qualifications are added after the initial Training Package endorsement, the last two numbers may differ from other Training Package qualifications as they identify the year in which those particular qualifications were endorsed.)

Unit of Competency Codes

Within each Training Package, each unit of competency has a unique code. Unit of competency codes are assigned when the Training Package is endorsed, or when new units of competency are added to an existing endorsed Training Package. Unit codes are developed as follows:

- a typical code is made up of 12 characters, normally a mixture of uppercase letters and numbers, as in MSL904001A;
- the first three characters signify the Training Package - MSL09 - in the above example and up to eight characters, relating to an industry sector, function or skill area, follow;
- the last character is always a letter and identifies the unit of competency version. An "A" at the end of the code indicates that this is the original unit of competency. "B", or another incremented version identifier means that minor changes have been made. Typically this would mean that wording has changed in the range statement or evidence guide, providing clearer intent; and
- where changes are made that alter the outcome, a new code is assigned and the title is changed.

Training Package, Qualification and Unit of Competency Titles

There are agreed conventions for titling Training Packages and their components. Always use the correct titles, exactly as they appear in the Training Package, and with the code always placed before the title.

Training Package Titles

The title of each endorsed Training Package is unique and relates the Training Packages broad industry coverage.

Qualification Titles

The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- first, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Vocational Graduate Certificate, or Vocational Graduate Diploma;
- this is followed by the words "in" for Certificates I to IV, and "of" for Diploma, Advanced Diploma, Vocational Graduate Certificate and Vocational Graduate Diploma;
- then, the industry descriptor, for example Telecommunications; and
- then, if applicable, the occupational or functional stream in brackets, for example (Computer Systems).

For example:

- MSL20109 Certificate II in Sampling and Measurement

Unit of Competency Titles

Each unit of competency title is unique. Unit of competency titles describe the competency outcome concisely, and are written in sentence case.
For example:

- MSL904001A Perform standard calibrations
-

Historical and General Information

Background to the Laboratory Operations Training Package

The Laboratory Operations Training Package (MSL09) addresses the training and recognition needs of samplers, testers and laboratory personnel working in a wide range of enterprises and industry sectors including:

- process manufacturing
- construction materials testing
- food and beverage processing
- biotechnology, biomedical research, pathology testing
- environmental monitoring and technology
- mining, mineral assay
- calibration
- chemical, forensic, environmental analysis
- education.

The most appropriate ANZCO Classifications are:

- Major Class 3. Technicians and Trades Workers
- 311 Agricultural, Medical and Science Technicians
- 312 Building and Engineering Technicians
- 399 Miscellaneous Technicians and Trades Workers
- Class 2 Professionals.
- 234 Natural and Physical Science Professionals

However, these ANZCO classifications do not cover all relevant workers (eg. scientific glass blowers, samplers and testers).

PML99

The Laboratory Operations Training Package, which was initially endorsed in 1999, has been the principal vehicle for addressing the emerging training and education needs of the people involved in these occupations.

PML99 was developed by Manufacturing Learning Australia with funding provided by the Australian National Training Authority (ANTA). A consulting team led by the Centre for Training, Assessment and Development, Canberra Institute of Technology (CIT), undertook the development of the endorsed components.

Initially, this Training Package was designed to cater for laboratory and testing activities in the manufacturing, biomedical and food processing industries. In 2000, coverage was subsequently expanded to include construction materials testing and scientific glassblowing.

PML04

In October 2002 it was determined that PML99 should be expanded to cover biotechnology, mineral assaying, specialist calibration technicians and laboratory technicians in educational institutions, and that a Certificate II should be developed to cover the needs of personnel working in manufacturing and field based sampling and/or testing. The pace of change in knowledge and skills requirements in these occupations has been a significant driver for the expansion and redevelopment of PML99.

PML04 was endorsed in October 2004, with a review date of 31 October 2007.

MSL09 - Summary of changes

The Laboratory Operations Training Package has been fully reviewed and updated. Refer to Appendix 1 for details of the development process and people involved.

Units of competency

Existing units of competency and qualifications have been revised as follows:

all units have been revised to include the latest version of Australian Standards, updated underpinning knowledge and Evidence Guides.

existing qualifications have been revised to improve flexibility and encourage further uptake of this cross-industry Training Package by even more industry sectors.

Fourteen (14) new units of competency have been developed to address industry needs in:

construction materials testing

mineral assay

calibration checks

treatment of measurement uncertainties

the authorised issue of results.

Packaging rules

The packaging rules for all qualifications have been revised to improve flexibility and encourage further uptake of this cross-industry Training Package by even more industry sectors.

One new qualification (MSL70109 Vocational Graduate Certificate in Instrumental Analysis) has been developed with six (6) new units of competency aligned to the new qualification.

This qualification was developed in response to a widespread industry shortage of technicians who have more than "a black box" knowledge of analytical instruments and an ability to optimise them for specific analytical methods and samples. It replaces a NSW accredited course and other non-Training Package qualifications and has strong industry support.

Addition of mandatory sustainability units

In line with the MSA Board's agreed policy that sustainability units are to be included in the mandatory and elective banks of all qualifications, the three MSA sustainability units have been incorporated into the Laboratory Operations qualifications.

As a result, the number of mandatory units has been increased by one in each existing qualification which requires that the revised qualifications be deemed 'not equivalent'. The impact on delivery and funding should be minimal – feedback from the National TAFE Science Network is that delivery of the sustainability component can be integrated with existing units and co-assessed.

Revised Training Package code and unit codes

As the review of a Training Package automatically results in coding changes, MSA made the decision to take the opportunity to change the Laboratory Operations Training Package code to MSL to indicate the cross-industry coverage of this package, replacing the previous process manufacturing prefix.

It was also decided as part of MSA's rationalisation process, the units of competency would be coded in line with a common coding format that is to be adopted across all future manufacturing units of competency as the qualifications and units are reviewed.

MSA has agreed to use numeric industry field identifiers for all units of competency. This provides a more data-friendly model of coding and one that is based on a logical arrangement. We had previously used alpha characters for industry field identifiers in some of our units/Training Packages but found that there were considerable conflicts arising within our own taxonomy. Given the range of fields in manufacturing sectors, with the potential to use identical alpha characters and the meaningless association with some possible alpha combinations, we determined that a purely numerical system provides a more logical solution for coding of manufacturing units.

The table below indicates the industry field codes for MSL09:

PML04	MSL09	Sector/competency field
CAL	90	Calibration
COM/ORG/TEAM	91	Communication/organisation
DATA	92	Data/analysis
MAIN/QUAL	93	Quality/laboratory maintenance
OHS	94	Laboratory OHS
SAMP	95	Sampling
SCIG	96	Scientific Glassblowing

TEST	97	Testing

For example

PMLCAL400A	MSL904001A Perform standard calibrations
PMLCOM500B	MSL915001A Provide information to customers
PMLORG500B	MSL915002A Schedule laboratory work for a small team
PMLTEAM600B	MSL916002A Manage and develop teams
PMLDATA200A	MSL922001A Record and present data
PMLMAIN300B	MSL933001A Maintain the laboratory/field workplace fit for purpose
PMLQUAL301B	MSL933003A Apply critical control point requirements
PMLOHS301B	MSL943001A Work safely with instruments that emit ionising radiation
PMLSAMP302A	MSL953001A Receive and prepare samples for testing
PMLSCIG300B	MSL963001A Operate basic handblowing equipment
PMLTEST402B	MSL974001A Prepare, standardise and use solutions

Industry priorities and expectations

Industry representatives and RTOs are keen to see this latest version of the Laboratory Operations Training Package implemented as soon as possible. They consider that the expanded coverage and improved flexibility will enhance uptake of recognised training in many sectors. For example, some organisations (e.g QLD Main Roads) are currently aligning the career frameworks for their technical workforce with units of competence and qualifications in this Training Package.

New units of competence and a new Vocational Graduate Certificate in Instrumental Analysis have been developed in response to well defined industry needs. The new units will address gaps in coverage for several important industry sectors (i.e. construction materials testing, mineral assay).

The Vocational Graduate Certificate will replace an accredited program and will provide much needed training and a qualification for technical specialists/analysts in a highly significant and increasingly technology driven sector.

Impact of the changes

No changes have been made to the previous version of the units or qualifications that will cause significant impacts to RTOs. As a full review of a Training Package results in coding changes, there is minimal impact from the revised coding format.

While all existing units have been revised to improve their currency and reflect feedback from users, the bulk of revised units are equivalent to the units in the previous version of the Training Package. This information is including in the Training Package documentation.

Other than the addition of a sustainability unit in the mandatory groups for existing qualifications, the revised qualifications are considered equivalent in technical content. In the revised Certificate IV, the mandatory OHS unit has been replaced with an AQF 3 unit, in response to requests from the National TAFE Science Network. However, the technical outcomes of that qualification remain the same also.

Specialisations have been listed for the Certificate III and IV qualifications. RTO and industry representatives have argued that providing the opportunity for specialisations to be included below the title of the Certificate III and IV qualifications will greatly enhance the appeal to specific industry sectors and enterprises. These suggestions have been adopted and examples of specialisations include, but are not limited to:

- construction materials testing
- environmental monitoring
- food testing
- mineral assay
- scientific glassblowing
- wine testing.

Implementation of MSL09 is expected in all States and Territories. Many RTOs throughout Australia have delivered previous versions of the Laboratory Operations Training Package (PML99 and PML04) for almost a decade. These RTOs will now be able to expand their delivery to take advantage of the wider range of units and qualification specialisations. The trend of increasing uptake and interest by private RTOs is also likely to continue – particularly in the construction materials testing and mineral assay sectors.

Delivery of the new Vocational Graduate Certificate does require access to expensive equipment. However, the packaging rules for the new Vocational Graduate Certificate do not preclude RTOs that do not have <u>all</u> the analytical instruments and techniques addressed by the units of competence from delivering the qualification. Some large RTOs, with a history of delivering Diploma and Advanced Diploma qualifications from the existing package (PML04) have the equipment already. In NSW, where an accredited course has been delivered for some time, there should be a seamless implementation for these Institutes. However, replacement of high cost equipment items in response to ever advancing technology is a challenge. For this reason, the most likely successful delivery and assessment model will involve partnering with companies/organisations that have modern laboratories and an interest in accredited training.

State and Territory Training Authorities, RTOs and industry stakeholders have been consulted during the development process and have been kept informed of the changes. MSA is not aware of any issues that need addressing to ensure successful implementation. It is expected RTOs with scope of existing PML04 qualifications will be seek automatic extension of scope for the revised qualifications.

Introduction to the Industry

The industry

This area covers a diverse group of technical and scientific occupations located across the whole of industry. In reality, the groups covered include scientific and technical employees involved in a variety of science-based occupations across many industries.

The Laboratory Operations Training Package (MSL09) addresses the training and recognition needs of samplers, testers and laboratory personnel working in a wide range of enterprises and industry sectors including:

- process manufacturing
- construction materials testing
- food and beverage processing
- wine making
- biotechnology, biomedical research, pathology testing
- environmental monitoring and technology
- mining, mineral assay
- calibration
- chemical, forensic, environmental analysis
- education.

The most appropriate ANZCO Classifications are:

- Major Class 3. Technicians and Trades Workers
- 311 Agricultural, Medical and Science Technicians
- 312 Building and Engineering Technicians
- 399 Miscellaneous Technicians and Trades Workers
- Class 2 Professionals.
- 234 Natural and Physical Science Professionals

However, these ANZCO classifications do not cover all relevant workers (eg. scientific glass blowers, samplers and testers).

Other classifications also include people whose work involves testing or monitoring of materials and processes using scientific methods and/or equipment.

In general terms, the occupations covered are those in which non-professional employees use scientific techniques and equipment to carry out tests, and to operate and manage scientific processes. The core of these jobs is the use of scientific techniques, equipment and related knowledge.

A range of factors has driven the need for Vocational Education and Training in these occupations. First amongst them is the increasing regulation of standards relating to use of materials and equipment. Testing and monitoring of environmental and health hazards in the food processing and rural sectors are typical areas where this is observed. Similarly, testing of product safety is particularly important in the manufacturing industry.

A second area of demand emerges particularly from the greater attention to quality within manufacturing and construction. Testing of materials and products is now an inherent part of design and product quality systems.

An estimation of the numbers of personnel in each occupational group is difficult. As there are no ANZCO occupations which wholly describe the work of technical assistants, laboratory assistants/aides/attendants, sampler/testers, and those operators who undertake limited quality control duties, it is not possible to accurately estimate the number of personnel in this group.

Qualifications Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?

A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the AQF Implementation Handbook. http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.
Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.

Qualifications

Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate of ...
- Vocational Graduate Diploma of ...

Graduate Certificates and Graduate Diplomas can also be awarded in the vocational education and training sector under certain conditions see the AQF Implementation Handbook for details.
On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the AQF Implementation Handbook and the AQTF 2010 Essential Standards for Initial and Continuing Registration. .

Statement of Attainment

A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). Issuance of Statements of Attainment must comply with the advice provided in the current AQF Implementation Handbook and the AQTF 2010 Essential Standards for Initial and Continuing Registration..

Under the AQTF 2010, RTOs must recognise the achievement of competencies as recorded on a qualification testamur or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes

The AQF Implementation Handbook provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I

Characteristics of Learning Outcomes
Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable.
Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.
Distinguishing Features of Learning Outcomes
Do the competencies enable an individual with this qualification to:

- demonstrate knowledge by recall in a narrow range of areas;
- demonstrate basic practical skills, such as the use of relevant tools;
- perform a sequence of routine tasks given clear direction receive and pass on messages/information.
- receive and pass on messages/information.

Certificate II

Characteristics of Learning Outcomes
Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.
Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.
Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.
Distinguishing Features of Learning Outcomes
Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas;
- apply a defined range of skills;
- apply known solutions to a limited range of predictable problems;
- perform a range of tasks where choice between a limited range of options is required;
- assess and record information from varied sources;
- take limited responsibility for own outputs in work and learning.

Certificate III

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the section of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team co-ordination may be involved.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning
- take limited responsibility for the output of others.

Certificate IV

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature. Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards
- take limited responsibility for the quantity and quality of the output of others.

Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and co-ordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team co-ordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters
- take some responsibility for the achievement of group outcomes.

Advanced Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas
- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level
- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters
- demonstrate accountability for personal and group outcomes within broad parameters.

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.
- Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.
- Generate and evaluate ideas through the analysis of information and concepts at an abstract level.
- Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.
- Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.
- Further specialisation within a systematic and coherent body of knowledge.
- Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts.
- Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level.
- Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts.
- Demonstrate full responsibility and accountability for personal outputs.
- Demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.
-

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.
- Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.
- Generate and evaluate ideas through the analysis of information and concepts at an abstract level.
- Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.
- Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
-

Qualification Pathways

Making the Laboratory Operations Training Package work for your industry

Where do you start? What qualifications or competencies in this Training Package might support your job role, or the different job roles in your organisation?
Because specialisation is a requirement in some industry sectors the MSL Certificates III, IV and Diploma qualifications can be packaged to suit a particular industry sector or specialisation. The specialisation can be included in brackets under the qualification title.
Industry sector/specialisations could include, but are not limited to:

- biological testing
- biological and environmental testing
- biotechnology
- calibration
- chemical testing
- construction materials testing
- environmental monitoring
- food testing
- wine testing
- manufacturing testing
- mineral assay
- pathology testing
- scientific glassblowing.

Many industries are not necessarily interested in delivering full qualifications. However, in those instances there are many units of competency that can be used to benchmark performance and upskill existing worders.
Many industry people will find this useful for:

- recruiting staff
- classifying staff
- designing on-the-job training to upskill existing workers
- buying training
- career pathways planning.

Examples of common job roles

We have identified seven common job roles that the MSL09 qualifications and units support:

- sampler/tester working in manufacturing or in a field environment
- laboratory/technical assistant working in construction materials testing
- laboratory assistant working in a food company
- technician working in a mineral assay laboratory
- technical assistant working in environmental monitoring
- technical officer working in biotechnology
- calibration technician.

Brief descriptions of these job roles follow. The relevant units of competency can be found in Volume 2 of MSL09.

If you are interested in full qualifications, refer to the packaging rules in Volume 2.

Sampler/Tester working in manufacturing or a field environment

Samplers and testers conduct limited sampling and measurement as part of their duties. In areas such as mineral assay for example, this work forms a whole job role. They apply a restricted range of skills and operational knowledge to perform these tasks and do not generally work inside a laboratory.

Examples of the work of samplers and testers are given below:

- An operator in a quarry may take samples from stockpiles and conveyors and conduct simple tests on different grades of aggregates.
- In the sample preparation facility of a mining company, field assistants collect, log and prepare samples to be forwarded for analysis in regional centres.

Some relevant units of competency required for this work include:

MSL952001A Collect routine site samples
MSL952002A Handle and transport samples or equipment
MSL972001A Conduct routine site measurements.

If you were interested in a full qualification, the most appropriate one would be the *MSL20109 Certificate II in Sampling and Measurement.*

Laboratory/Technical Assistant working in construction materials testing

Laboratory assistants perform straightforward sampling and testing. They follow set procedures and recipes, and apply well developed technical skills and basic scientific knowledge. The majority of their work involves a predictable flow of parallel or similar tasks within one scientific discipline.

For example a laboratory assistant working in construction materials testing receives and prepares soil samples for classification testing. Some relevant units of competency required for this work include:

MSL952001A Collect routine site samples
MSL952002A Handle and transport samples or equipment
MSL953001A Receive and prepare samples for testing
MSL973010A Conduct laboratory-based acceptance tests for construction materials
MSL974010A Perform mechanical tests.

If you were interested in a full qualification, the most appropriate would be the *MSL30109 Certificate III in Laboratory Skills (Construction Materials Testing).*

Laboratory Assistant working in a food company

As noted above, laboratory assistants perform straightforward sampling and testing. They follow set procedures and recipes, and apply well-developed technical skills and basic scientific knowledge. They generally work inside the laboratory, but may also perform technical tasks within the production plant.

For example, a laboratory assistant working at a dairy factory gathers samples from the milk tankers, vats and the processing line, and performs routine chemical and bacteriological tests on the samples. Some relevant units of competency required for this work include:

> MSL933003A *Apply critical control point requirements*
> MSL953001A *Receive and prepare samples for testing*
> MSL973001A *Perform basic tests*
> MSL973004A *Perform aseptic techniques*
> MSL973007A *Perform microscopic examination*
> MSL974004A *Perform food tests.*

If you were interested in full qualifications, the most appropriate would be the *MSL30109 Certificate III in Laboratory Skills (Food Testing).*

Technician working in a mineral assay laboratory

Technical assistants undertake a wide range of sampling and testing that requires the application of a broad range of technical skills and some scientific knowledge. Although technical assistants generally work in a laboratory, they often work closely with other personnel throughout the workplace. The work of technical assistants involves similar tasks within one scientific discipline with occasional peak periods and some interruptions.

For example, a technician who works in a mineral preparation plant receives and logs incoming ore samples and operates handling equipment to move samples to treatment points. In the laboratory, the technician conducts routine chemical and physical tests and redirects other subsamples for specialised analyses. Some relevant units of competency required for this work include:

> MSL953001A *Receive and prepare samples for testing*
> MSL954002A *Prepare mineral samples for analysis*
> MSL974003A *Perform chemical tests and procedures*
> MSL974005A *Perform physical tests*
> MSL975010A *Perform fire assay techniques*
> MSL973011A *Perform fire pouring techniques.*

If you were interested in full qualifications, the most appropriate would be the *MSL40109 Certificate IV in Laboratory Techniques (Mineral Assay).*

Technical Assistant working in environmental monitoring

As above, technical assistants undertake a wide range of sampling and testing that requires the application of a broad range of technical skills and some scientific knowledge. The work of technical assistants involves similar tasks within one scientific discipline with occasional peak periods and some interruptions. They may also assist other personnel to solve technical problems.

For example, a technician who works for an environmental consulting company conducts field sampling
and testing and operates/maintains several remote sensing sites. Some relevant units of competency required for this work include:

MSL973001A   *Perform basic tests*
MSL954001A   *Obtain representative samples in accordance with sampling plan*
MSL974007A   *Undertake environmental field-based monitoring*
MSL974009A   *Undertake environmental field-based, remote-sensing monitoring.*

If you were interested in full qualifications, the most appropriate would be the *MSL40109 Certificate IV in Laboratory Techniques (Environmental Monitoring).*

Technical Officers working in biotechnology, calibration, pathology and chemical analysis laboratories

Technical officers conduct a wide range of sampling and testing that requires the application of broad scientific-technical knowledge and skills, with substantial depth in some areas. Although technical officers generally work in a laboratory, they often work closely with personnel in other teams within a section of the workplace.

They may liaise with suppliers to troubleshoot product non-conformance at the direction of laboratory supervisors or managers. They gather information on non-conformance and events that may lead to the modification of workplace procedures. They may also demonstrate methods to others and train them to collect samples and conduct basic tests reliably.

The work of technical officers involves frequent peak periods and interruptions.

Biotechnology Technician

A technical officer working in a biotechnology laboratory prepares, maintains and preserves cells and cell lines for the large scale production of monoclonal antibodies. Some relevant units of competency required for this work include:

MSL973004A   *Perform aseptic techniques*
MSL973007A   *Perform microscopic examination*
MSL974011A   *Prepare tissue and cell cultures*
MSL974006A   *Perform biological procedures*
MSL975013A   *Perform tissue and cell culture techniques*
MSL975014A   *Perform molecular biology tests.*

Calibration Technician

A technical officer working in a calibration laboratory performs standard and non-standard calibrations of equipment provided by clients. Some relevant units of competency required for this work include:

MSL904001A   *Perform standard calibrations*
MSL905001A   *Perform non-standard calibrations*
MSL905002A   *Create or modify calibration procedures*
MSL905003A   *Create or modify automated calibration procedures*
MSL935001A   *Monitor the quality of test results and data.*

Pathology Technician

Technical officers who work in pathology laboratories perform a range of tests on body tissues and fluids to measure quantities such as the amount of biological substances. They also prepare cultures, stained tissue sections and thin films to count and classify cells, bacteria and parasites. Some relevant units of competency required for this work include:

MSL975001A   *Perform microbiological tests*
MSL975002A   *Perform haematological tests*
MSL975003A   *Perform histological tests*
MSL975004A   *Perform chemical pathology tests.*

Chemical Technician/Analyst

Technical officers working in analytical laboratories analyse samples using a range of techniques and instruments. They establish client needs for routine and non-routine samples, optimise enterprise procedures and instruments for specific samples, recognise atypical data and results and troubleshoot common analytical procedure and equipment problems. Some relevant units of competency required for this work include:

> *MSL975009A Apply routine chromatographic techniques*
> *MSL975018A Perform complex tests to measure chemical properties   of materials*
> *MSL975019A Apply complex instrumental techniques*
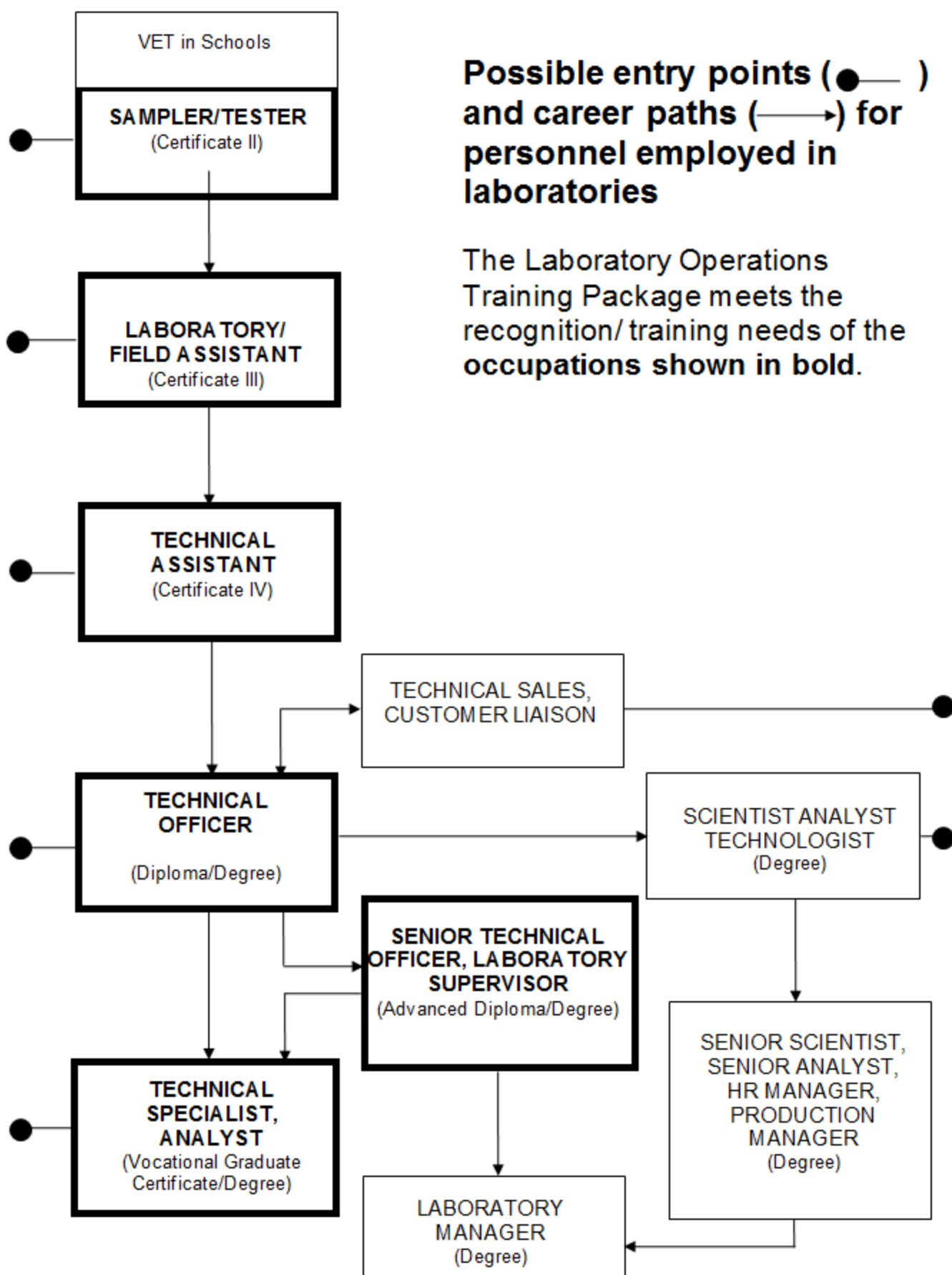> *MSL975020A Apply routine spectrometric techniques*
> *MSL975021A Apply routine electrometric techniques.*

If you were interested in a full qualification, the most appropriate for the above four job roles would be the *MSL50109 Diploma of Laboratory Technology (plus relevant specialisation).*

Qualifications pathways chart

The following flowchart sets out possible learning and career paths for laboratory personnel. It provides an indication of possible sequencing of qualifications, multiple entry points, links between qualifications in the VET and higher education sectors, and the occupational roles within laboratory operations. Market forces will determine the availability of particular learning pathways and employment outcomes.

Possible entry points (●—) and career paths (—►) for personnel employed in laboratories

The Laboratory Operations Training Package meets the recognition/ training needs of the **occupations shown in bold**.

VET in Schools

SAMPLER/TESTER
(Certificate II)

LABORATORY/ FIELD ASSISTANT
(Certificate III)

TECHNICAL ASSISTANT
(Certificate IV)

TECHNICAL SALES, CUSTOMER LIAISON

TECHNICAL OFFICER
(Diploma/Degree)

SCIENTIST ANALYST TECHNOLOGIST
(Degree)

SENIOR TECHNICAL OFFICER, LABORATORY SUPERVISOR
(Advanced Diploma/Degree)

SENIOR SCIENTIST, SENIOR ANALYST, HR MANAGER, PRODUCTION MANAGER
(Degree)

TECHNICAL SPECIALIST, ANALYST
(Vocational Graduate Certificate/Degree)

LABORATORY MANAGER
(Degree)

Skill Sets in this Training Package

Definition

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need.

Wording on Statements of Attainment

Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others. This is done by including the wording "these competencies meet [insert skill set title or identified industry area] need" on the Statement of Attainment. This wording applies only to skill sets that are formally identified as such in the endorsed Training Package.

See the 2010 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment.
http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf

Skill Sets in this Training Package

No Skill Sets have been developed for MSL09.

Employability Skills

Employability Skills

Employability Skills replacing Key Competency information from 2006

In May 2005, the approach to incorporate Employability Skills within Training Package qualifications and units of competency was endorsed. As a result, from 2006 Employability Skills will progressively replace Key Competency information in Training Packages.

Background to Employability Skills

Employability Skills are also sometimes referred to as generic skills, capabilities or Key Competencies. The Employability Skills discussed here build on the Mayer Committee's Key Competencies, which were developed in 1992 and attempted to describe generic competencies for effective participation in work.
The Business Council of Australia (BCA) and the Australian Chamber of Commerce and Industry (ACCI), produced the *Employability Skills for the Future* report in 2002 in consultation with other peak employer bodies and with funding provided by the Department of Education, Science and Training (DEST) and the Australian National Training Authority (ANTA). Officially released by Dr Nelson (Minister for Education, Science and Training) on 23 May 2002, copies of the report are available from the DEST website at:

The report indicated that business and industry now require a broader range of skills than the Mayer Key Competencies Framework and featured an Employability Skills Framework identifying eight Employability Skills*:

- communication
- teamwork
- problem solving
- initiative and enterprise
- planning and organising
- self-management
- learning
- technology.

The report demonstrated how Employability Skills can be further described for particular occupational and industry contexts by sets of facets. The facets listed in the report are the aspects of the Employability Skills that the sample of employers surveyed identified as being important work skills. These facets were seen by employers as being dependent both in their nature and priority on an enterprise's business activity.

*Personal attributes that contribute to employability were also identified in the report but are not part of the Employability Skills Framework.

Employability Skills Framework

The following table contains the Employability Skills facets identified in the report *Employability Skills for the Future*.

Skill	Facets
	Aspects of the skill that employers identify as important. The nature and application of these facets will vary depending on industry and job type.
Communication that contributes to productive and harmonious relations across employees and customers	- listening and understanding - speaking clearly and directly - writing to the needs of the audience - negotiating responsively - reading independently - empathising - using numeracy effectively - understanding the needs of internal and external customers - persuading effectively - establishing and using networks - being assertive - sharing information - speaking and writing in languages other than English
Teamwork that contributes to productive	working across different ages irrespective of

working relationships and outcomes	gender, race, religion or political persuasion
	• working as an individual and as a member of a team
	• knowing how to define a role as part of the team
	• applying teamwork to a range of situations e.g. futures planning and crisis problem solving
	• identifying the strengths of team members
	• coaching and mentoring skills, including giving feedback
Problem solving that contributes to productive outcomes	• developing creative, innovative and practical solutions
	• showing independence and initiative in identifying and solving problems
	• solving problems in teams
	• applying a range of strategies to problem solving
	• using mathematics, including budgeting and financial management to solve problems
	• applying problem-solving strategies across a range of areas
	• testing assumptions, taking into account the context of data and circumstances
	• resolving customer concerns in relation to complex project issues
Initiative and enterprise that contribute to innovative outcomes	• adapting to new situations
	• developing a strategic, creative and long-term vision
	• being creative
	• identifying opportunities not obvious to others
	• translating ideas into action
	• generating a range of options
	• initiating innovative solutions
Planning and organising that contribute to long and short-term strategic planning	• managing time and priorities - setting time lines, coordinating tasks for self and with others
	• being resourceful
	• taking initiative and making decisions
	• adapting resource allocations to cope with contingencies
	• establishing clear project goals and deliverables

	- allocating people and other resources to tasks - planning the use of resources, including time management - participating in continuous improvement and planning processes - developing a vision and a proactive plan to accompany it - predicting - weighing up risk, evaluating alternatives and applying evaluation criteria - collecting, analysing and organising information - understanding basic business systems and their relationships
Self-management that contributes to employee satisfaction and growth	- having a personal vision and goals - evaluating and monitoring own performance - having knowledge and confidence in own ideas and visions - articulating own ideas and visions - taking responsibility
Learning that contributes to ongoing improvement and expansion in employee and company operations and outcomes	- managing own learning - contributing to the learning community at the workplace - using a range of mediums to learn - mentoring, peer support and networking, IT and courses - applying learning to technical issues (e.g. learning about products) and people issues (e.g. interpersonal and cultural aspects of work) - having enthusiasm for ongoing learning - being willing to learn in any setting - on and off the job - being open to new ideas and techniques - being prepared to invest time and effort in learning new skills - acknowledging the need to learn in order to accommodate change
Technology that contributes to the effective carrying out of tasks	- having a range of basic IT skills - applying IT as a management tool - using IT to organise data - being willing to learn new IT skills - having the OHS knowledge to apply technology - having the appropriate physical capacity

Employability Skills Summary

An Employability Skills Summary exists for each qualification. Summaries provide a lens through which to view Employability Skills at the qualification level and capture the key aspects or facets of the Employability Skills that are important to the job roles covered by the qualification. Summaries are designed to assist trainers and assessors to identify and include important industry application of Employability Skills in learning and assessment strategies. The following is important information for trainers and assessors about Employability Skills Summaries.

- Employability Skills Summaries provide examples of how each skill is applicable to the job roles covered by the qualification.
- Employability Skills Summaries contain general information about industry context which is further explained as measurable outcomes of performance in the units of competency in each qualification.
- The detail in each Employability Skills Summary will vary depending on the range of job roles covered by the qualification in question.
- Employability Skills Summaries are not exhaustive lists of qualification requirements or checklists of performance (which are separate assessment tools that should be
- designed by trainers and assessors after analysis at the unit level).
- Employability Skills Summaries contain information that may also assist in building learners' understanding of industry and workplace expectations.
-

Industry Requirements for Employability Skills

This is a scientific and technology based industry. It is a key role of laboratory personnel to recognise and report non-conformance and maintain security and confidentiality of all client/enterprise data and information. They generally work under strict operating procedures and must be able to access, record and present information accurately. Initiative and planning is required at all levels.

Examples from this Training Package of Employability Skills embedded within unit components

Examples from this Training Package of Employability Skills embedded within unit components	
Unit component	**Example of embedded Employability Skill**
Unit Title	Prepare trial batches *(Planning, organising)*
Unit Descriptor	This unit of competency covers the ability to prepare trial batches of materials for evaluation. Materials can include soil, minerals and manufactured products, such as concrete, asphalt, food, plastics, paint and other industrial chemicals. *(Planning, initiative, problem solving)*
Element	Record description of the job to be undertaken, compare with specification and report any variations *(Planning, learning, initiative)* Evaluate properties of the mixture by inspection and standard test methods *(Problem solving, technology)* Clean equipment and dispose of materials *(Initiative, planning, organising)* Maintain a safe work environment *(Self management, organising)*
Performance Criteria	Record description of the job to be undertaken, compare with specification and report any variations *(Planning, communication, enterprise, learning)* Maintain confidentiality of enterprise information *(Initiative, self management)* Minimise the generation of wastes and environmental impacts *(Planning, enterprise, organising)* Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel

Examples from this Training Package of Employability Skills embedded within unit components

Unit component	Example of embedded Employability Skill
	(Communication, planning, self management, teamwork)

Examples from this Training Package of Employability Skills embedded within unit components

Unit component	Example of embedded Employability Skill
Range Statement	Typical problems may include: • not following SOPs • measurement errors • calculation errors • materials of unreliable quality • insufficient mixing • poor sampling procedures • equipment breakdown and breakage • *(Technology, planning, initiative, self management)*
Required Skills and Knowledge	Required skills include: • performing simple calculations • making accurate measurements of volume and mass • representative sampling • working safely with equipment and hazardous materials • working safely in laboratory and field conditions • setting up and maintaining tools and equipment • using tools and equipment to perform basic sampling and testing techniques • observing and recording information on testing and sampling • handling, transporting and storing materials • observing interpreting and reporting atypical situations • *(Technology, learning, communication, initiative, problem solving)*
Evidence Guide	The assistant tests the aggregates to determine their grading properties. From these results, he/she designs a mix to satisfy the project specifications using a standard design method. *(Technology, initiative, problem solving)* Assessors should ensure that candidates can: perform operations in accordance with laboratory and/or enterprise procedures, and appropriate

Examples from this Training Package of Employability Skills embedded within unit components	
Unit component	**Example of embedded Employability Skill**
	legislative requirements • accurately measure, calculate and record batch quantities, concentrations and other relevant parameters • evaluate properties of the mixture by inspection and standard test methods • recognise and report problems and atypical situations to relevant personnel. • *(Communication, planning, self management, initiative, problem solving)*

Assessment Guidelines

Licensing/Registration Requirements

No licensing or registration requirements apply to RTOs, assessors or candidates for this Training Package.

There are no general licensing issues associated with any units of competency, however, there may be regulatory requirements in some industries and local regulations should be checked for details.

Requirements for Assessors

Assessors will be required to meet the AQTF requirements. This includes demonstrated technical competency for the MSL units assessed.

Assessment in the laboratory and testing industries

What criteria must be met when designing assessment?

The design of assessment needs to ensure that all aspects of competency are covered:

• task skills (performance of individual tasks)
• task management skills (managing a number of different tasks within the job)
• contingency management skills (responding to problems, breakdowns and changes in routine)
• job/role environment skills (dealing with the responsibilities and expectations of the workplace)
• relevant underpinning knowledge.

Evidence-gathering methods must be gender- and culturally-inclusive and take into account the language, literacy and numeracy skills of both candidate and assessor. Assessors may consider:

- incorporating a range of assessment techniques
- integrating the assessment of units related to the performance of 'whole of work' tasks, roles or functions
- using a holistic approach which combines knowledge, understanding, problem-solving, technical skills and applications to new situations into the assessment process
- assessing in the workplace (wherever possible), using familiar skills and materials
- eliminating any unnecessary reading or written assessment (if these skills are not required to do the job, they should not be part of the assessment)
- ensuring understanding of questions by rephrasing to clarify and using the language and terms of the job and the workplace
- encouraging the candidate to ask questions to clarify instructions
- providing clarification of purpose and process of assessment
- considering cultural and gender issues when setting up the assessment.

Conducting Assessments

Evidence-gathering methods must be appropriate to the context of the assessment, the assessor and the candidate. The collection of evidence must meet the principles of validity, authenticity, sufficiency, currency and consistency.

Valid evidence collection ensures that the assessment assesses what it claims to assess. The evidence collected must be relevant to the activity and focus on the knowledge and skills specified in the Evidence Guides and Performance Criteria.

Authentic assessment relates primarily to achieving 'a close correspondence between the assessment situation and the situation in which the candidate will one day operate'. A driving practical test is, in this sense, an authentic assessment process. In other contexts where complete authenticity will usually not be practical, every effort should be made to maximise authenticity. An assessor must also ensure that the evidence actually relates to the performance of the person being assessed, and not that of another person. Where this is an issue, validation of the evidence by a third party may be necessary.

A **sufficient** assessment requires that sufficient evidence is collected to demonstrate competency in the standard being assessed. Evidence should be gathered on a number of occasions, in a range of contexts and using different assessment methods.

Currency of evidence collection ensures that the evidence is not outdated and that the person is competent in terms of the most recent standards. This is of particular concern when assessing for the purposes of recognition of current competencies.

A **consistent** assessment ensures both that the evidence collected demonstrates consistent achievement of the specified standard by the person being assessed, and that the outcomes of the assessment process are substantially consistent irrespective of where, when and by whom the assessment is conducted.

Following the assessment process, assessment outcomes need to be recorded and securely stored, and feedback provided in terms of performance against the relevant competency standards.

Where assessment is occurring in the workplace:

Take into account that the person being assessed may have had little experience of structured training and assessment. Carefully explain the process of making judgements against the standards and make the candidate feel as relaxed as possible.

Consult on the assessment process with the parties involved.

The assessment should take place over a reasonable length of time so that the candidate has the opportunity to demonstrate work responsibility and contingency management. (Third party reports of workplace performance, if available, are helpful for this.)

Consider the other staff in the workplace likely to be affected by the process. All staff directly or indirectly involved in the process should be briefed on the factors which will impact on them, such as duration or changes in work routine.

Ensure that assessment is as compatible as possible with the normal pattern of work and causes minimal disruption. If the process involves candidates being away from their work area for a period of time, then arrangements should be made with their immediate supervisor to cover their duties for that period of time.

Assessment resources for this Training Package should provide ways in which to address these matters.

Where assessment is occurring out of the workplace, it is important to ensure that:

- the assessment takes place in a situation as close as possible to workplace reality
- all aspects of competency are assessed
- the assessment takes place over a reasonable length of time so that the candidate has the opportunity to demonstrate work responsibility and contingency management. Third party reports of workplace performance, if available, are helpful for this
- documents used in assessment closely reflect workplace reality.

Assessment considerations for technical/testing units

All units have been written with a focus on a workplace assessment environment. In institutional delivery this can be achieved through simulation of workplace activities, or through work placements.

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The performance of testing units (code 97) relies on compliance with all the requirements of the organisation's quality management system. Where such systems are mandated by legislation or licensing then the context in which the competence is demonstrated/assessed must meet the requirements of that legislation or license to the satisfaction of the regulatory authority.

Consistent performance should be demonstrated. In particular, the assessor could:

- review test data/results obtained by the candidate over time, particularly to check accuracy, consistency and timeliness of results
- review test records and workplace documentation prepared by the candidate
- observe the candidate conducting sample preparation and a range of test procedures
- obtain feedback from clients, peers and supervisors
- question the candidate about relevant scientific/technical terms, test methods and enterprise procedures, common problems and corrective action
- conduct simulations and role plays to assess the candidate's ability to handle unforeseen problems, respond to simulated emergencies and to simulated working conductions where access to the workplace is not possible.

Designing Assessment Tools

This section provides an overview on the use and development of assessment tools.

Use of Assessment Tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgments about whether candidates have achieved competency.
There is no set format or process for the design, production or development of assessment tools. Assessors may use prepared assessment tools, such as those specifically developed to support this Training Package, or they may develop their own.

Using Prepared Assessment Tools

If using prepared assessment tools, assessors should ensure these relate to the current version of the relevant unit of competency. The current unit of competency can be checked on the National Register < www.ntis.gov.au>.

Developing Assessment Tools

When developing assessment tools, assessors must ensure that they:

- are benchmarked against the relevant unit or units of competency
- are reviewed as part of the continuous improvement of assessment strategies as required under Standard 1 of the AQTF 2007
- meet the assessment requirements expressed in Standard 1 of the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

A key reference for assessors developing assessment tools is TAE10 Training and Education Training Package.

Language, Literacy and Numeracy

The design of assessment tools must reflect the language, literacy and numeracy competencies required for the performance of a task in the workplace and not exceed these expectations.

Conducting Assessment

This section details the mandatory assessment requirements and provides information on equity in assessment including reasonable adjustment.

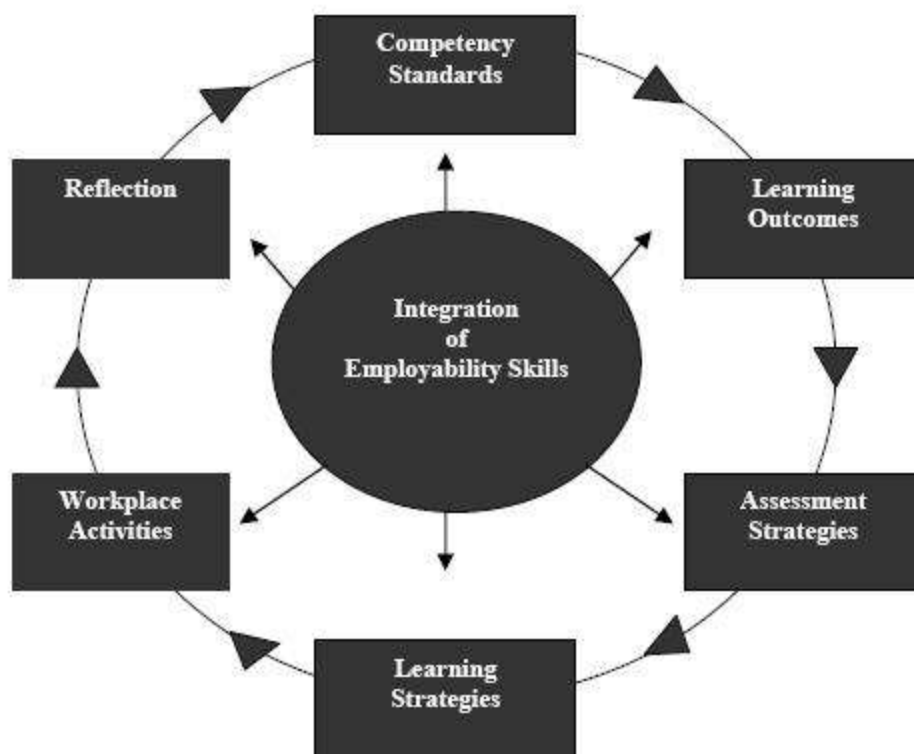**Mandatory Assessment Requirements**

Assessments must meet the criteria set out in the 2010 *Essential Standards for Initial and Continuing Registration*. For information, the mandatory assessment requirements from Standard 1 from the AQTF 2010 *Essential Standards for Initial and Continuing Registration* are as follows:

1.5		Assessment, including Recognition of Prior Learning:
	a)	meets the requirements of the relevant Training Package or accredited course,
	b)	is conducted in accordance with the principles of assessment and the rules of evidence, and
	c)	meets workplace and, where relevant, regulatory requirements.

	d)	is systematically validated.

Assessment of Employability Skills

Employability Skills are integral to workplace competency. As such they must be considered in the design, customisation, delivery and assessment of vocational education and training programs in an integrated and holistic way, as represented diagrammatically below.

Employability Skills are embedded and explicit within each unit of competency, and an Employability Skills Summary is available for each qualification. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

- reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the
- application of Employability Skills at that qualification outcome
- designing training and assessment to address Employability Skills requirements.

The National Quality Council has endorsed a model for assessing and reporting Employability Skills, which contains further suggestions about good practice strategies in teaching, assessing, learning and reporting Employability Skills. The model is available from < http://www.training.com.au/>.

The endorsed approach includes learners downloading qualification specific Employability Skills Summaries for Training Package qualifications from an online repository at < http://employabilityskills.training.com.au>

For more information on Employability Skills in Manufacturing Industry Skills Council Training

Packages go to the Manufacturing Industry Skills Council website at http://www.mskills.com.au.

Employability Skills are reported on each qualification using the following statement on the qualification testamur: "A summary of the Employability Skills developed through this qualification can be downloaded from http://employabilityskills.training.com.au "

Access and Equity

An individual"s access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment beyond the requirements specified in this Training Package: training and assessment must be bias-free.

Under the rules for their development, Training Packages must reflect and cater for the increasing diversity of Australia"s VET clients and Australia"s current and future workforce. The flexibilities offered by Training Packages should enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia"s economic development and social and cultural life.

Reasonable adjustments

It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for students with disability.

Under the Disability Standards for Education 2005, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While "reasonable adjustment" and "unjustifiable hardship" are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of students with and without disability.

An adjustment is any measure or action that a student requires because of their disability, and which has the effect of assisting the student to access and participate in education and training on the same basis as students without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the student"s disability, the views of the student, the potential effect of the adjustment on the student and others who might be affected, and the costs and benefits of making the adjustment.

An education provider is also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship. The Training Package Guidelines provides more information on reasonable adjustment, including examples of adjustments. Go to http://www.deewr.gov.au/tpdh/Pages/home.aspx.

Further Sources of Information

The section provides a listing of useful contacts and resources to assist assessors in planning, designing, conducting and reviewing of assessments against this Training PackageS.

Contacts

Manufacturing Skills Australia
PO Box 289
NORTH SYDNEY NSW 2059
Ph 02 9955 5500
Fax 02 9955 8044
Web: www.mskills.com.au
Email: info@mskills.com.au
Technical and Vocational Education and Training (TVET) Australia Limited
Level 21, 390 St Kilda Road, Melbourne VIC 3150
PO Box 12211, A"Beckett Street Post Office
Melbourne Victoria 8006
Ph: +61 3 9832 8100
Fax: +61 3 9832 8198
Email: sales@tvetaustralia.com.au
Web: www.tvetaustralia.com.au
For information on the TAE10 Training and Education Training Package contact:
Innovation & Business Skills Australia
Telephone: (03) 9815 7000
Facsimile: (03) 9815 7001
Email: virtual@ibsa.org.au
Web: www.ibsa.org.au

General Resources

AQF Implementation Handbook, Fourth Edition 2007. Australian Qualifications Framework Advisory Board, 2002 < www.aqf.edu.au>

Australian Quality Training Framework (AQTF) and AQTF 2010 Users" Guide to the Essential Standards for Registration
http://www.training.com.au/pages/menuitem5cbe14d51b49dd34b225261017a62dbc.aspx

For general information and resources go to http://www.training.com.au/
The National Register is an electronic database providing comprehensive information about RTOs, Training Packages and accredited courses - < www.ntis.gov.au>
The Training Package Development Handbook site provides National Quality Council policy for the development of Training Packages. The site also provides guidance material for the application of that policy, and other useful information and links.
http://www.deewr.gov.au/Skills/Overview/Policy/TPDH/Pages/main.aspx

Assessment Resources

Registered training organisations (RTOs) are at the forefront of vocational education and training (VET) in Australia. They translate the needs of industry into relevant, quality, client-focussed training and assessment.
RTOs should strive for innovation in VET teaching and learning practices and develop highly flexible approaches to assessment which take cognisance of specific needs of learners, in order to improve delivery and outcomes of training.

Resources can be purchased or accessed from: TVET Australia provides an integrated service to enable users of the national training system to identify and acquire training materials, identify copyright requirements and enter licenses for use of that material consistent with the scope and direction of the NQC. http://www.productservices.tvetaustralia.com.au/

Employability Skills are embedded and explicit within each unit of competency, and an Employability Skills Summary is available for each qualification. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

• reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
• analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the
application of Employability Skills at that qualification outcome
• designing training and assessment to address Employability Skills requirements.

PO Box 289
NORTH SYDNEY NSW 2059
Ph 02 9955 5500
Fax 02 9955 8044
Web: www.mskills.com.au
Email: info@mskills.com.au

Competency Standards

What is competency?

The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise.
Competency covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Workplace competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time and in the required workplace situations and environments. In line with this concept of competency Training Packages focus on what is expected of a competent individual in the workplace as an outcome of learning, rather than focussing on the learning process itself.
Competency standards in Training Packages are determined by industry to meet identified industry skill needs. Competency standards are made up of a number of units of competency each of which describes a key function or role in a particular job function or occupation. Each unit of competency within a Training Package is linked to one or more AQF qualifications.

Contextualisation of Units of Competency by RTOs

Registered Training Organisation (RTOs) may contextualise units of competency to reflect local outcomes required. Contextualisation could involve additions or amendments to the unit of competency to suit particular delivery methods, learner profiles, specific enterprise equipment requirements, or to otherwise meet local needs. However, the integrity of the overall intended outcome of the unit of competency must be maintained.

Any contextualisation of units of competency in this endorsed Training Package must be within the bounds of the following advice. In contextualising units of competency, RTOs:

- must not remove or add to the number and content of elements and performance criteria
- may add specific industry terminology to performance criteria where this does not distort or narrow the competency outcomes
- may make amendments and additions to the range statement as long as such changes do not diminish the breadth of application of the competency and reduce its portability, and/or
- may add detail to the evidence guide in areas such as the critical aspects of evidence or resources and infrastructure required where these expand the breadth of the competency but do not limit its use.

Components of Units of Competency

The components of units of competency are summarised below, in the order in which they appear in each unit of competency.

Unit Title

The unit title is a succinct statement of the outcome of the unit of competency. Each unit of competency title is unique, both within and across Training Packages.

Unit Descriptor

competency from other endorsed Training Packages, summary information is provided. There may also be a brief second paragraph that describes its relationship with other units of competency, and any licensing requirements.

Employability Skills statement

A standard Employability Skills statement appears in each unit of competency. This statement directs trainers and assessors to consider the information contained in the Employability Skills Summary in which the unit of competency is packaged.

Prerequisite Units (optional)

If there are any units of competency that must be completed before the unit, these will be listed.

Application of the Unit

This sub-section fleshes out the unit of competency's scope, purpose and operation in different contexts, for example, by showing how it applies in the workplace.

Competency Field (Optional)

The competency field either reflects the way the units of competency are categorised in the Training Package or denotes the industry sector, specialisation or function. It is an optional component of the unit of competency.

Sector (optional)

The industry sector is a further categorisation of the competency field and identifies the next classification, for example an elective or supervision field.

Elements of Competency

The elements of competency are the basic building blocks of the unit of competency. They describe in terms of outcomes the significant functions and tasks that make up the competency.

Performance Criteria

The performance criteria specify the required performance in relevant tasks, roles, skills and in the applied knowledge that enables competent performance. They are usually written in passive voice. Critical terms or phrases may be written in bold italics and then defined in range statement, in the order of their appearance in the performance criteria.

Required Skills and Knowledge

The essential skills and knowledge are either identified separately or combined. Knowledge identifies what a person needs to know to perform the work in an informed and effective manner. Skills describe the application of knowledge to situations where understanding is converted into a workplace outcome.

Range Statement

The range statement provides a context for the unit of competency, describing 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. As applicable, the meanings of key terms used in the performance criteria will also be explained in the range statement.

Evidence Guide

The evidence guide is critical in assessment as it provides information to the Registered Training Organisation (RTO) and assessor about how the described competency may be demonstrated. The evidence guide does this by providing a range of evidence for the The unit descriptor broadly communicates the content of the unit of competency and the skill area it addresses. Where units of competency have been contextualised from units of assessor to make determinations, and by providing the assessment context. The evidence guide describes:

- conditions under which competency must be assessed including variables such as the assessment environment or necessary equipment
- relationships with the assessment of any other units of competency
- suitable methodologies for conducting assessment including the potential for workplace simulation
- resource implications, for example access to particular equipment, infrastructure or situations
- how consistency in performance can be assessed over time, various contexts and with a range of evidence, and expectations at the AQF qualification level involved

Employability Skills in units of competency

The detail and application of Employability Skills facets will vary according to the job-role requirements of each industry. In developing Training Packages, industry stakeholders are consulted to identify appropriate facets of Employability Skills which are incorporated into the relevant units of competency and qualifications.

Employability Skills are not a discrete requirement contained in units of competency (as was the case with Key Competencies). Employability Skills are specifically expressed in the context of the work outcomes described in units of competency and will appear in elements, performance criteria, range statements and evidence guides. As a result, users of Training Packages are required to review the entire unit of competency in order to accurately determine Employability Skills requirements.

How Employability Skills relate to the Key Competencies

The eight nationally agreed Employability Skills now replace the seven Key Competencies in Training Packages. Trainers and assessors who have used Training Packages prior to the introduction of Employability Skills may find the following comparison useful.

Employability Skills	**Mayer Key Competencies**
Communication	Communicating ideas and information
Teamwork	Working with others and in teams
Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information Planning and organising activities
Self-management	
Learning	
Technology	Using technology

When analysing the above table it is important to consider the relationship and natural overlap of Employability Skills. For example, using technology may involve communication skills and combine the understanding of mathematical concepts.

Explicitly embedding Employability Skills in units of competency

This Training Package seeks to ensure that industry-endorsed Employability Skills are explicitly embedded in units of competency. The application of each skill and the level of detail included in each part of the unit will vary according to industry requirements and the nature of the unit of competency.

Employability Skills must be both explicit and embedded within units of competency. This means that Employability Skills will be:

- embedded in units of competency as part of the other performance requirements that make up the competency as a whole
- explicitly described within units of competency to enable Training Packages users to identify accurately the performance requirements of each unit with regards to Employability Skills.

This Training Package also seeks to ensure that Employability Skills are well-defined and written into units of competency so that they are apparent, clear and can be delivered and assessed as an essential component of unit work outcomes.

The following table contains examples of embedded Employability Skills for each component of a unit of competency. Please note that in the examples below the bracketed skills are provided only for clarification and will not be present in units of competency within this Training Package.

Example Employability Skills unit

Unit component	Example of embedded Employability Skill
Unit Title	Prepare trial batches (Planning, organising)
Unit Descriptor	This unit of competency covers the ability to prepare trial batches of materials for evaluation. Materials can include soil, minerals and manufactured products, such as concrete, asphalt, food, plastics, paint and other industrial chemicals. (Planning, initiative, problem solving)
Element	Record description of the job to be undertaken, compare with specification and report any variations (Planning, learning, initiative) Evaluate properties of the mixture by inspection and standard test methods (Problem solving, technology) Clean equipment and dispose of materials (Initiative, planning, organising) Maintain a safe work environment (Self management, organising)
Performance Criteria	Record description of the job to be undertaken, compare with specification and report any variations (Planning, communication, enterprise, learning) Maintain confidentiality of enterprise information (Initiative, self management) Minimise the generation of wastes and environmental impacts (Planning, enterprise, organising) Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel (Communication, planning, self management, teamwork)
Range Statement	Typical problems may include: • not following SOPs • measurement errors • calculation errors • materials of unreliable quality • insufficient mixing • poor sampling procedures • equipment breakdown and breakage

	(Technology, planning, initiative, self management)
Required Skills and Knowledge	Required skills include: • performing simple calculations • making accurate measurements of volume and mass • representative sampling • working safely with equipment and hazardous materials • working safely in laboratory and field conditions • setting up and maintaining tools and equipment • using tools and equipment to perform basic sampling and testing techniques • observing and recording information on testing and sampling • handling, transporting and storing materials • observing interpreting and reporting atypical situations (Technology, learning, communication, initiative, problem solving)
Evidence Guide	The assistant test the aggregates to determine their grading properties. From these results, he/she designs a mix to satisty the prohect specifications using a standard design method. (Technology, initiative, problem solving) • Assessors should ensure that candidates can • perform operations in accordance with laboratory and /or enterprise procedures, and appropriate legislative requirements • Accurately measure, calculate and record batch quantities, concentrations and other relevant parameters • evaluate properties of the mixture by inspection and standard test methods • recognised and report problems and atypical situations to relevant personnel (Communication, planning, self management, initiative, problem solving) (communication , planning, self management, initiative, problem solving) accurately measure, calculate and record batch quantities, concentrations and other relevant parameters

Competency Standards - Industry Contextualisation

MSL09 – contextualisation guidelines

This Training Package is relevant to the broad spectrum of Australian industries, and users are encouraged to customise qualifications and contextualise units of competency to suit their enterprise or sector purposes, provided that the customisation rules are followed. Customisation of this Training Package may be achieved by:

- choosing appropriate electives from units provided in this Training Package (refer to packaging rules for information on packaging for industry specialisations)
- importing elective units from other Training Packages
- contextualising units of competency to better suit an enterprise or industry context.

We welcome and encourage the export of these units to other Training Packages provided the rules below are observed.

Choosing appropriate electives

The electives listed within the Laboratory Operations Training Package provide for skill development in all areas identified by industry representatives during consultations. All qualifications are able to be customised since candidates are able to choose particular combinations of elective units to suit their individual needs or work context.

Importing elective units from other Training Packages

To achieve maximum cross-industry application, the packaging rules enable units of competency to be imported from any Training Package that is directly relevant to the candidate's current or intended laboratory work environment. In providing this flexibility it is incumbent on RTOs to ensure that the integrity of qualifications in the Training Package is maintained. The following guidelines for importing units apply.

- Imported units must relate to core functions or roles in the candidate's current or intended laboratory work environment (for example, food production processes, process manufacturing operations, information technology, front line management, workplace training and assessment)
- The original title and code for the imported unit of competency must be retained.
- Imported units must come from other endorsed Training Packages.
- Imported units must have the same scope and similar degree of complexity as the elective units they replace.

Exporting competencies to other Training Packages

MSL09 is a cross-industry Training Package, with application across a wide range of industries. It is expected and encouraged that these units of competency will be imported to a number of other Training Packages. All MSL09 units may be used provided that:

- the original unit code and unit title are retained
- they are only contextualised to the extent outlined in the section on Competency Standards
- the user advises the appropriate Skills Council in writing of the specific competencies exported to enable input during future revisions and ongoing communication.

Contextualising of units of competency

It is vital that these cross-industry competencies are able to be used in a wide range of industry sectors and enterprises. To enable this, contextualising of the units of competency is actively encouraged provided the requirements outlined in the earlier section on Competency Standards are met.

Appendices

Appendix 1
Development of MSL09

Industry drivers for change
The major industry drivers for the improvements are outlined below:

- There are approximately 800 construction materials testing (CMT) facilities and laboratories accredited by NATA (National Association of Testing Authorities) for a wide range of tests. These tests cover field and laboratory testing of raw materials and production mixes as well as in situ tests for the purposes of quality control, assisting with design and monitoring of the deterioration of structures. Common materials tested include: aggregates, concrete, soils and road pavement. The PML04 version of the Laboratory Training Operations Training Package did not adequately address the competency needs of this largest laboratory sector and there was strong industry interest and commitment to extend the package in this area.
- The mineral sector is an important sector of the Australian economy. New technology is being continually being introduced to improve productivity. The advent of robotic sample preparation systems and automated analytical instruments is revolutionising how samples are handled and analysed. The improved version of the Training Package will now cover the competency needs of technicians who operate these systems.
- There is a widespread inability of employers to recruit technical personnel who are able to set-up, optimise and operate specialised analytical instruments to obtain reliable results for a range of samples and techniques. Many laboratory managers state that job seekers trained at Australian and overseas universities lack the required practical, instrumental analysis skills while technicians already in the workforce (who may have VET training) require further skills development. A new Vocational Graduate Certificate in Instrumental Analysis has been developed to address this skills shortage. This new qualification has application in a range of testing sectors such as: forensic, chemical, mineral/materials testing, environmental, and biomedical.

Project management

The project was overseen by a MSA Board Sub-Committee made up of major stakeholders and technical experts. The terms of reference were to:

- oversee and advise on consultation processes
- provide advice on underpinning knowledge and technical content
- act as a technical advisory group in the development of new units of competency
- assist with the resolution of any issues.

The individuals and enterprises/organisations represented on the MSA Board Sub-Committee are set out in the following table:

Name	Enterprise/organisation
David Graham (Chair) ,	Huntsman Chemicals
Gail Silman	Australian Industry Group
Duncan Jones	Australian Laboratory Managers Association and Science Industry Australia
Ian Curry/Anne Donnellan	Australian Manufacturing Workers' Union
Kim Peterson	TAFE NSW and Royal Australian Chemical Institute
Marian Haire	National Measurement Institute

Consultation and validation processes

Consultations during the development and validation process were undertaken with:

- technical experts working in the areas of construction materials testing, mineral assay, treatment of measurement uncertainties and the authorised issue of results
- representatives of RTOs who already offer current qualifications and/or are intending to offer the new qualification.

Small workshops involving technical experts were used to draft new units of competence prior to their revision by larger groups of interested parties. Existing units were revised with input from technical experts and experienced RTO representatives.
Drafts of all units of competence and qualifications were then posted on the MSA website for validation and stakeholders were advised by email about how to access the site and provide feedback. This included industry stakeholders listed on the MSA database, State industry advisory bodies, members of the National TAFE Science Teacher's Network, State Training Authorities and National ISCs.
This feedback was used to further refine the units and qualifications. In some cases, the feedback received and the units involved were reviewed again by technical experts prior to final editing.
The final drafts of the new units and qualification have been validated and signed off by all major stakeholders (both industry and RTOs) with no outstanding or unresolved issues. Validation and acceptance of final drafts was undertaken by email.
The following individuals and organisations participated in the development process. The great value of their expertise and input is gratefully acknowledged.

Name	Organisation	State
Nopporn Song-im	National Centre for Forensic Studies, University of Canberra	ACT
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National TAFE Science Network

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