MSS Sustainability Training Package Companion Volume - *Range of Conditions*

Release 2.0 June 2018

Contents

1. Overview

This Companion Volume *Range of Conditions* has been developed to support the MSS Sustainability Training Package, Release 2.0. It provides information for Registered Training Organisations (RTOs) and enterprises to support the implementation of training and assessment based on the units of competency, skill sets, and qualifications in the MSS Sustainability Training Package.

This guide provides the following additional information to that included in the MSS Companion Volume *Implementation Guide*:

- *Range of conditions*, which includes definitions of terms and phrases included in units of competency that previously existed in the Range Statements of previous versions of MSS units.

This guide will be updated to include Range of Conditions information from units as they are reviewed in the future.

2. Range of Conditions

General	
Regulatory framework	The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used. Applicable legislation, regulations, standards and codes of practice include: • health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, equipment and production processes and hazardous materials • Australian/international standards relevant to the materials being used and products being made • any relevant licence and certification requirements. • All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.
Formal Reports	The following components might be included when preparing formal reports: • letter of transmittal - including distribution list • Title • Table of Contents • list of illustrations, images, diagrams, charts • Executive Summary • Introduction and background (including objectives) • Methods and Experimental procedures • Finding, results and discussions • Conclusions • Recommendations • Acknowledgements • References • Appendices
MSS014008 Improve sustainability through readily implementable change.	
Muda (waste) includes one or more of	• overproduction • delay/waiting • transportation • over processing • excess inventory • unnecessary motion • defects and rework.

Documentation (paper, electronic or other) includes one or more of	• standard operational procedures (SOPs) • engineering drawings • other sketches and diagrams • specifications and manuals • training and assessment manuals.
Drivers of change include one or more of	• a crisis related to current sustainability performance • regulatory requirements • demands from customers • community pressure • organisation commitment to improve sustainability • other demand for change on the organisation.
Sustainability problems include one or more of	• problems with procedures, process or equipment • problems with materials including material waste and disposal of waste materials • problems with energy consumption • problems with resource use including water • problems with culture or employee skills and knowledge • problems with design or specification.
MSS014009 Evaluate sustainability impact of a work or process area.	
Interactions with the environment include one or more of	• drawing physical resources from the environment • releasing materials to the environment (e.g. emissions) • drawing energy from/releasing energy to the environment.
Environmental sensitivities include one or more of	• fragile areas, rare or threatened species • heritage or cultural sensitivity issues • hazardous emissions • regulated emissions or other regulatory issues • community perceptions or other issues • other issues, such as those identified in AS/NZS ISO 14001 Environmental Management Standards (or its authorised replacement or other relevant standard).
Priority rankings include one or more of	• issues of high impact and high probability of occurrence • issues aligned to organisations strategic direction • issues related to regulatory requirements.
Determine includes one or more of	• developing solutions within the scope of skill • discussing issues with relevant experts to develop a solution • undertaking research (literature or physical) within the scope of skill to develop a solution.
Sustainability improvements include reduction in use of one or more of	• energy • water • raw materials • emissions • embedded carbon in transport, storage, rework and errors, inefficient processes and design, and general facility efficiencies.

Sustainability related issues include one or more of	• current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment • relationship with the local and broader community (e.g. effect of operations on aesthetic appearance, preservation of heritage, proximity to schools, religious facilities, and impact on local residents and infrastructure) • extent of regulatory oversight and extent and cost of compliance • AS/NZS ISO 14001 Environmental Management Standards (or its authorised replacement or other relevant standard) • consumer demand for more sustainable products and processes • ethical supply chain.
Desirability ranking includes one or more of	• direct dollar benefit/cost • customer benefit • stakeholder perception: • shareholders • employees • community • financial community • life cycle improvements • compliance with regulations • company sustainability strategy and strategic plans • company commitment to covenants and initiatives • availability of incentives.
MSS014010 Optimise sustainability of a process or work area	
Sustainability includes all of	• meeting all regulatory requirements • conforming to all relevant industry covenants, protocols and best practice guides • minimising ecological footprint of process, plant, product or work area • maximising economic benefit of process plant and product to the organisation and the community • minimising the negative work health and safety (WHS) impact on employees, community and customer (e.g. WHS impacts of process, product and wastes).
Interactions with the environment include one or more of	• drawing physical resources from the environment • releasing materials to the environment (e.g. emissions) • drawing energy from/releasing energy to the environment.
Procedures (written,	• work instructions

verbal, visual, computer based, etc.) include one or any combination of	• standard operating procedures • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
Environmental sensitivities include one or more of	• fragile areas, and rare or threatened species • heritage or cultural sensitivity issues • hazardous emissions • real or perceived overuse of scarce resources • noise • regulated emissions or other regulatory issues • community perceptions or other issues.
Performance is indicated by one or more of	• historical data and records • design performance • process/takt time requirements.
Sustainability improvements include reduction in use of one or more of	• energy • water • raw materials • emissions • embedded carbon in transport, storage, rework and errors, inefficient processes and design, and general facility efficiencies.
Sustainability related issues include one or more of	• current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment • relationship with the local and broader community, (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and extent and cost of compliance.
Hazards is used to include one or more of	• sustainability hazards • environmental hazards • health hazards • safety hazards.
Data and records include one or more of	• orders, project briefs or customer specifications • hazard logs • incident reports • maintenance records • errors and non-conformance reports

	• production records.
MSS014011 Facilitate team to develop and implement sustainability strategies	
Capability of the team includes one or more of	• necessary technical knowledge and information about relevant processes and support functions • sustainability related goals • sustainability knowledge and skills.
Mentoring processes include one or more of	• mentoring applied by the team leader directly to team members • mentoring arranged by the team leader to occur through other internal specialist employees • buddy systems within the team where more experienced team members mentor newer team members • external mentors and coaches.
Interactions with the environment include one or more of	• drawing physical resources from the environment • releasing materials to the environment (e.g. emissions) • drawing energy from/releasing energy to the environment.
Environmental sensitivities include one or more of	• fragile areas and rare or threatened species • heritage or cultural sensitivity issues • hazardous emissions • real or perceived over use of scarce resources • noise • regulated emissions or other regulatory issues • community perceptions or other issues.
Sustainability improvements include reduction in use of one or more of	• energy • water • raw materials • emissions • embedded carbon in transport, storage, rework and errors, inefficient processes and design.
Sustainability related issues include one or more of	• current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment • relationship with the local and broader community (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and extent and cost of compliance • AS/NZS ISO 14001 Environmental Management Standards (or its authorised replacement or other relevant standard).

Procedures (written, verbal, visual, computer based, etc.) include one or any combination of	• work instructions • standard operating procedures • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
Team includes one or more of	• formally designated work teams from all sections of the organisation, including production, maintenance, technical, administration/finance, sales and marketing • ad hoc, temporary or permanent teams/groups who are or should be working as a team.
MSS014012 Apply proactive maintenance strategies to sustainability	
Interactions with the environment include one or more of	• drawing physical resources from the environment • releasing materials to the environment (e.g. emissions) • drawing energy from/releasing energy to the environment.
Environmental sensitivities include one or more of	• fragile areas and rare or threatened species • heritage or culturally sensitive issues • hazardous emissions • real or perceived overuse of scarce resources • regulated emissions or other regulatory issues • noise • community perceptions or other issues.
Sustainability issues need to reduce the carbon footprint of product and process through reduction in use of one or more of	• energy • water • raw materials • emissions • embedded carbon in transport, storage, rework and errors, and inefficient processes and design.
Sustainability related issues include one or more of	• current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment • relationship with the local and broader community, (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and extent and cost of compliance.

Procedures (written, verbal, visual, computer based, etc.) include one or any combination of	• work instructions • standard operating procedures • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
Overall equipment effectiveness (OEE) includes one or more factors where	• availability takes into account losses due to breakdown, set-up and adjustments • performance takes into account losses due to minor stoppages, reduced speed and idling • quality rate takes into account the losses due to rejects, reworks and start-up waste.
Maintenance practices that impact sustainability include one or more of	• increased inspection frequency of equipment above minimum requirements • lubrication and filter changeovers above minimum requirements in order to achieve higher environmental performance • replacement at set intervals to eliminate/reduce breakdowns • duplicate circuits • remote monitoring • increased training of operators in equipment monitoring and minor maintenance.
MSS014013 Contribute to sustainability related audits	
Audit processes includes one or more of	• audits for regulatory, Global Reporting Initiative (GRI) or other compliance • audits related to responding to a government initiative or incentive • audits against externally set targets (e.g. set by governments, industry codes and clients/customers) • audits of carbon and carbon equivalence usage • energy audits • water audits • emission audits • sustainability related transport audits • efficiency audits, including audits of rejects and reworks.
Environmental sensitivities include one or more of	• fragile areas and rare or threatened species • heritage or culturally sensitive issues • hazardous emissions • regulated emissions or other regulatory issues • community perceptions or other issues.
Sustainability improvements include reduction in use of one	• energy • water • raw materials

or more of	• emissions • embedded carbon in transport, storage, rework and errors, inefficient processes and design, and general facility efficiencies.
Sustainability related issues include one or more of	• current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment • relationship with the local and broader community (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and extent and cost of compliance • AS/NZS ISO 14001 Environmental Management Standards (or its authorised replacement or other relevant standard).
Data and records include one or more of	• orders, project briefs or customer specifications • hazard logs • incident reports • maintenance records • errors and non-conformance reports • production records.
Inputs to process include one or more of	• water • energy • materials • carbon equivalence of inputs, where appropriate.
Procedures (written, verbal, visual, computer based, etc.) include one or any combination of	• work instructions • standard operating procedures • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
MSS014014 Implement social sustainability in work practices	
Techniques and tools include one or more of	• visual workplace concepts • measurement, display and/or recording devices • changed work practices/procedures • competence development and awareness training • group activities • external advice/services.
Equitable participation can be encouraged by	• protocols for communication and providing feedback • rewarding innovation and initiative

using activities and strategies including one or more of	• encouraging suggestions and implementing them, as feasible • recognition and reward programs • activities that recognise different ways of communicating and/or thinking, e.g. verbal, written and visual • encouraging respect for cultural diversity, diverse interests and differing opinions • using interpreters or translated information • addressing barriers to communication.
Procedures that support engagement include one or more of	• training and development • progression and promotion • hours of work and work-life balance • work conditions and leave entitlements • access to facilities and amenities • performance reviews and performance management • recognition and reward • anti bullying, discrimination and harassment.
Change management strategies include one or more of	• case studies from similar businesses • finding champions within the organisation • promoting internal success stories/runs on the board • identifying the benefits of social sustainability targeted to stakeholder interests/needs.
Stakeholders include one or more of	• employees • management • shareholders • customers • suppliers • regulatory bodies • other organisations • specialists who may have particular technical expertise.
MSS015021 Measure and report carbon footprint of a product or product class	
Carbon emissions include all of the following known or able to be physically measured emissions of	• gases, vapours and fumes • liquids • solids • assumed emissions through material balancing • assumed emissions through energy loss, including heat, friction and other energy conversion yield losses • relevant greenhouse gases, including those defined under the Kyoto protocol.
MSS015022 Develop strategies for more sustainable use of resources	
Muda (waste) includes all of	• excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process

	• making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisation's customers.
Emissions include one or more of	• known or able to be physically measured emissions of gases, vapours, fumes, liquids or solids • assumed emissions through material balancing • assumed emissions through energy loss, including heat, friction and other energy conversion yield losses.
Significant resources are deemed to be significant because they include one or more of	• high volume • high value • high environmental significance • important to the product or process • covered by legislation or regulation • important to the enterprise.
MSS015023 Design sustainable product or process	
Parameters of new product include one or more of	• function • form • market • desired sustainability performance • cost.
Sustainability impact includes one or more of	• resource footprint (e.g. carbon and water) of product and process • current and future availability of raw materials • current and future availability of energy • waste generation and disposal • efficiency of process • the extent to which the production process and product affects the environment (e.g. climate, quality of local air and water, ecology, noise) • relationship with the local and broader community, (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and cost of compliance.
Review design includes all of	• ensuring product and process meets requirements • analysis to identify further improvements.
MSS015024 Develop required sustainability reports	
Compliance requirements include one or more of	• regulatory requirements (e.g. energy efficiency, hazardous waste, National Pollutant Inventory (NPI), emissions and carbon) • state/federal environment departments • local government • energy/water authorities • Therapeutic Goods Administration (TGA) • AS/NZS ISO 14001 Environmental Management Standards (or its

	authorised replacement or other relevant standard) • other regulatory bodies.
Commercial reporting requirements include reports required by, or for one or more of	• Australian Stock Exchange (ASX) • Australian Competition and Consumer Commission (ACCC) • Board of Directors • shareholders • lending and insurance organisations • employees • community groups.
Sustainability impact includes one or more of	• resource footprint (e.g. water, carbon and carbon equivalent) of product and process • current and future availability of raw materials • current and future availability of energy • waste generation and disposal • efficiency of process • the extent to which the production process and product affects the environment • relationship with the local and broader community • extent of regulatory oversight and cost of compliance.
MSS015025 Develop a business case for sustainability improvements	
Expected benefit may be benefit against one or more of	• business • ecological • social • sustainability goals.
Capital improvements covers all of	• the purchase, installation, construction and commissioning of new equipment • alterations to existing equipment designed to improve the sustainability of the organisation's operations and which will be classed as capital in the organisation's balance sheet.
Production improvements include one or more of	• work re-organisation • eliminating or changing operating steps • use of different materials, components or supplies • changing equipment and process conditions.
Maintenance related improvements include an increase in one or more of	• condition monitoring • maintenance frequency • efficiency and sustainability of operating equipment.
Personnel costs include costs related to one or more of	• recruiting new staff • retrenchments • training and retraining • use of contract labour.
Time-related costs include one or more of	• time value of money • maintenance of new plant as part of the project.

MSS015026 Develop strategic sustainability plans	
Sustainability status includes one or more of	• resource footprint (e.g. carbon, water and energy) of product and process • current and future availability of raw materials • current and future availability of energy • waste generation and disposal • efficiency of process • the extent to which the production process and product affects the environment (e.g. effects on climate, quality of local air and water, ecology, noise) • relationship with the local and broader community (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and cost of compliance.
Sustainability indicators include one or more of	• water usage • energy usage • emissions • indicators for ethical/sustainable supply chain • community relationships/complaints • staff turnover • safety record • compliance with regulations and codes of practice • reduced waste • increased recycling • product improvement • meeting consumer expectations for sustainable use of resources • other indicators appropriate to the organisation, its value chain, processes and operations.
Suggestions for major improvements include one or more of	• non-compliances/near misses/incident reports • kaizen and other improvement processes • benchmarking activities • regulatory and non-regulatory related audits • community pressure • Board directions • changes in market • suppliers • customers.
Suggestions include improvements *to* one or more of	• products • processes • employee, health, safety and environment (HSE) or amenity • impact on the community • impact on the environment • efficiency and profit • waste management • emergency/incident response

	• facility/building design and management.
Suggestions can be ranked by all of	• need • benefit/cost • strategic impact.
Strategic approvals for implementation include one or more of	• regulatory approvals • financial approvals • internal approval processes • senior management/shareholder approvals • human resource implications, such as career paths and position descriptions • operational management approvals • supplier/client/contractor approvals.
Required documentation includes one or more of	• formal report or plan • business case • environmental impact statement.
MSS015027 Implement sustainability plans	
Sustainability improvement includes one or more of	• resource footprint (e.g. carbon, water and energy) of product and process • current and future availability of materials • current and future availability of energy • waste generation and disposal • efficiency of process • the extent to which the production process and product affects the environment • relationship with the local and broader community (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and cost of compliance • meeting external sustainability benchmarks.
Improvement actions include one or more of	• the purchase and installation of new equipment or alterations to existing equipment • improvements to manufacturing processes, such as work re-organisation, eliminating or changing manufacturing steps and use of different raw materials • changes to maintenance procedures, such as increased condition monitoring and maintenance frequency designed to improve the efficiency and sustainability of operating equipment • product life cycle improvements • changes designed to improve the organisation's compliance to sustainability related Acts and regulations.
Documentation (paper, electronic or other form) includes one or more of	• standard operating procedures • drawings and specifications • training and assessment manuals.

MSS015028 Conduct a sustainable water use audit	
Sources within the site include one or more of	• water generated by process • rain water • other natural water sources.
Water quality categorisation includes one or more of	• deionised/highly treated (e.g. high pressure boiler feed) • potable water • groundwater • waterway/reservoir • recycled water • grey water • black water • wastewater.
MSS015030 Conduct an emissions audit	
Materials include one or more of	• materials directly used and also materials which comprise components which are used • materials/resources which may be consumed to make a physical product • materials which may be consumed in delivering a service (e.g. fuel, energy and other consumables).
Emissions include one or more of	• fluid leaving the process, other than as part of the product • solid leaving the process, other than as part of the product • material leaving in waste streams or entering the process but not leaving as part of the product.
MSS015031 Conduct a sustainability related transport audit	
Transport used in a value chain includes one or more of	• vehicle • ship/boat • train • aeroplane • conveyor or other means.
Financial costs include one or more of	• purchase • lease • hire costs • maintenance costs.
Inefficient transport includes one or more of	• transport which uses more time, fuel or larger capacity of transport than is needed or causes more stock to be held than is necessary • not travelling by the most direct route • taking more time than necessary • not correctly matching load to capacity of transport vehicle • not correctly matching delivery and pick up times to production requirements.
MSS015033 Implement and monitor reengineering for sustainability	
Process performance	• benchmarking comparisons

analysis includes one or more of	• comparison with theoretical performance • comparisons with regulatory requirements • examination of operational and maintenance records • consultation with operational and maintenance staff to identify informal history (e.g. excessive effort in 'work arounds', and making it work in spite of the system) • conflicts in the organisation • an extremely high frequency of meetings • excessive use of non-structured communication (memos and emails).
Process improvement methodologies include one or more of	• kaizen • kaizen blitz • technical optimisation approaches • reengineering, including new plant and equipment, modification of existing plant and equipment and changes to specification of product or process.
Product includes	• goods • services.
Desirability ranking includes one or more of	• direct dollar benefit/cost • customer benefits • stakeholder perception • life cycle improvements • flexibility to adapt to future needs.
MSS015034 Inform and educate organisation and community representatives on sustainability issues	
Organisation and community representatives include one or more of	• employees and managers in own organisation • suppliers • customers • other members of a value chain (e.g. logistics suppliers, professional support services, contractors, training providers) • local, regional and national community representatives.
Need for sustainability information dissemination determined by means of one or more of	• discussions with organisation representatives • discussions with community representatives • examination of current and past requests for information.
Information covered by special provisions includes one or more of	• information required to be released under Acts or regulations • information required under supplier or customer contracts • industry codes, covenants and standards • commercial in confidence information • information requiring special clearances before release.
Sustainability related information and concepts include one or	• definitions of sustainable development • sustainability related philosophical concepts (e.g. precautionary principle, intra- and inter-generational equity, inter-regional

more of	and inter-country equity) • air, water and soil contamination • energy use and conservation • climate change, including greenhouse gases • overpopulation relative to food supply • effects of uneven population distribution • distinction between renewable and non-renewable resources • resource footprint • consumption of resources (e.g. reasons for use in the value chain, rate of use, impact on environment and ecology at both local and global level, alternative resources, efficiency of extraction and use of resources) • concepts of carbon accounting and carbon equivalence in resource consumption • generation and disposal of solid and liquid waste • conservation of biological and ecological diversity • community and government expectations on use of technology • environmental and sustainability related legislation and regulations, • inclusion of sustainability and environmental values in cost structures • general sustainability issues.
MSS015020 Facilitate an energy audit	
Purpose and benefits of energy and greenhouse gas (GHG) audits	• assisting with planning, forecasting and budgeting • reduced operational costs • improved productivity or quality outcomes • reduce maintenance costs • improve organisation's image • demonstration of corporate responsibilities • staff engagement • meeting stakeholder expectations • contribute to achieving government reduction targets
GHG emissions reduction schemes may include	• Emissions Trading • Carbon Trading • Carbon Offset • Clean Development Mechanism
Carbon reduction solutions may include	• HVAC • cut energy usage • cut waste • increase recycling • cut down on travel, haulage, commuting
MSS017009 Analyse and determine organisational risk areas in sustainability	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment)

	• economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures) • particular local social issues (e.g. distortions to the housing market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use/or deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle) • product improvement/life cycle (e.g. organisational risk of loss of sales due to consumer preference/economic opportunity for more sustainable products, competitors meeting this market, consumer preferences not to use companies with poor sustainability credentials).
Significance of impact includes one or more of	• permanent loss or degradation • loss or degradation which inhibits use by the following generation • temporary degradation requiring remediation • temporary degradation which is self-remediating • speed of change/degradation/loss.
Appropriate response when impact cannot be prevented includes one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • capitalising on revealed opportunities • other approaches which meet the sustainability requirements.
MSS017010 Determine process loss through mass or energy balancing	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Mass/energy balancing	• mass balancing is an analysis technique which allows for the

includes one or more of	calculation of mass flows and consumption through a process and losses of mass from the system/product • energy balancing is an analysis technique which allows for the calculation of energy flows and consumption through a process and the losses of energy from the system/product • mass and energy balancing may be undertaken as separate activities or in some circumstances as a combined mass/energy balance.
Appropriate response when impact cannot be prevented includes one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017011 Identify and respond to external sustainability factors for an organisation	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Factors external to the organisation include one or more of	• government (at any level) legislation or regulation • government (at any level) direct action programs or similar • government (at any level) incentives or similar • customer expectations • community expectations • market trends • competitor actions • other factors.
Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures) • particular local social issues (e.g. distortions to the housing market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use or/deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle).
Significance of impact	• permanent loss or degradation • loss or degradation which inhibits use by the following

includes one or more of	generation • temporary degradation requiring remediation • temporary degradation which is self-remediating • speed of change/degradation/loss.
Sustainability impacts which cannot be prevented require mitigation and amelioration techniques which include one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017012 Lead sustainable strategy deployment	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Current operations include one or more of	• production • maintenance • logistics and warehousing • administration and human resources • client/customer, contractor and supplier liaison and administration.
Sustainability strategy includes all of	• scope • timeline • key performance indicators (KPIs) • budget.
Required changes include one or more of	• new/modified metrics, where required • changes resulting from kaizen • data feeding into kaizen.
Convene periodic review process includes one or more of	• a formal or informal meeting • a series of meetings • a virtual meeting/series of meetings • an electronic interchange • other form of interchange.
Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures) • particular local social issues (e.g. distortions to the housing

	market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use or/deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle).
Sustainability impacts which cannot be prevented require mitigation and amelioration techniques which include one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017013 Manage a major sustainability non-conformance	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Impact of non-conformance includes one or more of	• negligible impact • fines or other organisation legal penalties • personal fines, jail terms or other personal penalties • court litigation or similar • remediation costs • loss of market share • loss of brand viability • loss of licence to operate.
Other stakeholders include one or more of	• regulatory bodies, such as local councils and environmental protection agencies • customers/clients • suppliers • service suppliers.
Plan for conformance includes one or more of	• the temporary situation has been corrected • the process has been adapted to the permanent change in the environment.
Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures)

	• particular local social issues (e.g. distortions to the housing market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use or/deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle, other issues, such as those identified by AS/NZS ISO 14001 Environmental Management Standards or its authorised replacement or other relevant standard).
Significance of impact includes one or more of	• permanent loss or degradation • loss or degradation which inhibits use by the following generation • temporary degradation requiring remediation • temporary degradation which is self-remediating • speed of change/degradation/loss.
Appropriate response when impact cannot be prevented includes one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017014 Identify and improve sustainability interactions with the community	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Community includes one or more of	• residents living in the area of the value chain • people who use amenities in the area of the value chain • people who work near the value chain • employees of the value chain or the organisation • other organisations in the area of the value chain • general community.
Amenities include one or more of	• roads and public transport • waterways • parks and gardens • public facilities, such as halls, libraries, shopping centres and other facilities open to the public.
Importance to the community is based on one or more of	• significance of impact • importance perceived by a community member or organisation.

Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures) • particular local social issues (e.g. distortions to the housing market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use or/deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle).
Significance of impact includes one or more of	• permanent loss or degradation • loss or degradation which inhibits use by the following generation • temporary degradation requiring remediation • temporary degradation which is self remediating • speed of change/degradation/loss.
Sustainability impacts which cannot be prevented require mitigation and amelioration techniques which include one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017015 Design for sustainability	
Sustainability incorporates all of	• survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment) • economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business) • social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).
Product includes one or more of	• physical product • service • some other type of product.
Benefit includes consideration of one or more of	• deliverable the customer expects • location in which it should occur • timing, duration, frequency and longevity of the deliverable • value to the customer • required maintenance and other 'running' inputs • disposal/replacement required by the customer

	• the degree to which the designed product is portable, modular, reusable, recyclable, returnable, easily able to be repaired after malfunction, durable, aesthetics and price.
Alternative methods of delivering benefits include one or more of	• selling a redesigned product • selling the benefit obtained from the product rather than the product • selling a combination of physical product and service rather than either • leasing (or similar) of the above • providing buy back/take back or similar • other alternative strategies (e.g. design for reuse, remanufacture, recycling).
Sustainability issues of particular relevance include one or more of	• particular sensitivities of the local ecology (e.g. endangered species, sensitive local flora/fauna, material scarcity, water availability) • general ecology issues and regulations (e.g. climate change and carbon footprint, pollution control measures) • particular local social issues (e.g. distortions to the housing market, disruption to local lifestyles) • general social issues (e.g. corporate citizenship, use or/deterioration to infrastructure) • particular local economic issues (e.g. cost of capital, profit margins, competition) • general economic issues (e.g. state of the economy, stage of the business cycle).
Appropriate response when impact cannot be prevented includes one or more of	• capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions • dilution/dispersion and similar techniques which reduce concentration but not amount • other approaches which meet the sustainability requirements.
MSS017016 Develop a proactive social sustainability strategy	
Purpose of a social sustainability strategy includes one or more of	• enacting core values • identifying and/or enacting a social purpose • becoming a leader in social sustainability and related areas, such as corporate citizenship • establishing long-term business sustainability by creating shared value • identifying business opportunities • improving financial returns • applying voluntary standards or codes, e.g. Global Reporting Initiative (GRI) reporting and ISO 26000:2010 Guidance on social responsibility.
Facilitate processes includes one or more of	• planning activities • running activities • briefing and/or managing external consultants, facilitators and

	similar • guiding, managing or coaching other personnel • arranging budget.
Strategic analysis and planning techniques include one or more of	• political, economic, social and technological (PEST) analysis • strengths, weaknesses, opportunities and threats analysis (SWOT) • scenario planning • envisioning • balanced scorecard • value chain mapping • current state-future state • brainstorming • strengths, opportunities, aspirations, results (SOAR) • appreciative enquiry.
Impact on resources and systems includes one or more of	• changes to job roles and responsibilities • additional staff • budget for new initiatives • processes for planning and managing change • processes to support innovations • changes to organisational vision, goals, structures, policies and procedures • workplace health and safety.
Progressing the strategy includes one or more of	• improvement projects • new programs • amended policies and procedures • product/service innovations • review of organisational values and structures • the organisation revising its values and goals to accommodate new perspectives of social sustainability.
Evaluation criteria relates to issues including one or more of	• the purpose of the social sustainability strategy • the strategic planning process • stakeholder engagement in the strategy development and/or implementation • implementation processes • outcomes of the implementation • social sustainability metrics • other business metrics.
Equitable participation includes one or more of	• developing protocols for communication and providing feedback • managing communications and group dynamics • activities that encourage critical thinking, new ideas and innovations • activities that recognise different ways of communicating and/or thinking, e.g. verbal, written and visual • encouraging respect for cultural diversity • encouraging understanding of and respect for diverse interests

	and differing opinions • providing information and/or activities that acknowledge the range of drivers for and barriers to social sustainability • providing information that targets different levels of awareness and commitment among stakeholders • using interpreters or translated information • addressing barriers to communication.
MSS024013 Work and communicate effectively as an environmental technician	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, International Conventions and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, cultural/heritage sites, vegetation management, biodiversity management, water and water management, pollution and contaminated sites • legislation, standards and codes of practice for WHS and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • workplace environmental management plans and procedures for specific sites and/or activities (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures
Environmental technical services include one or more of:	• routine site sampling of water, air, soil and/or noise • packaging, labelling, storing and transporting samples • routine site measurements that involve a narrow range of variables and/or easily recognised acceptable ranges • straightforward field surveys • entering of data into databases, checking of data quality and reporting results • cleaning of equipment and/or vehicles • housekeeping of work areas
Sustainable energy principles and work practices include one or more of:	• examining work practices that involve excessive use of electricity, gas and/or water • switching off equipment when not in use • regularly cleaning filters • recycling and reusing materials wherever feasible • minimising waste

Business ethics requirements include:	• following workplace policies and procedures (e.g. employment conditions, ethics, copyright, intellectual property, privacy, quality and customer service) • behaving honestly and openly • respecting others and treating them with courtesy and impartiality • working diligently and responsibly • ensuring confidentiality of information such as client identification, data and results
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant
MSS024014 Implement environmental management plans and procedures	
Environment includes one or more of:	• air, water and land • natural and built resources • flora and fauna • humans and how they interrelate
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • workplace environmental management plans and procedures for specific sites and/or activities (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment,

	processing and safe disposal procedures
Environmental management plans include one or more of:	• aim, vision and workplace policy statement • roles and responsibilities • potential environmental issues • actions to avoid, remedy and mitigate the issues • procedures and forms to minimise and manage specific environmental impacts and risks • quality management plans • communication and training requirements • monitoring, auditing and reporting requirements
Environmental issues include one or more of:	• emissions to air • releases to, and of, water • releases to land • soil erosion, sedimentation and salinity • contamination of land • disturbance of flora and fauna, threats to sensitive species and destruction of habitat • introduction of pests, such as weeds and fire ants • noise and vibration • disturbance to heritage sites or items • generation, reuse and disposal of waste • use of energy sources • handling, storage, spills, or exposure involving hazards, such as chemicals and radiation
Environmental risks and impacts include one or more of:	• mismanagement of chemicals or fuel products • mismanagement of biological agents • land use practices • planning deficiencies • poor construction processes • waste generation and disposal
Sites include one or more of:	• buildings and other infrastructure • construction, mining, manufacturing, forestry, agricultural and maintenance sites • bushland • catchments, flood plains, surface/groundwater sites and drainage sites • wetlands and marine/coastal areas
Environmental reporting requirements include one or more of:	• regular site environmental reports • non-conformance report forms • hazard, near miss and safety incident report forms • environmental incident investigation report forms • regulatory agency reports
Environmental management documentation includes	• site/project history, plans, procedures, actions and checklists • information about applicable legislation and regulatory requirements

one or more of:	• records of correspondence and complaints • incident reports and incident investigation reports • quality assurance/verification checklists • job hazard analyses, permits and safe work procedures • internal check/audit reports • training records • records to comply with permit, licence and approval conditions
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant
MSS024015 Apply an understanding of environmental principles to a site	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for workplace health and safety (WHS); care and use of animals for scientific purposes; handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set, and AS 1726 Geotechnical site investigations; • registration/licensing and/or accreditation requirements • workplace environmental management plans and procedures for specific sites and/or activities (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Ecological principles and concepts include one or	• ecosphere, biome and major ecosystem types • ecological niche and biogeography • trophic dynamics, autotrophs, heterotrophs and detrivores, and

more of:	food webs • distribution and abundance of organisms, populations and communities, and biodiversity • abiotic and biotic components and their interrelationships and dependencies • energy and material flows and cycles, including biogeochemical cycles • population ecology: • distribution, abundance and dispersion • growth rates and age structures • migration and dispersal in space and time • behavioural ecology (communication and learning, aggression and territoriality, and social group dynamics) • community ecology (ecological interactions): • intra/interspecific competition • concepts of coexistence, adaptive and competitive, including mimicry, coevolution, parasitism, mutualism, commensalism and predator/prey systems • species diversity in time and space.

Earth science principles and concepts include one or more of:	• geological concepts and principles, such as:
	  • earth structure and plate tectonics
	  • classification of rocks (e.g. igneous, sedimentary, volcanic and stratigraphy)
	  • weathering
	• geomorphological concepts and principles, such as:
	  • erosion and mass wasting
	  • transportation and deposition, and sedimentation
	  • fluvial, aeolian, hillslope and weathering processes
	• soil science concepts and principles, such as:
	  • soil classification
	  • soil formation and soil profiles
	  • pedology
	  • edapology.

Hydrological principles and concepts include one or more of:	• aspects of the hydrologic cycle, such as:
	  • run-off
	  • infiltration
	  • subsurface flow
	  • water quality
	  • ecohydrology
	  • hydrogeology
	  • water resources
	• aspects of hydrologic measurement such as:
	  • surface flows (stream gauging)
	  • groundwater (infiltration and flow)
	  • precipitation and evaporation.

Workplace procedures for field activities include one or more of:	• use of field notebooks or log books • SOPs covering fieldwork, sampling and testing • equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures • emergency, first aid and survival procedures • requirements related to protection of the environment • incident/accident/injury report forms.
Field monitoring activities include one or more of:	• sample collection, preservation, labelling, storage and transportation according to workplace procedures • use and calibration of field instruments according to written instructions • performance of field tests for specific parameters using standard methods • recording of data • safe operation of motor vehicles and boats.
Hazards include one or more of:	• solar radiation, dust and noise • personnel getting lost • accidents, emergencies and incidents, such as snake, insect or animal bites • exposure to severe weather conditions • manual handling of heavy objects • vehicle and boat handling in rough/remote conditions.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024016 Process and present environmental data	
Standards, codes, and/or workplace requirements include the latest version of one or more of:	• Australian and international standards covering: environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; ISO 5725 Accuracy (trueness and precision) of measurement methods and results, and ISO/IEC Guide covering uncertainty in measurement • registration/licensing and/or accreditation requirements • sampling/testing methods, procedures, guidelines provided by workplace or regulator • validation of equipment and associated software; validation of spreadsheets developed in-house for routine calculations where applicable • workplace documents, such as standard operating procedures (SOPs), work schedules, quality manual, recording and reporting

	procedures, equipment manuals, supplier catalogues, handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Concepts of metrology include one or more of:	• all measurements are estimates • repeated measurements belong to a sample of the measured parameter • repeatability, precision, accuracy and significant figures • sources of error and uncertainty • traceability.

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

Calculations include one or more of:	• calculations performed with or without a calculator • calculations performed using computer software, spreadsheets, databases and statistical packages
Calculations of scientific quantities include one or more of:	• converting units involving multiples and submultiples • significant figures, rounding off, estimating and approximating • transposing and evaluating formulae • fractions, decimals, proportions and percentages • percentage and absolute uncertainties in measurements and test results • statistical values of data, such as mean, median, mode and standard deviation • perimeters and angles, areas (m2) and volumes (mL, L, m3) of regular shapes • sampling times • dose (mg), average mass, mass percentage, density, specific gravity, moisture, relative and absolute humidity, viscosity and permeability • ratios, such as mass to mass, mass to volume and volume to

	volume percentages • concentration, such as molarity, g/100mL, mg/L, mg/□L, ppm, ppb, dilution mL/L • average count, colonies per swab surface and cell counts, such as live and dead/total • variables, such as pressure, gauge pressure, velocity and flow rates • biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbons (TOC) • % content of moisture, sulphur dioxide and trace metals, such as calcium or zinc.
Records include one or more of:	• purchase orders for equipment and materials • equipment service records • safety procedures • history of calibration and test results.
Work health and safety (WHS) and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024017 Collect spatial and discrete environmental data	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) and handling of dangerous goods • Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • workplace procedures for sampling, monitoring and in-field testing; recording, processing, presenting and reporting data • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment,

	processing and safe disposal procedures.
Background information includes one or more of:	• site or project history and client history • records of consultations with stakeholders • site access protocols and permits • site utilities/services (e.g. water, sewer, electricity and gas) • maps (e.g. road, topographical and survey marks) • existing data sets (e.g. vegetation, topography, soils and regional ecosystem maps) • hazards and safety risks • emergency plans and safety procedures.

Specifications include one or more of:	• purpose of data collection
	• detailed descriptions of spatial and environmental data requirements, such as:
	  • positional data, metadata, calculated information
	  • environmental measurements
	  • sampling
	  • data processing requirements
	  • data quality requirements
	  • data presentation/reporting requirements.

Equipment includes one or more of:	• any handheld GPS receiver • sampling and environmental monitoring equipment • communications equipment (e.g. radio and phone) • safety equipment.
Project parameters include one or more of:	• coordinate systems • datum • display formats • information displays • data outputs, formats and protocols.
Verifying environmental data includes one or more of:	• comparison with expected or reference values • conducting repeat tests, and using duplicate samples or locations.
Required documentation includes one or more of:	• map of GPS data locations • sampling, monitoring or in-field test data and results • records of vehicle/equipment use • records of time spent and approved expenditure • emails and correspondence • records of site consultations • final report/briefing.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of

	infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024018 Perform sampling and testing of water	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set, and the sampling and analysis of water, such as AS/NZS 2031, AS 3550 series, AS/NZS 4276 series, AS/NZS 5667 series • industry methods and guidelines, such as US Environmental Protection Authority (EPA) Methods and guidance for the analysis of water; American Public Health Association (APHA) Standard methods for the examination of waters and wastewaters; ANZECC Guidelines for fresh and marine water quality; and Australian guidelines for water quality monitoring and reporting • registration/licensing and/or accreditation requirements • site-specific requirements; workplace procedures for sampling, monitoring and in-field testing; recording, processing, presenting and reporting data • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties, supplier catalogue and handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Common field test parameters include one or more of:	• pH • electrical conductivity • dissolved oxygen • salinity • temperature • turbidity • Secchi disk depth.

Laboratory and/or field test parameters include one or more of:	• total suspended solids • volatile suspended solids • nitrogen (nitrate, organic, ammonia and Kjeldahl) • phosphorus (total and soluble reactive) • chlorophyll and phaeophytin • total organic carbon (TOC) • biological oxygen demand (BOD) • chemical oxygen demand (COD) • silica • metals (total and dissolved) • organic and inorganic pollutants • microorganisms.
Workplace procedures for field activities include one or more of:	• use of field notebooks or log books • SOPs covering fieldwork, sampling and testing • equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures • emergency, first aid and survival procedures • requirements related to protection of the environment • incident/accident/injury report forms.
Equipment includes one or more of:	• navigation and communication equipment (e.g. compass, maps, global positioning system (GPS), two-way radio and mobile phone) • survey equipment • data loggers • sampling equipment and containers, filters and sieves and animal cages • parameter specific meter or multi-probes (e.g. dissolved oxygen, electrical conductivity, pH, turbidity, nitrates, phosphates and temperature) • field test kits to determine such parameters as dissolved gases, chemical anions and cations, heavy metals, E. coli and BOD • portable colorimeters and field microscopes • soil monitoring kits • first aid equipment.
Hazards include one or more of:	• solar radiation, dust and noise • personnel getting lost • accidents, emergencies and incidents, such as snake, insect or animal bites • exposure to severe weather conditions • manual handling of heavy objects • vehicle and boat handling in rough/remote conditions.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions

	• accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024019 Collect and evaluate meteorological data	

Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures
	• state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations
	• legislation, standards and codes of practice for work health and safety (WHS)
	• Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; and air measurements, such as AS 2923 Ambient air
	• industry methods and guidelines, such as:
	  • Australian Bureau of Meteorology Observation Specification 2013.1 Guidelines for the siting and exposure of meteorological instruments and observing facilities
	  • National Environment Protection (Ambient Air Quality) Measure Technical Paper No 6: Meteorological Measurements
	  • World Meteorological Organisation - No. 8: Guide to Meteorological Instruments and Methods of Observation
	• registration/licensing and/or accreditation requirements
	• workplace or regulator's procedures for meteorological monitoring; recording, processing, presenting and reporting meteorological data
	• workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Siting and installation considerations for meteorological instrumentation include one or more of:	• topography • vegetation and built structures • exposure • availability of services • site security.

Meteorological instrumentation includes one or more of:	• thermometers, such as liquid in glass, thermocouples, Pt resistance, thermistors, hygrometers and psychrometers • barometers, such as aneroid, mercury • anemometers, such as rotational, pressure tube and Doppler • rain gauges, such as manual, tipping bucket, automatic weather stations (AWS), radiometers, net pyranometer, total solar radiometer.
Meteorological parameters include one or more of:	• temperature and temperature gradient • atmospheric pressure • humidity • precipitation • wind speed and direction (vector and scalar) • vertical wind speed • insolation and net radiation • evaporation.
Hazards include one or more of:	• sunlight, dust, noise and heat • extreme weather conditions (e.g. fire, flood and storms) • manual/handling of heavy equipment or materials • crushing, entanglement and cuts associated with moving machinery • vehicular traffic on roads and sites • injuries caused by falling objects and working conditions such as: uneven surfaces, heights, slopes and wet surfaces • biohazards (e.g. microbiological organisms in soils) • chemical hazards/contaminants in soils.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024020 Recognise common geological landforms and samples	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition and planning; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations

	• legislation, standards and codes of practice for work health and safety (WHS), handling of dangerous goods • Australian and international standards covering environmental management such as AS/NZS ISO 14000 Set; testing of soils such as AS 1289 series • registration/licensing and/or accreditation requirements • workplace or regulator's procedures for sampling and in-field testing • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Equipment and materials include one or more of:	• survey equipment, compass, global positioning system (GPS), maps and aerial photos • tape measure, clinometers and theodolite • hammers, picks, shovel, scoops, buckets, bags, sieves and sample containers • coring/excavation equipment (e.g. auger) • hand lens and microscope • pH meter and conductivity meter • chemical field test kits • worksheets, sampling/test methods • portable computers and personal digital assistants (PDAs).
Common landforms include one or more of:	• mounds, hills, ridges, cliffs, valleys, rivers, peninsulas and numerous other structural and size-scaled (i.e. ponds vs. lakes, hills vs. mountains) elements, including various kinds of inland and oceanic water bodies and sub-surface features • geological features characterised by physical attributes, such as elevation, slope, orientation, stratification, rock exposure and soil type.
Geological processes include one or more of:	• plate tectonics • glaciation • vulcanism • action of wind and water • weathering • mass wasting or erosion • action of groundwater and surface water.
Physical properties of common rocks and minerals include one or more of:	• composition, texture and structure • colour, streak, crystal form, habit, cleavage, fracture and hardness.
Common soil properties include one or more of:	• colour • structure (i.e. size and shape of aggregate particles) • texture (i.e. varying percentages of sand, silt or clay, and organic

	matter) • water retention and water repellence • depth to bedrock • pH • chemical properties (e.g. nitrates, sulphates, phosphates and carbonates) • electrical resistivity and conductivity.
Soil degradation includes one or more of:	• forms of erosion, such as gully, sheet, landslide, tunnel and stream bank • erosion agents, such as wind, water, heating and cooling of rocks, freezing of water in cracks, plant roots, upheaval of trees and chemicals • weathering • decomposition of organic material • salinity • acidification • structural degradation • soil pollution (e.g. hydrocarbons and heavy metals).
Hazards include one or more of:	• sunlight, dust, noise and heat • extreme weather conditions (e.g. fire, flood and storms) • manual/handling of heavy equipment or materials • crushing, entanglement and cuts associated with moving machinery • vehicular traffic on roads and sites • injuries caused by falling objects and working conditions, such as uneven surfaces, heights, slopes, wet surfaces, trenches and confined spaces • biohazards (e.g. microbiological organisms in soils) • chemical hazards/contaminants in soils.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024021 Assist with assessing and monitoring stormwater systems	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation. such as the Environment Protection and Biodiversity Conservation Act, and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition and planning; environmental protection; vegetation management; nature conservation and wildlife/plant

	protection; water and water management; soil conservation; pollution and contaminated sites
	• legislation, standards and codes of practice for work health and safety (WHS), handling of dangerous goods
	• Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; AS/NZS 5667 Set Water quality
	• industry guidelines and manuals, such as:
	  • state/territory Environmental Protection Agency (EPA) guidelines and manuals
	  • Managing urban stormwater: Council handbook (NSW EPA)
	  • Water quality sampling manual (QLD EPA)
	  • Regulatory monitoring and testing: Water and wastewater sampling (EPA SA)
	• registration/licensing and/or accreditation requirements
	• workplace or regulator's procedures for sampling and in-field testing
	• workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Stormwater survey, inspection and audit activities include one or more of:	• broad scale, 'whole of catchment' assessment of catchment health • assessment of environmental conditions or risk in a smaller, localised study area or individual premises.
Stormwater management plan includes one or more of:	• existing and future values of a catchment • stormwater management objectives to protect these values • problems and issues that may compromise these objectives • agreed stormwater management practices (non-structural/structural) to mitigate existing impacts and minimise future impacts.
Stormwater management techniques include one or more of:	• retention and restoration of existing watercourses and wetlands and riparian/foreshore vegetation, and aquatic habitats • control of source water quality and quantity through minimising impervious areas, stormwater re-use and infiltration, limiting development of flood plains, community education, small on-site treatment measures • 'end of pipe' techniques, such as use of retarding basins, gross pollutant traps, channel stabilisation/design, erosion and sediment control, and large off-site treatment.
Stormwater system information includes one	• terrain models • stormwater drainage plans • flood and drainage studies

or more of:	• water and sediment quality studies • contaminated site reports • aquatic ecology and riparian vegetation studies • land use information, such as topographical maps, aerial photos, satellite imagery and land use/zoning maps • reports of consultations with the scientific community, local environmental groups and industry associations, catchment management committees and councils • history of engineering works and modifications.
Field equipment and materials include one or more of:	• stormwater drainage maps, topographic maps, aerial photos, compass, survey point markers and drivers, GPS, tape measure, flagging tape and binoculars • data recording sheets, palm pilot, laptop, data logger and digital camera • sampling equipment, such as bottles, bags, biological specimen containers, secateurs, scoop nets, esky, preservatives, water pumps and tubing • automatic water samplers • portable water quality probe that measures dissolved oxygen, temperature, turbidity, pH, conductivity and field test reagents • tipping bucket rain gauge and data logger • flow meters • soil infiltration test rigs • personal protective equipment (PPE) • appropriate clothing and footwear • phone • first aid kit • insect repellent.
Laboratory analyses include one or more of:	• suspended solids • total phosphorus • filterable reactive phosphorus • total nitrogen • total Kjeldahl nitrogen • oxidised nitrogen • faecal Coliforms • soil permeability.

Catchment characteristics and existing conditions include one or more of:	• physical characteristics, such as:
	  • soils and sediments
	  • topography, including slope characteristics
	  • climate, including rainfall, evaporation
	  • bridge and culvert crossings, major utility services that may impact on management practices
	  • point sources of pollution (e.g. sewage treatment)
	  • major sewer outflows
	  • existing stormwater management structures (e.g. retarding basins and constructed wetlands)

	• social characteristics, such as:
	  • recreational areas
	  • land use and land use zoning
	• waterway characteristics, such as:
	  • stormwater transport via piped, lined or natural channels
	  • characteristics of receiving water bodies (e.g. lakes, reservoirs, wetlands and estuaries)
	  • erosion/sediment transport processes for natural/modified stormwater systems
	  • surface hydrology (e.g. flooding and low flow)
	  • water quality in stormwater transport systems and receiving bodies (dry/wet conditions)
	• ecological characteristics, such as:
	  • aquatic fauna and flora in stormwater transport systems and receiving bodies
	  • riparian zone fauna and flora
	  • areas of urban bushland.

Catchment values include one or more of:	• aquatic fauna habitats, such as appropriate substrate, woody debris and aquatic plants • terrestrial fauna habitats, such as riparian zone vegetation • aquatic flora (e.g. macrophytes) habitats, such as appropriate sediment, stream flow and water quality • terrestrial flora habitats, such as morphology of banks/floodplain, prevailing stream flow and groundwater conditions • avifauna (e.g. land-based and water birds) habitats, such as riparian zone, stormwater transport system and receiving water bodies • public health and safety (e.g. risk of bacterial pollution in stormwater run-off) • recreational values • visual amenity of stormwater systems and riparian zone • use of surface or groundwater as a water source • aquaculture and other commercial fishing • reuse of stormwater for (non)potable use • value of properties adjacent to visually attractive constructed wetlands and natural channels.
Environmental issues and possible causes include one or more of:	• poor water quality in waterways (wet/dry conditions) due to excess fertiliser application, washing of cars in streets, sewer overflows, domestic animal droppings and atmospheric deposition • inappropriate stream flow regime (flooding, base flows) due to increased run-off from impervious areas and insufficient stormwater reuse • degraded aquatic habitats due to increased sediment

	deposition, removal of riparian vegetation • barriers to aquatic fauna migration weirs • degraded riparian vegetation due to introduction of exotic species and vegetation removal • channel erosion and sedimentation due to increased flood flows following urbanisation and vegetation removal • litter in watercourses due to insufficient number/emptying of rubbish bins and commercial waste • weed growth in urban bushland due to stormwater nutrients, weeds from residential gardens, and removal of canopy vegetation • degradation of ecologically sensitive water bodies • health risks associated with recreational use of polluted waters • low visual amenity and landscape value due to litter along watercourses and concrete lined channels.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024022 Perform environmental biological techniques	

Legislation, standards, codes, procedures and/or workplace requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act
	• state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with environmental protection, nature conservation, wildlife/plant protection, prevention of cruelty to animals and quarantine
	• legislation, standards and codes of practice for work health and safety (WHS)
	• codes of practice dealing with the care and use of animals for scientific purposes
	• Australian and international standards covering safety in laboratories and water microbiology, such as AS/NZS 2243.3:2010 Safety in laboratories - Microbiological safety and containment, and AS/NZS 4276 Water microbiology
	• international guidelines and methods, such as:
	  • Australian and New Zealand Guidelines for fresh and marine water quality
	  • American Public Health Association (APHA) Standard methods for examination of water and wastewater
	• registration/licensing and/or accreditation requirements
	• workplace documents, such as standard operating procedures (SOPs), work schedules; quality management procedures;

	sampling procedures, validated/authorised test procedures; safety data sheets (SDS) and safety procedures; equipment manuals; recording and reporting procedures; cleaning, hygiene, personal hygiene requirements; waste minimisation, containment, processing and safe disposal procedures.
Equipment, materials and systems include one or more of:	• sampling equipment for different sample types and species, such as air samplers (e.g. for Legionella), nets (e.g. for plankton), sediment samplers, soli samplers (e.g. Niskin and Nansen) • protective and physical containment facilities and equipment for safe handling of microorganisms, including personal protective equipment (PPE), such as gloves, gowns, masks, safety glasses, and gloves for working with extremes of heat and cold • laboratory equipment, such as glassware and measuring equipment; transfer equipment such as inoculating loops, pipettes (quantitative and qualitative), flasks, tubes and spatulas; Bunsen burners and bench incinerators; water baths; filtration membranes; disinfecting and sterilising equipment, such as ultraviolet (UV) lamps and autoclaves • laboratory consumables, such as stains, media, reagents; disinfecting and sterilising solutions • materials suitable for the safe containment, collection, processing and disposal of biological and non-biological wastes • carbon dioxide cabinets, incubators, anaerobic jars, fermentation chambers, continuous culture systems and other devices for controlling growth environments of microorganisms; liquid nitrogen containers for cell storage • microscopes with bright field and other relevant illumination systems and stereomicroscopes • counting chambers for micro-enumeration; colony counting devices • laboratory information management systems (LIMS), reference databases, record and filing systems.
Samples include one or more of:	• air • surface water, wastewater and stormwater • soils and sediments • plants and animals.
Aseptic techniques include one or more of:	• preparation of basic and enriched media • sterilisation of media • aseptic transfer of microorganisms (e.g. bacteria, fungi and yeasts) to culture media • production and identification of pure cultures on solid media • production of contaminant-free cultures in liquid media.
Microscopes and microscopy techniques	• bright field microscopy • dark field microscopy techniques

include one or more of:	• Kohler illumination and its importance in producing uniform and glare-free images • phase contrast microscopy • polarised light microscopy • stereo microscopy techniques • image analysers and camera eyepieces • stage micrometers and microscopic measurement • counting chambers.
Organism classification includes one or more of:	• kingdoms • hierarchical system of species classification • dichotomous keys.
Cell structure and function include one or more of:	• eukaryotic and prokaryotic cells and their organisation • cell organelles and structures, including plasma membrane and cell wall, chromosomes, nucleus, cytoplasm, vacuoles and vesicles, golgi complex, endoplasmic reticulum, lysosomes, chloroplasts, ribosomes and mitochondria, cytoskeleton, cilia and flagella • biological membranes (structure and function - osmosis, diffusion, active transport cellular metabolism) • heterotrophic and autotrophic organisms.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024023 Navigate in urban, regional and remote areas	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition and planning; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) and handling of dangerous goods • Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set

	• registration/licensing and/or accreditation requirements • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, vehicle and equipment manuals and warranties; safety data sheets (SDS) and safety procedures.
Background information includes one or more of:	• site or project history, and project reports • client history • records of consultations with stakeholders and current issues • details of local inhabitants and landowners • site access protocols and permits • site access and exit routes • maps, guide books and aerial photos • information about terrain, significant features, natural protection or shelter, and cultural heritage sites • existing databases (e.g. vegetation, topography, soils and regional ecosystem maps) • safe work procedures • communication protocols when working in remote/regional areas • emergency plan and response procedures.
Maps include one or more of:	• cadastral maps showing land tenure/ownership • topographical maps • charts and guidebooks • aerial photos, sketch maps and diagrams • web-based maps and directories • street directories.
Navigational equipment and aids include one or more of:	• global positioning system (GPS) units • compass • track and survey markers, cairns, signs and arrows • navigation beacons.
Map symbols and navigation data include one or more of:	• map legend and scale • entry and exit routes • distances and estimated travel times • grid lines and numbers, and grid reference points • contour lines, gradient and altitude gain/loss • magnetic variation/declination, grid and magnetic bearings • identifiable features (natural and built) • navigation/survey markers, beacons and water depth.
Surroundings include one or more of:	• terrain, such as hills, mountains, ridges and valleys • natural landforms/landmarks, such as caves, observation towers, trig stations, bridges, buildings, and track and creek junctions/crossings • water bodies, such as creeks, rivers, dams and lakes.
Hazards and obstacles include one or more of:	• extreme weather, such as wind, rain, fog and snow • damage to roads and tracks

	• thick/impenetrable vegetation • unsafe gradients • marshes, soft sand or bogs • impassable water crossings.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS024024 Undertake simple environmental project activities	
Legislation, standards, codes, procedures and/or workplace requirements include the latest version of one or more of:	• federal legislation, such as Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with: land use, acquisition and planning; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, vehicle and equipment manuals and warranties; safety data sheets (SDS) and safety procedures; workplace or regulator procedures for sampling, monitoring and in-field testing; safe work procedures and material safety data sheets (MSDS); project management tools and procedures.
Environment includes one or more of:	• air, water and land • natural and built resources • flora and fauna • humans and how they interrelate.
Simple environmental project activities include one or more of:	• sourcing and collating available information about environmental sites or simple issues • collecting data related to air quality, water quality, ecology studies, soil surveys, hydrological surveys, land management, coastal management, wetland management, stormwater management and waste management

	• conducting sampling and/or in-field testing • conducting simple flora and/or fauna surveys • checking data files, processing data, and presenting data/results in useable formats.

Project documentation includes one or more of:	• project brief with details, such as:
	  • aims/expectations/rationale
	  • project activities
	  • assigned tasks and deliverables
	• project plan with details, such as:
	• scope and objectives
	• work breakdown structure
	• available resources (e.g. equipment and team)
	  • specific roles and responsibilities
	  • budget and cost estimates
	  • milestones
	  • quality requirements and assurance procedures
	  • risk analysis and control measures
	  • safety requirements and related work procedures
	  • stakeholders and consultation procedures
	  • project management procedures, including reporting.

Background information includes one or more of:	• site or project history • client history • records of consultations with stakeholders • emergency plans and safety procedures • site access protocols and permits • maps (road and topographical) • existing databases (e.g. vegetation, topography, soils and regional ecosystem maps).
Sites include one or more of:	• public places • industrial settings (e.g. manufacturing, mining, forestry and construction) • roadways • indoors • farms • domestic locations • waterways and catchment areas • natural heritage or conservation areas.
Project data and documentation includes one or more of:	• sampling, monitoring or in-field test data and results • records of vehicles/equipment use • records of time spent and approved expenditure • emails and correspondence • records of consultations • progress reports • final reports/briefings.
Agreed problem-solving	• researching and applying more efficient methods of completing

strategies include one or more of:	project tasks • seeking technical advice • sharing expertise and assisting team members • reducing costs • seeking further resources • negotiating an extension of deadlines or redefining deliverables • changing roles and responsibilities within the project team.
Work health and safety (WHS/OHS) requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025017 Assist with assessing site environmental indicators	
Legislation, regulations, standards, codes, workplace procedures and/or requirements include the latest version of one or more of:	• federal legislation, such as Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with: land use, acquisition, planning and protection; environmental protection; cultural/heritage sites; vegetation management; nature conservation, wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering environmental management such as: AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set, and AS ISO 14050 Environmental management – Vocabulary • ANZECC Core environmental indicators for reporting on the state of the environment, ANZECC Guidelines for fresh and marine water quality, OECD Key environmental indicators, US Environmental Protection Authority (EPA) Environmental indicators gateway • national strategy for the conservation of Australia's biological diversity • site-specific requirements and specific environmental standards.
Project activity or process includes making contributions to one or	• environmental studies • environmental impact statements • environmental impact assessments • environmental monitoring programs

more of:	and where these contributions are consistent with the role of an environmental officer working under the supervision of an environmental scientist, engineer or planner.
Site or locality information includes one or more of:	• notice of intention and initial advice statement • environmental impact assessment • environmental impact statement • public environment report • environmental indicators • national environment protection measures • statutory environmental quality concentration limits • data in existing databases, such as vegetation, topography, soils and regional ecosystem maps • geological, hydro geological, ecological and meteorological data for site • environmental management plans for specific site, locality or project • site environmental management procedures and actions for specific issues • site environmental management action checklists • relevant site reports, case studies and good practice models.

Site-relevant environmental indicators include one or more of:	• atmospheric indicators, such as:
	  • exceedances of national environment protection measures
	  • air quality standards for gases and particulates
	  • emissions of air pollutants
	  • greenhouse gas emissions and atmospheric concentrations
	• water indicators, such as:
	  • water salinity
	  • exceedances of groundwater and surface water quality guidelines
	  • water extraction versus availability
	  • environmental flows objectives
	  • health of aquatic habitats
	  • wastewater treatment
	  • estuarine and marine water quality
	• land indicators, such as:
	  • salinity and acidity
	  • potential for erosion
	  • exceedances of maximum residue levels
	• biodiversity indicators, such as:
	  • threatening processes
	  • loss of biodiversity
	  • biodiversity conservation management.

Environmental chemistry	• biogeochemical cycles

principles and concepts include one or more of:	• aquatic chemistry
	• aquatic microbial biochemistry
	• water pollution, such as:
	  • trace elements and heavy metals
	  • inorganic pollutants
	  • trace organic pollutants
	  • sewage (e.g. biological oxygen demand (BOD), pathogens and detergents)
	  • chemical carcinogens
	  • sediments
	  • radionuclides
	• water and wastewater treatment
	• atmosphere and atmospheric chemistry, such as:
	  • structure and composition
	  • inversions and air pollution
	  • meteorology, weather and climate
	  • atmospheric particulates
	  • inorganic air pollutants, including CO, SOX, NOX, acid rain, ammonia and chlorine compounds
	  • organic air pollutants and photochemical smog
	• soil chemistry, such as:
	  • soil and agriculture
	  • macronutrients and micronutrients in soil
	  • contaminated soil
	  • soil loss and degradation
	  • environmental chemistry of hazardous wastes
	  • environmental toxicological chemistry.

Biodiversity principles and concepts include one or more of:	• scope (levels) of biodiversity, such as genetic diversity, species diversity and ecosystem diversity
	• biodiversity attributes, such as components, patterns and processes
	• bioregional planning and management
	• biodiversity and the balance between conservation and ecologically sustainable development
	• biodiversity and ecosystem health, such as soil fertility, clean freshwater and clean air
	• managing threatening processes, such as:
	  • land clearing and habitat loss
	  • alien species
	  • pollution control
	  • fire
	  • climate change.

WHS and environmental management	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying

requirements include:	standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025018 Assess the environmental risk and impact of a project activity or process	
Legislation, regulations, standards, codes, workplace procedures and/or requirements include the latest version of one or more of:	• federal legislation, such as Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage sites; vegetation management; nature conservation, wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • workplace environmental management plans for specific sites and/or projects • workplace or regulator procedures for sampling, monitoring and in-field testing; procedures and tools for assessment of environmental risks and impacts • workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Project activity or process includes one or more of:	• construction activities • plant operations • functions and processes relocating to new premises • changes in processes involving changes in use of products or generation of waste • production of new materials • any work activities with significant risk to, or potential impact on, the environment and where risk/impact assessment of these is consistent with the role of an environmental officer working under the supervision of an environmental scientist, engineer or planner.

Organisation environmental management documents include one or more of:	• notice of intention, initial advice statement • environmental impact assessment • environmental impact statement • public environment report • environmental management plans for specific sites and projects • site environmental management procedures and actions for specific issues • site environmental management action checklists • quality verification checklists • work method statements • job hazard analyses • reporting forms.
Site or project environment includes one or more of:	• physical, biological and social components • land uses and tenures • climate • geology, landforms and soils • surface and groundwater, water quality and hydrology • air quality and dust • noise • pollutants and contaminants • vegetation, plant diseases, clearance and weeds • animal life, habitats, mobility and threats • rare and endangered species • community infrastructure • ethnography of area • archaeology • regional and local demography.

Environmental issues include one or more of:	• physical issues, such as:
	  • significant land disturbance, erosion, subsidence and instability
	  • alteration of water courses
	  • effects on quality, quantity or availability of surface water or groundwater
	  • salination of water or land
	  • acid drainage
	  • heavy metal contamination
	  • impact on coastal or marine landforms
	• ecological issues, such as:
	  • direct impacts on vegetation
	  • loss of habitat
	  • displacement of fauna
	  • impact on ecological processes and linkages
	  • loss of biodiversity
	  • potential for spreading plant diseases and noxious weeds
	  • impact of toxic or hazardous materials
	  • creation of new habitats

	• land use issues, such as:
	  • major changes of land use
	  • compatibility of development with surrounding land uses
	  • preclusion of alternative land use (e.g. conservation or recreation)
	  • increased demand on scarce natural resources
	  • creation of new water storage and supplies
	  • creation of opportunities for alternative beneficial land uses
	• social issues, such as:
	  • influx of population
	  • impact on health and safety
	  • changes in community character
	  • creation of employment
	  • increased revenue for local communities
	  • community and cultural aspects
	  • infrastructure issues, such as load on existing roads
	  • impact on services, including utilities, health, education and community services.

WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025019 Report environmental data	
Standards, codes, and/or workplace requirements include the latest version of one or more of:	• Australian and international standards covering: environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; ISO 5725 Accuracy (trueness and precision) of measurement methods and results, ISO/IEC Guide covering uncertainty in measurement, and Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement • national measurement regulations and guidelines, registration/licensing and/or accreditation requirements, and National Association of Testing Authorities (NATA) technical notes • sampling/testing methods, procedures, guidelines provided by workplace or regulator • validation of equipment and associated software, validation of spreadsheets developed in-house for routine calculations where applicable • workplace documents, such as standard operating procedures (SOPs), work schedules, quality manual, recording and reporting

	procedures, equipment manuals, supplier catalogues, handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Data records include one or more of:	• worksheets • spreadsheets or databases linked to information management systems • results of tests, measurements, analyses and surveys.
Laboratory computations include one or more of:	• calculations involving fractions, decimals, ratios, proportions and percentages • evaluation of formulae containing powers, exponents and logarithms functions • use of scientific notation, correct units and correct number of significant figures • calculation of percentage and absolute uncertainties in measurements and test results • use of calculators and/or computer software, such as spreadsheets, databases and statistical packages.
Calculations of scientific quantities include one or more of:	• density and salinity • noise (dB and dBA) • dose (mg), dilution(1:10), concentration (molarity, g/mL, mg/L, ppm and ppb) • pH, [H+], [OH-], buffer calculations, Ka, pKa, Kb, pKb and Kw • solubility constants Ks and pKs • radioactive half-life, dose, activity and exposure • optical properties, such as absorbance, transmittance, path length, extinction coefficient, concentration (Beers law) and detection limits • electrical properties such as: conductivity and resistivity.
Graphical analysis includes one or more of:	• preparation and interpretation of linear, semi-log and log-log graphs • determination of linear, logarithmic, exponential and power relationships • determination of regression lines and interpretation of correlation coefficients.
Statistical analysis includes one or more of:	• preparing frequency distributions/plots, histograms, stem and leaf plots, box plots and scatter plots • probability and normal probability plots • calculation and interpretation of statistical quantities, such as central tendency (mean, median, mode) and dispersion (range, variance and standard deviation) • regression methods for calibration, linearity checks and comparing analytical methods • Pearson's product moment correlation coefficient • chi squared tests • ANOVA

	• data acceptability tests, such as Q, t and Youden.
Records include information associated with one or more of:	• purchase of equipment and materials • service records • safety procedures • history of calibration and test results • management of data sets.
Work health and safety (WHS) and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying ??andard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025020 Provide environmental information to customers	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • national strategies dealing with water quality management, ecologically sustainable development, greenhouse and energy reporting • legislation, standards and codes of practice for work health and safety (WHS) and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • information for specific sites and/or activities (e.g. sampling, monitoring, construction and mining), such as applicable legislative requirements and approval requirements, workplace environmental and emergency management plans and procedures, site processes and work schedules, monitoring/inspection procedures and environmental management actions, sampling and in-situ measurement procedures • procedures covering receipt of requests for information and release of information data and results, confidentiality and security of workplace information, records and reporting

	• workplace documents, such as work schedules, standard operating procedures (SOPs); equipment manuals and warranties; job hazard analyses; work method statements; safety data sheets (SDS) and safe work procedures; waste minimisation, containment, processing and safe disposal procedures.

Environmental information includes one or more of:	• details of legislation, regulations, guidelines, standards, codes of practice, licence conditions, approvals and permits
	• workplace environmental management plans, policies, strategies, procedures and required actions
	• site/project initial advice statements and risk/impact assessments
	• records of site consultations with interested parties
	• site/project environmental reports (e.g. weekly/monthly monitoring of air, water and noise)
	• flora and fauna survey results
	• environmental data sets, such as:
	  • satellite imagery and remote sensing data
	  • geophysical, geochemical, geological, hydrological and meteorological data
	  • ecological data, such as distribution of vegetation, fauna and pests
	  • social science data, such as demographic and census information
	  • land use data, zoning and property classifications
	• historical records and photographs
	• workplace information about sites/projects/programs for stakeholders and interested parties
	• entries for workplace website
	• cost, estimation of quantities and time
	• contractual variations and claims
	• notification of environmental issues and problems
	• internal environmental audit/inspection findings
	• environmental training records.

Customers include one or more of:	• internal customers, such as site environmental officer, environmental manager, construction manager, operations manager and project manager • external customers, such as regulatory authorities, government departments, suppliers, contractors, consulting engineers, scientists, planners and community groups.
Sources of information include one or more of:	• workplace intranet/information management system • contractors providing environmental services • government departments and agencies (e.g. environment, climate change, agriculture and mining) • regulatory authorities • utility authorities/companies (e.g. water, gas and electricity)

	• land title office and Valuer General • local government records • Geoscience Australia • Australian Social Science Data Archive • internet, library/archive collections, annual reports and community newsletters • media reports (e.g. TV, video, audio and photographs).
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025021 Collect and evaluate groundwater data	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; water and water management; pollution and contaminated sites; mining operations • legislation, standards and codes of practice for work health and safety (WHS) and handling of dangerous goods • government policies dealing with sustainable development and environmental impact assessment • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; and sampling of groundwater, such as AS/NZS 5667 Water quality series • industry guidelines, such as Australian Drinking Water Guidelines; Australian and New Zealand Guidelines for Fresh And Marine Water Quality; and Geoscience Australia's field guide for groundwater sampling and analysis • registration/licensing and/or accreditation requirements • information for specific sites, such as applicable legislative requirements and approval requirements, site access and work schedules, groundwater monitoring, sampling and in-situ test procedures • workplace documents, such as standard operating procedures (SOPs); equipment manuals and warranties; job hazard analyses; work method statements; safety data sheets (SDS) and safe work procedures; waste minimisation, containment, processing and safe disposal procedures.

Workplace procedures for field activities include one or more of:	• use of field notebooks or log books • standard operating procedures covering fieldwork, sampling and testing • equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures • emergency, first aid and survival procedures • requirements related to protection of the environment • use of incident/accident/injury report forms.

Sampling/monitoring plans include one or more of:	• purpose of sampling, such as:
	  • identification of aquifers, leakage and hydraulic connection of aquifers
	  • assessment of groundwater movement, flow, recharge and discharge and quality
	  • assessment of salt, nutrients, pesticides and other contaminants
	• sampling criteria, such as:
	  • spatial and depth distribution within target
	  • depth to water level for shallow/deep aquifers
	  • contamination potential and land use
	  • nature of recharge/discharge mechanisms
	  • diversity of groundwater use
	  • bore accessibility and bore equipment availability
	• sampling frequency/duration depending on purpose, such as level, quality indicators (e.g. temperature and electrical conductivity), long-term quality parameters and could be continuous, hourly, daily, monthly, quarterly, six monthly, annual and long term.

Site and sampling hazards include one or more of:	• risk of surface collapse around old wells • unsafe stages and ladders • working in confined spaces, such as wells, boreholes, wellheads and basements • exposure to contaminated groundwater and confined space atmospheres • solar radiation, dust and noise • handling bulky or heavy equipment.
Safe working procedures include one or more of:	• use of safety harness, suitable clothing and boots, sunglasses, hat and gloves and sunscreen • use of breathing apparatus • ensuring two persons are present during sampling of wells (one at the surface) • testing of atmosphere for oxygen deficiency and flammable/toxic vapours • working upwind of known contaminants • prohibition of eating, drinking and smoking

	• separation of heavy equipment into smaller units/cases for transport • location and avoidance of site utility services • securing and counterbalancing of pumps and water filled hoses down the hole • testing and earthing of electrical generators, trip out devices and connectors (especially at waterlogged sites) • shielding of hot surfaces and exhausts • careful handling of glass containers and preservatives • regular medical checks • access to drinking water, first aid equipment and mobile phone.

Drilling and construction of wells and bores includes one or more of:	• drilling techniques, such as auger, rotary air, rotary mud, cable tool, direct push technologies, sonic drilling and vibro coring
	• bore construction techniques, such as:
	  • use of PVC, stainless steel and fibreglass casings
	  • mechanical casing joints
	  • screen and gravel packs
	  • cement or bentonite seals
	  • lockable caps, bore name and ID label
	• piezometer construction techniques, such as:
	  • shallow piezometers
	  • bundled mini piezometers.

Purging and field sampling equipment include one or more of:	• Teflon, glass and stainless steel items • bailers and cords, and syringe devices • air-lift, suction-lift, gas operated, bladder, submersible, inertial (foot pump) and submersible piston pumps • inlet screens • flow meter water sampler • groundsheets, scrubbing brushes, hoses, buckets, jerry cans and waste containers • cables, batteries, generator and air compressor • tripods, stands, swivelling blocks and tools • eskies and ice and will vary according to the position of the sampler intake, purge criteria used and composition of the groundwater to be sampled.
Sample preparation and transport include one or more of:	• filtering groundwater samples using syringes, filter capsules and hand operated pumps • sample preparation for major and minor chemistry, nutrients and isotope analysis • sampling and filtration for incubated microbiology samples • collecting samples of dissolved and entrained or evolving gases • labelling and packing of samples to ensure integrity, traceability, preservation and prevention of cross-contamination during transit

	• sample delivery within specified holding times.
Field testing equipment and instruments include one or more of:	• maps, global positioning system (GPS), two-way radio and mobile phone • tape measures and weights, plopper/samplers and water level meters • flow cells • parameter specific meter or multi-probes, such as dissolved oxygen, electrical conductivity, pH, turbidity, nitrates, phosphates and temperature • field test kits for parameters such as dissolved gases, chemical anions and cations, heavy metals, E. coli and biological oxygen demand (BOD) • portable colorimeters and field microscopes • portable gas analyser for CH4, O_2, CO_2, CO and H_2S • sterile sample bottles and other sample containers specific to analytical method • reagents, calibration solutions and cleaning solutions • media/substrates for presence or absence microbiology field tests • filters and sieves • data loggers and digital cam$_e$ra • equipment manuals and sampling/testing procedures.
Field measurements/tests include one or more of:	• measuring depth of bores and water levels • pH and temperature • electrical conductivity • dissolved oxygen • redox potential • alkalinity using burette titration and alkalinity titrator • presence or absence microbiology field tests • field gas analysis for CH_4,O_2, CO_2, CO and H_2S.
Field observations and data include one or more of:	• sampling point name, location, time, date and type • nature of aquifer and water bearing strata • well/bore dimensions and description of conditions • pumping status, depth of pump suction and/or discharge • water level within well or borehole • method of sampling and depth of sampling • sample appearance when collected (colour, clarity and odour) • results of on-site analysis (e.g. pH, electrical conductivity and dissolved oxygen) • details of sample preservation techniques used • details of on-site filtration (e.g. filter pore size) • details of sample storage method required/used • name of sample collector.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying

	standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025022 Perform sampling and testing of soils	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; soil conservation; pollution and contaminated sites • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering: soil sampling (e.g. AS 1199 Sampling procedures for inspection by attributes series, and AS 4433.2-1997 Guide to the sampling of particulate materials - Preparation of samples); soils testing (e.g. HB 160-2006 Soils testing, and AS 1289 Methods of testing soils for engineering purposes series); geotechnical site investigations (e.g. AS 1726-1993 Geotechnical site investigations); and transport of dangerous goods/emergency procedures (AS 1678 Emergency procedure guide series) • registration/licensing and/or accreditation requirements • site plans, maps and specifications; methods and procedures for sampling and in-field testing to meet workplace, client and/or regulatory/certifying body requirements; client sampling schemes and sampling plans • workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; supplier catalogue and handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Materials sampled include one or more of:	• solid samples, such as soil and sediments • natural, agricultural and engineered soils • solid wastes • soil water • soil gas/vapour.
Types of samples include one or more of:	• discrete samples • composite samples • quality control samples • research or one-off samples • environmental or survey samples.

Sampling tools and equipment include one or more of:	• maps, global positioning system (GPS) unit and compass • shovels and crow bars • metal-free scoop and cleaning brush • folding rulers and tape measures • hand and power augers, pry bars and files (auger maintenance) • push tubes, sampling tubes, dip tubes, spears and syringes • front-end loader, backhoe, excavator and drill rig • sample bottles or containers, plastic bags/containers and disposable buckets • sample splitters, graters and mills, mortar and pestles • lysimeters, soil gas probes.
Testing equipment and instruments include one or more of:	• digital camera, hand lenses and microscopes • sieves and sieve shakers • Munsell soil colour chart • pH meter and soil pH test kit • conductivity meter • tensiometer (moisture measurements) • ultraviolet/visible (UV/Vis) spectrophotometer • atomic absorption spectrophotometer • gas chromatographs (GC) and GC-MS • infrared spectrophotometer • diffuse reflectance accessories • inductively coupled plasma (ICP) spectrometers and ICP-MS • X-ray fluorescence (XRF) spectrometers • radiation monitor (e.g. Geiger-Muller counter).
Site and sampling hazards include one or more of:	• solar radiation, dust and noise • wildlife such as snakes, spiders and domestic animals • biohazards such as microorganisms and agents associated with soil • chemicals such as acids and hydrocarbons • manual handling of heavy sample bags and containers • crushing, entanglement and cuts associated with moving machinery and hand tools • vehicular and pedestrian traffic.
Chemical soil tests include one or more of:	• electrical conductivity • pH • alkalinity • cation exchange capacity • organic carbon • available phosphorus • nutrients and micronutrients • sulfate • carbonate • nitrate and total nitrogen • metals, including heavy metals • organics, including pesticides and other hazardous chemicals.

Physical soil tests include one or more of:	• soil profile description • particle size analysis, soil colour (Munsell), soil texture and water repellence • infiltration • soil moisture content • liquid limit, plastic limit (plasticity index), Atterberg limits, volume expansion and linear shrinkage • compaction, standard penetration test, cone penetration test • dispersibility (Emerson class number) • soil resistivity • radioactivity.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS025023 Plan and conduct environmental project work	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage protection; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering environmental management (e.g. AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set) • industry guidelines and codes, such as state and territory regulator (e.g. EPA) sampling and testing manuals, and Australian Dangerous Goods Code • registration/licensing and/or accreditation requirements • site plans, maps and specifications; methods and procedures for sampling and in-field testing to meet workplace, client and/or regulatory/certifying body requirements; client sampling schemes and sampling plans; workplace environmental management plans and procedures for specific sites and/or activities (e.g. sampling, monitoring, construction and mining)

	• workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; supplier catalogue and handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Background information includes one or more of:	• site or project history, and client history • records of consultations with stakeholders • emergency plans and safety procedures • site access protocols and permits • maps (road and topographical) • existing databases (e.g. vegetation, topography, soils and regional ecosystem maps) • legislative/regulatory requirements • workplace environmental management plans for site • workplace, regulatory or standard methods/procedures for environmental sampling, monitoring or in-field testing • manufacturer information or manuals for environmental equipment • relevant case studies and good practice models.
Environmental project work includes collecting and presenting data relating to one or more of:	• outdoor air quality • noise • water quality, surface water, environmental flows, groundwater and catchment studies, and hydrological surveys • occupational hygiene (e.g. air quality, noise and radiation) • ecology studies • soil surveys, geotechnical surveys • contaminated site management (with appropriate risk analysis and supervision) • land management • coastal management • wetland management • stormwater management • energy technologies and services • waste management.
Environmental measurements include one or more of:	• conducting in-field sampling and testing • conducting flora and/or fauna surveys • conducting soil surveys and soil profiling at a site • commissioning or modifying field equipment or instruments • establishing or modifying environmental monitoring stations • growth of species of environmental interest under controlled conditions • remediation trials • laboratory testing of environmental samples.
Project plans include one	• scope, objectives, work breakdown structure • sampling/testing/monitoring/survey methods

or more of:	• available resources (e.g. equipment and personnel), specific roles and responsibilities of participants • budget and cost estimates • data quality requirements and assurance procedures • risk analysis and control measures, safety requirements and related work procedures • stakeholders and consultation procedures • milestones, output/project deliverables and their acceptance criteria • project management procedures covering planning, risk analysis, communications and reporting • project management software and tools, such as Gantt and program and evaluation review technique (PERT) charts, critical path method, and records of costs and inputs.
Safety procedures and control measures include one or more of:	• use of personal protective equipment (PPE), such as sunscreen, hats, safety glasses, gloves, coveralls and safety boots • use of specified safe work procedures for tasks • 'stay with vehicle' and other survival techniques • regular communication schedule • use of global positioning system (GPS), maps and aerial photos • handling, storage and disposal of all hazardous materials/waste in accordance with SDS, labels, workplace procedures, codes and regulations.
Mathematical/statistical/ graphical methods and software include one or more of:	• determination of linear, logarithmic, exponential and power relationships • determination of regression lines and correlation coefficients • uncertainty calculations • frequency and probability plots • parametric statistical tools, such as t-test, z-test, binomial and analysis of variance (ANOVA) • non-parametric statistical tools, such as Chi-square test • use of spreadsheets and databases.
Project documentation includes one or more of:	• sampling, monitoring, survey or in-field test data and results • records of equipment use, time spent and approved expenditure • emails and correspondence, records of consultations • progress reports • final reports/briefings
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.

MSS027013 Coordinate environmental management activities	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage protection; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS), and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • site information, such as applicable legislative requirements and approval requirements, site processes, work schedules, emergency preparedness and response, job hazard analyses, safe work procedures and work method statements • workplace environmental management plans and monitoring/inspection procedures and management actions to prevent/control environmental impacts or risks for specific sites and/or activities (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Environmental information and training include one or more of:	• workplace environmental management policy • content and purpose site/project environmental management plan • legislative responsibilities • licensing/permit/compliance requirements • due diligence and duty to notify • lines of communication • introduction to site/project and environmental considerations, and sources of environmental information • environmental management actions and checklists, methods/procedures for specific activities • incident management and reporting.
Provision of environmental	• site induction (environmental component) • task specific training (e.g. spill management)

information and training includes one or more of:	• toolbox talks (regular, 'as required' and topic specific) • daily, pre-start meetings with supervisors/team leaders about specific issues (e.g. hazards and working in close proximity to known fauna habitats) • posters and reading materials displayed in common areas and noticeboards • supervisor notices and daily bulletins about specific environmental issues • response to community complaints.
Site personnel and stakeholders include one or more of:	• workplace employees • contractors and subcontractors • consultants, such as environmental scientists, planners, engineers and external auditors • suppliers and service providers • community representatives and landowners • visitors or members of the public • government/regulator representatives and inspectors.
Reports include one or more of:	• non-conformance report form • hazard near miss report form • site/project incident investigation report • weekly environmental report • monthly environmental report • regulatory agency reports (where required by permit, approval or licence conditions).
Site/project records include one or more of:	• digital photographs • environmental monitoring data • internal quality/environmental audit reports • records required by permit, approval or licence conditions • records of training • records of monitoring equipment purchase, calibration, inspection, maintenance and service • records of complaints and government requests • records of environmental non-conformances, incidents or significant impacts • contractor and supplier information • electronic/hard copy correspondence • records of approved expenditure and orders.
Environmental issues and incidents include one or more of:	• finding or disturbing an actual/potential cultural heritage item or site • community or stakeholder complaint • failure of erosion or sediment controls • spill or release of chemical, hydrocarbon or other hazardous material • decline in water quality due to site/project activities • decline in air quality due to dust, SO_X and NO_X • unacceptable noise levels

	• environmental harm to protected habitat or species • transport of prohibited materials to/from site (e.g. pests, weeds and contamination).
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027014 Apply environmental legislation, codes and standards	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS), handling of dangerous goods, radiation protection • Australian and international standards covering environmental management such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • workplace environmental management plans for specific sites and/or activities, monitoring/inspection procedures, management actions to prevent/control environmental impacts or risks • site information, such as applicable legislative and approval requirements, site processes and work schedules, emergency preparedness and response, job hazard analyses, safe work procedures and work method statements • workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; safety data sheets (SDS); and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Major features of legislation, codes and standards include one or	• scope of application, objectives and policies • assessment procedures • works approval procedures • permits

more of:	• regulation of activities • licensing procedures, terms and conditions • environment protection notices, offences and penalties • notification requirements • auditing requirements • powers of investigation • courts, enforcement provisions and sentencing options.
Site personnel include one or more of:	• employees • contractors and subcontractors • consultants, such as environmental scientists, planners, engineers and external auditors • suppliers and service providers • government/regulator representatives and inspectors • visitors, members of the public, community representatives and landowners.
Reports include one or more of:	• weekly environmental reports • monthly environmental reports • regulatory agency reports as required by permit, approval or licence conditions.
Sources of information about legislative changes include one or more of:	• Environmental Defenders Office (EDO) Network • Australasian Legal Information Institute • industry forums • compliance reports • government/industry newsletters • industry journals • information updates from regulatory authorities • websites.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027015 Provide environmental advice to clients	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water

	management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • national strategies dealing with water quality management, ecologically sustainable development, greenhouse and energy reporting • legislation, standards and codes of practice for work health and safety (WHS), and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • information for specific sites and/or activities (e.g. sampling, monitoring, construction and mining), such as applicable legislative requirements and approval requirements, workplace environmental and emergency management plans and procedures, site processes and work schedules, monitoring/inspection procedures and environmental management actions, sampling and in-situ measurement procedures • procedures covering receipt of requests for information and release of information data and results, confidentiality and security of workplace information, records and reporting • workplace documents, such as work schedules; standard operating procedures (SOPs); equipment manuals and warranties; job hazard analyses; work method statements; safety data sheets (SDS) and safe work procedures; waste minimisation, containment, processing and safe disposal procedures.
Environmental issues and problems include one or more of:	• identifying and addressing cultural heritage issues • managing site amenity and access issues • designing/conducting environmental monitoring baseline studies and social risk/impact assessments • managing expectations and addressing community concerns about impacts, community development and local employment opportunities • responding to community or stakeholder complaints • responding to environmental exceedances (e.g. noise, dust and water quality) and adverse audit findings • investigating/responding to environmental non-conformance, non-compliance and incidents • informing interested parties about changes to site/project/program operations • involving interested parties in site/project/program closure planning • developing and coordinating a site rehabilitation program • developing environmental management strategies (e.g. for water use, wastewater, energy, waste and sustainability).

Information includes one or more of:	• legislation, regulations, guidelines, standards, codes of practice, licence conditions and approval processes
	• environmental management case studies, research findings and models of good practice
	• workplace environmental management plans, policies, strategies and procedures
	• site/project initial advice statements and risk/impact assessments
	• records of site consultations with interested parties
	• site/project environmental reports (e.g. weekly and monthly monitoring)
	• environmental data sets, such as:
	  • satellite imagery and remote sensing data
	  • geophysical, geochemical, geological, hydrological and meteorological data
	  • ecological data, such as distribution of vegetation, fauna and pests
	  • social science data, such as demographic and census information
	• land use data, zoning and property classifications
	• historical records and photographs
	• community surveys
	• maps (road and topographical) and aerial photos
	• site utilities/services (e.g. water, sewer, electricity and gas)
	• government reports
	• articles (e.g. online, academic, newspaper and journal).

Sources of information include one or more of:	• government departments and agencies (e.g. environment, climate change, agriculture and mining) • regulatory authorities • universities, cooperative research centres • utility authorities/companies (e.g. water, gas and electricity) • Land Title Office and Valuer General • local government records • Geoscience Australia • Australian Social Science Data Archive • companies providing environmental services • internet, library/archive collections, annual reports and community newsletters.
External expert opinion includes one or more of:	• government regulators • environmental consultants • contractors • solicitors • environmental scientists, engineers and planners • professional groups and organisations • community leaders and tribal elders.

WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027016 Contribute to improving environmental performance	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage protection; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS), and handling of dangerous goods • Australian and international standards covering environmental management (e.g. AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set); quality and/or environmental management systems auditing (e.g. AS/NZS ISO 19011:2014 Guidelines for auditing management systems) • registration/licensing and/or accreditation requirements • site/project/program information, such as applicable legislative requirements and approval requirements, site processes, work schedules, emergency preparedness and response procedures, job hazard analyses, safe work procedures and work method statements, and sampling and in-situ measurement procedures (e.g. water, air, noise and soils) • workplace environmental management system, plans, monitoring/inspection procedures and management actions to prevent/control environmental impacts or risks for specific sites, projects and/or programs (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs); work schedules; audit/review procedures; recording and reporting procedures; equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Scope of review/audit	• components of an initial environmental review (IER) prior to

activities includes one or more of:	establishing an environmental management system (EMS)
	• periodic inspection against environmental management plan requirements for:
	  • monitoring and measurement
	  • materials and energy usage
	  • materials storage and handling, and spills
	  • wastewater management
	  • air emissions management
	  • noise management
	  • chemical waste management
	  • solid waste management
	• scheduled review/internal audit of site, section, function or work area
	• scheduled review/internal audit of components of an workplace EMS, such as:
	  • non-conformity, corrective/preventative actions
	  • competence, training and awareness programs
	  • control of records
	  • supplier or contractor performance
	  • emergency preparedness and response
	• adequacy of environmental management for new or changed operations, processes and work activities
	• investigation of a complaint, environmental incident or suggested improvements.

Information includes one or more of:	• workplace environmental management policies, procedures, plans and actions, and work instructions
	• background information, such as:
	  • previous internal review/audit reports
	  • previous external audit reports
	  • records of complaints, incidents, non-conformance/non-compliance and the corrective and/or preventative actions taken
	• site documentation, such as:
	  • minutes of meetings
	  • log books, records of environmental monitoring and test results, and regular performance reports
	  • records of equipment use, calibration and maintenance
	  • records of training
	  • instructions for contractors and suppliers
	• external reports (e.g. external experts and regulator)
	• records of observations, inspections and interviews.

Review/audit results include one or more of:	• observations • findings • examples of best practice • non-conformances/non-compliances with options for corrective

	and preventative actions, and improvements
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027017 Contribute to environmental decision making	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage protection; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS), and handling of dangerous goods • Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set • registration/licensing and/or accreditation requirements • site/project/program information, such as applicable legislative requirements and approval requirements, community engagement, management of stakeholder relations and communication protocols, site processes, work schedules, emergency preparedness and response procedures, job hazard analyses, safe work procedures and work method statements • workplace environmental management plans and monitoring/inspection procedures and management actions to prevent/control environmental impacts or risks for specific sites, projects and/or programs (e.g. sampling, monitoring, construction and mining) • workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.
Environmental issues and problems include one or	• modifying/developing/negotiating land use and other site agreements • identifying and addressing cultural heritage issues

more of:	• managing site amenity and access issues • designing/conducting environmental monitoring baseline studies and social risk/impact assessments • managing expectations and addressing community concerns about impacts, community development and local employment opportunities • responding to community or stakeholder complaints • responding to environmental exceedances (e.g. noise, dust and water quality) and adverse audit findings • investigating/responding to environmental incidents or adverse audit findings • informing interested parties about changes to site/project operations • involving interested parties in site/project closure planning • developing a site rehabilitation program.

Information includes one or more of:	• legislation, regulations, guidelines, standards, codes of practice, licence conditions and approval processes
	• environmental management case studies, research findings and models of good practice
	• workplace environmental management policies and procedures
	• site/project initial advice statements, risk/impact assessments and environmental management plans
	• records of site consultations with interested parties
	• site/project environmental reports (e.g. weekly and monthly monitoring)
	• environmental data sets, such as:
	  • satellite imagery and remote sensing data
	  • geophysical, geochemical, geological, hydrological and meteorological data
	  • ecological data, such as distribution of vegetation, fauna and pests
	  • social science data, such as demographic and census information
	• land use data, zoning and property classifications
	• historical records and photographs
	• community surveys
	• maps (road and topographical) and aerial photos
	• site utilities/services (e.g. water, sewer, electricity and gas).

Sources of information include one or more of:	• government departments and agencies (e.g. environment, climate change, agriculture, mining and land use/planning) • utility authorities/companies (e.g. water, gas and electricity) • Land Title Office and Valuer General • local government records • Geoscience Australia • Australian Social Science Data Archive • companies providing environmental services

	• internet, library/archive collections, annual reports and community newsletters.
Information collection methods include one or more of:	• accessing external publications, workplace files and reports • conducting internet searches • conducting interviews with workplace personnel, government representatives and interested parties • consulting with external experts • holding discussion groups, learning circles, workshops, reference groups and community consultative committees • conducting community/stakeholder surveys.
External expert opinion includes one or more of:	• government regulators • environmental consultants, contractors • solicitors • environmental scientists, engineers and planners • professional groups and organisations • community leaders, tribal elders and traditional owners.
Strategies and activities to encourage effective participation in decision making include one or more of:	• one-on-one informal or impromptu discussions • formal interviews • regular briefings • public meetings, focus groups and workshops • a site/project visitor centre, open days and site visits • hotline or 24 hour contact numbers to record issues or complaints • websites • direct mail or newsletters • links with community liaison or advisory groups • translation of key information into local languages.
WHS requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027018 Undertake complex environmental project work	
Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• federal legislation, such as the Environment Protection and Biodiversity Conservation Act, Australian Heritage Council Act, Native Title Act and National Environmental Protection Measures • state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use, acquisition, planning and protection; environmental protection; cultural/heritage protection; vegetation management; nature conservation and wildlife/plant protection; water, water

	management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations • legislation, standards and codes of practice for work health and safety (WHS) • Australian and international standards covering environmental management (e.g. AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set); and sampling, testing and/or monitoring of air, water and soils • industry methods and guidelines • registration/licensing and/or accreditation requirements • site/project-specific information, such as applicable legislative requirements and approval requirements; work schedules; industrial processes; environmental management plans; monitoring/inspection procedures and management actions to prevent/control environmental impacts or risks; methods for sampling and in-field testing; procedures for recording, processing, presenting and reporting data; job hazard analyses; safe work procedures and work method statements • workplace documents, such as standard operating procedures (SOPs); equipment manuals and warranties; supplier catalogue and handbooks; safety data sheets (SDS); waste minimisation, containment, processing and safe disposal procedures.
Complex environmental project work includes developing, evaluating/updating and implementing environmental management and/or monitoring programs associated with one or more of:	• planning, operation or closure of construction, infrastructure, industrial and mining sites • rehabilitation of sites • revegetation of sites • management of pests • acid sulphate soils • acid rock drainage • wetlands • stormwater systems • air quality, dust and emissions/odours • water quality and water supply/use issues • contaminated sites (e.g. hydrocarbons) • waste, stockpiles and waste rock dumps • protection of biodiversity • acquisition and commissioning of complex equipment • significant quality improvement projects • set-up and operation of remote sensing sites • set-up and operation of groundwater bores • investigating a multifaceted or difficult environmental complaint, non-conformance or incident.
Background information includes one or more of:	• legislative/regulatory, permit, licence and approval requirements for site/project • site or project history • client history and correspondence

	• information about site processes and work schedules • records of consultations with stakeholders • emergency plans and safety procedures • site access protocols and permits • maps (road and topographical) • existing databases (e.g. vegetation, topography, soils and regional ecosystem maps) • workplace environmental management plans for site • workplace, regulatory or standard methods/procedures for environmental sampling, monitoring or in-field testing • manufacturer information or manuals for environmental equipment • relevant case studies and good practice models.
Project plans include one or more of:	• purpose, scope, inclusions and exclusions • objectives, milestones, output/project deliverables and their acceptance criteria and quality standards • performance criteria/indicators, expected outcomes/measurable benefits and evaluation criteria • project management framework for: • planning, implementation, closure and governance • communications with stakeholders • cost estimates, budget and financial management • procurement and contract management • risk analysis and control measures • quality control and assurance procedures • WHS requirements • record keeping and reporting • specific roles and responsibilities of team members • work breakdown structure, schedules and timeframes • available facilities and resources (e.g. equipment and personnel).

Project management tools include one or more of:	• project management software and tools, such as:
	  • Gantt and bar charts
	  • program and evaluation review technique (PERT) charts
	  • critical path method
	  • cost schedule control system
	  • logistics support analysis
	  • life cycle cost analysis
	  • spreadsheets
	  • electronic and manual recording systems.

Project information and data include one or more of:	• schedules, records of time spent and progress • costs, expenditure, invoices, payments, quotations and purchases • records of equipment used • emails and correspondence • records of consultations

	• sampling, monitoring, survey or in-field test data and results • progress reports and draft plans/procedures • project outputs • final reports/briefings/recommendations.
Solutions to project problems include one or more of:	• researching and applying models of good practice or relevant findings from case studies • seeking input from environmental specialists • reducing costs • seeking additional resources to meet deadlines • negotiating an extension to a deadline • redefining completion or quantity or quality of project outputs/outcomes • sharing ideas to generate improved work processes • changing roles and responsibilities within project team • outsourcing project components.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS027019 Implement and maintain the site health and safety management system	

Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:	• legislation, standards and codes of practice for WHS
	• Australian and international standards covering:
	  • environmental management (e.g. AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set)
	  • occupational personal protection (e.g. AS/NZS 1337 Personal eye protection series, AS/NZS 2161 Occupational protective gloves set, AS/NZS 2210 Safety, protective and occupational footwear series, AS/NZS 4501 Occupational protective clothing series, and HB 9-1994 Occupational personal protection)
	  • occupational noise management (AS/NZS 1269 Occupational noise management Set), and safe working in a confined space (AS 2865-2009 Confined spaces)
	  • flammable and combustible liquids (AS 1940-2004 The storage and handling of flammable and combustible liquids); corrosive substances (AS 3780-2008 The storage and handling of corrosive substances), and toxic substances (AS/NZS 4452:1997 The storage and handling of toxic substances)
	  • transport emergency procedure guide (AS 1678 Emergency procedure guide – Transport series)

	• industry codes and guidelines, such as:
	  • Australian Dangerous Goods Code
	  • Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Codes of Practice
	  • National Code of Practice for the labelling of workplace substances (NOHSC:2012)
	  • National Health and Medical Research Council (NHMRC) Guidelines
	• WHS policies and procedures covering hazards, risks, controls, emergency and environmental incidents, recording and reporting; job hazard analyses; safe work procedures and work method statements; hazardous goods manifest and substance register; and safety data sheets (SDS)
	• workplace documents, such as standard operating procedures (SOPs); equipment manuals and warranties; supplier catalogue and handbooks; waste minimisation, containment, processing and safe disposal procedures.

Site personnel include one or more of:	• managers and supervisors • health and safety and other employee representatives • contractors, consultants and visitors • WHS committee members • operations personnel • external WHS agency representatives.

Participative processes with site personnel and their representatives include one or more of:	• committees, such as:
	  • WHS
	  • consultative
	  • planning
	  • employee and supervisor/manager involvement in WHS activities such as inspections, audits and risk assessments
	• procedures for reporting hazards and raising and addressing WHS issues
	• identification of hazards and assessment of level of risk
	• implementation of risk control measures and review of effectiveness
	• injury and incident investigations
	• development of policies and procedures
	• review of WHS records and statistics
	• review of registers of hazardous substances and dangerous goods
	• audits and workplace inspections
	• job safety analysis
	• consultation with site personnel.

Workforce characteristics and composition that impact on WHS and	• language and literacy • communication skills • cultural background

environmental management include one or more of:	• gender • workers with special needs • part time, casual or contract workers.

Hazard identification processes include one or more of:	• review of hazard and incident reports
	• workplace inspections
	• pre-purchase risk assessments
	• review of relevant internal documentation, including SDS, manufacturer manuals and minutes of meetings
	• review of legislation, codes of practice, standards and guidelines
	• review of publications, such as:
	  • WHS regulators
	  • industry bodies
	  • journals
	  • newsletters.

Risk assessment includes:	• analysing the effectiveness of existing controls • determining the likelihood of each consequence considering exposure and hazard level • combining these in some way to obtain a level of risk • comparison of the determined risk with pre-established tolerance criteria and ranking of risks requiring control.
Information for evaluation of the WHS management system includes one or more of:	• hazard, incident and injury reports • site inspections • audit reports • formal and informal input of employees and contractors.
WHS and environmental management requirements include:	• compliance with relevant federal/state/territory WHS legislation at all times • assuming that samples are potentially hazardous and applying standard precautions • accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.
MSS402082 Apply cost factors to work practices	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz)

	• cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Cost components include all of:	• fixed and variable costs, such as power/energy, materials, plant and equipment, production or process time, including impact of salary and wages • office expenses, such as telephone and internet • government taxes and charges.
Process includes one or more of:	• production • maintenance • logistics • office • other support processes in an organisation.
Overall cost includes all of:	• the assessment of negative and positive financial implications • negative long-term issues, such as work health and safety (WHS), environmental and regulatory issues.
MSS402083 Use planning software systems in operations	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Relevant data and information includes one or more of	• technical and other drawings • standard operating procedures (SOPs) and other work instructions • production schedules, including historical data

	• orders and order tracking information • stock control • contact lists • work health and safety (WHS) information.
Stages where value stream actions may occur include one or more of:	• sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing • final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support.
Items in the value stream include one or more of:	• physical elements of the production system, such as sites, workstations, equipment and material, including stock, work in progress and finished products • information needed to meet customer requirements, such as designs, drawings, work instructions, SOPs, standards, material lists and pricing • information not directly related to current customer requirements but required by the organisation.
Procedures (written, verbal, visual, computer based, etc.) include one or more of:	• work instructions • SOPs • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
MSS403085 Ensure process improvements are sustained	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping

	• problem solving • run charts • standard procedures • current reality tree.
A change aimed at reducing muda (waste) will be an improvement in one or more of:	• systems/processes • equipment • operations/practices • products.
Customers include one or more of:	• internal customers • external customers • final customers.
Suppliers include one or more of:	• internal suppliers • external suppliers • ultimate source of process inputs(e.g. raw materials).
Systems include all of:	• equipment/plant • systems/processes • procedures and work practices.
Resources include all of:	• equipment • modifications • consumables • people • suitable work area • time • money (expense/capital).
Procedures (written, verbal, visual, computer based, etc.) include one or any combination of:	• work instructions • standard operating procedures (SOPs) • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
Techniques for sustaining improvements include one or more of:	• techniques for preventing mistakes by designing the operations process, equipment and tools so that an operation cannot be performed incorrectly (e.g. baka-yoke) • techniques that generate warning signals where a mistake is about to be performed (poka-yoke) • use of technology so that it is impossible to do the job any other way • changes to process or procedures or other changes to the operations system which, if followed, will sustain the change.
Measuring performance includes one or more of:	• personally taking measurements • arranging for measurements to be taken/made by appropriate personnel.

MSS403086 Improve cost factors in work practices	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Cost components include consideration of all of:	• fixed and variable costs, such as power/energy, materials and other inputs, plant and equipment, salary and wages, and office expenses (e.g. telephone) • government taxes and charges.
Causes of variability in costs include one or more of:	• time-based variation • fluctuations in variable costs related to different volumes of sales, production or operations • fluctuations in fixed/overhead costs related to changes in the economy, financial markets and similar • abnormal cost fluctuations due to poor design of product or process, poor scheduling, faults, breakdowns and other muda (waste).
Process includes consideration of all of:	• all functions that go to meet customer requirements • all other required functions (e.g. regulatory related functions) • design • production • maintenance • logistics • office processes.
Procedures (written, verbal, visual, computer based, etc.) include one or any combination of:	• work instructions • standard operating procedures (SOPs) • safe work method statements • formulas/recipes • batch sheets • temporary instructions

	• any similar instructions provided for the smooth running of the plant.
Benefits include all of:	• positive benefits • negative benefits • quality • safety • reliability • similar issues which may be impacted by a cost saving.
MSS403087 Mistake proof an operational process	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Mistake proofing (baka-yoke or poka-yoke) includes one or more of:	• eliminating the possibility of an error occurring • reducing the occurrence of errors and/or to minimise their impact • eliminating the possibility of the error via changes to the process • preventing the error from occurring via physical or virtual barriers • reducing likelihood of the error by encouraging correct action (e.g. through warning systems) • mitigating the impact of the error if it does occur.
Prioritising options for mistake proofing includes one or more of:	• success rate in eliminating errors • feasibility • skills required by employees • cost • capacity to reduce waste.
Procedures (written, verbal, visual, computer	• work instructions • standard operating procedures (SOPs)

based, etc.) include one or any combination of:	• safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
MSS404084 Undertake process capability improvements	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Variation includes all of:	• random variation (no assignable cause) • non-random variation (which has an assignable cause).
Improved process capability may result from one or more of:	• continuous improvement with the process capability being recalculated periodically • an improvement project with the process capability recalculated as part of that project.
Procedures (written, verbal, visual, computer based, etc.) include one or any combination of:	• work instructions • standard operating procedures (SOPs) • safe work method statements • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant.
MSS405084 Manage people relationships	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three

	sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Key personnel for communication include one or more of:	• managers • supervisors • workforce delegates • key opinion shapers, such as employees with specialist technical knowledge.
Formal mechanisms for communication include one or more of:	• noticeboards • employee circulars • consultative committees • staff associations • union representatives • team leaders.
Stakeholders include one or more of:	• team members • personnel officers • industrial officers • union delegates • production management • human relations management • financial management • engineering/technical personnel.
MSS405085 Develop a documentation control strategy for an organisation	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen)

	• breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Documents include one or more of:	• hard copies of documentation, such as correspondence, procedures, contracts, agreements, specifications, production and other records, manuals and other reference materials • computer files, including word processed files, emails, databases and spreadsheets • technical drawings both hard copy or computer-aided design (CAD) files.
Document control strategy includes procedures for one or more of:	• authoring control • version control • access and distribution • review and revision • storage and archiving • access and security • approval for and means of destruction.
Archiving of documentation includes one or more of:	• compliance with legislative or regulatory requirements, and/or with organisational policy • an indexing system that specifies the period for which the document is to be retained • compliance with relevant requirements regarding physical storage and security.
External standards, requirements and conventions include one or more of:	• *AS/NZS ISO 9000:2016 Quality management systems - Fundamentals and vocabulary* requirements • AGPS Style manual • engineering and other technical standards • drawing standards • organisational style/marketing guides • documentation requirements of suppliers, customers and regulatory agencies.
MSS405086 Develop sustainable energy practices	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems

	• supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Muda includes all of:	• excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisations customers.
Necessary muda includes all of:	• an activity or cost which does contribute directly to customer benefit/feature in the product • an activity or cost which cannot be avoided (e.g. regulatory compliance and fixed costs).
Unnecessary muda includes all of:	• an activity or cost which does not contribute directly to customer benefit/features in the product • an activity or cost which can be avoided.
Sources and use of energy includes one or more of:	• all sources of energy used by the process be it electricity, gas/oil/coal or mobile transport fuel • used for heating and cooling • used for moving materials (e.g. pumps and conveyors) • used for modifying materials (e.g. cutting, forming, weaving, knitting, reacting, moulding, extruding and mixing) • used for generating pressure/vacuum or providing motive power for equipment and transport.
Energy trading includes one or more of:	• formal trading, such as buying of energy through alternative suppliers and tender processes and selling of excess energy produced by the organisation to energy companies or other producers • internal trading of excess energy from one area to an energy consuming area elsewhere in the organisation.
MSS407014 Prepare for and implement change	
Competitive systems and practices include one or	• lean operations • agile operations

more of:	• preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
High level change network includes one or more of:	• sponsors • cascading change sponsors • targets • agents • advocates • enablers • impeders.
Organisation includes:	• any part of a manufacturing or service organisation • companies, government bodies or other body of people aiming to produce a product to service a customer.
Key change project personnel include one or more of:	• project sponsors • cascading sponsors • relevant managers • change agents.
Risks include one or more of:	• business risks (e.g. over-spending) • market risk (e.g. loss of market share) • HSE risks • relationship risks (e.g. to shareholders, employees, suppliers, customers or the community).
Organisation capacity includes one or more of:	• organisation history of implementing change • capability in change implementation • adaptability of people to change • demand for the change in the part of the organisation.
Specific risk dimensions include one or more of:	• impact of the solution (its potential for disruption to production, quality, delivery and budgets) • readiness of people to accept the change, including readiness to accept changes in role and responsibilities • availability of resources, including financial, plant and

	equipment, and dedicated personnel.
Transition approach includes one or more of:	• transition style (top down/pilot/process focused/delegated change) • degree of sponsorship to be cascaded • balance of engagement/involvement • internal and/or external resources • use of change to build organisation capacity.
High level involvement plans involve groups within defined constraints which include one or more of:	• objectives for involvement • decision parameters • timing of involvement • problem/opportunity identification • solution design • implementation/transition planning • solution building • solution testing • solution piloting • training design • training delivery • communication roll out • solution roll out.
Alignment plan ensures alignment and sustainability between:	• policies, processes and procedures • incentives and rewards (KPIs and intended outcomes) • consequences and penalties for non-compliance • preventing pre-change behaviours and patterns recurring.
Sustaining improvement includes one or more of:	• standard procedures and work instructions • standard practice • other relevant documents and practices.
MSS407015 Build relationships between teams in an operations environment	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts

	• standard procedures • current reality tree.
Organisational teams include one or more of:	• downstream customer teams (internal or external) • upstream supplier teams (Internal or external) • support teams (e.g. maintenance and information technology).
Cooperation within teams includes one or more of:	• assistance with problem solving • dealing with disruptions to flow • dealing with variations of flow level/volume • dealing with variations in quality/quantity/timeliness.
KPIs include one or more of:	• reward systems • systems (formal and informal) which encourage some types of behaviour over others.
MSS407016 Lead a process to determine and solve root cause for a complex problem	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Complex problem includes one or more of:	• requires going into the value stream for data/information • is wider than just applying to a single job • applies to less common solutions or problems • requires a higher level of knowledge and skill • requires significant specialist knowledge • requires significant specialist skill • requires more theory/understanding of technology or process • data is not easily available and may need particular strategies to obtain • requires overcoming resistance from people, including employees, customers or suppliers • requires extracting data not regularly reported from SCADA or similar systems

	• the problem and/or proposed solutions require reporting or authorisations from a Board or external authorities, such as licensing or regulatory bodies.
Problem recognition includes one or more of:	• an obvious and current complex problem • an intractable problem which has been known about and 'lived with' for some time • a complex problem which has not been previously recognised.
Group includes one or more of:	• real (i.e. physical or face to face) • nominal (i.e. never meets and may not know who each other is) • or any combination in between.
MSS407017 Review continuous improvement processes	
Competitive systems and practices include one or more of:	• lean operations • agile operations • preventative and predictive maintenance approaches • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree.
Relevance of KPIs includes consideration of all of:	• appropriateness (did they lead to/encourage desirable performance?) • currency (are they still encouraging desirable performance?) • unintended consequences (do they lead to outcomes which are not desirable, even if some performance is desirable?) • signal/noise (is the balance between desirable and undesirable outcomes strong and positive?).
Bases for comparing outcomes include one or more of:	• benefit/cost • timing • value stream implications • sustainability issues • process reliability issues • benefit to customer/perceived customer benefit.
Required resources include consideration of	• plant/equipment • materials (e.g. raw materials, components, work in progress and

all of:	other consumables) • energy (e.g. heating, cooling and fuel) • people • skills • finances • feedback/visual enterprise resources • measuring equipment.
Techniques for sustaining improvement include one or more of:	• standard procedures and work instructions • standard practice • other relevant documents and practices.
Team leader includes one or more of:	• a person who has a formal, permanent role • a person with an ad hoc role in facilitating the function of a team in a workplace.