



Australian Government

MSS025035 Perform sampling and testing of soils

Release: 1

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Modification History

Release 1. Unit code changed. Application changed. Performance Criteria changed. Foundation Skills populated. Assessment Requirements changed. Supersedes and is equivalent to MSS025022 Perform sampling and testing of soils.

Application

This unit describes the skills and knowledge required to collect and perform field and laboratory tests on soil samples.

This unit applies to environmental technicians and similar roles who are required to interpret a defined sampling plan, obtain samples, conduct physical and chemical tests, check the validity of data, recognise atypical test data and interpret results to determine whether remedial action is needed.

This unit applies in a range of industry sectors, including but not limited to geotechnical services and civil engineering; site remediation or rehabilitation; solid and hazardous waste management; natural resource management; management of contaminated sites; environmental services (sampling and monitoring of air quality, water and soil); environmental compliance, auditing and inspection; groundwater and clean water (catchments, supply and environmental flows).

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

MSS024032 Document simple geological information for a site

Competency Field

Environmental monitoring and technology

Unit Sector

Nil

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Confirm soil	1.1 Review site plan, sampling and testing locations and history of

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sampling and testing requirements with supervisor	sampling and testing 1.2 Confirm sampling locations, numbers and types of samples, and timing and frequency of sampling from workplace or client sampling plan 1.3 Check that sampling and testing procedures are in accordance with client or workplace requirements and relevant standards and guidelines
2. Prepare for soil sampling	2.1 Identify site and sampling and testing hazards and review workplace safety procedures 2.2 Liaise with relevant personnel to arrange site access and obtain clearances and permits 2.3 Select sampling equipment and conditions to achieve representative samples and to preserve sample integrity during collection, storage and transit 2.4 Select field test equipment and instruments and check operation and calibration in accordance with procedures and manufacturer instructions 2.5 Assemble and check all sampling equipment, field test equipment, materials, containers and safety equipment and stow for safe transport 2.6 Arrange suitable transport to, from and around site
3. Conduct sampling and log soil samples	3.1 Locate sampling points and any services at the site 3.2 Work effectively with other site personnel during drilling and excavation operations to collect and log reliable samples 3.3 Conduct representative sampling in accordance with sampling plan and defined procedures for field and laboratory testing 3.4 Record information and label samples in accordance with traceability requirements 3.5 Record environment and any conditions or atypical observations made during sampling that may impact sample representativeness or integrity 3.6 Transport samples back to base according to workplace procedures and codes
4. Prepare soil samples for testing	4.1 Prepare sub-samples and back-up sub-samples that are representative of the source 4.2 Label sub-samples to ensure traceability and store in accordance with workplace procedures

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	4.3 Follow defined preparation and safety procedures to limit hazards and contamination to samples, self, work area and environment 4.4 Distribute sub-samples to required destinations for testing, maintaining sample integrity, traceability and chain of custody requirements
5. Conduct physical and chemical soil tests in the field	5.1 Obtain sample or sub-sample for designated field test 5.2 Check that equipment, instruments and reagents are fit for purpose 5.3 Set up and calibrate instruments to ensure safe operation and valid results 5.4 Operate equipment and instruments in accordance with test method requirements 5.5 Perform tests, procedures and observations in accordance with specified methods 5.6 Record field observations and results and ensure that they are accurately transferred to workplace information management system
6. Conduct physical and chemical soil tests in the laboratory	6.1 Obtain sample or sub-sample for designated laboratory test 6.2 Check that equipment, instruments and reagents are fit for purpose 6.3 Set up and calibrate instruments to ensure safe operation and valid results 6.4 Operate equipment and instruments in accordance with test method requirements 6.5 Perform tests and procedures on samples, blanks and standards in accordance with specified methods 6.6 Record test data noting atypical observations 6.7 Process the data for samples, standards and blanks in accordance with workplace procedures 6.8 Enter approved information into workplace information management system
7. Review results and assess soil suitability for specific purposes	7.1 Interpret results in relation to legislative and client requirements 7.2 Compare data with required, established and desired parameters to establish suitability for purpose 7.3 Determine and document any need for remedial action and report to client

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
8. Maintain a safe work environment	8.1 Rehabilitate sampling site to render it safe and to minimise environmental impact 8.2 Clean all equipment, instruments, containers, work area and vehicles according to workplace procedures 8.3 Check serviceability of all equipment and instruments before storage 8.4 Use defined safe work practices and personal protective equipment (PPE) to ensure personal safety and that of others 8.5 Minimise the generation of wastes and environment impacts according to procedures 8.6 Ensure the safe collection of all hazardous wastes for disposal

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

- Reading skills to interpret sampling plan, test methods and procedures
- Writing skills to record data, environmental conditions and observations
- Oral communication skills to liaise with others to confirm requirements and arrange for access
- Numeracy skills to interpret sampling plan, take and interpret readings and measurements and perform calculations.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSS025022 Perform sampling and testing of soils.

Links

Companion Volume Implementation Guides are found in VETNet -

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

Assessment Requirements for MSS025035 Perform sampling and testing of soils

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- collect, preserve and label a set of representative air samples for at least one site in accordance with sampling plan
- prepare soil (sub)samples and conduct the following, using specified test methods:
 - 2 field tests, including one chemical and one physical test
 - 2 laboratory tests, including one chemical and one physical test
- process and interpret data from at least 2 tests, including estimation of measurement uncertainty.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- scientific terminology used in job role covering soil sampling and testing
- fundamentals of soil morphology, including soil profiles, horizons, structure and texture, and mineralogy
- chemical and physical soil testing
- (Australian) soil classification system
- fundamentals of soil formation
- land use and soil systems (interactions and impacts), including plant-soil interactions, soil fertility, soil contamination and remediation
- fundamentals of geomorphology, including erosion and mass wasting, transportation and deposition, sedimentation; fluvial, aeolian, hillslope and weathering processes
- fundamentals of soil chemistry, including soil salinity
- physical and/or engineering soil properties, including:
 - colour (Munsell chart)
 - liquid and plastic limits
 - linear shrinkage
 - soil particle density
 - particle size distribution
 - dispersion and Emerson class number

- fundamentals of sampling, including:
 - sampling plans and site selection
 - principles of representative samples
 - principles and procedures for random, systematic, stratified and composite sampling, including consistency of sampling procedures
 - preservation of the integrity of samples
 - maintaining identification of samples relative to their source, workplace and legal traceability requirements
 - cost-effectiveness of sampling
- characteristics of soils to be sampled and likely contaminants
- materials for sampling and different types of samples
- sampling tools and equipment
- testing equipment and instruments
- links between quality control, quality assurance, quality management systems and sampling procedures
- workplace procedures dealing with legislative requirements for the handling, labelling and transport of hazardous goods
- common site hazards and control measures
- health, safety and environment requirements, including field safety and survival principles and high-risk sites.
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Assessment Conditions

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

- use of facilities, equipment and resources, including:
 - soil sampling equipment, field test equipment and instruments, laboratory test equipment and instruments, equipment manuals, digital camera, containers, reagents and consumables
 - safe work procedures and safety equipment
 - maps, site plans
 - site sampling plans and test methods
- modelling of industry operating conditions, including:
 - access to site/s.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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