

Title	Demonstrate introductory knowledge of geology at surface extraction sites		
Level	3	Credits	5

Purpose	People credited with this unit standard are able to demonstrate knowledge of: rocks and minerals at surface extraction sites, in relation to safety and quality; and geological structures at surface extraction sites in terms of their impact on operations.
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Classification	Extractive Industries > Surface Extraction
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Available grade	Achieved
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Guidance Information

Performance of the outcomes of this unit standard must comply with the following:

- Health and Safety at Work Act 2015 (HSW);
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;
- Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;
- Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2022;
- approved codes of practice issued pursuant to the HSW Act.

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of rocks and minerals at surface extraction sites, in relation to safety and quality.

Performance criteria

- 1.1 Rocks and minerals relevant to the candidate's work site are identified, and described in terms of their value to the operation.

Range may include but is not limited to – waste rock, aggregate, overburden, ore, plant feed, industrial minerals, coal; evidence is required for two.

- 1.2 The physical properties of industrial rocks and minerals are described in relation to their extraction and processing characteristics.

Range includes but is not limited to – hardness, solubility, specific gravity, abrasiveness, texture, mineralogy, weathering characteristics.

- 1.3 Potentially hazardous or toxic properties of industrial rocks and minerals are described in relation to worker health, safety, and the environment.

Range health and safety considerations may include, but are not limited to – toxic mineral dust (e.g. silica, erionite, asbestos), toxic or explosive gas generation (e.g. coal, pyrite), skin contact, ingestion or inhalation risks from toxic minerals such as arsenic (e.g. arsenopyrite), lead (e.g. galena), antimony (e.g. stibnite), mercury (e.g. cinnabar); radiation risk (e.g. uranium), environmental pollution (e.g. acid and heavy metals), or fire risk (e.g. coal).

Outcome 2

Demonstrate knowledge of geological structures at surface extraction sites in terms of their impact on operations.

Performance criteria

- 2.1 The structural characteristics of the mineral and host rock are described in relation to their geological features.

Range structural characteristics may include but is not limited to – faults, jointing, folding, bedding, foliation, roof, floor, intrusions, orientation.

- 2.2 Other structures or geological events are described in relation to their effect on mineral, industrial rock, and host rock.

Range structures or geological events may include but is not limited to – landslides, ancient riverbeds, old mine workings, depositional environment, volcanism, alteration, tectonic faulting, weathering.

- 2.3 The geological hazards impacting on excavation design are described in relation to surface extraction processes.

Range geological hazards may include but is not limited to – face height and angle in rock, clay, sand and gravel, orientation of geological structure with respect to cut faces, slope instability, groundwater seepage, rockfall, berm condition, surface drainage and dust generation.

Planned review date	31 December 2029
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 July 1999	31 December 2017
Review	2	27 January 2005	31 December 2017
Rollover and Revision	3	16 July 2010	31 December 2017
Review	4	18 June 2015	31 December 2026
Rollover and Revision	5	25 January 2018	31 December 2026
Review	6	30 January 2025	N/A

Consent and Moderation Requirements (CMR) reference

0114

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.