40825 Prepare to work safely in an underground extractive operation

Kaupae | Level	2
Whiwhinga | Credit	6
Whāinga | Purpose	This skill standard provides workers with the essential knowledge and skills required to work safely underground before entering and working in an underground operation in the extractive industry. This skill standard covers health and safety requirements, use of self-rescuers and cap lamps, personal protective equipment (PPE), communication and emergency signalling systems, isolation of energy sources, navigation, emergency procedures, ventilation, gas hazards, and ground support awareness. This skill standard may be used in programmes leading to qualifications and micro-credentials at Level 4 or above in extractive operations.

Hua o te ako me Paearu aromatawai \| Learning outcomes and assessment criteria

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
1. Determine the requirements of health and safety legislation and regulations for working in an underground operation.	a. Identify health and safety requirements and their application to underground work.
	b. Explain the responsibilities of employers and employees as stated in the Health and Safety at Work Act (2015).
	c. Define the term "reasonably practicable" in the context of underground operations.

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
2. Use a self-rescuer, cap lamp, and personal protective equipment (PPE) correctly for underground operations.	a. Describe the components and function of each piece of a self-rescuer.
	b. Identify time limitations and factors that may impact its effectiveness and duration.
	c. Complete checks to assess the condition of a self-rescuer identifying defects, rejection and replacement to maintain readiness and compliance.
	d. Demonstrate the donning and operation of each component of a self-rescuer.
	e. Demonstrate the removal and relevant changeover of a self-rescuer.
	f. Check and prepare a cap lamp prior to use to ensure operational readiness.
	g. Identify potential risks associated with cap lamp use.
	h. Demonstrate the donning and use of a cap lamp.
	i. Describe the function of items of PPE for underground operations.
	j. Identify PPE requirements for different roles.
	k. Describe PPE options relevant to environmental, situational, and communication needs.
	l. Demonstrate the donning of role-appropriate PPE.
3. Isolate energy systems safely in underground operations.	a. Describe the purpose and use of energy supply systems.
	b. Describe the safety considerations and potential risks of different types of energy used.
	c. Describe safety measures and equipment used to manage energy supply.
	d. Isolate of energy systems safely, including lockout and test-out procedures.

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
4. Determine personnel security, personnel accounting, navigation, and emergency procedures in an underground operation.	a. Identify personnel security systems used to ensure safety.
	b. Describe personnel accounting systems.
	c. Describe communication and emergency signalling systems and their applications
	d. Describe emergency procedures when working in an underground operation.
	e. Use an underground plan to navigate within an underground operation.
5. Identify gases and their associated hazards and describe ventilation principles and practices in an underground operation.	a. Describe the natural composition of air in underground operations.
	b. Identify causes of oxygen reduction in underground atmospheres.
	c. Describe the properties of gases related to flammability, density, and toxicity.
	d. Identify gas testing systems and describe appropriate responses to gas detection.
	e. Describe the purpose of ventilation.
	f. Describe methods of air distribution for a healthy and safe working environment.
	g. Describe the purpose and use of ventilation control devices (VCDs).
6. Identify unsupported and poorly supported ground and appropriate actions to maintain safety and stability in underground operations.	a. Describe the risks of unsupported and poorly supported ground.
	b. Identify indicators of unsupported and poorly supported ground.
	c. Describe appropriate actions to take when encountering unsupported ground.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

Skills must be demonstrated in the workplace or simulated environment that reflects workplace conditions and contingencies.

All tasks must be carried out in accordance with industry good practices and company procedures where appropriate.

Evidence presented for assessment against this skill standard may include oral, visual, video, written and/or practical activities demonstrated in the workplace.

Definitions:

Company procedures mean the documented methods for performing work activities and include health and safety, operational, environmental, and quality management requirements. They may refer to legislation, regulations, guidelines, standard operating procedures, manuals, codes of practice, or policy statements.

Industry good practice may be documented in management plans, control plans, company procedures, managers' rules, occupational health and safety policy, industry guidelines, codes of practice, manufacturers' instructions, and safe working and/or job procedures (or equivalent).

Underground operation includes extractive or tunnelling operations.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content

Duties of employers (mine operator), duties of employees (workers), accident procedures, hazard identification, approved codes of practice, offences and penalties, High Hazards Unit (HHU) inspectors, regulations, fitness for work, in the workplace.

Factors affecting self-rescuer effectiveness, such as stress levels, smoking habits, personal health conditions, and fitness levels.

Pre-use checks for self-rescuers and defect reporting.

Pre-use checks of cap lamps, such as battery fully charged, bulbs, seals, glass, leaks, switch, cable, glands, battery casing, battery condition, and process for reporting defects.

Risks associated with cap lamp use, such as battery overheating and failure, electrical hazards, faulty wiring, chemical leaks, dismantling, ignition of gases, improper fit, and storage.

PPE such as clothing, Hi-Viz, reflective strips, footwear, hearing protection, eye protection, hard hat, gloves, lamp belt/backpacks, and dust protection.

PPE selection for different underground roles, such as electricians and mechanical trades.

Communication and emergency signalling systems such as radios (two-way), phones, Wifi, Tag systems, hand signals, Underground intercom, strobe lights, alarms, stench gas, cap lamps, oncoming vehicles, laser barriers, barriers and signage, cage signals, and lines.

Energy systems such as internal combustion engine compressed air, electricity, hydraulic fluid, and high-pressure water.

Isolation of energy supplied, such as lockout/tagout and de-energisation procedures.

Personnel security and accounting systems such as contraband, restricted zones, restricted materials, drug and alcohol testing and declarations, and Fitness for Work.

Underground navigation and emergency procedures such as work areas, safe areas, escape routes, refuge chambers, and restricted areas.

Purpose of ventilation systems such as dilute and remove dust, dilute and remove unwanted gases, provide cooling, provide oxygen, dilute DPM (diesel particulate matter), and recirculate.

Ventilation control devices, stoppings/seals, fans, air intake, return airflow.

Gases such as methane, carbon dioxide, carbon monoxide, nitrogen oxides, oxygen, hydrogen sulphide, hydrogen, sulphur dioxide.

Signs of unsupported ground and safety measures such as cracks, loose rocks, abnormal ground movement, vibration, and noise.

Actions for unsupported and poorly supported ground such as mark hazardous area, exclusion zones, alternate route, evacuation, reporting.

Rauemi | Resources

Legislation, regulations and/or industry standards

- Health and Safety at Work Act 2015 (HSW Act); https://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html.
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016; https://www.legislation.govt.nz/regulation/public/2016/0013/latest/dlm6727530.html.
- Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016; https://www.legislation.govt.nz/regulation/public/2016/0016/latest/dlm6314002.html.
- Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016; https://www.legislation.govt.nz/regulation/public/2016/0017/latest/DLM6732829.html.
- Approved codes of practice issued pursuant to the HSW Act.

Where any Acts, regulations, standards, codes of practice, guidelines, or authority requirements and conditions cited in this skill standard are amended, replaced, or superseded during the lifetime of the standard, the current versions shall apply for assessment purposes until this skill standard is formally reviewed.

Pārongo Whakaū Kounga | Quality assurance information

Ngā rōpū whakatau-paerewa | Standard Setting Body	Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council
Whakaritenga Rārangi Paetae Aromatawai | DASS classification	Engineering and Technology > Extractive Industries > Underground Extraction
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga | CMR	0014

Hātepe | Process	**Putanga** | Version	**Rā whakaputa** | Review Date	**Rā whakamutunga mō te aromatawai** | Last date for assessment
Rēhitatanga | Registration	1	25 September 2025	N/A
Kōrero whakakapinga | Replacement information	This skill standard replaced unit standard 7146.		
Rā arotake | Planned review date	31 December 2030		

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