

**Field      Engineering and Technology****Review of *Extractive Industries* and *Metalliferous Mining* unit standards**

<b>Subfield</b>	<b>Domain</b>	<b>ID</b>
Metalliferous Mining	Metalliferous Mining - Operations	24470, 24473
	Metalliferous Mining - Processing	24474-24476, 24478-24485, 24487, 26750-26759
Extractive Industries	Extractive Industries Management	7143, 7144, 8899, 15658, 16686, 16687, 17691, 17692, 17693, 17695, 17744, 21151, 23545, 23550, 23648, 25876-25884, 26855, 26856
	Surface Extraction	8897, 8902, 8904, 8905, 8909, 8911, 8916, 8917, 15663-15665, 15667, 16694, 16695, 17992, 21153-21156, 22341, 22342, 22344-22346, 27238-27242
	Underground Extraction	7145, 7146, 7151, 7160, 13358, 15662, 15666, 17705, 21278-21281, 21629, 21661, 21663, 21813-21822, 21824, 22057

NZ Motor Industry Training Organisation (MITO) has completed the review of the unit standards listed above.

**Date new versions published**

**18 June 2015**

**Planned review date**

**31 December 2019**

**Summary**

MITO's Extractives Governance Group and Working Groups, which include elected representation from industry and Tertiary Education Organisations, considered the content of these unit standards in conjunction with the development of new New Zealand qualifications for Extractives. The review also considered recommendations by the recently appointed New Zealand Mining Board of Examiners. The Board of Examiners advises the WorkSafe board about the health and safety competency requirements for workers in the extractives industry – a key recommendation of the Royal Commission on the Pike River Tragedy. These competency requirements include standards from the *Extractives Industries* subfield.

The review of these standards has resulted in updated outcomes and evidence requirements that reflect current industry practice. The review has also re-aligned the levels to ensure they reflect the NZQF level descriptors, and to ensure they will accord rationally with the Graduate Profile Outcomes in the New Zealand qualifications.

The Governance Group has endorsed the changes made to the standards.

## Main changes

- Standards from the *Metalliferous Mining – Processing* domain were moved to the *Extractive Industries Management* domain so that they can be used by more than one sector.
- Standards 8897, 8898, and 8911 from the *Surface Extraction* domain were designated expiring and replaced by standard 28794 in the *Extractive Industries Management* domain.
- Standards 8902, 8922, 17992, and 21156 were moved from the *Surface Extraction* domain to the *Extractive Industries Management* domain.
- Standards 24470 and 24473 were moved from the *Metalliferous Mining – Operations* domain to the *Extractive Industries Management* domain.
- The level for 12 standards were changed to better align with the NZQF level descriptors.
- The credit value of 33 standards was amended.
- Five standards were designated expiring.
- Four standards were replaced.
- Nine new standards were developed.
- Purpose statements, entry requirements, explanatory notes, outcomes, evidence requirements, and range statements were updated to ensure they are fit for purpose and to ensure clarity for users.
- The titles of standards were amended to reflect changes made.

The last date for assessment of superseded versions of these standards is 31 December 2017. Results will not be accepted where the assessment date is after the last date for assessment of the superseded version of the standard.

## Category C and D unit standards will expire at the end of December 2017

### Impact on existing organisations with consent to assess

Current consent for			Consent extended to		
Nature of consent	Classification or ID	Level	Nature of consent	Classification or ID	Level
Domain	Surface Extraction	Any	Standard	8922	2
			Standard	28794	3
		4	Standards	8902, 17992	5
		5	Standard	21156	5
Domain	Extractive Industries Management	4	Standard	15658, 28983	5

### Detailed list of unit standards – classification, title, level, and credits

All changes are in **bold**.

Key to review category	
<b>A</b>	Dates changed, but no other changes are made - the new version of the standard carries the same ID and a new version number
<b>B</b>	Changes made, but the overall outcome remains the same - the new version of the standard carries the same ID and a new version number
<b>C</b>	Major changes that necessitate the registration of a replacement standard with a new ID
<b>D</b>	Standard will expire and not be replaced

Engineering and Technology> Extractive Industries> Surface Extraction  
**Engineering and Technology> Extractive Industries> Extractive Industries Management**

ID	Title	Level	Credit	Review Category
8897	Adjust jaws on crushing plant for extractive industries	3	10	C
8898	Adjust cone crusher on crushing plant for extractive industries	3	10	C
8911	Operate a static primary crushing plant	2	12	C
<b>28794</b>	<b>Operate crushers at an extractive site</b>	<b>3</b>	<b>8</b>	
8902	Prepare and implement safety plans for surface face and benching operations	4	4	B
	<b>Prepare a safety inspection plan for extractive operations</b>	<b>5</b>		
8922	Conduct safety checks prior to equipment usage at an extractives site	2	2	B
	<b>Conduct safety checks before and after equipment use at an extractive site</b>			
17992	Select, design, maintain, and manage stockpiles at an extraction site	4	15	B
	<b>Select, design, maintain, and manage stockpiles at an extractive site</b>	<b>5</b>		
21156	Plan, implement, and describe surface extraction production to minimise environmental impacts	5	15	B
	<b>Demonstrate knowledge of planning and managing extraction to minimise environmental impacts</b>			

Engineering and Technology> Metalliferous Mining > Metalliferous Mining – Operations  
**Engineering and Technology> Extractive Industries> Extractive Industries Management**

24470	Assess ground conditions in a metalliferous mine	3	4	B
	<b>Assess ground conditions at an extractive site</b>			
24473	Respond to local emergencies and incidents in a metalliferous mine	3	5	B
	<b>Respond to local emergencies and incidents at an extractive site</b>	<b>4</b>		

Engineering and Technology> Extractive Industries> Extractive Industries Management

ID	Title	Level	Credit	Review Category
7143	Inspect and report on extractive site and operations	5	10	B
	<b>Inspect and report on safety and operations at an extractive site</b>			
7144	Review and implement plans for ongoing operations of an extractive site	5	15	B
	<b>Review plans and recommend changes for ongoing operations at an extractive site</b>			

ID	Title	Level	Credit	Review Category
8899	Plan storage for product processed at extractive sites <b>Operate and maintain stockpile storage for product processed at extractive sites</b>	4	8	B
15658	Select excavation and transportation plant for surface extraction <b>Demonstrate knowledge of the selection of excavation and transportation plant and equipment for surface extraction</b>	4 5	8	B
16686	Conduct an incident investigation at an extraction site <b>Conduct an incident investigation at an extractive site</b>	5	8	B
16687	Demonstrate knowledge of hazardous substances at an extractive site	3 4	3 5	B
17691	Use mathematics to solve problems in an extractive industries workplace	4	15	B
17692	Use advanced mathematics to solve problems in an extractive industries workplace	5	15	B
17693	Explain and determine water flow, select pumps, and structures for an extraction site <b>Explain and determine water flow, and describe the selection of pumps and structures for an extractive site</b>	6	20	B
17695	Attach, lift, move, and place loads using mobile plant	3	10	B
17744	Read and interpret an underground extractive site plan <b>Read and interpret an extractive site plan</b>	4	5	B
21151	Demonstrate knowledge of planning rehabilitation operations of an extractives site <b>Demonstrate knowledge of planning rehabilitation operations for an extractive site</b>	6	15	B
23545	Investigate and analyse mine incidents <b>Investigate and analyse extractive site incidents</b>	7 6	20	B
23550	Manage the mine ventilation system at an extractive site	7	30	B
23648	Demonstrate knowledge of and follow safe working practices at an extractive site	3	5	B
25876	Describe the effects of an extractives site on the environment and related requirements and responsibilities <b>Describe the effects of an extractive site on the environment and related requirements and responsibilities</b>	3	4	B

ID	Title	Level	Credit	Review Category
25877	Demonstrate knowledge of the environmental effects of a specific extractives site and related legislative requirements <b>Demonstrate knowledge of the environmental effects of a specific extractive site and related legislative requirements</b>	5	6	B
25878	Demonstrate knowledge of crushing and screening plant for extractive industries	4 3	15 3	B
25879	Select crushing and screening plant and describe the selection criteria for screens for extractive industries <b>Select crushing and screening plant for extractive industries</b>	5	10	B
25880	Use simple maths to solve extractives related problems	2	4	B
25881	Operate conveyors at an extractives site <b>Operate conveyors at an extractive site</b>	3	5	B
25882	Inspect and maintain conveyors at an extractives site <b>Inspect and maintain conveyors at an extractive site</b>	4	8	B
25883	Operate screens at an extractives site <b>Operate screens at an extractive site</b>	3	3	B
25884	Inspect and maintain screens at an extractives site <b>Inspect and maintain screens at an extractive site</b>	4	3	B
26855	Analyse Human Factors present in workplace practices to determine how they contribute to incidents at an extractive site <b>Analyse Human Factors present in workplace practices at an extractive site</b>	5 4	10	B
26856	Carry out the risk management processes at an extractive site	4	10	C
28983	<b>Carry out the risk management process at an extractive site</b>	5	10	
28792	<b>Demonstrate and apply knowledge of requirements and procedures to minimise environmental impact at an extractive site</b>	4	4	New
28793	<b>Conduct safety inspections for extractive operations</b>	4	4	New
28795	<b>Inspect and maintain crushers at an extractive site</b>	4	8	New
28796	<b>Demonstrate knowledge of a social licence to operate for an extractive site</b>	5	3	New
28982	<b>Develop standard operating procedures for an extractive site</b>	5	5	New

ID	Title	Level	Credit	Review Category
8904	Produce product using a mobile crushing plant	4	25 10	B
8905	Construct and maintain access roads within surface extraction sites <b>Demonstrate knowledge of construction and maintenance of roads within a surface extraction site</b>	3	3 5	B
8909	Maintain working surfaces at surface extraction sites <b>Demonstrate knowledge of the maintenance of working surfaces at a surface extraction site</b>	2	2	B
8916	Operate secondary and tertiary crushing plant	4	25 15	B
8917	Operate haul trucks safely for surface work at an extractive site	3	12 6	B
14960	Describe and operate a ladle carrier at a slag extraction site	3	20	D
14961	Describe and operate a dock truck at a slag extraction site	3	20	D
14962	Describe and operate a coil fork at a slag extraction site	3	20	D
15663	Design and maintain stockpiles and sloping surfaces in surface excavations and stockpiles <b>Demonstrate knowledge of the design and maintenance of stockpiles and sloping surfaces at surface extraction sites</b>	6	20	B
15664	Demonstrate knowledge of the geological nature of surface extraction sites <b>Demonstrate introductory knowledge of geology at surface extraction sites</b>	3	5	B
15665	Demonstrate knowledge of the geology of surface extraction	4	5	B
15667	Demonstrate knowledge of extraction methods and the effects of geological features on these methods <b>Demonstrate knowledge of surface extraction methods and the effects of geological features on these methods</b>	5	10	B
16694	Control quality of aggregate produced by mobile and static plant <b>Control quality of product from operation of mobile and static sizing plant</b>	3 4	4	B
16695	Create a safety management system document for an extractive site	5	3	D
21153	Demonstrate and apply knowledge of dewatering, pump maintenance, and cleaning settling ponds at extraction sites <b>Demonstrate and apply knowledge of dewatering, pump maintenance, and settling ponds at an extractive site</b>	3	12 5	B

ID	Title	Level	Credit	Review Category
21154	Demonstrate and apply knowledge of procedures to minimise environmental impact at an extraction site	5	7	D
21156	<i>Demonstrate knowledge of planning and managing surface extraction to minimise environmental impacts (Recommended alternative standard)</i>	5	15	
21155	Review consent conditions and demonstrate knowledge of the use of water at surface extraction sites	3	10	B
	<b>Demonstrate and apply knowledge of the use of water at a surface extraction site</b>	4	7	
22341	Operate a wheeled dozer safely for surface work at an extractive site	3	15 8	B
22342	Operate a track type tractor safely for surface work at an extractive site	3	20 10	B
22344	Describe, prepare, and operate recovery equipment at an extractive site	3	20 10	B
22345	Operate an articulated dump truck safely for surface work at an extractive site	3	15 8	B
22346	Operate a water truck safely for surface work at an extractive site	3	12 6	B
27238	Operate a wheeled loader safely for surface work at an extractive site	3	15 8	B
27239	Operate an excavator safely for surface work at an extractive site	3	15 8	B
27240	Operate a mechanical rockbreaker safely for surface work at an extractive site	3	12 6	B
27241	Operate a motor grader safely for surface work at an extractive site	3	20 10	B
27242	Operate an excavator at the face safely for surface work at an extractive site	3	10 5	B
28797	<b>Review consent conditions and describe how to prepare a water management plan for a surface extraction site</b>	5	10	New

## Engineering and Technology &gt; Extractive Industries &gt; Underground Extraction

ID	Title	Level	Credit	Review Category
7145	Design, establish, and maintain effective ventilation systems for an underground mine <b>Design and maintain effective ventilation systems for an underground operation</b>	5	20	B
7146	Demonstrate basic knowledge and ability required to work in an underground mine <b>Demonstrate basic knowledge and ability required to work in an underground operation</b>	2	6	B
7151	Operate a load haul dump machine with attachments in an underground mine <b>Operate a load haul dump machine with attachments in an underground operation</b>	3	20 10	B

ID	Title	Level	Credit	Review Category
7160	Describe and operate a feeder breaker in an underground extractive site <b>Describe and operate a feeder breaker in an underground operation</b>	3	15 5	B
13358	Describe and operate a longhole drill for underground extraction <b>Describe and operate a longhole drill in an underground operation</b>	4	12 10	B
15662	Evaluate ground conditions and design support methods for underground mines and tunnels <b>Evaluate ground conditions and demonstrate knowledge of design of support methods for underground operations</b>	6	20 15	B
15666	Demonstrate knowledge of geology for underground extraction	4 5	10	B
17705	Describe, develop, and maintain basic ventilation systems for an underground mine or tunnel <b>Describe, develop, and maintain basic ventilation systems for an underground operation</b>	4	15	B
21278	Describe, install, and reassess support systems for an underground mine	4	15	B
21279	Describe mobile machines and operate a mobile machine in an underground extractive site <b>Describe mobile machines and operate a mobile machine in an underground operation</b>	3	20 10	B
21280	Demonstrate knowledge of and design an effective ventilation system in an underground mine <b>Demonstrate knowledge and evaluate the design of an effective ventilation system in an underground mine</b>	6	20	B
21281	Interpret and test for gases in an underground extraction site	4	15	B
21629	Evaluate and implement plans to manage old workings and inundations in underground sites <b>Evaluate plans to manage old workings and inundations in underground sites</b>	5	10	B
21661	Demonstrate knowledge of the use of electrical reticulation plant and equipment in underground mines <b>Demonstrate knowledge of the use of electrical reticulation plant and equipment in underground operations</b>	4	10 7	B
21663	Describe and operate pipejacking and microtunnelling equipment in an underground mine <b>Describe and operate pipejacking and microtunnelling equipment in an underground operation</b>	4	20	B
21813	Describe and operate a continuous miner to cut and extract in an underground mine	4	35 20	B

ID	Title	Level	Credit	Review Category
21814	Describe and operate a powered mobile drill rig to drill a blast pattern in an underground mine <b>Describe and operate a powered mobile drill rig to drill a blast pattern in an underground operation</b>	4	10	B
21815	Install roof and side supports using a powered mobile drill rig in an underground mine <b>Install roof and side supports using a powered mobile drill rig in an underground operation</b>	4	10 6	B
21816	Describe and operate a diesel haul truck in an underground mine <b>Describe and operate a diesel haul truck in an underground operation</b>	3	20 10	B
21817	Describe and operate a hand held drill borer to drill to blast in an underground mine <b>Describe and operate a hand held drill borer to drill to blast in an underground operation</b>	4	10 5	B
21818	Describe, drill, and install support systems with a hand held drill borer in an underground mine <b>Describe, drill, and install support systems with a hand-held drill borer in an underground operation</b>	4	10	B
21819	Describe and operate a shuttle car in an underground mine <b>Describe and operate a shuttle car in an underground operation</b>	3	20 10	B
21820	Describe and operate an hydromonitor in an underground mine <b>Describe and operate a hydromonitor in an underground mine</b>	4	20 15	B
21821	Supply, maintain, deliver, and store services for an underground mine <b>Maintain and install services for an underground operation</b>	3	15	B
21822	Position, set up, and maintain services for hydromonitor sub-levels in an underground mine	4	15 8	B
21824	Describe and operate a roadheader to cut and extract in an underground mine <b>Describe and operate a roadheader to cut and extract in an underground operation</b>	4	35 20	B
22057	Demonstrate knowledge of fluid power systems used in underground mines and tunnels <b>Demonstrate knowledge of pneumatic and hydraulic power systems used in underground operations</b>	4	10 7	B
28798	<b>Demonstrate introductory knowledge of ground support and geology at an underground operation</b>	3	5	New

ID	Title	Level	Credit	Review Category
28799	<b>Demonstrate introductory knowledge of mining methods and equipment for underground operations</b>	3	3	New

Engineering and Technology> Metalliferous Mining> Metalliferous Mining – Processing  
**Engineering and Technology> Extractive Industries> Extractive Industries Management**

ID	Title	Level	Credit	Review Category
24474	Handle reagents for transportation, storage, mixing and usage in a metalliferous mine <b>Handle reagents for transportation, storage, mixing, and use at an extractive site</b>	2	5	B
24475	Operate heat exchangers that form part of a heating, cooling or refrigeration system in a metalliferous mine <b>Operate heat exchangers that form part of a heating, cooling, or refrigeration system at an extractive site</b>	2	3	B
24476	Operate raw material feed systems in a metalliferous mine <b>Operate raw material feed systems at an extractive site</b>	2	4	B
24478	Prepare for metal casting, and cast ingots, in a metalliferous mine <b>Cast ingots at an extractive site</b>	3	3	B
24479	Conduct calcinations activities in a metalliferous mine <b>Conduct calcinations activities at an extractive site</b>	3	2	B
24480	Conduct electrowinning/electrorefining operations in a metalliferous mine <b>Conduct electrowinning/electro-refining operations at an extractive site</b>	3	5	B
24481	Conduct elution processes in a metalliferous mine <b>Conduct elution processes at an extractive site</b>	3	10	B
24482	Conduct gold room operations in a metalliferous mine <b>Conduct gold room operations at an extractive site</b>	3	10	B
24483	Conduct leaching process in a metalliferous mine <b>Conduct leaching process at an extractive site</b>	3	15	B
24484	Conduct milling/grinding in a metalliferous mine <b>Conduct milling/grinding at an extractive site</b>	3	15	B
24485	Conduct thickening and clarifying process in a metalliferous mine <b>Conduct thickening and clarifying process at an extractive site</b>	3	7	B
24487	Operate furnaces in a metalliferous mine <b>Operate furnaces at an extractive site</b>	3	3	B

ID	Title	Level	Credit	Review Category
26750	Operate programmed logic control systems in a metalliferous mine <b>Operate programmable logic control systems at an extractive site</b>	2	4	B
26751	Control acid plant operations in a metalliferous mine <b>Control operations in acid plant at an extractive site</b>	2 3	3	B
26752	Handle, store and use cyanide in a metalliferous mine <b>Handle, store, and use cyanide at an extractive site</b>	2	5	B
26753	Treat and dispose of rejects and tailings in a metalliferous mine <b>Treat and dispose of rejects and tailings at an extractive site</b>	2	2	B
26754	Distribute tailings in a metalliferous mine <b>Distribute tailings at an extractive site</b>	2	2	B
26755	Monitor tailings dam environment in a metalliferous mine <b>Monitor tailings dam environment at an extractive site</b>	2	2	B
26756	Conduct filtering process in a metalliferous mine <b>Conduct filtering process at an extractive site</b>	3	10	B
26757	Conduct pressure oxidation in a metalliferous mine <b>Conduct pressure oxidation at an extractive site</b>	3	15	B
26758	Conduct flotation process in a metalliferous mine <b>Conduct flotation process at an extractive site</b>	3	15	B
26759	Supervise processing operations in a metalliferous mine <b>Supervise processing operations at an extractive site</b>	5	10	B