



National Competency Standards for “Assistant Supervisor in Mining Process Technology”



**National Competency Standards
For
“Level-4 Mining Process Technology”**



**National Vocational and Technical Training Commission (NAVTTTC),
Government of Pakistan**



National Competency Standards for “Assistant Supervisor in Mining Process Technology”



ACKNOWLEDGEMENT

National Vocational and Technical Training Commission (NAVTTC) extends its gratitude and appreciation to representatives of business, industry, academia, government agencies, provincial TEVTAs, sector skill councils and trade associations who spared time and extended their expertise for the development of National Vocational Qualifications for the trade of **Mining Process Technology**. This work would not have been possible without the technical support of the above personnel.

NAVTTC initiated development of CBT&A based qualifications for 200 traditional / hi-tech trades under the Prime **Minister’s Hunarmand Pakistan Program**, focusing on Development & Standardization of 200 Technical & Vocational Education & Training (TVET) Qualifications. NAVTTC efforts have received full support from the Ministry of Federal Education and Professional Training, which highly facilitated progress under this initiative.

It may not be out of place to mention here that all the experts of Industry, Academia, VET TEVTAs, BTEs and PVTC work diligently for making this qualification worthy and error free for which all credit goes to them. However, NAVTTC accepts the responsibility of all the errors and omissions still prevailing in the qualification document.

Development of Skill Standards is a dynamic and ongoing process, and the developed skill standards need periodic review and updating owing to the constant technological advancements, development in scientific knowledge, and growing experience of implementation at the grass root level as well as the demand of industry. NAVTTC will ensure to keep the qualifications abreast with the changing demands of both national and international job markets.

**Executive Director,
NAVTTC**



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1. Introduction

Mining technology is extraction of valuable minerals ores like Manganese, tantalum, Cassiterite, copper, tin, nickel, bauxite, iron, gold, silver, and diamonds or other geological materials from the surface or under the earth. Usually these ore bodies in the form of lode, vein, seam, reef, or placer deposit. In other words, industrial activity removes rock from the Earth's crust and processes it to remove valuable minerals for us to use. This technology in a wider sense also includes extraction of any non-renewable resource such as petroleum, natural gas, or even water.

Primarily, there are two types of mining methods being used for the extraction of minerals and ores; surface/opencast mining and underground mining. The choice of method is largely determined by factors such as depth, geology of the mineral deposit and the cost of equipment. When evaluating mineral deposits, it is extremely important to keep profit in mind. The total quantity of mineral in a given deposit is referred to as the mineral inventory, but only that quantity that can be mined at a profit is termed ore reserves.

The overall sequence of activities in modern mining is often compared with the five stages in the life of a mine: prospecting, exploration, development, exploitation, and reclamation. In the first Prospecting stage; geophysical, geochemical procedures, Location of favourable loci (maps, literature, and old mines), Air source/aerial photography, airborne geophysics, satellite, Surface/ground geophysics, geology and Spot anomaly is evaluated. Exploration (Ore body); Sample (drilling or excavation), assay, testing analysis, Estimation tonnage and grade, Value deposit: present value, income cost, Feasibility study: make decision to abandon or develop. Development (Prospect); Acquire mining rights (purchase or lease), File environmental impact statement, technology, assessment, permit, Construct access roads, transport system, Locate surface plant, construct facilities, Excavate deposit (strip or sink shaft). Exploitation (Mine); Factors in choice of methods like geologic, geographic, economic, environmental, societal safety, Types of mining methods. Surface: open pit, open cast, etc. Underground: room and pillar, block caving, etc. Monitor costs and economic payback. Reclamation (Real estate); Removal of plant and buildings. Reclamation of waste and tailings dumps, Monitoring of discharges

Being cognizant of this fact, National Vocational & Technical Training Commission (NAVTTC) developed competency standards for Mining and mineral technology training under National Vocational Qualifications Framework (NVQF). These competency standards have been developed by a Qualifications Development Committee (QDC) and validated by the Qualifications Validation Committee (QVC) having representation from the leading development in mining area of the country.



2. Purpose of the Qualification

The competency based NVQ has been developed to train the unskilled men and women of Pakistan on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by enhancing their livelihood income.

The purpose of these qualifications is to set professional standards for upcoming experts, who will serve as key elements enhancing quality of Pakistan’s manufacturing sector. The specific objectives of developing these qualifications are as under:

- Improve the professional competencies of individual in metallurgy and cast metal technology
- Capacitate the local community and trainers in modern CBT trainings, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in metallurgy and cast metal technology
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training in Pakistan
- Enabling the youth with greater employment opportunities



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3. Date of Validation

The level 4 Mining Process Technology qualification has been validated on 04 Oct to 08 Oct, 2021 at PITAC, Lahore, by the qualification validation committee (QVC) members.

4. Date of Review

The qualification shall be reviewed after 3 years.

5. Codes of Qualifications

Qualification Title	Code
National Vocational Certificate Level 4 in Mining Process Technology “ Assistant Supervisor ”	724MP14



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6. Members of Qualification Development Committee

The following members participated in the qualification development process at PITAC, Lahore.

Date: 13 to 17 August 2021

S#	Name	Designation
1.	Dr. Shahid Tufail Sheikh	Member Science, Ex-Head of MPRC Lahore
2.	Dr. Farhat Yasmeen	Professor, UET Lahore
3.	Dr. Muhammad Naeem Khan	AP, Govt Science College Wahdat Road, Lahore
4.	Dr. Irfan Hafeez	Senior Scientific Officer, PCSIR Lahore
5.	Dr. Asma Sheikh	Scientific Officer, PCSIR Lahore
6.	Dr. Shafia Iftikhar	AP, University of Sahiwal
7.	Muhammad Irfan Zubair	Deputy Director GSP, Lahore
8.	Shahbaz Muhammad	Assistant geophysicist GSP, Lahore
9.	Hafiz Zeeshan Akram	Assistant Director GSP, Lahore
10.	Muhammad Shahzad	Director, NAVTTC, Islamabad
11.	Engr. Saba Sadiq	DACUM FACILITATOR, Islamabad



7. Members of Qualification Development Committee

The following members participated in the qualification development process at PITAC, Lahore. **Date: Oct 4th 2021 to oct 8th 2021**

S#	Name	Designation
1.	Aftab Hussain	DACUM Facilitator/ Principal P-TEVTA Rawalpindi
2.	Dr. Shahid Tufail Sheikh	Member Science, Ex-Head of MPRC Lahore
3.	Dr. Farhat Yasmeen	Professor, UET Lahore
4.	Dr. Muhammad Naeem Khan	AP, Govt Science College Wahdat Road, Lahore
5.	Dr. Irfan Hafeez	Senior Scientific Officer, PCSIR Lahore
6.	Engr. Shafaat Ali	Lecturer (Mining) GCT KharBajaur
7.	Engr. M. MuneeburRehman Khan	Measurement Engineer, ACC PVT Ltd
8.	ZeeshanMusadiq	Data Engineer/Mudlogger (Geologist) Petro Services
9.	Tariq Mehmoob	Incharge Operational Wing PBTE, Lahore
10.	Mr. Tahir Shah	Assistant Secretary TTB Peshawar
11.	Syed Mansoor Ahmed	Assistant Manager IT, NVQF Registry Incharge, SBTE Sindh

8. ENTRY REQUIREMENTS

For National Vocational Certificate Level-4 in Mining process Technology “Assistant Supervisor”, the entry requirement is Level-3 in Mining process Technology “Senior Technician” in formal institute. The entry in informal sector is not prescribed.

9. Regulation of the Qualification and schedule of units

Not applicable



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10. Summary of Competency Standards

Sr. No	Competency Standards	NVQ F Level	Category	Estimated Contact Hr.			Credit Hr.
				Th.	Pr.	Total	
Assistant supervisor in Mining Process Technology -LEVEL 4							
1.	Analyze with Workplace Policy and Procedures	4	Generic	12	18	30	3
2.	Perform Advance communication	4	Generic	20	30	50	5
3.	Establish and Maintain the Occupational Health and Safety System	4	Generic	20	30	50	5
4.	Maintain Professionalism in Workplace	4	Generic	14	66	80	8
5.	Operate Machines for Mining	4	Technical	31	99	130	13
6.	Perform Underground Mining Technique	4	Technical	26	114	140	14
7.	Perform Surface Mining Technique	4	Technical	26	114	140	14
8.	Install Ground Support	4	Technical	24	126	150	15
9.	Operate Underground Mining Machines	4	Technical	29	171	200	20
10.	Carryout Dredging Operations	4	Technical	29	171	200	20
11.	Perform Basic Green Skills for Mining	4	Generic	9	21	30	3
Total				240	960	1200	120



11. Details of Competency Standards

Level 4 – Assistant Supervisor in Mining Process

041700841A-Competency Standard: Analyze with Workplace Policy and Procedures

Overview: This unit describes the skills and knowledge required to implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Competency Unit	Performance Criteria
CU1. Manage work timeframes	<p>You must be able to:</p> <p>P1. Complete work tasks within deadlines in according to order of priority</p> <p>P2. Supervisors are informed of any delays in work times or projects</p>
CU2. Manage to convene meeting	<p>You must be able to:</p> <p>P1. Develop agenda in line with meeting purpose</p> <p>P2. Select participants and notify them accordingly</p> <p>P3. Carryout meeting arrangements according to the time</p> <p>P4. Record the minutes of the meeting</p>
CU3. Set and meet own work priorities at instant	<p>You must be able to:</p> <p>P1. Take initiative to prioritize and facilitate competing demands to achieve organizational goals and objectives</p> <p>P2. Use technology efficiently and effectively to manage work priorities and commitments</p> <p>P3. Maintain appropriate work-life balance</p>
CU4. Develop and maintain professional competence	<p>You must be able to:</p> <p>P1. Assess personal knowledge and skills against competency</p> <p>P2. Participate in networks to enhance personal knowledge, skills and work relationships</p> <p>P3. Seek feedback from employees, clients and colleagues to</p>



	develop and improve competence
CU5. Follow and implement work safety requirements	You must be able to: P1. Identify and report emergency incidents P2. Practice organizational policy and procedures for responding to emergency incidents P3. Identify and implement workplace procedures and work instructions for controlling risks

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- Healthy work life balance
- Meeting terminologies, structures and arrangements
- Relevant organizational procedures and policies regarding meetings, chairing and minutes.
- Barriers to implement policies and procedures in an organization and possible strategies to address them.

Tool & Equipment

- Note book
- Pen

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

1. A person who demonstrates competency in this unit must be able to provide evidence of the ability to understand workplace policy and procedures. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments



724CO10B-Competency Standard: Perform Advance Communication

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills used professionally. It covers plan and organise work and conduct trainings at workplace, along with demonstrating professional skills independently.

Competency Unit	Performance Criteria
CU1. Demonstrate basic communication skills	<p>You must be able to:</p> <p>P1. Demonstrate different modes of communication:</p> <ul style="list-style-type: none"> • Speaking • Reading • Writing • Listening <p>P2. Demonstrate presentation skills through multimedia etc</p> <p>P3. Develop CV according requirements</p> <p>P4. Develop interview skills according to job requirement</p>
CU2. Plan and Organize work	<p>You must be able to:</p> <p>P1. Identify task requirements.</p> <p>P2. Plan steps to complete tasks</p> <p>P3. Review planning and organizing process</p> <p>P4. Organize work as per task requirement</p>
CU3. Conduct Professional Activities Ethically	<p>You must be able to:</p> <p>P1. Identify the ethical problems</p> <p>P2. Identify affected parties and their interests</p> <p>P3. Evaluate each solution using the interest those involves</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Training skills
- Professional skills
- Advanced language skills
- Assessment and trainees feedback methods
- Direct and indirect communication methods
- The need of the training type at the work place

Tool & Equipment

- Note book
- Pen

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Develop CV
2. Prepare report on plan and organize work



724CO10C-Competency Standard: Establish and Maintain the Occupational Health and Safety System

Overview: This unit covers how to establish, maintain and evaluate an occupational health and safety system in the work environment.

Competency Unit	Performance Criteria
CU1. Carryout Risk assessment at workplace	You must be able to: P1. Identify potential hazards at workplace P2. Evaluate the risk P3. Take corrective/preventive action to mitigate the risk P4. Record your findings P5. Review the risk assessment
CU2. Follow emergency response protocol/procedure	You must be able to: P1. Identify emergency exits at workplace P2. Select suitable positions for the P3. Identify assembly area at workplace P4. Follow procedure and instructions to evacuate the building P5. Report immediately at designated assembly area in case of emergency
CU3. Perform safe storage and disposal of waste	You must be able to: P1. Identify different types of waste material P2. Identify types of containers to store the different types of waste material P3. Use required labels on storage containers P4. Store the waste materials according to standards P5. Identify types of waste bins P6. Dispose- off waste material according to the safety procedure
CU4. Maintain ergonomics condition at workplace	You must be able to: P1. Follow standard working posture/position at workplace P2. Follow standard procedure to provide sufficient light at workplace P3. Use ergonomic workstations to avoid muscle fatigue

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- Risk assessment at workplace
- Hazard identification
- Ergonomic working condition



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- Hierarchy of control (the preferred order of risk control measures from most to least preferred that is:
 - Elimination
 - Substitution
 - Engineering control
 - Administrative controls
 - And personal protective equipment)
- Types of emergencies at workplace
- Storage and disposal of hazardous material
- Emergency protocol/procedure for fire, hazardous chemical spills, major power failure and terrorism activity and nature disasters
- Current Safety principles and practices used at workplace

Tool & Equipment

- PPEs
- Note book
- Pen
- Safety sign board
- Different Barricades

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Perform risk assessment and hazard identification at the workplace
- Demonstrate safe disposal regarding given hazardous material



724MP14D-Maintain Professionalism in Workplace

Overview: This unit describes the skills and knowledge required to use advanced and specialized communication skills in the client-counselor relationship.

Competency Unit	Performance Criteria
CU.1 Respect Work Timeframes	You must be able to: P1. Demonstrate punctuality in meeting, set working hours and times. P2. Utilize working hours only for working and follow company regulations. P3. Complete work tasks within deadlines according to order of priority P4. Perform extra ordinary during working hours
CU.2 Maintain Personal Appearance and Hygiene	You must be able to: P1. Clean hair, body and nails regularly. P2. Wear suitable cloths for the workplace, and respect local and cultural contexts P3. Meet specific company dress code requirements P4. Keep smiling and have positive body language during working hours
CU.3 Maintain Adequate Distance with Colleagues and Clients	You must be able to: P1. Respect personal space of colleagues and clients with reference to local customs and cultural contexts. P2. Avoid cross transmission of infections (especially through respiration).
CU.4 Work in An Ethical Manner	You must be able to: P1. Follow company values/ethics codes of ethics and/or conduct, policies and guidelines. P2. Use company resources in accordance with company ethical standards. P3. Undertake work practices in compliance with company ethical standards, organizational policy and guidelines. P4. Instruct co-workers on ethical, lawful and reasonable directives. P5. Share Company values/practices with co-workers using appropriate behavior and language. P6. Report works incidents/situations and/or resolved in accordance with company protocol/guidelines.

Knowledge & Understanding



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The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Application of good manners and right conduct
- Basic practices for oral and personal hygiene
- Common products used for oral and personal hygiene
- Outline the company code of conduct/values
- Outline the Company regulations, performance and ethical standards
- Work responsibilities/job functions
- Communication skills
- Workplace hygiene standards

Tool & Equipment

- Note book
- Pen

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Prepare a report about professionalism in workplace



724MP14E-Operate Machines for Mining

Overview: This competency standard covers the skills and knowledge required to operate different surface mining machines.

Competency Units	Performance Criteria
CU1. Operate Shovel/Excavator	You must be able to: P1. Select appropriate type of equipment attachments P2. Carry out start-up, park and shut-down procedures P3. Operates equipment within recommended speed, engine capability and limitations P4. Dig and load material P5. Adjust load as per machine capacity P6. Adjust pushing speed and direction P7. Minimize spillage and contamination through digging and loading techniques P8. Conduct housekeeping activities
CU2. Operate Scraper	You must be able to: P1. Select appropriate type of equipment attachments P2. Carry out start-up, park and shut-down procedures P3. Operates equipment within recommended speed, engine capability and limitations P4. Scrape and load material P5. Adjust bowl, apron and ejector to ensure constant flow of material from bowl P6. Adjust pushing speed and direction P7. Conduct housekeeping activities
CU3. Conduct dozer operations	You must be able to: P1. Perform all safety and pre-operational visual checks P2. Carry out start-up, park and shut-down procedures P3. Operate equipment within recommended speed, engine capability and limitations



	<p>P4. Adjust equipment pushing speed and direction</p> <p>P5. Carry out ripping activities</p> <p>P6. Conduct housekeeping activities</p>
<p>CU4. Operate mining dumper operations</p>	<p>You must be able to:</p> <p>P1. Plan and prepare all necessary safety and emergency issues</p> <p>P2. Conduct machine pre-operational checks</p> <p>P3. Adjust engine power to ensure efficiency of truck movements and to minimise damage to the engine and gears</p> <p>P4. Synchronize engine power with gear selection ensuring smooth transition and operation within torque range</p> <p>P5. Operate dumper</p> <p>P6. Monitor road/traffic conditions constantly</p> <p>P7. Position vehicle at load and discharge points with a minimum of manoeuvre</p> <p>P8. Control dumper movements including the raising and lowering of the tray smoothly</p> <p>P9. Assess weight and distribution of load for type of material and size of vehicle</p> <p>P10. Discharge load on slope and/or over face at fill site</p> <p>P11. Dump/spread material evenly</p> <p>P12. Clear, lower and secure tray before resuming travel</p> <p>P13. Clear work area and dispose of or recycle materials</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- K1.** Surface mining machines
- K2.** Safety standards of operations
- K3.** Manuals for driving instructions
- K4.** Site and equipment safety requirements
- K5.** Materials Safety Data Sheets and materials handling methods

Tool & Equipment

- Tool kit
- Excavator
- Dump truck
- Dozer



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- Scraper
- Safety signs
- PPE

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Operate Shovel/Excavator
- Operate mining dumper operations
- Conduct dozer operations
- Operate scraper



724MP14F-Perform Underground Mining Technique

Overview: This competency standard covers the skills and knowledge required to perform Room and pillar, long wall method for underground mining.

Competency Units	Performance Criteria
CU.1 Perform Room and Pillar Method	You must be able to: P1. Conduct rock face preparation for underground mining P2. Use room and pillar mining method in coal, salt and large ore deposits P3. Identify horizontal plane P4. Create horizontal arrays of rooms and pillar P5. Cut a slot as deep as possible along the bottom of a section of ore P6. Create a pile of ore that is loaded and hauled out of the mine P7. Retreat the mining P8. Maintain all post operation activities
CU.2 Perform Long Wall Method	You must be able to: P1. Recognize the limits of long wall mining P2. Fix hydraulic supports P3. Identify the distance for mining P4. Maintain all post operation activities

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of :

- K1.** Room and pillar method
- K2.** Long wall method

Tool & Equipment

- Drill
- Explosive material
- Long wall shearer
- Conveyor belt



- Continues miner
- Hydraulic supports

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Perform different under mining techniques
 - ✓ Room and pillar method
 - ✓ Long wall method



724MP14G- Perform Surface Mining Technique

Overview: This competency standard covers the skills and knowledge required to perform surface mining techniques

Competency Units	Performance Criteria
CU1. Perform Open Pit Mining	You must be able to: P1. Conduct rock face preparation for open pit mining P2. Carry out drill holes for core sampling of ore P3. Generate the Isopach map of ore body P4. Remove top soil and create benches to assess the ore body P5. Carry out drilling and blasting process for extraction of ore P6. Load and transport the required material
CU2. Perform Strip Mining	You must be able to: P1. Remove a long strip of overlying soil and overburden rock P2. Carry out drill holes P3. Collect the core samples of ore deposit P4. Generate the Isopach map of ore body P5. Remove top soil P6. Carry out drilling and blasting process P7. Load and transport the required material
CU3. Perform Placer Mining	You must be able to: P1. Collect the sample as per required procedure P2. Apply the following methods for up gradation of ore a. Panning b. Rocker box c. Sluice box d. Dry washing e. Trommel (Optional)

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of:



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- K3.** Importance of pit mining
- K4.** Bench formation
- K5.** Ore identification
- K6.** Understand how to perform placer mining method

Tool & Equipment

- Drilling machine
- Explosive material
- Excavator
- Dozer
- Dumpers
- Jackhammer
- Pan
- Rocker box
- Sluice box
- Trommel (Optional)

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Perform different surface mining techniques
 - ✓ Open pit mining
 - ✓ Strip mining
 - ✓ Placer mining



724MP14H- Install Ground Support

Overview: This competency standard covers the skills and knowledge required to install ground support for mining excavation and transportation.

Competency Units	Performance Criteria
CU1. Prepare for Installation	<p>You must be able to:</p> <p>P1. Select & wear PPEs</p> <p>P2. Select ground support equipment</p> <p>P3. Remove all surface soils and vegetation</p> <p>P4. Scale down loose material</p> <p>P5. Position drill holes according to ground support plan</p>
CU2. Assemble and Install Ground Support	<p>You must be able to:</p> <p>P1. Assemble anchors to full depth</p> <p>P2. Drill holes to specified diameter and depth</p> <p>P3. Install and tension anchors and bolt to pattern and tensioning degree</p> <p>P4. Install water suppression devices minimizing water infiltration to ground supports</p> <p>P5. Check ground support periodically and adjusts stressing</p> <p>P6. Perform housekeeping activities</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of :

- K1.** De-watering procedures and characteristics
- K2.** Drilling procedures
- K3.** Ground support characteristics and applications

Tool & Equipment

- Water suppressing device
- Ancillary equipment (generators, pumps, lights, compressors, cleaning equipment, power tools, hand tools)
- Cutting implement
- Drill rigs



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- Lifting and handling equipment (winch, crane, block and tackles)

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Perform assembling and installation of ground support



724MP14I- Operate Underground Mining Machines

Overview: This competency standard covers the skills and knowledge required to operate underground mining machines.

Competency Units	Performance Criteria
CU1. Operate Mining Drill	You must be able to: P1. Select & wear PPEs P2. Select equipments P3. Carry out start-up, park and shut-down procedures P4. Adjust bowl, apron and ejector P5. Adjust pushing speed and direction P6. Operates equipment P7. Scrape and load material P8. Perform housekeeping activities
CU2. Operate Underground Loader	You must be able to: P1. Select & wear PPEs P2. Select equipments P3. Carry out start-up, park and shut-down procedures P4. Adjust bowl, apron and ejector P5. Adjust pushing speed and direction P6. Operates equipment P7. Scrape and load material P8. Perform housekeeping activities
CU3. Operate Crane Lift	You must be able to: P1. Select & wear PPEs P2. Select equipments P3. Carry out start-up, park and shut-down procedures P4. Adjust bowl, apron and ejector P5. Adjust pushing speed and direction P6. Operates equipment P7. Scrape and load material



	P8. Perform housekeeping activities
CU4. Operate Shotcrete Machine	<p>You must be able to:</p> <p>P1. Select & wear PPEs</p> <p>P2. Select equipments</p> <p>P3. Carry out start-up, park and shut-down procedures</p> <p>P4. Adjust bowl, apron and ejector</p> <p>P5. Adjust pushing speed and direction</p> <p>P6. Operates equipment</p> <p>P7. Scrape and load material</p> <p>P8. Perform housekeeping activities</p>
CU5. Operate Machines in Long Wall Mining	<p>You must be able to:</p> <p>P1. Select & wear PPEs</p> <p>P2. Select equipments</p> <p>P3. Carry out start-up, park and shut-down procedures</p> <p>P4. Adjust bowl, apron and ejector</p> <p>P5. Adjust pushing speed and direction</p> <p>P6. Operates equipment</p> <p>P7. Scrape and load material</p> <p>P8. Perform housekeeping activities</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of:

- K1.** Different Under mining machines its procedures
- K2.** Different parts of under mining machines

Tool & Equipment

- Mining drill
- Shotcrete machine
- Crane Lift
- Underground loader

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Operate different under mining machines



724MP14J-Carryout Dredging Operations

Overview: This competency standard covers the skills and knowledge required to evaluate dredging operations.

Competency Units	Performance Criteria
CU1. Dredge materials	<p>You must be able to:</p> <p>P1. Operate dredger on central-line P2. Adjust radius of swing P3. Monitor and adjusts dredge indicators P4. Adjust position of dredge using adequate float line P5. Cut out hard materials P6. Complete all required records and documentation</p>
CU2. Perform retreat	<p>You must be able to:</p> <p>P1. Get clearances from operational plant operators P2. Maintain dredge on center line at full swing limit P3. Adjust tonnage during the retreat P4. Adjust spuds and carriage way P5. Completes all required records and documentation</p>
CU3. Conduct Centre-line changes	<p>You must be able to:</p> <p>P1. Gain relevant clearances and visual checks before center-line change P2. Adjust cable line and float line P3. Align dredge with center line indicators P4. Maintain full swing and adjusts spuds and carriage way P5. Completes all required records and documentation</p>
CU4. Conduct anchor moves	<p>You must be able to:</p> <p>P1. Halt ladder swinging and maintains full feed P2. Pay out ample length of cable P3. Move anchors alternately, at a safe speed and to the required positions P4. Move anchor to minimize downtime</p>



	P5. Completes all required records and documentation
CU5. Conduct side-line cable replacement	You must be able to: P1. Lower auxiliary spud, raises ladder and flushes plant out before side-line cable is replaced P2. Remove existing cable from drum P3. Track new cable on drum P4. Move cable to batter using transportation method P5. Tension cable onto drum P6. Connect cable to anchor P7. Complete documentation as per given format
CU6. Conduct plant moves	You must be able to: P1. Conduct plant movement according to mine plan P2. Maintain adequate float line on pond, avoiding breakage or damage to float line P3. Complete documentation as per given format

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of:

- K1.** Dredging
- K2.** Dredging techniques
- K3.** Anchoring techniques

Tool & Equipment

- Dredging machine and equipment
- Attachments
- Tool kit

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Carry out dredging operations



724MP14K- Perform Basic Green Skills at Mining Site

Overview: This unit describes the performance outcomes, skills and knowledge required to perform basic green skills for mining. It will also allow you to manage sustainability of materials used at mining and waste at site. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Manage sustainability of materials used at crush plant	You must be able to: P1. Select sustainable raw materials as per requirement P2. Follow standard procedure to manage systems (waste, energy, water) P3. Perform impact quantification of used material at crush plant
CU2. Manage crush plant waste	You must be able to: P1. Identify various types of waste at site P2. Sort and categorize reusable waste P3. Dispose unusable waste as per set standards P4. Place reusable material at designated storage area P5. Transport waste material to designated place

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes knowledge of:

- Environmental degradation
- Types of raw materials at crush plant
- Types of waste
- Waste reduction techniques
- Concept of 6 R approach (Reduce, Reuse, Recycle, Repair, Renew, and Rethink)
- Reusable materials
- Recyclable materials
- Methods for disposal of unusable materials
- Just-in-time (JIT) approach Basic knowledge



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- Fill checklist of incorporating waste/reusable materials, wastage controls, and resources management as per instructions.
- Prepare impact assessment report of material used at site



COMPLETE LIST OF TOOLS AND EQUIPMENT

Sr. #	Description
1.	Computer system
2.	White board
3.	Printer
4.	Multimedia
5.	Safety Helmets
6.	Blankets
7.	Board of Safety instructions.
8.	Ear Plug
9.	Face mask
10.	Fire Buckets.
11.	Fire Extinguishers
12.	First aid Kit
13.	Hand gloves
14.	Hooks / Anchors
15.	Manufacturers Operation and Maintenance Manual & Video;
16.	Measuring Tape
17.	Multimeter
18.	Safety Apron
19.	Safety Belts
20.	Safety goggles



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21.	Safety harness
22.	Safety net
23.	Safety Shoes
24.	Long wall shearer
25.	Explosive material
26.	Slings
27.	Spatula
28.	Scraper
29.	Stretcher
30.	Various hand / power tools
31.	Scanner
32.	Dozer
33.	Dumpers
34.	Dump truck
35.	Excavator
36.	Drill rigs
37.	Drill
38.	Cameras
39.	Tool kit
40.	Conveyors
41.	Dredging machine and equipment
42.	Steel Rules



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43.	Tri Square
44.	Vernier Caliper
45.	Underground loader
46.	Crane Lift
47.	Shotcrete machine
48.	Mining drill
49.	Snap Gauge set
50.	Lifting and handling equipment (winch, crane, block and tackles)
51.	Set of Adjustable Wrench
52.	Set of Spanners (Open end, Ring)
53.	Pipe wrench
54.	L-key sets
55.	Nose pliers
56.	Grip pliers
57.	Cutting implement
58.	Ball peen Hammer
59.	Claw Hammer
60.	Ancillary equipment (generators, pumps, lights, compressors, cleaning equipment, power tools, hand tools)
61.	Water suppressing device
62.	Continuous miner
63.	Drilling machine



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64.	Hydraulic supports
65.	Jackhammer
66.	Pan
67.	Rocker box
68.	Sluice box
69.	Trommel (Optional)