3M Science. Applied to Life.™

Mining

3M ANZ
Vertical Markets Playbook

Phone: 1300 289 773 www.htch.com.au Email: 3M@htch.com.au

Introduction

The mining industry consists of extracting some valuable substance from the soil. Both the extraction and the separation will show process variations according to the technique, the extracted raw material and the desired valuable mineral as final product.

The purpose of this Sales Guide is to assist our sales professionals in finding, keeping and winning business in the underground and open-pit mining verticals.

Good luck!

Mining

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Vertical Markets Playbook

Mining Industry Overview

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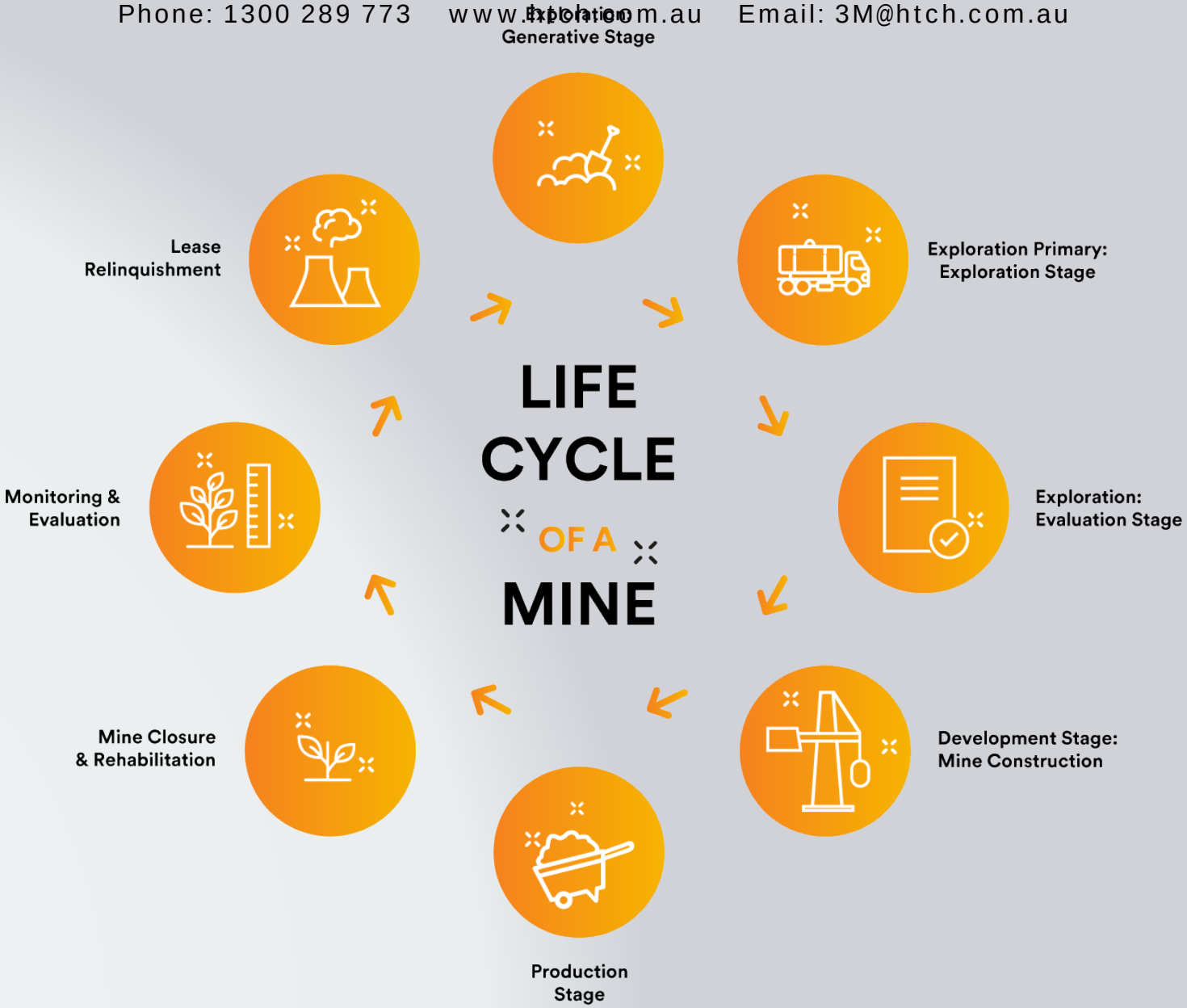

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Customer Profiles

Mining Companies		Mining Contractors
Companies that got the approval to mine. Its final product is the mineral		Companies contracted by the miners to carry out services that support the production operation
• Administration, extraction, processing and other core activities • Responsible for employee's safety and environment impacts	Core Activities	• Services related to construction, maintenance and others considered non core
• Safety for Safety companies • Follow very restricted and evolved local regulations	Regulation	• Safety for Compliance companies • Attend the local legislation is a challenge • Help them to understand the regulation can open business opportunities
• Most Common: Respiratory, Hearing, Head and Eye, road crashes, explosions and fall • Opening for discussions on more conceptual security issues and more technological solutions	Risks	• The contractors have the same risks of a Mining Company but, because of the nature of their work, they are more exposed in high risks activities such confined spaces and fall.
• Criteria: Regulation attainment, productivity, comfort. • PPE validation implemented in some customers	PPEs	• Search for equipment that complies with the legislation • Low PPE validation on these companies

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Safety Manager Persona

Mining Segment

One important stakeholder that will work on the Safety Solution definition. Know more about his personality:

As the safety manager I think about safety 24/7. My goal is to get my workers and contractors home safe after every shift, for each worker to be accountable for safety on the job site, and not to be seen as the safety cop.

This sounds simple, but it is very complex. While no day is typical, I wear 5 different hats to achieve this goal – there never seems to be enough time in the day to meet the demands of ensuring my workers are safe.

The many tasks include safety and worker compliance, identification of potential on-site hazards for accident avoidance in mines (hearing, respiratory, mechanical), meeting country/local/company standards and regulations, training, inventory management, and emergency response.

My biggest challenge is making safety part of the culture and understanding regulations – a safety plan is great but everyone needs to own safety on the job site to make personal safety and the safety of others a reality.

Role

- Safety may not be their only responsibility, but are often key safety decision maker
- Feel strong responsibility to protect employees and contractors
- Proactively look for solutions
- Want to be perceived as experts within their organization
- Budget control (w/ Sourcing & HR
- Wants to be recognized as influencer/coach by the team and considered a pioneer of solutions

Key Drivers

- Want to earn employee's & employer's trust
- Important to know what products can and can't do and which comply with regulations
- Look for innovative solutions, design, comfort, style and value-add features to increase usage & support safety program
- Want the best value for the money
- Want to minimize risk
- Emotionally & rationally justifies paying more for quality products
- Interest in staying updated on new solutions, regulations and best practices
- Values products that meet high standards

Key Challenges

- Preventing the occurrence of accidents/mitigating risk
- Training employees adequately and ensuring compliance
- Keeping up to date with new standards/regulations and what their responsibility is
- Achieving a balance between safe practices, time for training and Productivity
- Keep Labor Organizations satisfied

Other Stakeholders

There are other important stakeholders that must be considered on a relationship with a Mining Company. In some companies, these stakeholders could have more influence on new safety solution introduction than the Safety Manager, specially the Site Manager and the Procurement

Site Manager

- Time is money!
- Having full work force is important
- PPE Availability is key – can mean they will pay more if needed.
- Does not drive PPE selection, implements decisions from first group
- Can be influencer based on workers likes/dislike or if PPE helps/hinders productivity.

Operator/ Owner

- Time is money!
- Zero accidents and no citations are priority, opportunity costs higher when there is an accident
- PPE costs are minor part of total costs
- Limited available workforce, looking at automation/technology to reduce labor needs and safety risks
- Do not typically dictate PPE brands
- This role may also be owner of contractors

Procurement/ Purchasing

- Cares about cost, availability, & terms
- Becomes more influential in PPE decisions when asked to improve profits
- Availability or product can be top priority
- Find it challenging to identify reliable supplier networks in remote or unstable areas
- PPE may be a small percent (>10%) of total spend responsibility
- Strong personality

Workers

- Looks to experienced workers (sometimes within family) for information
- Multi-generational worker and has seen impact to health on parents/grandparents
- Concerned about comfort more than safety and have brand loyalty

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Vertical Process Maps

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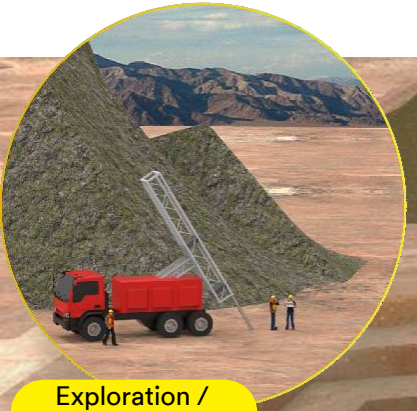
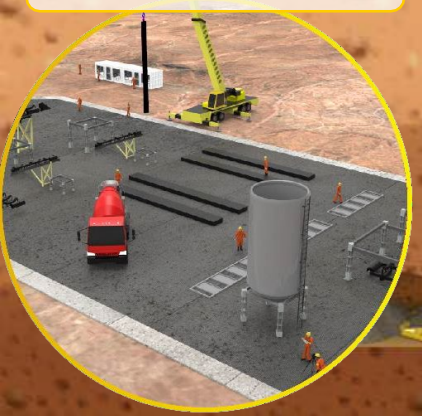
Mining Process



Exploration / Construction

It all starts with the search, sampling and analysis to identify the mineral reserve and generate a feasibility report.
The mining companies look for regions where the soil can have minerals and generate a profitable project.
After an analysis of samples that confirm the presence of minerals, the development of an environmental impact plan and the respective permits to operate, the mine construction begins.



Extraction

The extraction stage begins with an extraction of the ore, which contains a mineral concentration. In this process the rock is broken into pieces of size that allow it to be transported to a factory to be processed. The process for extracting the ore varies, especially between surface mines and underground mines. These processes involve many risks for workers.

Transport In

Once extracted, the ore needs to be taken to a factory, where it goes through processes that will separate the valuable metal from the common rock.
Transporting ore to the factory can occur in different ways. In the case of surface mines, large trucks are used, which are powered by backhoe loaders. In underground mines, transport may occur through conveyor or small wagons on rails.

Maintenance

The maintenance process has the objective to guarantee that the operation remains mostly uninterrupted. It involves all the process steps and all the extraction and transportation equipment. The maintenance also involves some risks.

Processing

Once in the factory the objective is to separate the mineral from the rock. Here the ore goes through size reduction processes and where the valuable metal can be separated from that which has no value.
The main processes are mechanical, such as crushing, grinding, chemical processes, flotation and pressure filter. (The processes vary according to the mineral).

Store & Transport Out

The ore is stored using different methods in the mining site according to the type of ore, when ready to be transported out. (Stack, shed, silos or stow)

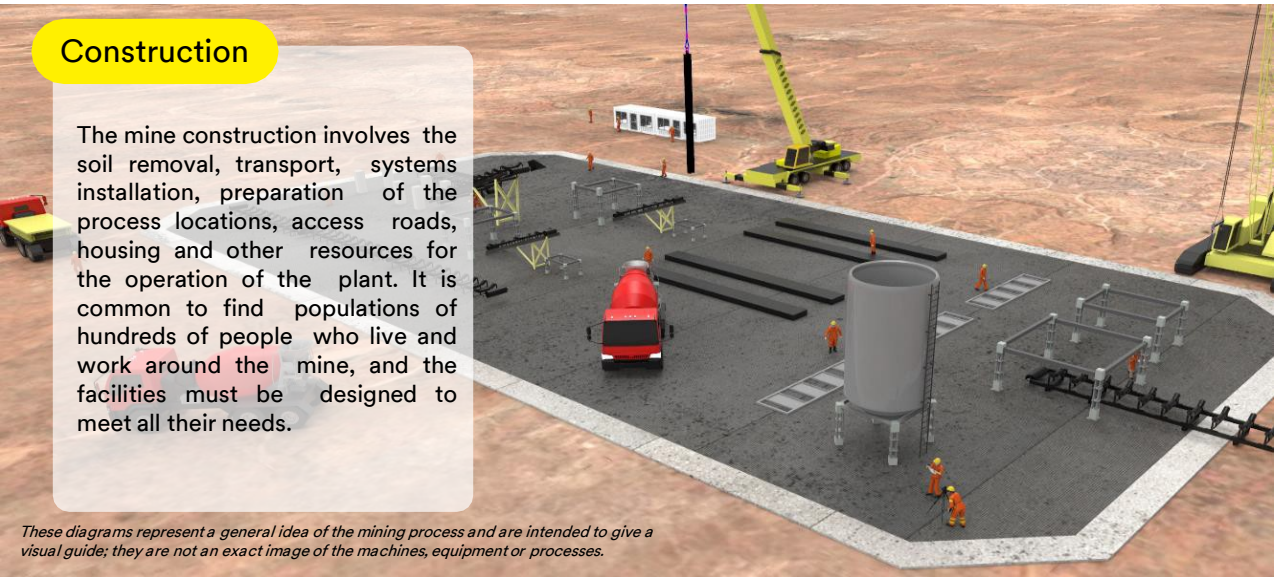
The main means of transport for the ore are trucks, trains or ships that are loaded and taken to the client or to the next production step .

These diagrams represent a general idea of the mining process and are intended to give a visual guide; they are not an exact image of the machines, equipment or processes.

Mining Planning & Development

Exploration

In the exploration process, geologists drill more than one kilometre deep to take soil samples to find possible underground deposits, as well as calculating mineral reserves.



Construction

The mine construction involves the soil removal, transport, systems installation, preparation of the process locations, access roads, housing and other resources for the operation of the plant. It is common to find populations of hundreds of people who live and work around the mine, and the facilities must be designed to meet all their needs.

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Risks / Needs

Noise of tools during sampling, power tools, grinding, welding and other metalworking processes during construction.

Chemical processes in sampling and laboratory tests during exploration and particulate materials, gases and vapors generated by welding or painting during construction.

The mine construction involves work in confined spaces that need access means, air supply, gas detection and rescue.

Dust and particle projections can injure the employee's eyes. The eyewear solution should have a good relationship with the earmuff.

In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

In construction, workers can also hit their heads against pipes or any other protruding part of the structure. Tools or any other object may fall.

The construction activities of the structures in mining locations may involve work at heights with the risk of falling workers or tools.

3M Solutions

Body

- Comfort Grip
- TR-819
- M-306

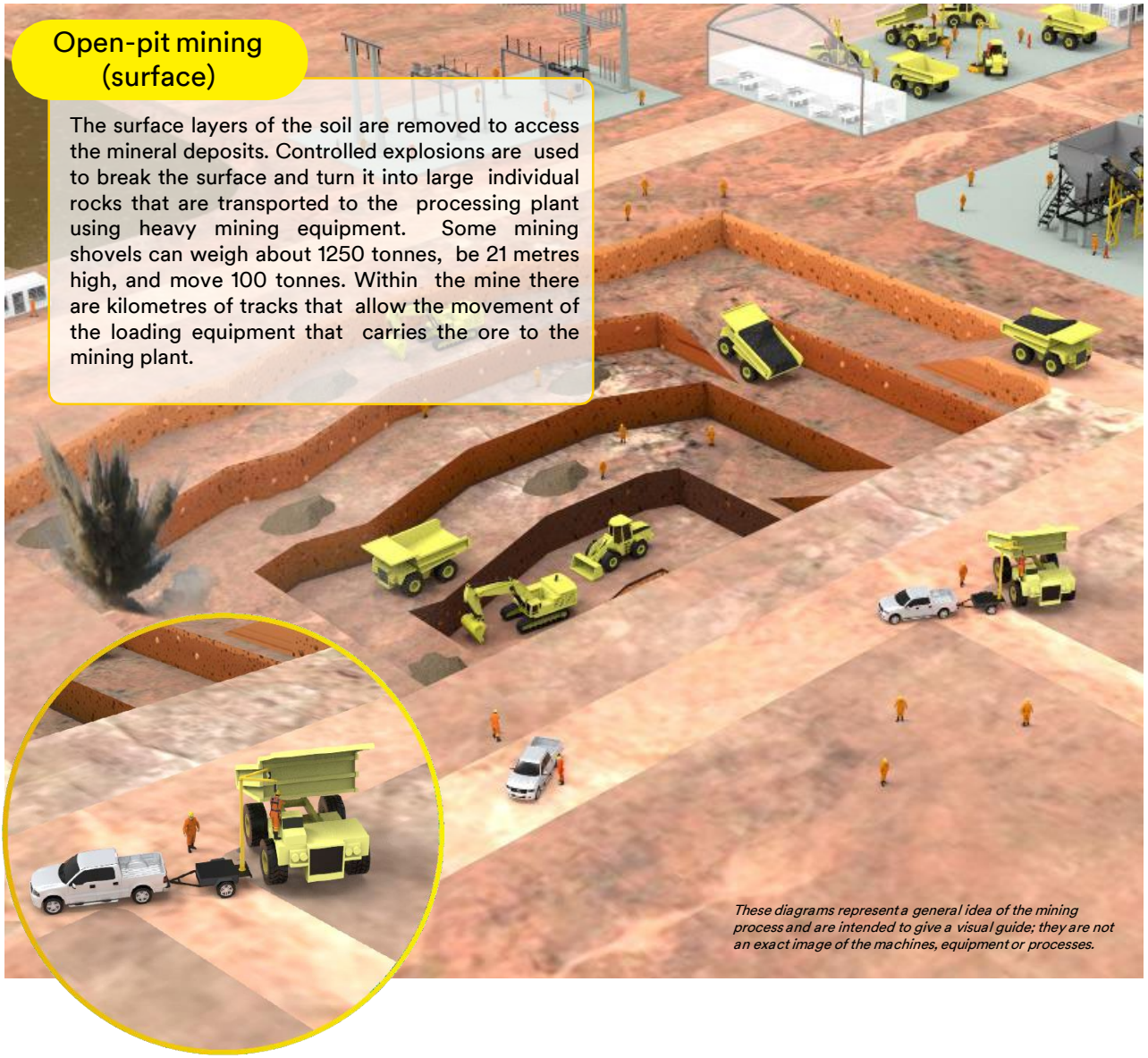
Face

- TA570 Helmet
- SecureFit 400
- LiteCom Pro II
- Skull Screws
- 9322A+
- 7500 Series
- 5925 Filter
- 6051 Cartridge

Extraction Open Pit

Open-pit mining (surface)

The surface layers of the soil are removed to access the mineral deposits. Controlled explosions are used to break the surface and turn it into large individual rocks that are transported to the processing plant using heavy mining equipment. Some mining shovels can weigh about 1250 tonnes, be 21 metres high, and move 100 tonnes. Within the mine there are kilometres of tracks that allow the movement of the loading equipment that carries the ore to the mining plant.



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Risks / Needs

The explosions and the traffic of mining trucks generate a high level of noise. High level of attenuation is needed, associated to comfort.

Removing the ore and putting it in the trucks generates dust. As the respirator will be used with a hardhat, a respirator that can be removed from the face with no need to get the hardhat off is ideal.

Dust and particle projections can injure the employee's eyes. The eyewear solution should have a good relationship with the earmuff.

In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

Because of the explosions and the stone carrying, objects and stones can fall and impact an employee's head.

The trucks and other machines need maintenance in the field. During maintenance the mechanics need fall protection. The work in proximity to excavations edges implies the risk of falling.

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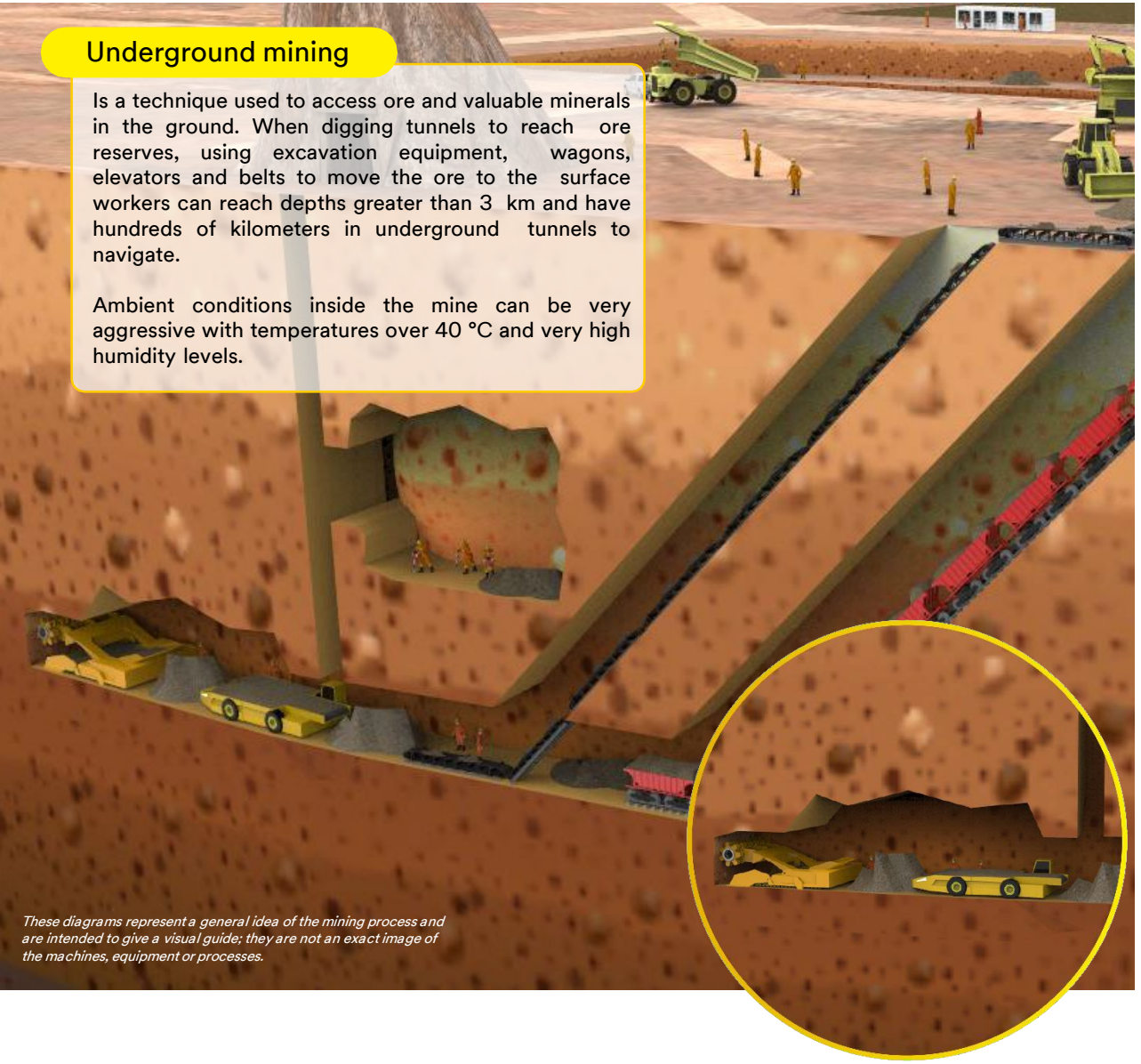
Extraction Underground

Underground mining

Is a technique used to access ore and valuable minerals in the ground. When digging tunnels to reach ore reserves, using excavation equipment, wagons, elevators and belts to move the ore to the surface workers can reach depths greater than 3 km and have hundreds of kilometers in underground tunnels to navigate.

Ambient conditions inside the mine can be very aggressive with temperatures over 40 °C and very high humidity levels.



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Risks / Needs

The explosions, tools impacting against stones, engines for ventilation systems and vehicles traffic generate a high level of noise. High level of attenuation is needed, associated to comfort.

Removing the ore, vehicle traffic, drilling, ore carrying and loading equipment (i.e. scoops) generates dust.

Dust and particle projections can injure the employee's eyes. The eyewear solution should be compatible with the earmuff and respirator.

In mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

Because of the explosions and the stone carrying, objects and stones can fall and impact an employee's head.

Entering confined spaces or climbing ladders in some mines that have ramps and ventilation ducts, means potential fall risk for workers or tools.

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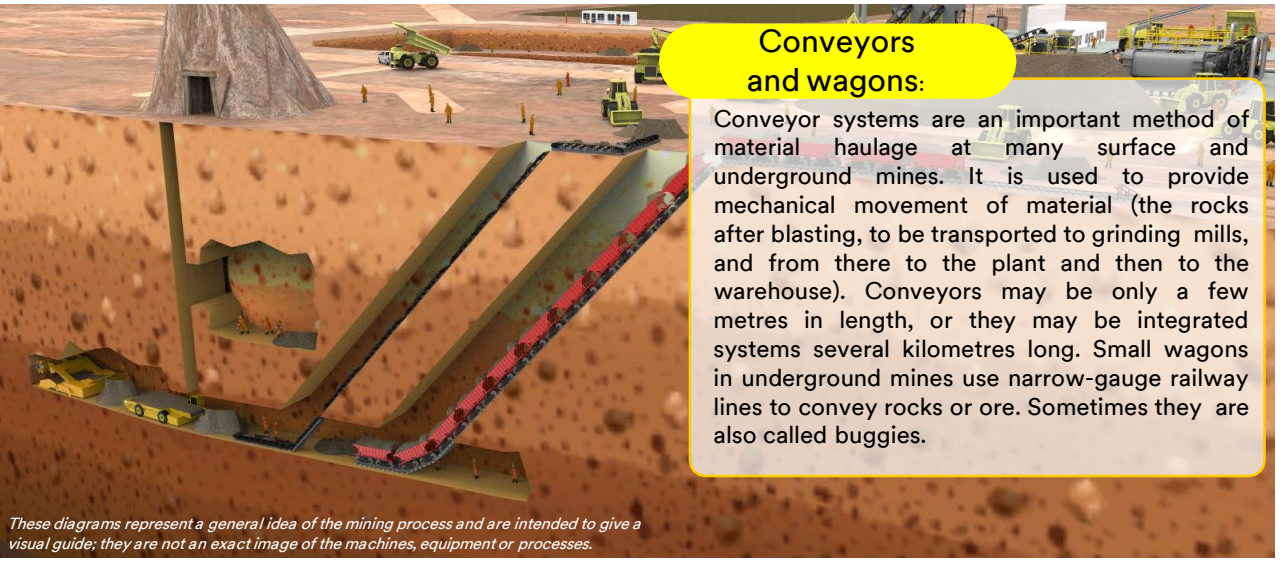
Transport In

Heavy Equipment

In mining, bulky machines like cranes, shovels, dump trucks, excavators, and bulldozers are used. These heavy-duty vehicles are mainly used for construction and earthwork tasks such as ore loading and transport. A mining truck can move more than 270 tonnes and measure more than 9m high.



Conveyors and wagons:

Conveyor systems are an important method of material haulage at many surface and underground mines. It is used to provide mechanical movement of material (the rocks after blasting, to be transported to grinding mills, and from there to the plant and then to the warehouse). Conveyors may be only a few metres in length, or they may be integrated systems several kilometres long. Small wagons in underground mines use narrow-gauge railway lines to convey rocks or ore. Sometimes they are also called buggies.

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Risks / Needs

Vibrations due to carrying material can cause discomfort. The traffic of vehicles generates a high level of noise.

When depositing and transporting the ore in the conveyors and wagons, the work environments have a large amount of particulate material suspended in the air.

In transport, dust and particle projections can injure the employee's eyes. The eyewear solution should be compatible with the earmuff and respirator.

In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

With transport in conveyors or mining trucks, objects and stones can fall and impact the employee's head.

Sometimes, the trucks, wagons and conveyors need interventions or maintenance. During these operations, the workers need fall protection for themselves and their tools

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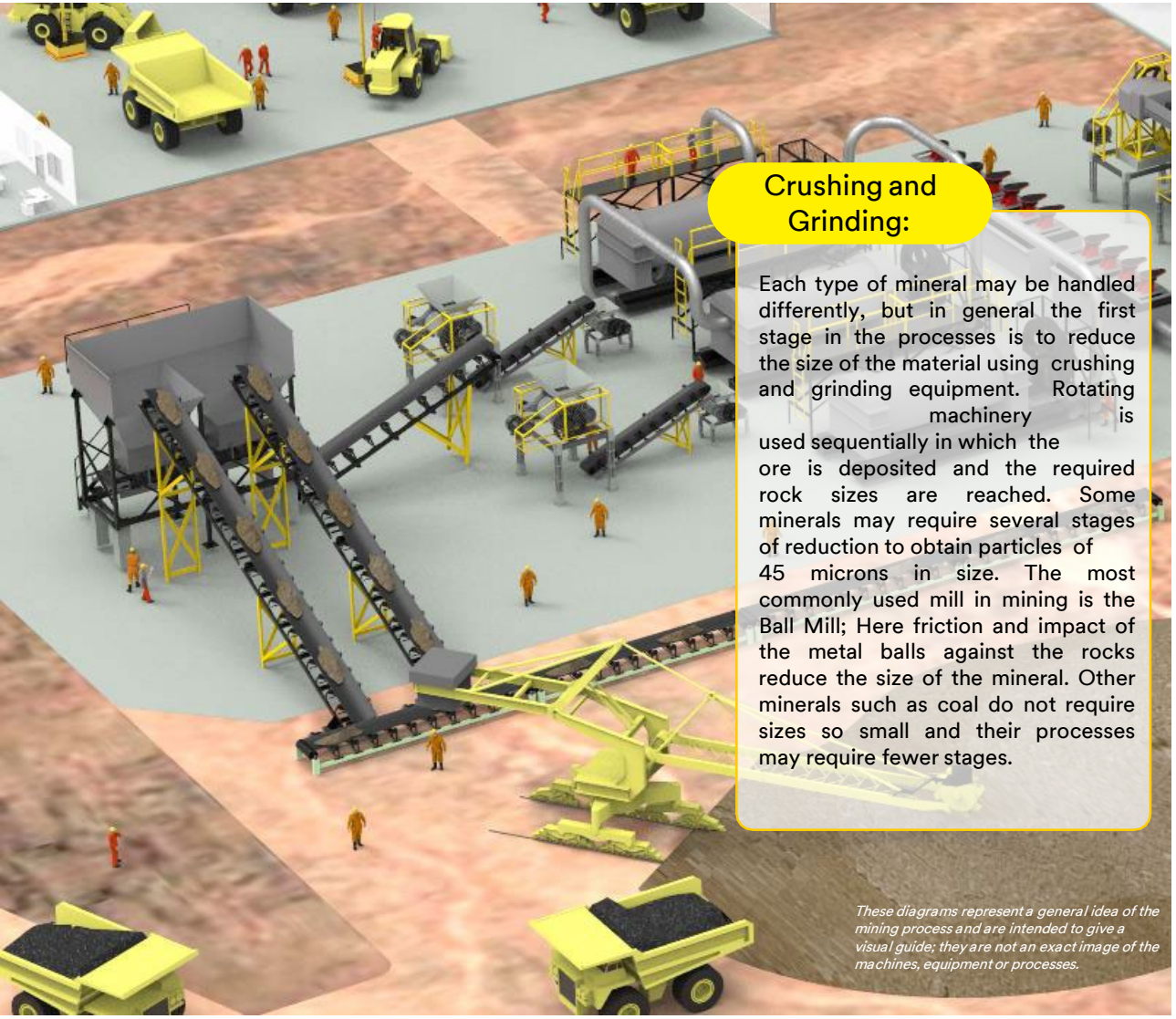
Crushing and Grinding



Crushing and Grinding:

Each type of mineral may be handled differently, but in general the first stage in the processes is to reduce the size of the material using crushing and grinding equipment. Rotating machinery is used sequentially in which the ore is deposited and the required rock sizes are reached. Some minerals may require several stages of reduction to obtain particles of 45 microns in size. The most commonly used mill in mining is the Ball Mill; Here friction and impact of the metal balls against the rocks reduce the size of the mineral. Other minerals such as coal do not require sizes so small and their processes may require fewer stages.

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Risks / Needs

The mineral goes into a mill, the friction and impact of the metal balls against the rocks generate high noise levels. High level of attenuation is needed, associated to comfort.

The mineral size reduction and its transport between the mills implies the generation of dust in this part of the process.

The ore process involves work in confined spaces that need access means, air supply, gas detection and rescue.

Dust and particle projections can injure the employee's eyes. The eyewear solution should have a good relationship with the earmuff and respirator.

In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

Workers can hit their heads against pipes or any other protruding part of the structure.

The common means of access for platforms or machines are ladders. Working at ladder heights involves the risk of falling people and tools.

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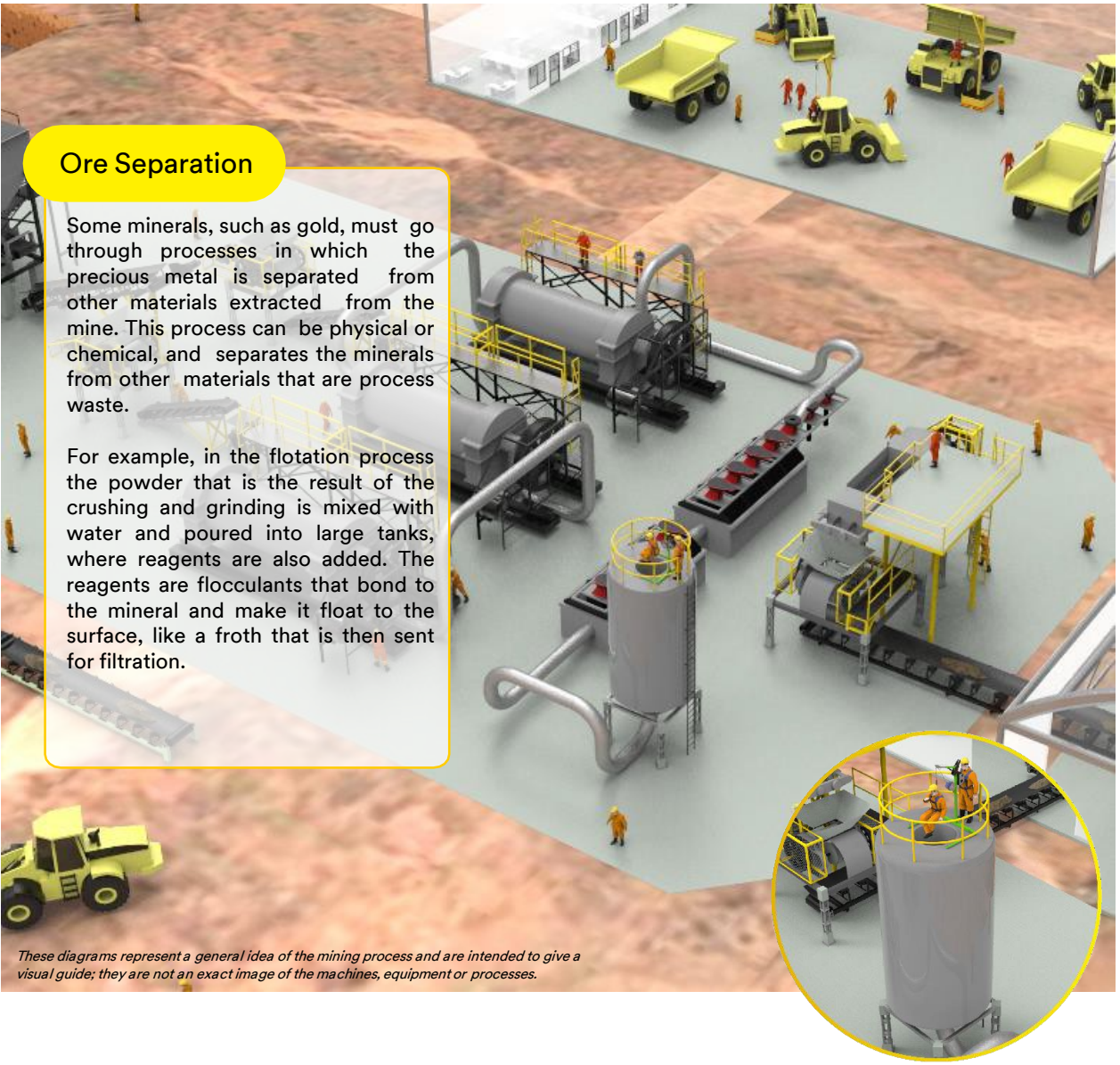
Ore Separation



Ore Separation

Some minerals, such as gold, must go through processes in which the precious metal is separated from other materials extracted from the mine. This process can be physical or chemical, and separates the minerals from other materials that are process waste.

For example, in the flotation process the powder that is the result of the crushing and grinding is mixed with water and poured into large tanks, where reagents are also added. The reagents are flocculants that bond to the mineral and make it float to the surface, like a froth that is then sent for filtration.

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Risks / Needs

The equipment used for the ore separation can generate noise by vibration, changes in pressure or engine movement, this generates noise.

Some of the separation process uses chemicals that generate gases or vapors that can affect the worker.

The ore process involves work in confined spaces that need access means, air supply, gas detection and rescue.

Dust, liquids and particle projections can injure the employee's eyes or face.

In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.

Workers can hit their heads against pipes or any other protruding part of the structure.

The common means of access for platforms or machines are ladders. Working at height involves the risk of falling of people and tools.

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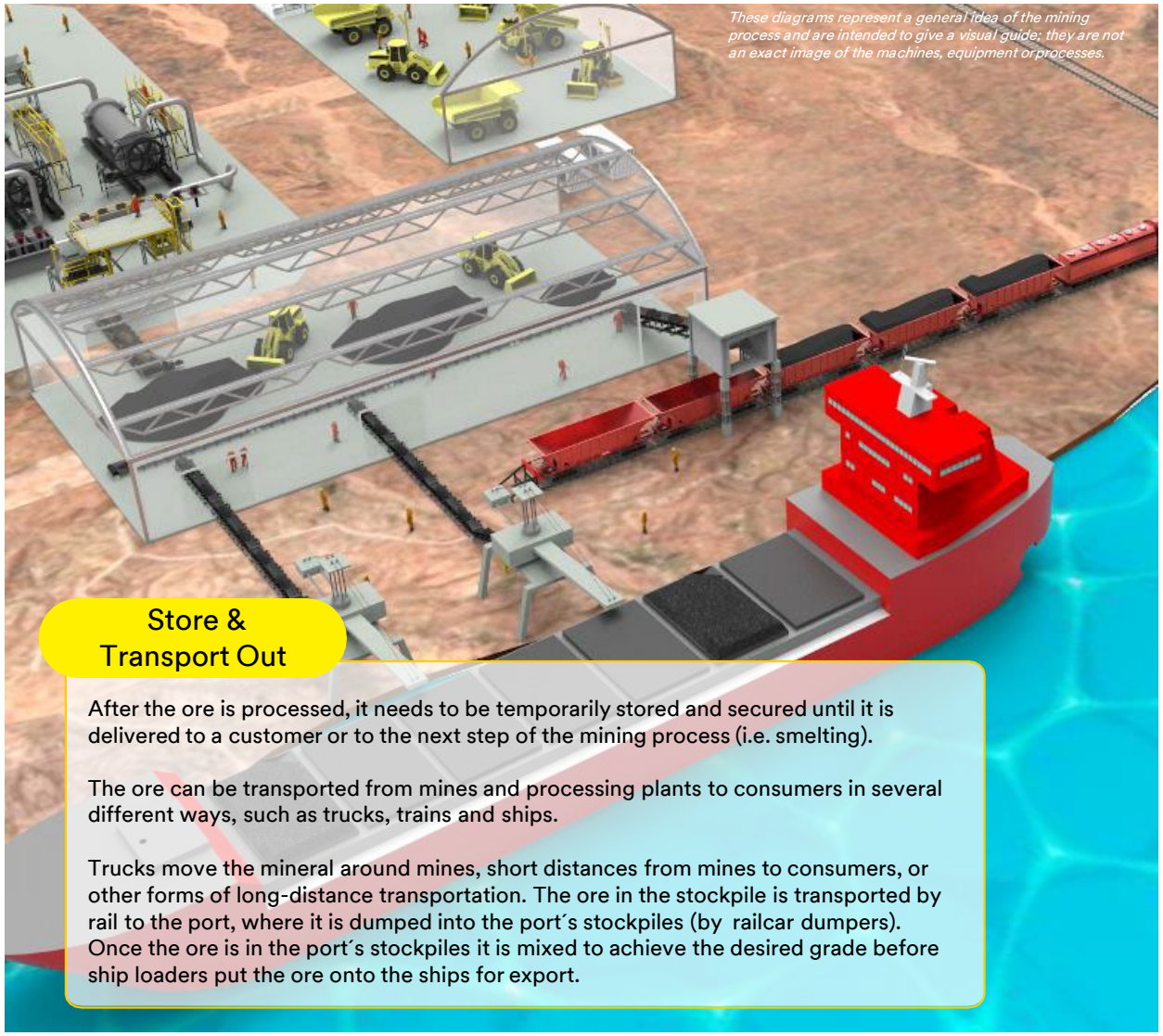
Storage & Transport Out



Store & Transport Out

After the ore is processed, it needs to be temporarily stored and secured until it is delivered to a customer or to the next step of the mining process (i.e. smelting).

The ore can be transported from mines and processing plants to consumers in several different ways, such as trucks, trains and ships.

Trucks move the mineral around mines, short distances from mines to consumers, or other forms of long-distance transportation. The ore in the stockpile is transported by rail to the port, where it is dumped into the port´s stockpiles (by railcar dumpers). Once the ore is in the port´s stockpiles it is mixed to achieve the desired grade before ship loaders put the ore onto the ships for export.

Risks / Needs

- Vibrations when the mineral is transported by conveyors system, or by trucks and downloading operations.
- Downloading from the trucks and storage in piles generates dust. The mineral contains chemicals from the processing so respiratory protection is required.
- The ore storage and transport involves work in confined spaces that need access means, air supply, gas detection and rescue.
- Dust and particle projections can injure the employee's eyes. The eyewear solution should be compatible with the earmuff and respirator.
- In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.
- Workers can hit their heads or against pipes any other of the protruding part structure.
- Climbing stairs, working on machinery or reviewing the transportation process, creates a risk of falling and needs safe means of access.

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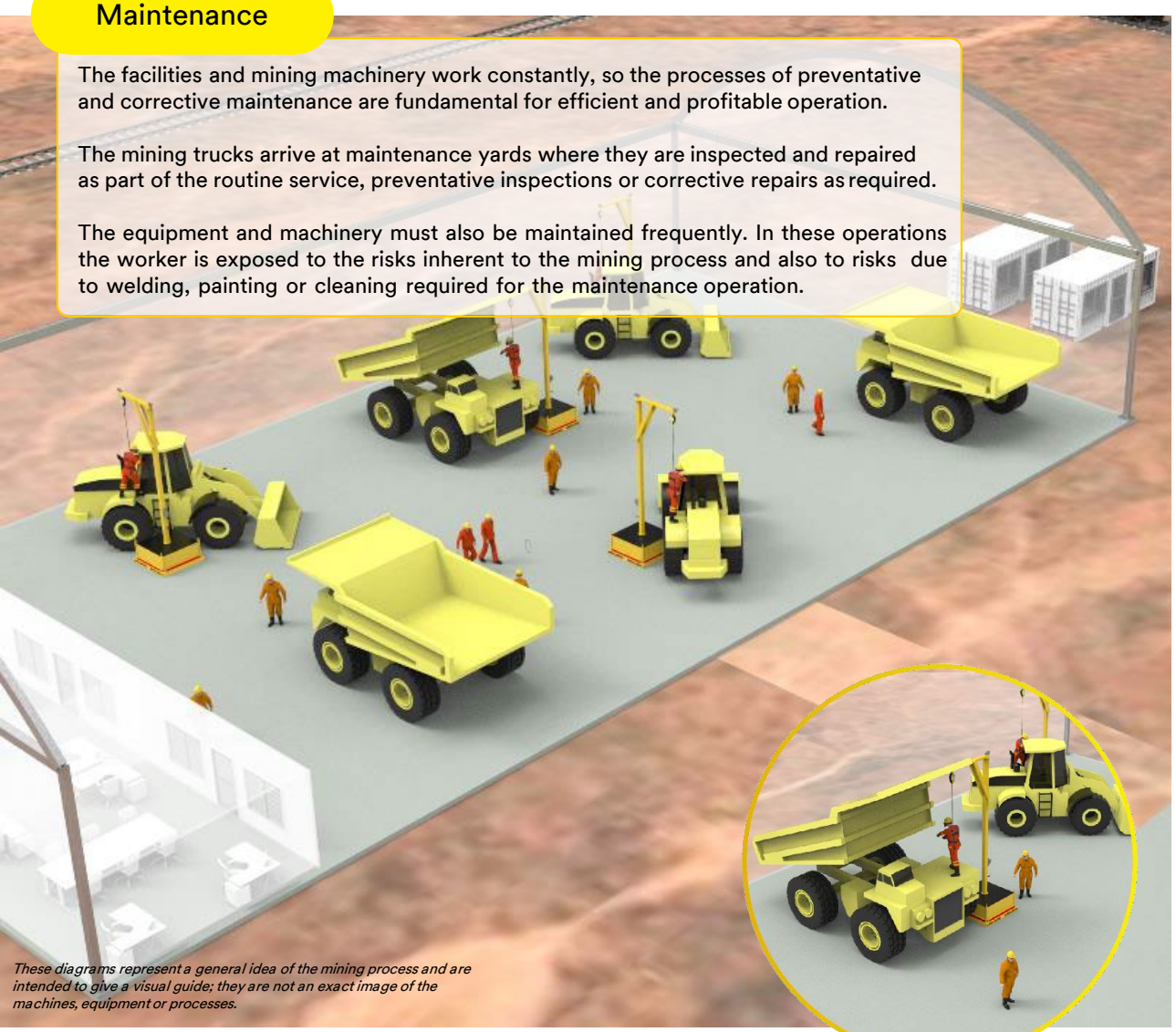
Maintenance

Maintenance

The facilities and mining machinery work constantly, so the processes of preventative and corrective maintenance are fundamental for efficient and profitable operation.

The mining trucks arrive at maintenance yards where they are inspected and repaired as part of the routine service, preventative inspections or corrective repairs as required.

The equipment and machinery must also be maintained frequently. In these operations the worker is exposed to the risks inherent to the mining process and also to risks due to welding, painting or cleaning required for the maintenance operation.



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Risks / Needs

- Several sources of high noise level in processes that involve abrasive processes, spray painting, welding, cutting, pressurized air, etc.
- Dust, gases and vapours from abrasive processes, mists from spray painting, welding and cutting fumes, molecules from cleaning activities, painting, tailing fields etc.
- The maintenance involves work in confined spaces that need access means, air supply, gas detection and rescue.
- Dust / mists, particle projections, splashes of liquids, gases and vapors can injure the employee's eyes.
- In the mining locations, the workers are close to the process equipment, shovels, dump trucks, and need to be seen by other workers.
- Workers can hit their heads against pipes or any other protruding part of the structure. Tools or any other object can fall.
- Mining equipment and the structures of the process require maintenance that involve the risk of falling (workers & tool), other factors such as hot work or falls on sharp edges are involved.

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Product Sales Guide

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Mining Playbook

3M Australia Vertical Markets

Sales Guide

Head, Eye & Face Protection

Problem

Head and Face Protection - For people working on busy mine sites there is potential for head injuries from falling objects, flying/swinging objects, overhead hazards, electrical hazards and much more.

Eye Protection - Miners can be exposed to flying particles, small objects and sparks whilst on the job. These can be mechanical, thermal or electrical in this industry.

Consequence

Head and Face Protection - Not having correct head and skull protection puts workers at risk of serious head injuries, brain damage and potential disability.

Eye Protection - Exposure to flying objects without sufficient eye protection can lead to serious eye injury and potential blinding. Eye injuries are extremely common in the workplace.

Solution

Head and Face Protection - 3M TA570 Safety Helmets are Type 1 helmets that adhere to Australian standards for general mining conditions. This helmet not only protects from potential hazards, but has unique cooling vents for comfort in hot, humid conditions.

Eye Protection - 3M Safety Spectacles are designed to protect workers from hazardous object contact and dangerous radiation in a stylish and comfortable way. Choosing the right spectacles for a workers mining job relies upon ergonomics, view, security and coverage.

Open a Call

- What type of overhead hazards are around your mine site?
- Are you working in hot and/or humid conditions?
- Are you exposed to sparking, dust or chipping of objects?
- Do you have any extra vision requirements? (Lens colour etc.)

Typical Sales Cycle

3M™ TA570 Safety Helmet ABS Vented

3M™ SecureFit™ Protective Eyewear 400 Series

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

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Sales Guide

Hearing Protection

Problem

Miners who work in the industry can be exposed to a wide range of noise hazards.

Hands and gloves are seldom clean, and are usually covered in dirt and dust.

Restricted vision means that workers may not be able to see the person/s that they need to communicate with.

Consequence

Without proper protection that adheres to local standards, workers risk damaging their ears and hearing.

By using dirtied hands to insert earplugs, workers risk serious ear infections with prolonged use.

Being unable to see to communicate makes day-to-day tasks extremely dangerous when large machinery and equipment is involved.

Solution

3M Earmuffs are designed to adhere to local standards, enhancing comfort and protecting from extreme noise hazards.

3M Earplugs have easy insertion without rolling the foam, which makes them ideal for miners' dirty hands.

3M Communications products are intrinsically safe and ensure sufficient noise blockage whilst opening radio communication pathways.

Open a Call

- What type of mining environment are you working in?
- Are you frequently digging, using dirty equipment and/or exposed to a large amount of dust?
- Are you working with others? If so, do you need a sufficient communication device?

Typical Sales Cycle

3M™ PELTOR™ LiteCom Pro II Headset

3M™ Skull Screws™ Corded Earplug

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

Mining Playbook

3M Australia Vertical Markets

Sales Guide

Hand Protection

Problem

Miners working with material handling, digging and demolition can be exposed to a wide range of hazardous materials and abrasion.

The bare hands of workers do not have the grip required to hold on to slippery, wet or oily surfaces.

Consequence

Without proper care taken, workers risk cuts, burns and severe injuries to hands and fingers.

Not having proper grip risks that sharp or heavy objects can be dropped or slip, creating potential for injury to themselves and others.

Solution

3M Comfort Grip Gloves are a light, abrasion-resistant alternative to cotton and latex-palmed gloves. 3M Comfort Grip Gloves also meet local Australian standards.

These gloves are ideal for light to medium duty jobs that require precision handling, especially in hot and sweaty conditions.

They are a long-lasting product that provide excellent grip, even in wet or oily conditions.

Open a Call

- What type of work are you completing? Light or heavy duty?
- Do you handle objects frequently that have potential to slip or be dropped?
- Are you handling slippery, wet or oily materials?

Typical Sales Cycle

3M™ Comfort Grip Glove

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

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Sales Guide

Disposable Respirators

Problem

People working in mines are exposed to dust and other particles. This can also extend to diesel exhaust and smoke when working in machinery operation.

Miners working in hot and humid underground conditions are more inclined to remove face respirators if they become hot and sweaty.

Consequence

Without correct respiratory protection,workers risk breathing dangerous particulates into their respiratory system, and can potentially cause conditions such as asthma and silicosis, and has potential to increase the likelihood of respiratory cancers.

When a worker decides to remove their mask in an uncomfortable situation, they are immediately compromising their protection against dangerous particulates.

Solution

3M Disposable Respirators are designed to protect workers with a wide range to suit all face types, and stay securely in place. They accommodate for facial movement and have compatibility with other 3M Face Protection products.

3M Aura 9322A+ Disposable Respirators are fitted with an innovative cooling valve, exclusive to 3M, to ensure maximum comfort. This mask is also collapse resistant and has a sweat absorbent nose pad to create a comfortable environment for the face.

Open a Call

- What types of particulates are you exposed to?
- Are you working in hot, humid conditions?
- Do you work in machinery operation or have contact with heavy machinery?

Typical Sales Cycle

3M™ Particulate Respirator 9322+P2

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

Phone: 1300 289 773 www.htch.com.au Email: 3M@htch.com.au

Mining Playbook

3M Australia Vertical Markets

Sales Guide

Reusable Respirators

Problem

Workers in both underground and open-cut mines can be exposed to a range of hazardous contaminants such as coal dust and diesel particulate matter.

Miners that work in oil and gas extraction are also exposed to similar hazards.

Consequence

Without proper respiratory protection, particulates can make their way into the respiratory system of workers and increase the likelihood of respiratory diseases such as asthma, fibrosis and cancer.

Inadequate respiratory protection whilst exposed to gases and vapours can result in serious damage to the lungs and body, and create significant long-term illness.

Solution

3M Reusable Respirators meet Australian local standards for protection against a range of harmful substances, and are a comfortable choice for protecting mine workers.

3M Reusable Respirators have a secure facial seal, and are designed to keep out any harmful substances. They are lightweight, cool, and are well-balanced.

Open a Call

- What type of mining environment are you working in? Underground or open-cut?
- Are you exposed to dust, gases, vapours or other airborne particulates?
- Do you require half face or full face protection?

Typical Sales Cycle

3M™ Half Facepiece Reusable Respirator 7502

3M™ P2 Particulate Filter 5925

3M™ A1 Organic Vapour 6051

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

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Problem

Workers in underground mines can be exposed to dangerous particulates, such as coal dust. Miners working in gas and oil extraction are also exposed to gases and vapours such as ammonia and other inorganic gases.

Consequence

Without proper protection, particulates can make their way into the respiratory system of workers and increase the likelihood of respiratory diseases such as asthma, fibrosis, silicosis and pneumoconiosis.

Solution

3M Powered Air Units and Accessories adhere to Australian local standards for protection against harmful substances and are a comfortable choice for protecting mine workers.

Powered Air products have a protection factor up to 100+, based on the filter being used. These units also reduce inhalation and exhalation resistance. This is done using either an open head top or tight-fitting mask.

Open a Call

- Do you work underground?
- What type of dusts and particulates are you exposed to?
- Are you exposed to vapours and gases?
- Will you require other PPE equipment (helmets, hearing etc.)?

Typical Sales Cycle

3M™ Versaflo High Impact Helmet M-306

3M™ Versaflo Starter Kit TR-819A

1. Discussion with customer about comfort and compatibility
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

Problem

Cleaning

Mine workers may have a need to prepare surfaces, including precious metals, and remove any dirt or substrate. Without the correct disc, this process can be lengthy and inefficient, increasing labour time and affecting final outcome.

Solution

The 3M Scotch-Brite Clean & Strip Disc is a general purpose disc. The non-woven black is a safe alternative to wire brushes, offering a greater surface area which leaves a finer finish and may eliminate the need for subsequent finishing steps.

Problem

Cutting

Miners who work in hard rock mining and mining operations may come across a need to cut precious metals, rocks or stone. Without the correct disc for a cutting application, miners are unable to cut cleanly and safely and put their personal safety and the safety of others at risk.

Solution

3M Cutting Wheels are designed to safely cut through metal, stone and sheets with exceptional precision. The 3M Silver Cut-Off Wheel has exceptional durability, making it a great value long-term offering. 3M Precision-Shaped Grain also cuts exceptionally fast, increasing worker productivity.

Problem

Grinding

Workers in the mining industry may come across a need to remove unwanted area or or material on a surface. Without the correct grinding disc, workers have an increased likelihood of personal injury and/or damage to the surface.

Solution

The 3M Cubitron II Grinding Wheel is constructed with 3M Precision- Shaped Grain to bring you an exceptionally fast-cutting and long- lasting rigid bonded wheel for heavy-duty grinding applications. Our grinding wheel works well on almost all materials.

Typical Sales Cycle

3M™ Silver Cut-Off Wheel

3M™ Cubitron II Grinding Wheel

3M™ Scotch-Brite Clean & Strip Disc Black

1. Discussion with customer about application and practicality
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering

Problem

VHB

Mine construction is a large part of the industry, and stability, reliability and longevity are key to a good mining structure.

Solution

3M VHB Tapes can replace screws, bolts and rivets, thereby reducing corrosion, water ingress points and stress localisation during mine construction projects. 3M VHB Tapes are also weather-proof and will create a permanent hold in a large number of conditions.

Problem

Epoxy

Miners may come across a need to bond materials together when constructing mines and using machinery.

Solution

3M™ Scotch-Weld™ Epoxy Adhesive is a toughened, two-part epoxy adhesive. It exhibits good shear and peel strengths along with good impact and durability. It bonds extremely well to many surfaces, such as metals, ceramics, wood and some plastics.

Problem

Reflective Tapes

When working on a mine site, it is essential that all large machinery and hazards be visible in all types of light. Many mines are underground with minimal sunlight, making it difficult to spot hazards and equipment.

Solution

3M™ Reflective Tapes are highly reflective with pressure sensitive adhesive for easy application to large vehicles, machinery and equipment. This helps to enhance visibility and detection distance in both day and night time.

Typical Sales Cycle

3M™ 4910 VHB Clear

3M™ DP-420 Epoxy Duo Pack

3M™ Diamond Grade™ Conspicuity Markings

1. Discussion with customer about application and practicality
2. Propose product and service with a demonstration
3. Present the commercial conditions
4. Ordering process
5. Service delivering