Tier 3 Copper Cliff Mine Complex (CCMC) Mine Orientation - UNLOCKED

1. Copper Cliff Mine Complex

1.1 Copper Cliff

Mine Complex Orientation

1.2 Disclaimer

Disclaimer

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The information contained within this orientation is intended for controlled use within the Learning and Development Department for Ontario Operations. The content and structure of this orientation provides the learner with an overview of Site Specific Plant Entry Procedures and the Hazards and Controls specific to Copper Cliff Mine Complex.

The information herein is intended as a training presentation and is not intended to be the sole source of reference information for this system.

The content of this document is current as of the latest release date. Any discrepancies found should be noted and reported to the Learning and Development Department for action.

1.3 How to navigate this Presentation

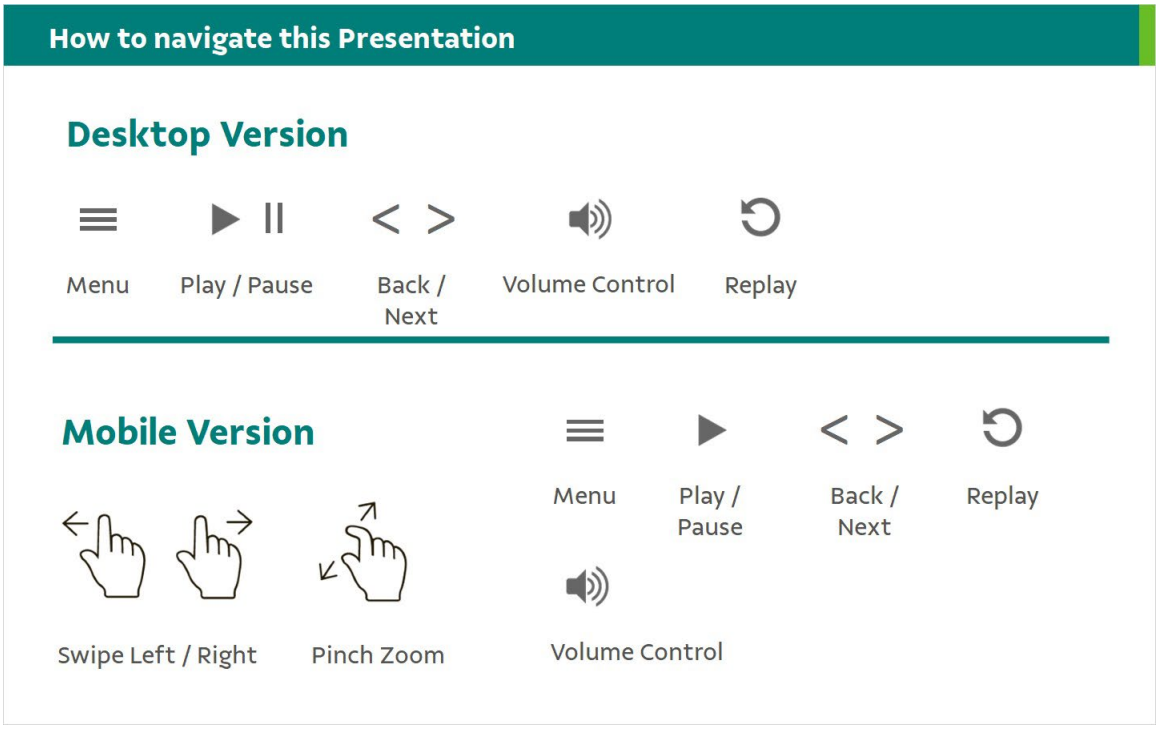
How to navigate this Presentation

This presentation has been designed to provide you with relevant information for working on Vale property.

The learning environment has been enriched with additional tools to provide you with an interactive learning experience.

Each slide is narrated and videos and animations will launch automatically.

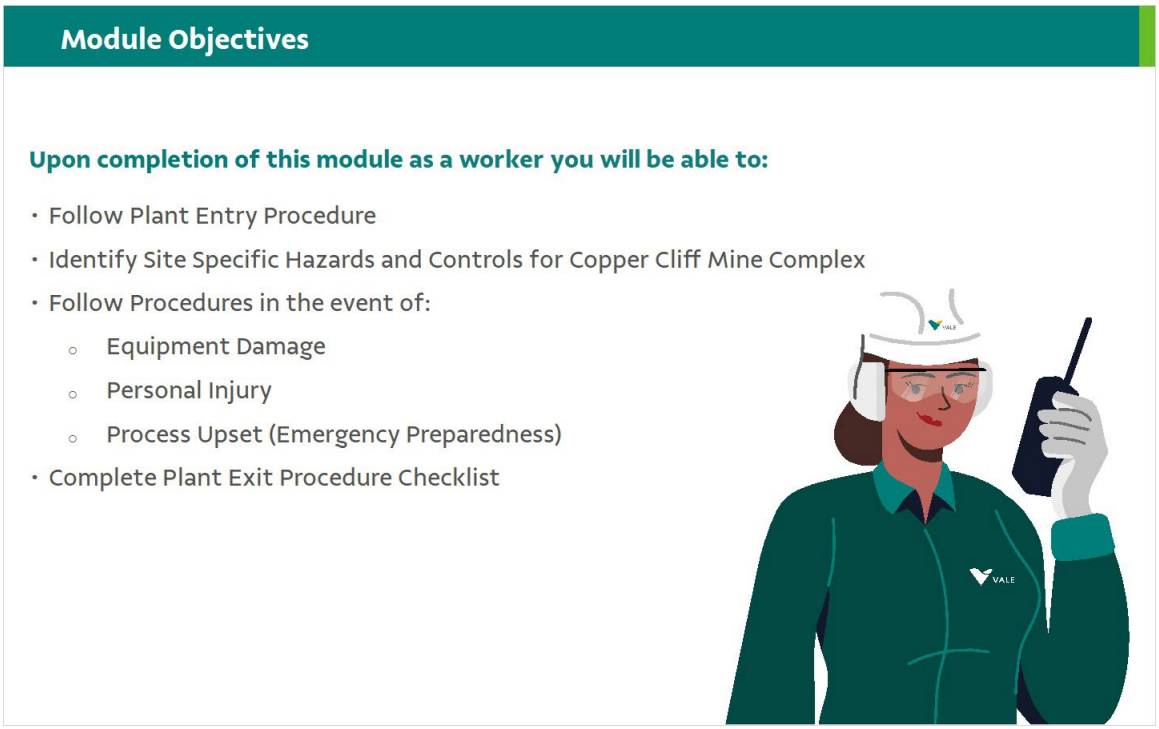
1.4 How to navigate this Presentation



1.5 Life Matters Most

1.6 Untitled Slide

1.7 Course Objectives



2. Introduction

2.1 Introduction

2.2 Copper Cliff Mine Overview

Copper Cliff Mine Complex – Overview

The Copper Cliff Mine Complex is comprised of two sides, the North Side and the South Side.

Both Sides share the same underground workings and function as one mine.

Copper Cliff Mine – North Side

Copper Cliff Mine – South Side

2.3 Copper Cliff Mine Complex - Overview

Copper Cliff Mine Complex – Overview

Copper Cliff Mine Complex utilizes the Bulk Mining/VRM (vertical retreat mining) method.

Although CCM complex is primarily mining nickel, there is a vast array of other minerals being mined as well, which include;

- Platinum group metals (PGMs)
- Gold
- Silver
- Copper

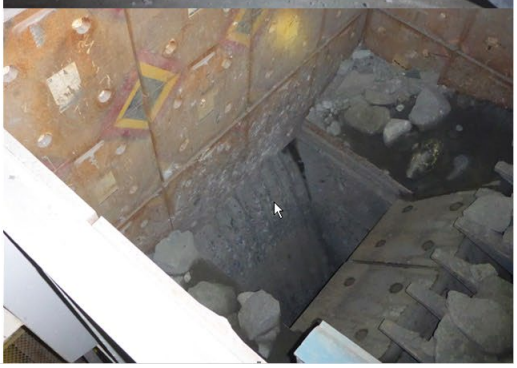
2.4 Copper Cliff Mine Complex - Overview

Copper Cliff Mine Complex – Overview

Copper Cliff Mine Complex Process Flow:

With Copper Cliff Mine Complex being comprised of two sides North and South, they each have their own shaft and Ore handling methods.

Both sides crush material with a Jaw crusher and skip to surface. The downstream customer of the Copper Cliff Complex is Clarabelle Mill.

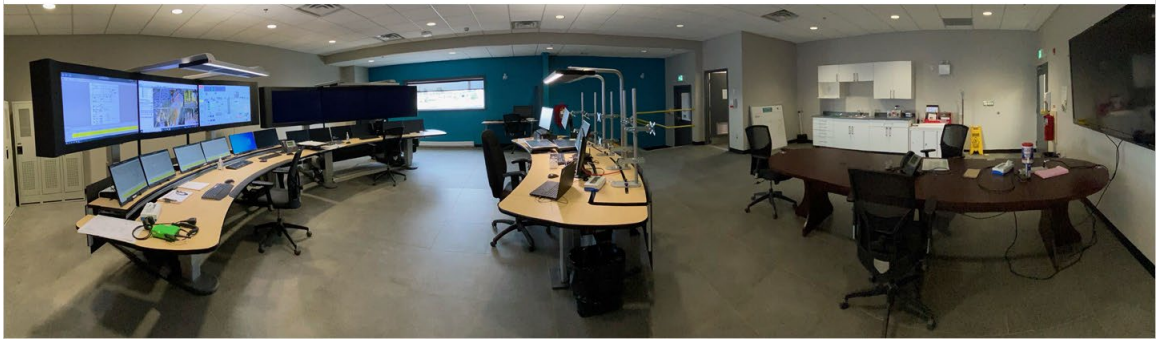


2.5 Copper Cliff Mine Complex - Overview

Copper Cliff Mine Complex – Overview

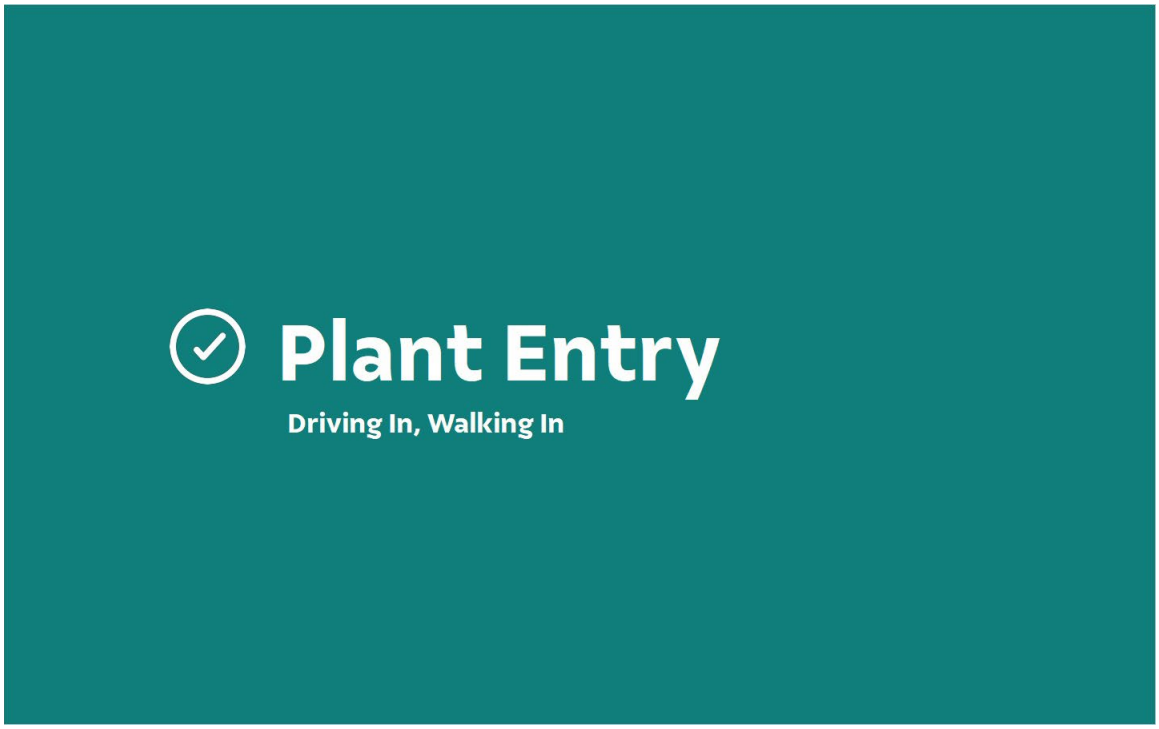
The newly updated Central Control Room (CCR), monitors and controls both sides of the complex, interacts in conjunction with Short Interval Control (SIC) system operation. Which includes a hybrid network communication system supported by, fiber-op, CAT5 and wi-fi (LTE and RF systems).

Underground and surface material handling processes are monitored with restricted access from the control room.



3. Plant Entry

3.1 Plant Entry



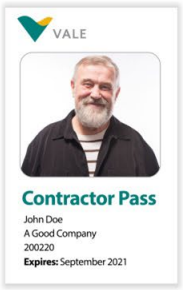
3.2 Plant Entry

Plant Entry

Any workers entering Copper Cliff Mine Complex are to have a Vale Swipe Access Card on their person.

This card is required to gain access to:

- Turnstiles at the mine entrances.
- Restricted Access Areas.
- Cap and powder mags.



3.3 Traffic Management

Traffic Management

Driving on a mine site can be hazardous if the proper traffic rules are not followed. It is important to understand and follow the basic traffic rules to ensure safety for yourself and others.

All workers operating Motor Vehicles at CCMC South Side are required to obey all posted signage, and adhere to the traffic management plan.

The Copper Cliff Mine Complex Traffic Plan stipulates the following speed limits:

- Plant Access roads: 50 km/h – unless otherwise posted
- Internal roads: 50 km/h – unless otherwise posted
- North Side Yard Supply Areas: 20 km/h
- South Side Surface Areas: 20 km/h
- Equipment Underground: 20 km/h – unless otherwise posted

Note; All equipment has been ramp tested, and has a LOAD/GEAR/CAPACITY label inside the operators compartment identifying the maximum gear in which the unit can be operated underground.

3.4 Plant Entry - South Side

Approaching the Plant

South Side

3.5 Approaching the Plant – South Side

Approaching the Plant – South Side

Copper Cliff Mine South Side has one point of entry into the plant which is accessed via Power Street off of Municipal Road 55.

The road is a single laned roadway with strict restrictions from passing any vehicles.

The road traverses two sets of railway tracks.

Be aware of large trucks hauling various products to and from the Power Street roadway.

Always be aware of your surroundings and proceed with caution.

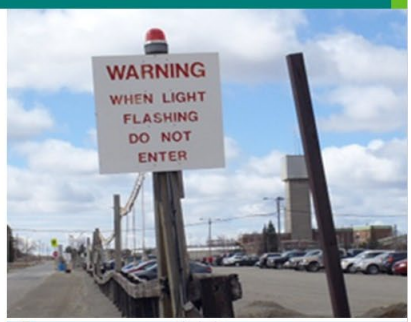
3.6 Approaching the Plant – South Side

Approaching the Plant – South Side

Approaching the plant during an emergency

If you are approaching an area during a plant emergency you must comply with the following instructions:

- Do not enter the plant or property and keep entry routes clear for Emergency Response vehicles.
- Remain in your vehicle, close the windows and shut off ventilation.
- Follow any instruction from Vale Emergency Response or Protection Services Professionals.
- If it's safe to do so, drive off the site until the emergency condition is controlled, if you're unable to do so, remain parked in your vehicle.
- Inform your supervisor of your current location due to entry restrictions and remain in contact until the emergency is resolved.
- Return to site once the emergency has been declared "all clear".



3.7 Parking

Approaching The Plant – South Side

As you are entering the plant you will see two different parking lots:

Day Shift Parking Lot is located on your left side as you access the mine. This parking lot is dedicated to personnel working *Day shift only.*

Night Shift Parking Lot is located on your right side as you access the mine. This parking lot is dedicated to personnel working Night *shift only.*

3.8 Surface Sign-in Requirements – South Side

Surface Sign-in Requirements – South Side

All visitors working on surface must sign in to the surface sign-in book when entering the plant, and must sign out when leaving.

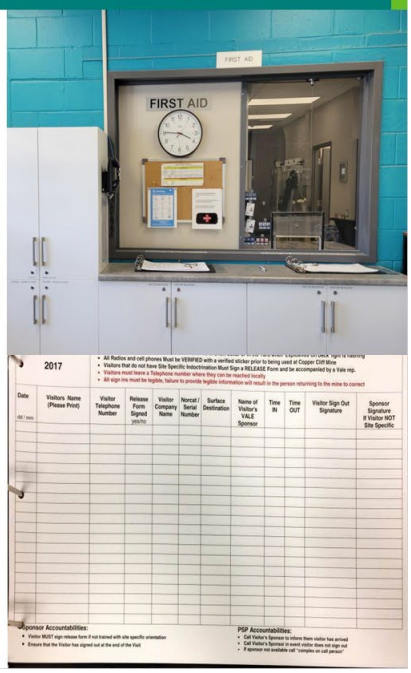
The surface sign-in book is located outside of the First Aid office, immediately inside the main entrance.

3.9 Surface Sign-in Requirements – South Side

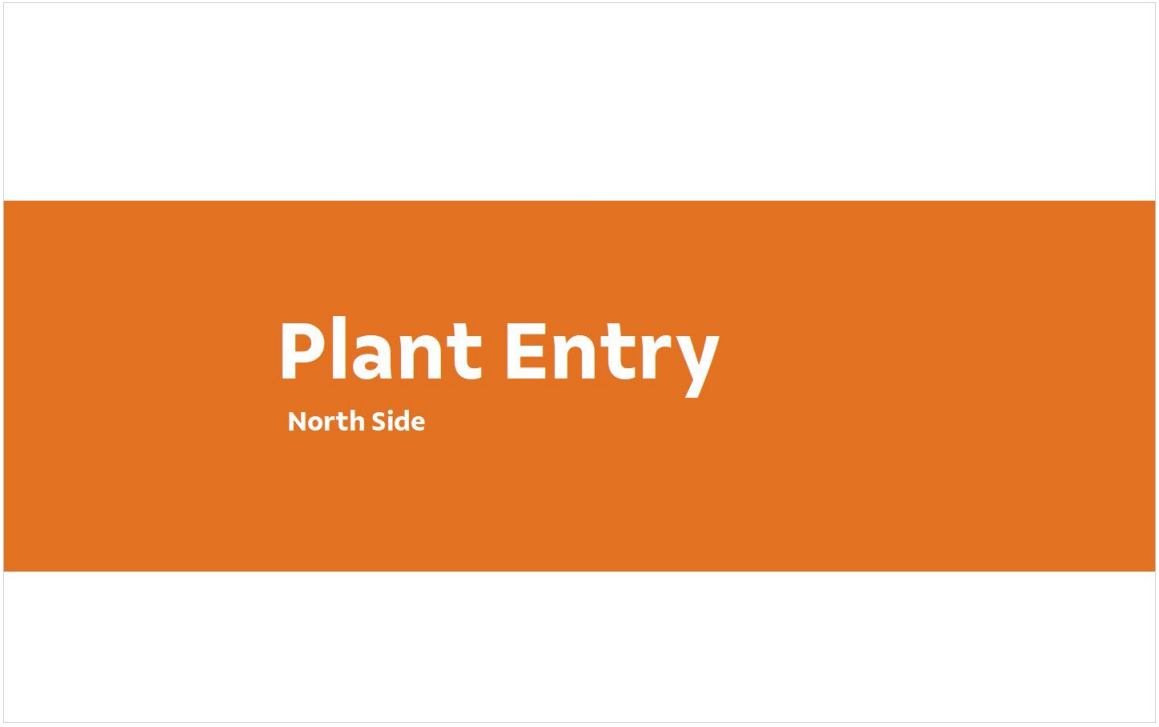
Underground Tag-in Requirements – South Side

Every long term employee coming to the Copper Cliff Mine Complex-South Side will require an identification tag, this can be obtain at the First Aid office.

Visitors traveling underground, will sign in to the underground visitor log book. If you require a Visitor Tag for Underground access, please see First Aid.



3.10 Plant Entry - North Side



3.11 Approaching The Plant

3.12 Parking

Approaching The Plant – North Side

As you are entering the plant you will see three different parking lots:

Parking Lot "C" is the first parking lot you will encounter on the right side as you drive into the mine. This parking lot is dedicated *Night shift only*.

Parking Lot "A" is located on your left side as you access the mine. This parking lot is dedicated *Day shift only*.

Parking lot "B" is located directly in front of the administration building. This parking lot is also dedicated *Day shift only*.

3.13 Approaching the Sign-in Location

Approaching the Sign in Location – North Side

There is a designated pedestrian crosswalk that leads into the warm room of the mine from the parking lot on the left.

Be aware that there may be traffic going through the gate when crossing the road.

The gated area is restricted access only, to gain access you must have an approved Vale Swipe card.

3.14 Approaching the Sign in Location – North Side

Approaching the Sign in Location – North Side

As you enter the main building take your first right and you will find the First Aid office where you are required to sign in.

If you are entering the front of the building First Aid is just before the warm room on the left.

4. Surface General Hazards

4.1 Surface General Hazards

4.2 PPE Policy

Surface General Hazards

PPE Policy at Copper Cliff Mine Complex

Protective eyewear (SPI-SAF 01):

The following areas are *exempt* from eye protection:

- Refuge stations underground.
- Underground offices.
- Surface offices and dry.

Note: Protective eyewear must be worn when performing work, even in the exempt areas.

4.3 PPE Policy

Surface General Hazards

PPE Policy at Copper Cliff Mine Complex

Protective headwear (SPI-SAF 07):

Hardhats must be worn whenever performing work at the Copper Cliff Mine Complex.

Hard hats must also have employees names clearly displayed on the front, mounted ear muffs installed except for welders in the process of welding, shaft crew employees with authorization from your Vale contact person and those with a doctor's note.

In all cases, portable muffs must instead be carried with the worker.

4.4 PPE Policy

Surface General Hazards

PPE Policy at Copper Cliff Mine Complex

Adornment:

Personnel working in industrial environments are not allowed to wear exposed jewelry that can become entangled, caught in or pose unnecessary risk to the employee (e.g. dangling chains or hooped earrings).

No hoodies are to be worn under coveralls, jackets or hardhats while on site.



4.5 PPE Policy

Surface General Hazards

PPE Policy at Copper Cliff Mine Complex

Protective headwear (SPI-SAF 07):

The following areas are *exempt* from wearing protective headwear:	
Surface:	**Underground:**
Control room	Refuge stations including outside in immediate washing area
Office building	Lunch room
Parking lot	Vehicles with enclosed cabs
Vehicles with enclosed cabs	Underground offices
Surface offices	
Hoist cubicle	

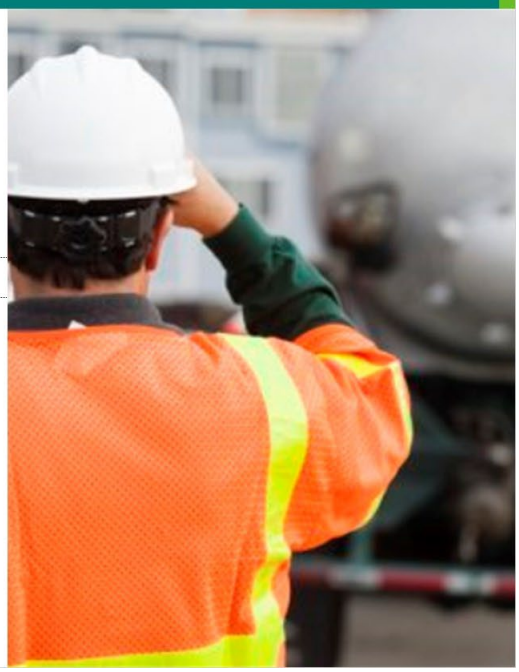
4.6 Additional Directives and Procedures

Surface General Hazards

Additional Directives and Procedures

Mobile Equipment:

- A mobile equipment spotter is required when:
  - Entering or exiting a building or workshop.
  - View of mobile equipment is obstructed.
  - While operating mobile equipment in close proximity to buildings and pedestrian walkways when in reverse.



4.7 Smoking Policy

Surface General Hazards

Smoking at Copper Cliff Mine Complex

Smoking is only permitted in the designated smoking area on surface. No smoking is permitted anywhere else in the facility, whether surface or underground.

No worker is permitted to bring cigarettes, cigars, e-cigarettes or butane lighters underground.

Designated Smoking Area

5. Underground Entry Procedures

5.1 Underground Entry Procedures

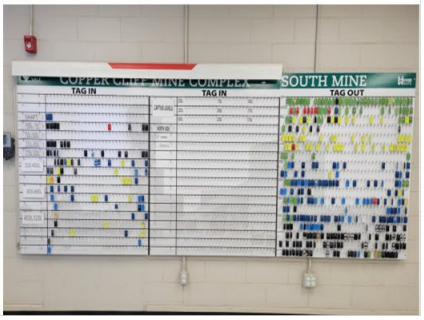
5.2 Underground Tag-in Requirements P1

Underground Entry Requirements

Underground Tag-in Requirements

All employees going underground need to tag in the appropriate section of the underground tag in board located in the warm room.

Employees travelling underground that do not have tags must sign in to the underground, must sign in to the underground sign in book and obtain a visitor identification tag and cap lamp from First Aid.



5.3 Underground Tagging Requirements P2

Underground Tagging Requirements

When tagging in, remember the following:

- You are required to tag in before going underground.
- Do not tag in until it is permitted to do so in the event the board has been blocked for blasting or clearing.
- Tag in to the correct area and shift.
- Always remember to remove your tag and sign out when you return to surface.

Both Copper Cliff Mine South Side and Copper Cliff Mine North Side maintains their own underground tag in board for the same shared work area.

5.4 Going Underground - South Side

Underground Tagging Requirements

Going Underground

On deck at Copper Cliff Mine South Side there is only one location where you enter and exit the cage.

Once the South Side Shaft Service Leader (SSL) announces your scheduled personnel run on the PA system proceed to the sub collar via the ramp located in the warm room.

- Ensure you are wearing all required PPE at this time.
- Only lunch pails, bit bags and small hand supplies are allowed on regular scheduled personnel runs.

Any additional parts or tools needed underground are to be placed in the collar house and tagged for the level they need to go to.

They will be delivered during the parts run.

5.5 Going Underground - North Side

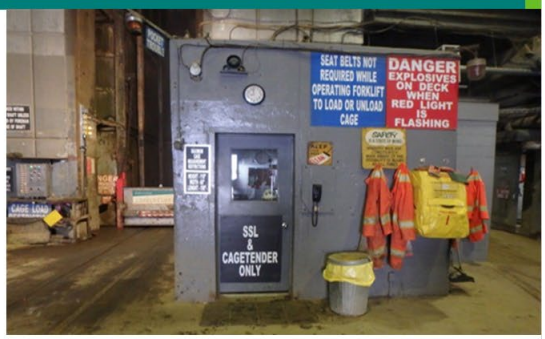
Underground Tagging Requirements

Going Underground

On deck at Copper Cliff Mine South or North Side there is only one location where you enter and exit the cage.

Once the Shaft Service Leader (SSL) announces your scheduled personnel run on the PA system proceed to sub-collar via the ramp located in the warm room.

- Ensure you are wearing all required PPE at this time.
- Only lunch pails, bit bags and small hand supplies are allowed on regular scheduled personnel runs.



Any additional parts or tools needed underground are to be placed in the collar house and tagged for the level they need to go to.

They will be delivered during the parts run.

6. Underground Hazards and Controls

6.1 Underground Hazards and Controls

6.2 Site Specific Hazards

Site Specific Hazards

Using the tools that you learned in Tier 1 Orientation, ensure to use operational controls to mitigate risk associated to the identified hazards.

Be Aware
Be aware of your surroundings and the risks around you.

Follow Policies & Procedures
Our internal policies and procedures guide us in doing our work in a manner that reduces risk.

The following section lists identified hazards that may be encountered in the work you're doing.

Knowing if these hazards apply to your work can be found through:

- Vale Contact Person
- PMRA/PHR/JHA (or other Risk Assessment Tools)
- SLAM / FLHA

6.3 Site Specific Hazards

Site Specific Hazards

At Copper Cliff Mine Complex, workers need to be aware of site-specific hazards and their related controls. These include but are not limited to:

- Ramp Travel
- Ground Water Management
- Dust/Airborne Contaminants
- Ventilation
- Noise
- Heat Stress
- Mobile Equipment
- Seismicity
- Getting Lost

6.4 Driving Underground

Driving Underground

Be Aware that any personnel who are required to drive a vehicle underground at Copper Cliff Mine South Side must first receive site specific ramp travel training.

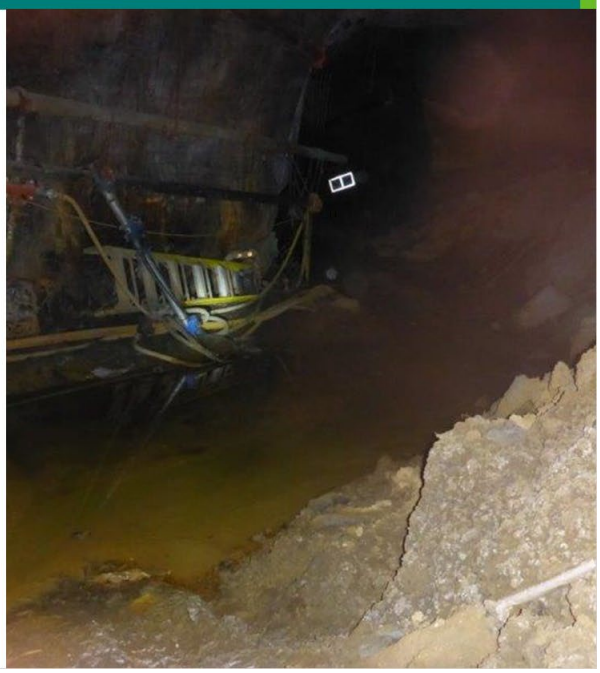
6.5 Road Conditions - Hazard

Road Conditions – Hazard

A rough roadway surface puts unnecessary stress on equipment components as well as you the operator.

Workers must be aware of the hazardous conditions caused by rough road conditions, which include;

- Loss of Control of the vehicle.
- Equipment Damage.
- Personal Injury.
- Falls of material / loss of load.



6.6 Road Conditions - Control

Road Conditions – Control

To mitigate this hazard, Copper Cliff Mine Complex has implemented the following controls:

- Follow the Ramp Speed of 35 km/hr. or second gear when traveling on the ramp.
- Always wear your seatbelt in moving vehicles.
- Ensure all loads are properly secured.
- At the first sign of problems, raise your concerns with supervision.

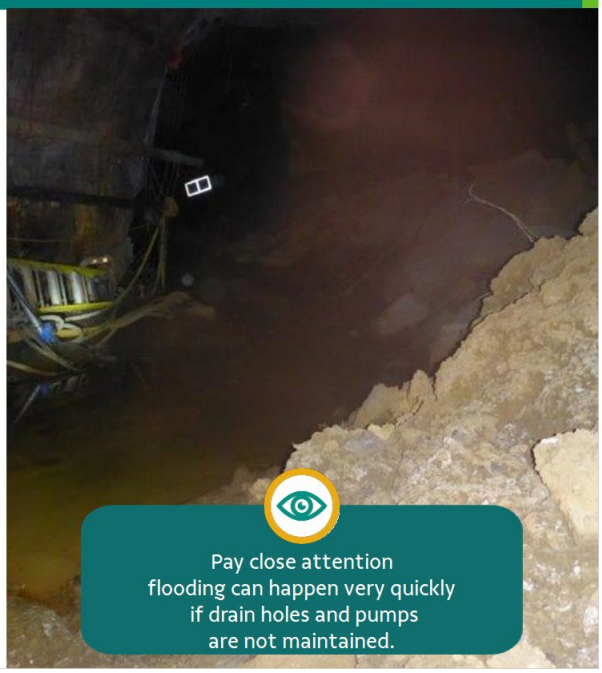
6.7 Managing Ground Water - Hazard

Managing Ground Water – Hazard

Copper Cliff Mine Complex is considered a wet mine.

Workers need to be aware of site specific hazards such as, slippery conditions or runs of muck and their related controls.

If ground water is not controlled and allowed to accumulate, there is a risk that it can become impounded, which can result in an uncontrolled flow of material.

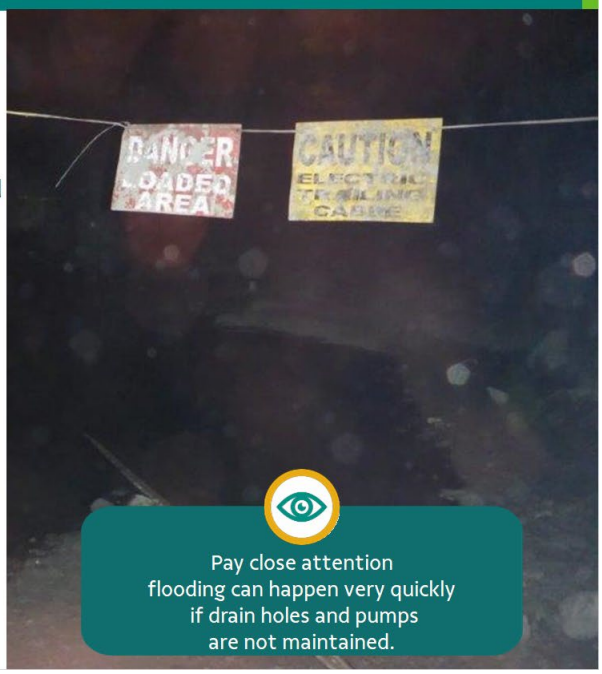


6.8 Managing Ground Water - Control

Managing Ground Water – Control

To mitigate this hazard be aware of the following controls:

- The Water Management Plan including:
  - Drain holes and sumps are inspected and maintained on a regular basis.
  - Dams and bulkheads.
  - Report any excess water to your supervisor.



6.9 Dust / Airborne Contaminants - Hazard

Dust / Airborne Contaminants – Hazard

During mining activities, (e.g. drilling, tramming or shotcreting) dust and/or other airborne contaminants can be created that can pose long term health hazards.

- Airborne chemicals are breathed in through the mouth or nose.
- The size of particles or droplets can affect where the chemical settles in the respiratory tract.
- Where the chemical settles in the respiratory tract determines what symptoms or diseases will develop.

6.10 Dust / Airborne Contaminants – Hazard

Dust / Airborne Contaminants – Control

To mitigate the hazard of being exposed to dust or airborne contaminants be aware of the following controls:

- Signs posted throughout the mine informing workers if respirators are required.
- Conditioning the muck with water will greatly reduce the amount of airborne dust.
- Dust suppression applied to road, when required.
- Reporting dusty conditions to your supervisor.
- Occupational exposure testing of workers.
- Controlling dust at the source with the use of water sprays or washing work area.

6.11 Ventilation - Hazard

Ventilation – Hazard

Copper Cliff Mine Complex has a very large footprint. At times it would be easy to surpass the ventilation requirements for equipment use which presents the hazard of workers being exposed to contaminated air.

Airborne contamination in the mine includes Dust, Carbon Dioxide and Diesel particulates.

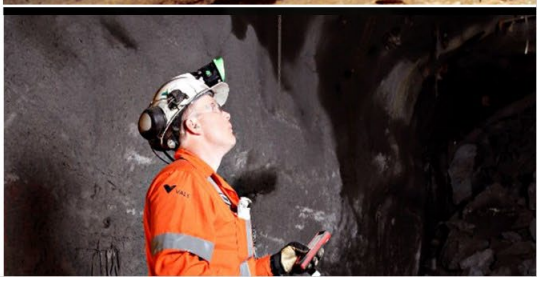
6.12 Ventilation - Hazard

Ventilation – Hazard

Methane is a common gas that may accumulate in pockets in the rock. It is sometimes noticed escaping from drill holes and making a hissing sound.

Water from the hole may be seen to be bubbling, or the sense of smell may be alerted by a rotten-egg odor if methane is accompanied by hydrogen sulphide gas.

Methane, at certain accumulations, is highly explosive and should always be considered dangerous.



6.13 Ventilation - Control

Ventilation – Control

To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex has implemented the following controls:

- Interactive Ventilation.
- Emissions testing of mobile equipment.
- Regular maintenance of mobile equipment.
- Protocols for staging equipment in the ore bodies are in place to ensure there is no exceedance of the CFM requirements.
- Ventilation prints are posted in all refuge stations underground.
- Weekly audits of ventilation flows.

6.14 Ventilation – Control (Applies to South Side Only)

Ventilation – Control ***(Applies to South Side Only)***

To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex has implemented the following controls:

- An interactive ventilation system has been installed to control the main fresh air and return air fans on surface, as well as 180 new fans underground.

6.15 Ventilation – Control (Applies to South Side Only)

Ventilation – Control ***(Applies to South Side Only)***

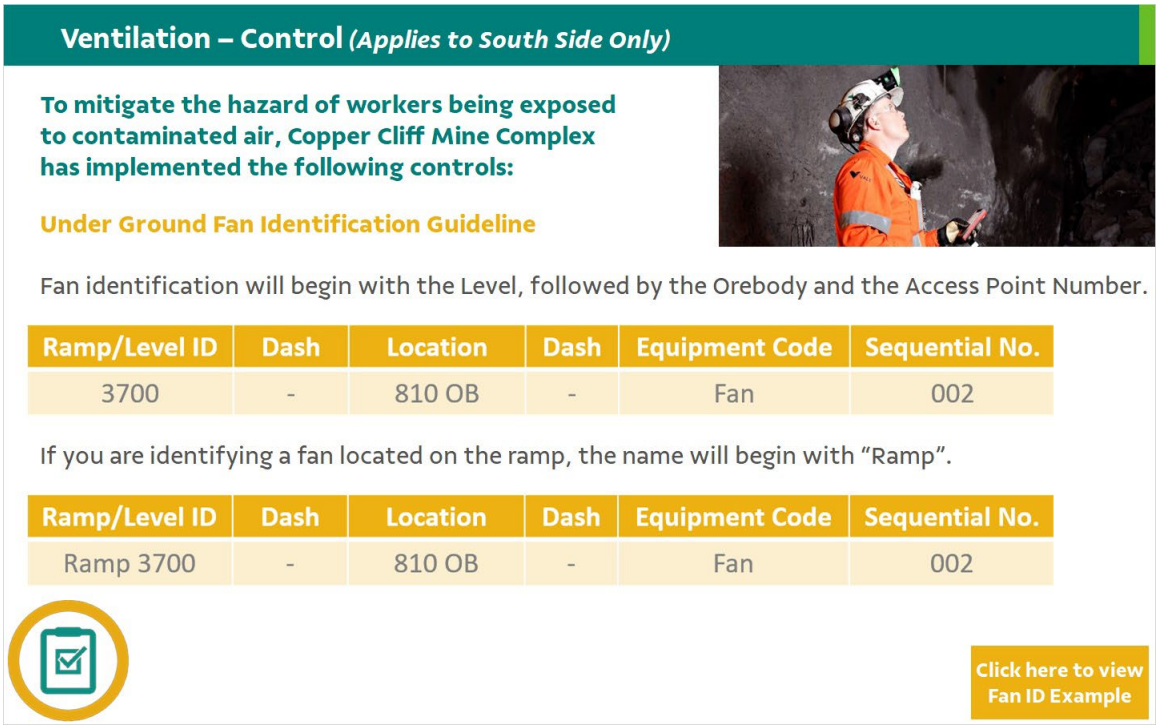
To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex Side has implemented the following controls:

Under Ground Fan identification Guideline

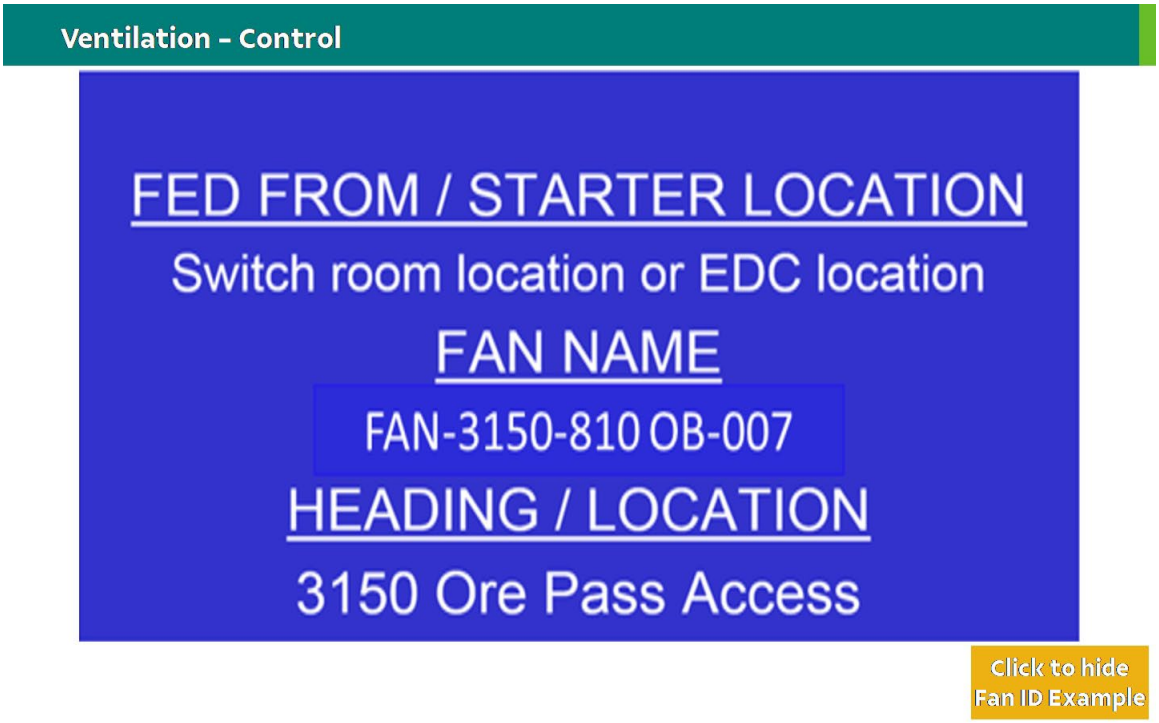
The Copper Cliff Mine Complex guideline for Ground Fan identification is used to provide a basis for consistent standardized identification of ventilation fans installed underground.

Identification is critical to ensure information for remote starting and stopping as well as local operation and that locking and tagging are clearly legible and intact on all new and old installations.

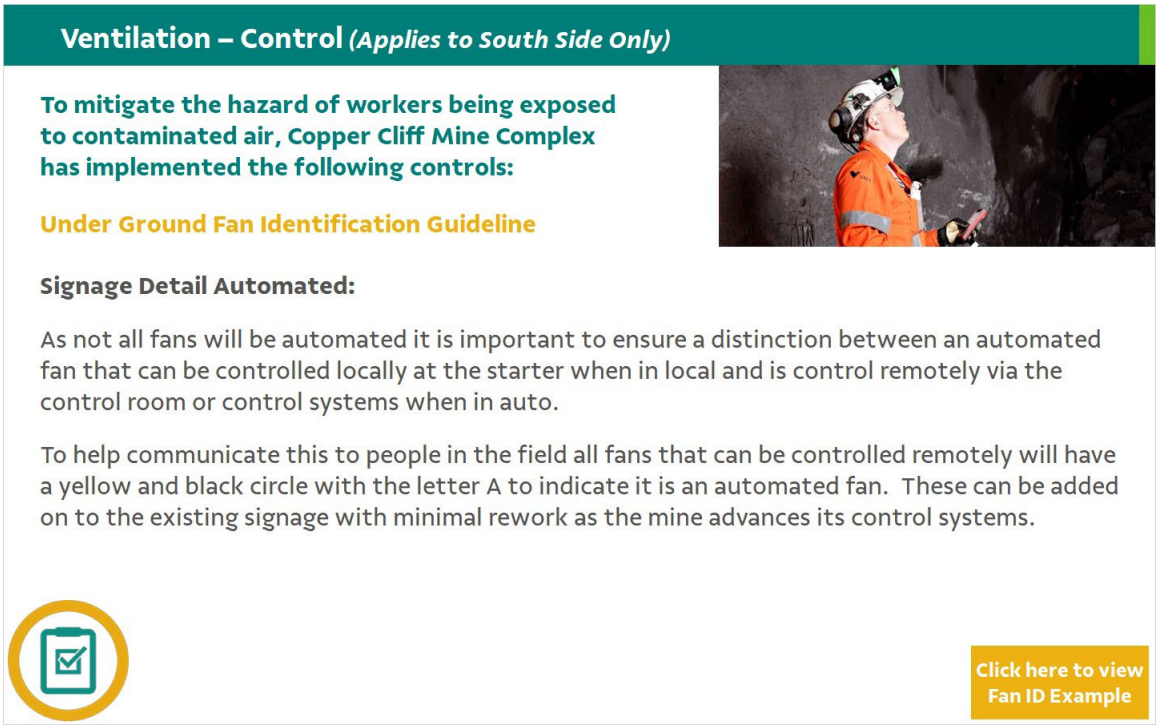
6.16 Ventilation – Control (Applies to South Side Only)



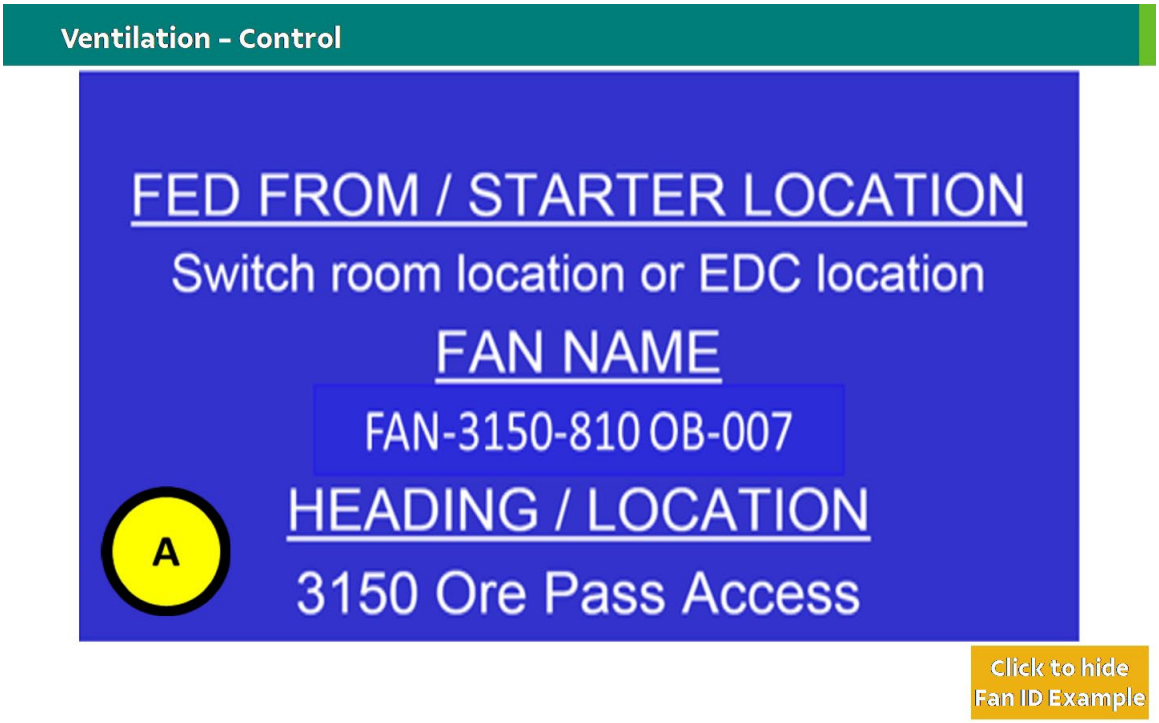
Example (Slide Layer)



6.17 Ventilation – Control (Applies to South Side Only)



Example (Slide Layer)



6.18 Ventilation – Control (Applies to South Side Only)

Ventilation – Control *(Applies to South Side Only)*

To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex has implemented the following controls:

Under Ground Fan Identification Guideline

For these reasons the signage is to be mounted as shown here, to the left or right upper side of the fan ensuring it is visible from the ground.

This will prevent mobile equipment traffic from accidental removal in lower back areas due to equipment heights potentially catching the sign and detaching it from the fan.

6.19 Ventilation – Control (Applies to South Side Only)

Ventilation – Control *(Applies to South Side Only)*

To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex has implemented the following controls:

Air Flow and Quality is measured by 50 New Air Analyzing Transmitters (AIT) and regulated by 30 Air Quality Stations (AQS) all of which are monitored and controlled from the Central Control Room.




Click on the images above for more information.

Layer 1 (Slide Layer)

Layer 2 (Slide Layer)

Layer 3 (Slide Layer)

Layer 4 (Slide Layer)

6.20 Ventilation - Control

Ventilation – Control

To mitigate the hazard of workers being exposed to contaminated air, Copper Cliff Mine Complex has implemented the following controls:

- Employees are required to report any damage or deficiencies to the ventilation system to ensure it is being maintained and repaired when necessary.
- Report of location and position of vent doors. Do not change position of a door unless authorized to do so.

6.21 Noise - Hazard

Noise – Hazard

Equipment used in mining activities such as drilling, tramming or shotcreting operate at a noise level that can potentially cause long term hearing loss.

6.22 Noise - Control

Noise – Control

To mitigate the hazard of workers being exposed to noise, Copper Cliff Mine Complex has implemented the following controls:

- Minimum single hearing protection required.
- Double hearing protection to be worn as posted.
- Risk Assessment for the work being performed.
- OEMP noise monitoring.

Hearing Protection Required

Double Hearing Protection Required

6.23 Heat Stress - Hazard

Heat Stress – Hazard

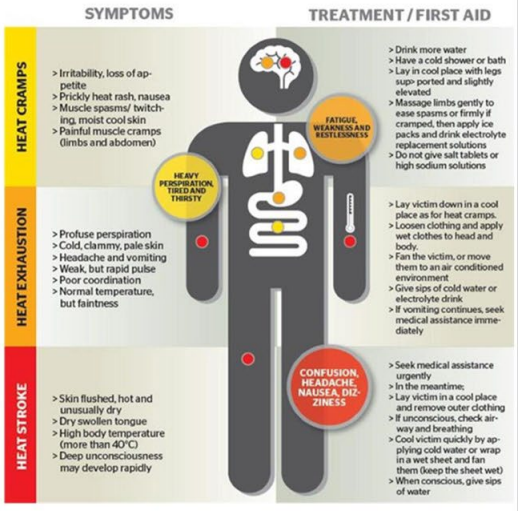
Due to the depth at Copper Cliff Mine Complex, the inherent rock temperature is naturally higher.

This combined with humid environments increases the air temperature significantly.

What is heat stress?

Heat stress can happen when hot, humid conditions and physical activity overcomes your body's natural cooling system.

Heat stroke can kill quickly.

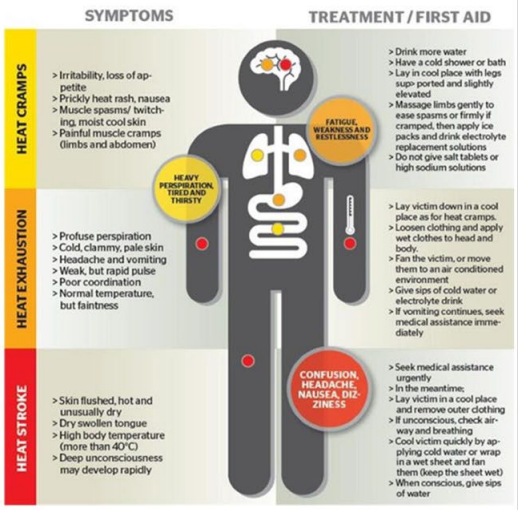


6.24 Heat Stress - Hazard

Heat Stress – Hazard

Working in these conditions creates a hazard of heat stress. Signs or symptoms of heat stress include;

- Cramps
- Fainting
- Serious heat exhaustion and/or
- Heat stroke



6.25 Heat Stress - Control

Heat Stress – Control

To mitigate the hazard of heat stress, Copper Cliff Mine Complex has implemented the following controls:

- Drinking water can be found in the form of 5 gallon bottles of water both on surface and underground.
- The drinking water underground is located in refuge stations, either in the fridge or in a storage rack.
- Work/rest regimes are in place for areas identified through workplace assessments.

6.26 Mobile Equipment - Hazard

Mobile Equipment – Hazard

Mobile equipment presents a high risk hazard of collision with vehicles or pedestrians.

The mobile equipment hazards at Copper Cliff Mine Complex include the following:

- Diesel haulage trucks, boom trucks and other small mobile equipment are also hauling on this ramp.
- Service vehicles such as boom trucks and other small mobile equipment are continuously operating throughout the mine.
- Large scoops operating on different levels that have very limited visibility.

6.27 Mobile Equipment - Hazard

Mobile Equipment – Hazard

The following list identifies the different types of mobile equipment you will encounter while working underground at Copper Cliff Mine Complex.

CAT R1700K: This scoop has a 10 yard bucket payload to load the AD45B truck in only three passes. This will also be capable of implementing semi-autonomous mucking from surface between shifts (from the central control room).

CAT R1700XE: This is a full battery electric 8 yd production scoop. Electric scoops produce significantly less noise than diesel powered scoops. As such, they are more difficult to hear operating.

Operating on 4330/4130L to 3930L.
Charging station located on 4330L

6.28 Mobile Equipment - Hazard

Mobile Equipment – Hazard

The following list identifies the different types of mobile equipment you will encounter while working underground at Copper Cliff Mine Complex.

AD45 CAT: This will be the largest truck in use at Copper Cliff Mine with a 45 metric ton payload capacity. This truck will allow us to move more material per load, and has a push-box dump mechanism that will allow for flexibility in where it can dump.

5200-3930L Main Haulage

Boltec 034: A fully mechanized and cabbed rock bolting unit. Can handle a range of bolt types and removes the operator from the face where ground conditions are poor and there is risk from falling loose. Utilizes resin injection and screen handler to reduce MSD type injuries.

6.29 Mobile Equipment - Hazard

Mobile Equipment – Hazard

The following list identifies the different types of mobile equipment you will encounter while working underground at Copper Cliff Mine Complex.

Simba E7: It has a boom mounted drilling unit that will allow flexible 360 degree drilling capability, using 5.5" drill rods vs the older 4" rods, with the reach to allow drilling multiple rings on a single setup. It will also have autonomous drilling capability, so it can continue drilling between shifts and can be monitored from the central control room.

MacLean Personnel Carrier: Used for transporting personnel throughout the mine.

6.30 Mobile Equipment - Control

Mobile Equipment – Control

To mitigate the risk of collision, Copper Cliff Mine Complex has implemented the following controls:

Designated Traffic/Travel procedure:
Follow the Copper Cliff Mine Complex Traffic Plan (22OP0055).

Level entry protocols:
When a scoop tram is operating on the level, indicated by a large yellow flashing light, gate or single barricade with signage.

6.31 Mobile Equipment - Control

Mobile Equipment – Control

To mitigate the risk of collision, Copper Cliff Mine Complex has implemented the following controls:

- Headlights and vehicle yellow flashing lights are to remain on at all times when operating mobile equipment.
- JAWS system on all mobile equipment and caplamps.
- Hi-vis clothing apparel for all personnel.
- Trained and authorized equipment operators.
- Pre-use check of equipment.
- Safety bays are located every 100 feet on ramp.

6.32 Seismicity - Hazard and Control

Seismicity – Hazard and Control

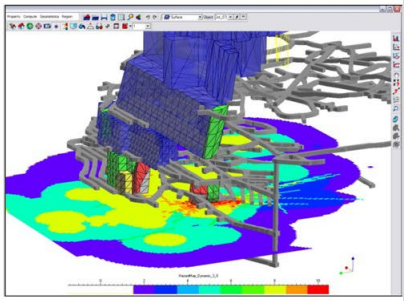
Copper Cliff Mine Complex is operating in deep areas. Due to this, along with other geological factors, you could encounter seismic activity.

To mitigate this hazard be aware of the following controls:

There are sensors throughout the mine that record seismic activity. *(These can also be monitored by the Ground Control Dept.)*

Always be alert and report any suspected seismic activity to your supervisor.

If warranted, there will be instructions broadcast on all channels – follow instructions.



6.33 Getting Lost - Hazard and Control

Getting Lost – Hazard and Control

Copper Cliff Mine Complex underground workings are connected, as these mines have areas that have been inactive for several years, access to old workings are prevalent.

To mitigate this hazard be aware of the following controls:

Travel with a mine ventilation or ground control person when going into old workings of the Mine.

Multiple locations where guardrails and barriers are installed to prevent people from entering restricted areas.

Guardrails and barricades may have deteriorated or fallen over time – Confirm their condition & request permission from Supervisor before entering.

All refuge stations have ventilation prints available as per legislation.

Directional signs are maintained throughout the mine to identify locations and destinations.

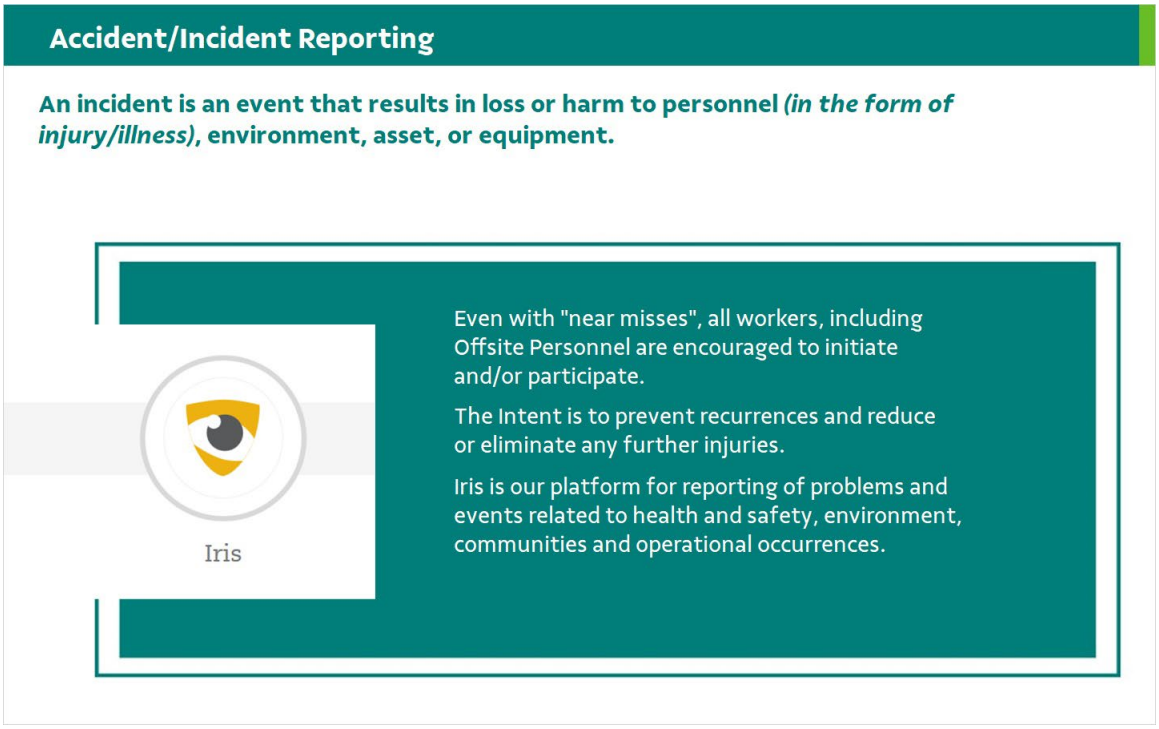
Follow the Copper Cliff Mine South Side Traffic Complex (22OP0055)
If you Don't Know – Don't Go.

7. Accident/Incident Reporting

7.1 Accident/Incident

Reporting

7.2 Accident/Incident Reporting



7.3 Accident/Incident Reporting

8. Emergency Preparedness

8.1 Emergency Preparedness

8.2 Emergency Preparedness

Emergency Preparedness

The Surface Tier 2 Orientation provided guidance on the application of Emergency Preparedness including activating an emergency and how to classify one.

The following is a general overview of how to respond to an emergency at Copper Cliff Mine Complex.

It is necessary that you familiarize yourself with the fire procedure(s) that apply to your specific area(s) of work at Copper Cliff Mine Complex. Your Supervisor or plant contact should review this with you.

8.3 Emergency Reporting

Emergency Reporting

To report any emergency at Copper Cliff Mine Complex, notify your supervisor or plant contact immediately or contact First Aid and/or the Control Room.

Here is a list of Copper Cliff Mine Complex Emergency Numbers, as well as the radio channels in use.

Copper Cliff Mine Complex Emergency Numbers

First Aid – PSP (South): 705-682-5034 or 5055

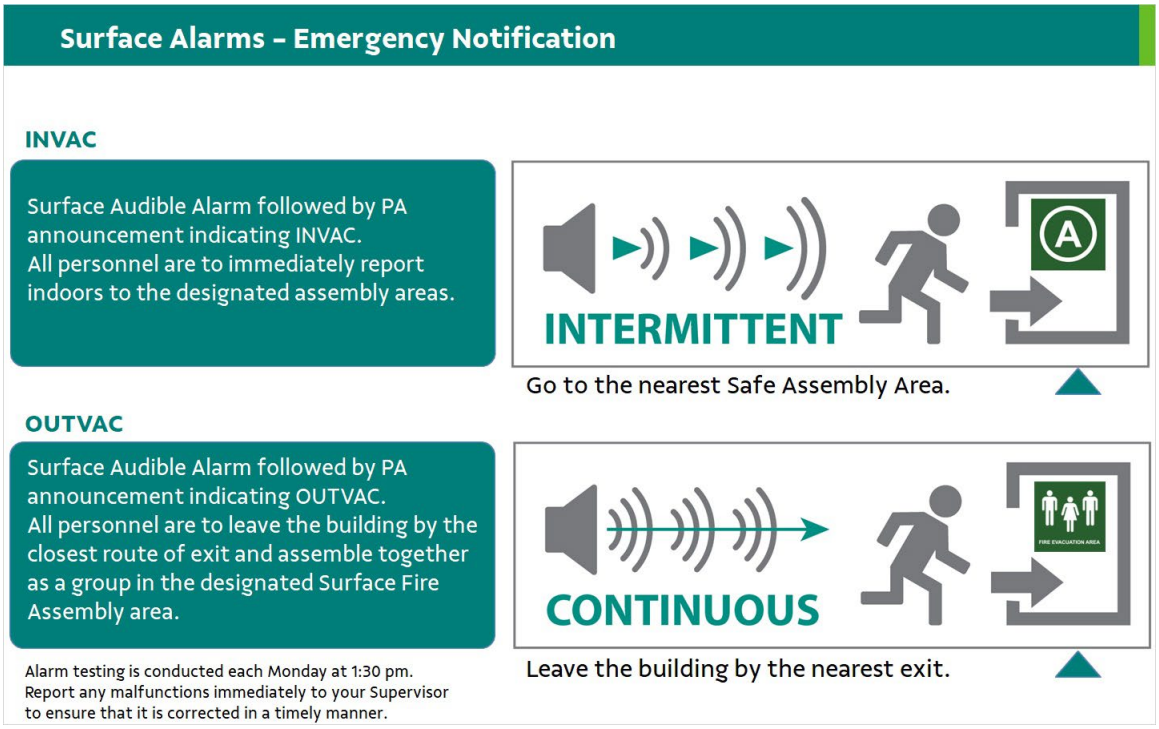
First Aid – PSP (North): 705-682-5264

Control Room (South Side Only)

705-682-5222

Sel.Pos.	CCM South Radio Channels
1	**CCM North – FIRST AID**
2	Division 1 – 3400 & UP
3	Division 2 – Below 3400
4	Tram
5	CCM South – Lower Ramp Dispatch P33 to 5200
6	CCM South – Lower Ramp Dispatch Surface to 3500
7	CCM South – Operations
8	CCM South – SSL
9	CCM South – Operations
10	CCM South – Maintenance
11	CCM South – Mobile
12	CCM South – Special Operations
13	CCM South – Commissioning
14	CCM South – Div. 1 CHAT
15	CCM South – Surface / UG Link / Logisitics
16	**CCM South – FIRST AID**
Channel Common to all CCM Radios (North & South)	
South Side Only	

8.4 Notification – Copper Cliff Mine



8.5 Emergency Procedures - South Side

8.6 INVAC - Surface Assembly Area - South Side

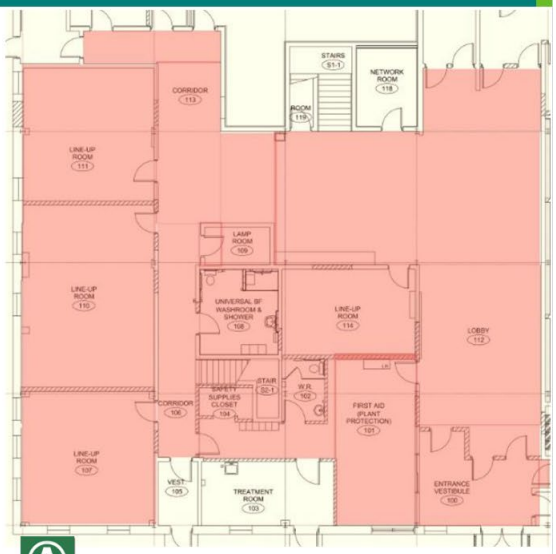
INVAC – Surface Assembly Area South Side

The Invac assembly area for Copper Cliff Mine South Side is located in the warm room.

All workers, except specific qualified personnel, will proceed immediately to the assembly areas to await further instructions.

Do not leave the assembly area until instructed to do so, or until the all clear is given.

Copper Cliff Mine Complex can be affected by a Level 3 from the Smelter (noxious gases) or the Nickel Refinery (carbonyl or ammonia).



A CCMC – South Side Warm Room – INVAC Safe Assembly Area.

8.7 Outvac - Surface Fire Assembly Area - South Side

Outvac – Surface Fire Assembly Area South Side

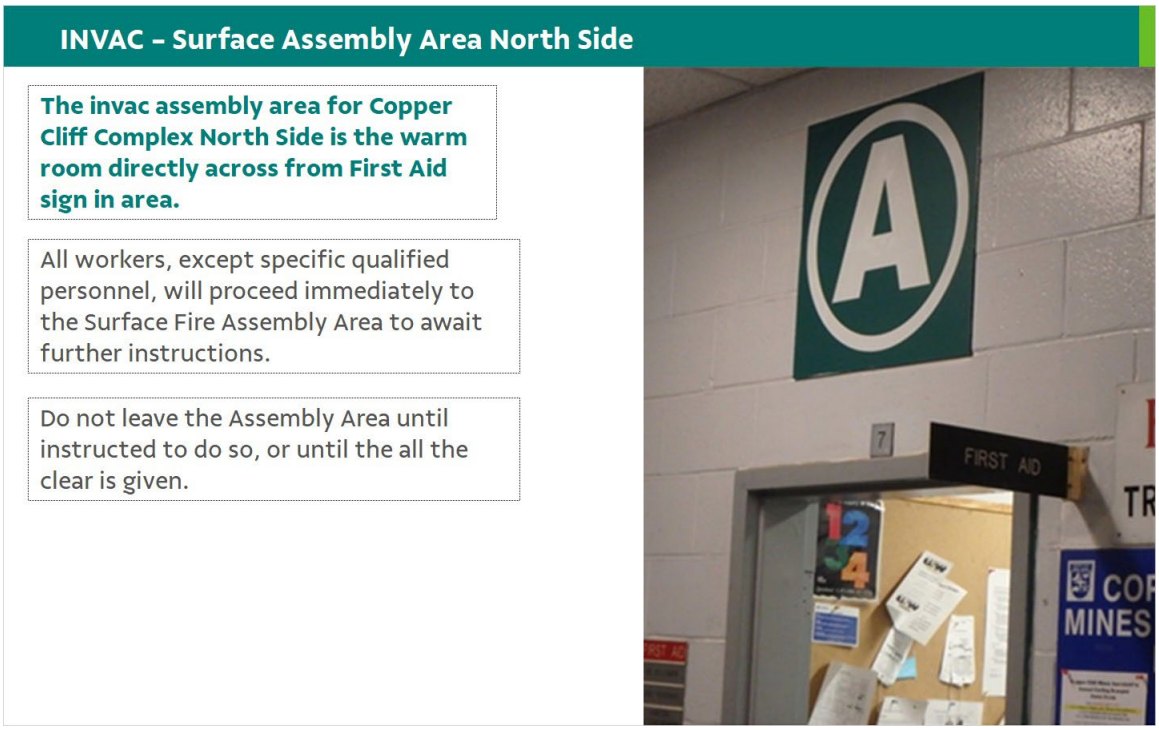
The Outvac for Copper Cliff Mine South Side is located outside of the main entrance turnstiles.

All workers, except specific qualified personnel, will proceed immediately to the Surface Fire Assembly Area to await further instructions.

Do not leave the Surface Fire Assembly Area until instructed to do so, or until the all the clear is given.

8.8 Emergency Procedures - North Side

8.9 INVAC - Surface Assembly Area - North Side



8.10 Outvac - Surface Fire Assembly Area - North Side

Outvac – Surface Fire Assembly Area North Side

The Outvac for Copper Cliff Mine Complex North Side is located nearest to Parking Lot C (Night shift parking).

All workers, except specific qualified personnel, will proceed immediately to the Surface Fire Assembly Area to await further instructions.

Do not leave the Surface Fire Assembly Area until instructed to do so, or until the all the clear is given.

8.11 Underground Fire Procedures

Underground Fire Procedures

In the event of a fire underground at Copper Cliff Mine Complex, stench will be injected into the fresh air system, as well as a message broadcast on all channels "There is a fire underground – Report to the nearest refuge station".

Report to the nearest refuge station and follow the underground fire procedure.

In remote areas of Copper Cliff Mine Complex that do not have standard refuge stations, the following types of emergency fresh air installations are available to protect workers.

- Tent style emergency fresh air stations.
- Cascade systems inside a standard refuge station.

8.12 Underground Fire Procedures

Underground Fire Procedures

Be sure to follow the Do's and Don'ts for underground fire situations.

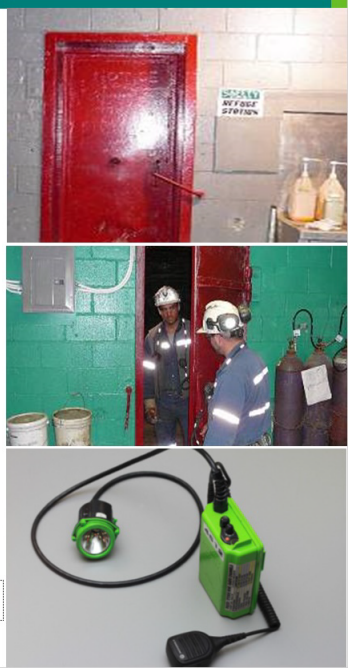
Do:

- Report directly to a refuge station.
- Follow the procedure located in the refuge station.
- Conserve all water/food that may be in the refuge station.
- Turn off all radios and cap lamps but one to conserve power.

Do Not:

- Use the phone unless you're being contacted.

NEVER REFUSE ANYBODY ENTRY INTO THE REFUGE STATION!



8.13 Emergency Fresh Air Station: Tent Style

Emergency Fresh Air Station: Tent Style

The Emergency Fresh Air Stations are temporary shelters offering breathable air in the event of an emergency.

They are intended for use in the event of a fire, ONLY if you are unable to reach a refuge station or are trapped in the workplace due to smoke.

Proceed to Emergency Fresh Air Station (EFAS).

- Turn on compressed air valve (main line) to EFAS.
- Un-zip the access door and step inside.
- Watch footing on tubing floor as it is slippery.
- Re-zip the door shut.

8.14 Emergency Fresh Air Station: Tent Style

Emergency Fresh Air Station: Tent Style

The Emergency Fresh Air Stations are temporary shelters offering breathable air in the event of an emergency.

They are intended for use in the event of a fire, ONLY if you are unable to reach a refuge station or are trapped in the workplace due to smoke.

Proceed to Emergency Fresh Air Station (EFAS).

- Ensure that the compressed air valve (inside roof) is open to pressurize the enclosure.
- Remain inside of enclosure until rescued or released by Control Group.

8.15 3000 Level Refuge Station - North Side

3000 Level Refuge Station – North Side

The refuge station at 3000 level also contains 5 compressed air cylinders (cascade system) that is located inside.

One person will take charge and carry out the Standard Refuge Station Procedure. Using the compressed air cylinders to pressurize the Refuge Station;

- Turn on the first air cylinder only.
- Watch the air pressure by checking the gauge regularly, when the gauge reaches a pressure of 100 psi close the cylinder.
- Turn on the next cylinder and repeat step 2 above.
- Contact the CONTROL BASE (Manager's office) each time a new cylinder is turned on.
- Do NOT adjust the regulator.
- Remove the plug in the door after the first compressed air cylinder is turned on.

8.16 Other Mine Emergency

Other Mine Emergency

In the event there is a mine emergency that may affect personnel underground, other than an underground fire, the emergency will be broadcast on all channels.

Report to the nearest refuge station, ensure you are accounted for and wait for instructions. Do not clay the doors unless otherwise instructed.

9. Plant Exit

9.1 Plant Exit

9.2 Arriving on Surface

Arriving on Surface

Immediately remove your underground tag from the tag-in board and sign out of underground book, if applicable.

9.3 Plant Exit

Plant Exit

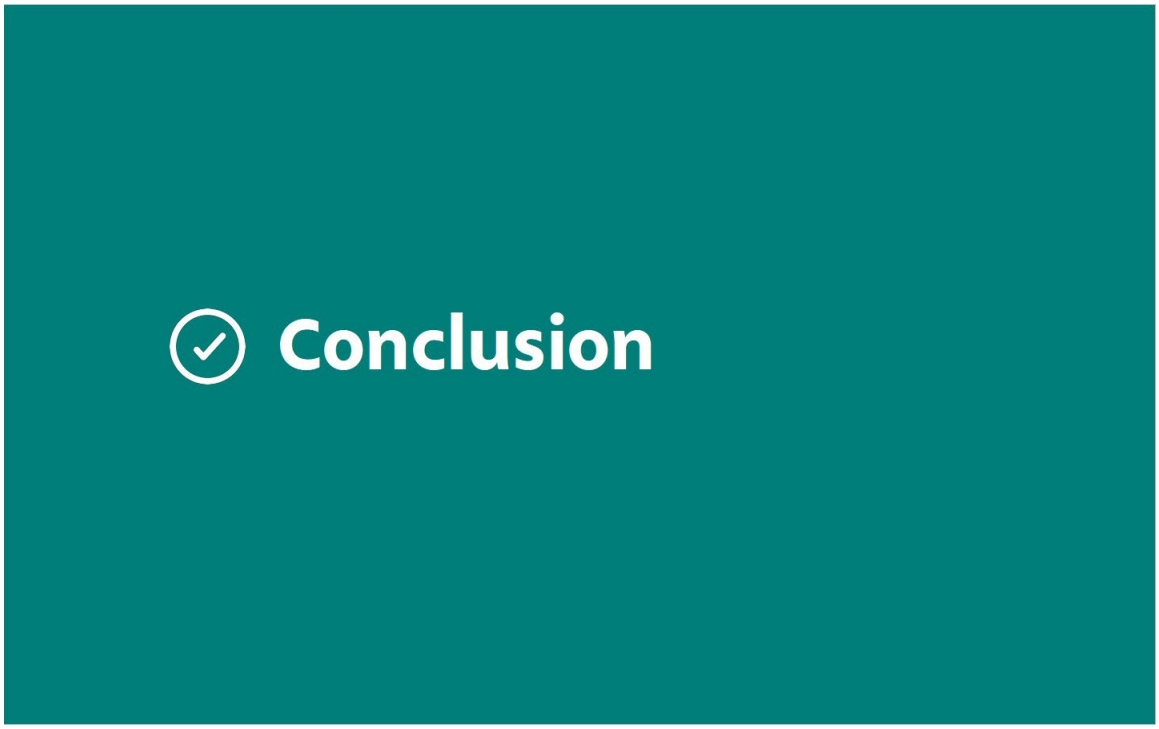
Good work practices dictate that you close the loop on work you were doing to avoid creating risks or hazards for other work groups, cross shifts, or other work in your area.

Here are some tasks to consider when getting ready to exit the plant to ensure your safety and that of those around you:

- ✓ **Housekeeping** – Is your worksite cleaned up after your job?
- ✓ **Personal Lock and Tag** – Has your personal protection been removed at the end of the shift?
- ✓ **Status Tagging** – Is there ongoing work that needs a status tag placed or is there equipment in Bad Order that needs to be identified?
- ✓ **End States** – Have you left the process in the proper state?
- ✓ **Waste Segregation** – Have you disposed of materials in the appropriate waste receptacles/bin/area?
- ✓ **Control room** – Do I need to let the control room know that I'm clear of an area?
- ✓ **Vale Contact Person** – Do they need any end of shift report from me?
- ✓ **Permits** – Do I need to close or hand in any permits?
- ✓ **Sign out –** At the gate or other designated areas.

10. Conclusion

10.1 Conclusion



10.2 Conclusion

Conclusion

This concludes the material for Tier 3 Vale Copper Cliff Mine Complex Site Specific Orientation.

You should now have a working knowledge and understanding of:

- The Mining Plant Layout and Boundaries
- Plant entry and tagging requirements

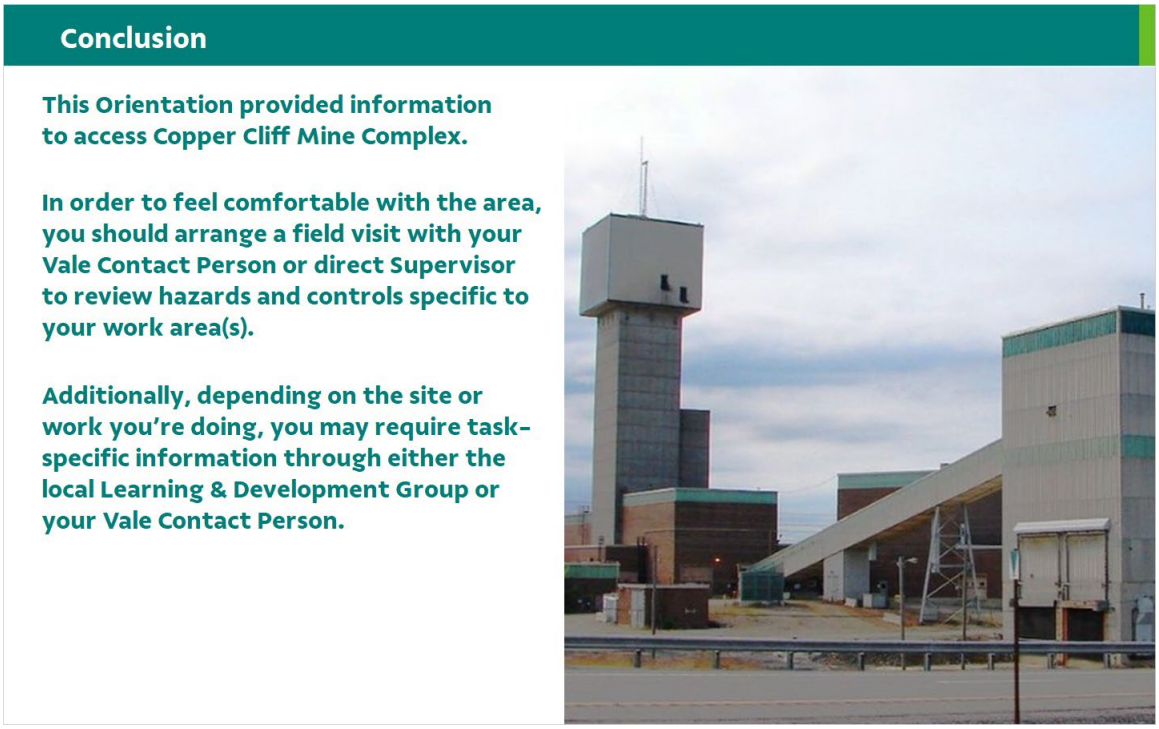
10.3 Conclusion

Conclusion

The high level general hazards and controls with regards to:

- Ramp Travel
- Ground Water Management
- Dust/Airborne Contaminants
- Ventilation
- Noise
- Heat Stress
- Mobile Equipment
- Seismicity
- Getting Lost

10.4 Conclusion



10.5 Start The Module Quiz