BC GUIDANCE DOCUMENT

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Health, Safety and Reclamation Code for Mines in British Columbia

Off Road Vehicles

BRITISH COLUMBIA
Ministry of Mining and Critical Minerals

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Purpose of Guidance Document

This document provides guidance regarding the new additions to Part 4 of the Health, Safety and Reclamation Code for Mines in British Columbia (the Code) which relates to off road vehicle safety on mine sites. This document also provides guidance on the Ministry of Mining and Critical Minerals (MCM) expectations for the application of the Code and is meant to assist operations in understanding and complying with the Code.

This guidance document is intended to be general and not prescriptive in nature and provide context to clarify the Code requirements. The provisions of the Mines Act (the "Act") and the Code prevail in cases where differences may occur in interpretations of the guidance.

The responsibility and authority for interpretation of this guidance document rests with the Chief Inspector of Mines.

Abbreviations

ANSI	*American National Standards Institute*
CSA	*Canadian Standards Association*
DOT	*Department Of Transportation*
E-bike	*Electric Bicycle*
FLRA	*Field Level Risk Assessment*
FOPS	*Falling Object Protective Structure*
OEM	*Original Equipment Manufacturer*
ORV	*Off-Road Vehicle*
OSHA	*Occupation Safety and Health Administration*
PPE	*Personal Protective Equipment*
ROPS	*Roll-Over Protection Structure or System*
SAE	*Society Of Automotive Engineers*
WLL	*Working Load Limit*

Chapter 1: Definitions

The term off-road vehicle (ORV) is used as a general category encompassing various vehicle types designed for off-highway use, such as utility terrain vehicles (UTVs) and snowmobiles. It is important to note that "ORV" is a broad descriptor and not intended to imply any specific design features, capabilities, or operational limits. When interpreting ORV-related requirements in the Code, workers and supervisors should refer to the specific vehicle classification (e.g., UTV, snowmobile) and ensure that guidance is applied appropriately based on the actual equipment in use.

DEFINITION: All-terrain cycle (ATC)

"All-terrain cycle" or *"ATC"* means a motorized vehicle that

(a) is designed to travel on 1, 2 or 3 low-pressure tires,

(b) has handlebars for steering, and

(c) has a seat designed to be straddled by the operator.

Guidance on "All-terrain cycle (ATC)"

All-terrain cycles (*ATCs*) refer to motorized, straddle-ridden vehicles with 1, 2, or 3 low-pressure tires and handlebar steering.

FIGURE 1: EXAMPLES OF ATC CONFIGURATIONS

These include vehicles such as:

- ***Dirt bikes***
- ***Motorcycles***
- ***Three-wheelers***
- ***Tricycles***
- ***Motorized unicycles or monocycles***

Due to their high center of gravity, poor lateral stability, and lack of ROPS or restraint systems, ATCs are prohibited within the permitted mine area. They are inherently less stable than four-wheeled platforms and are more prone to rollovers, particularly on uneven or sloped terrain.

DEFINITION: All-terrain vehicle (ATV)

"All-terrain vehicle" or "*ATV*" means a motorized vehicle, not including an all-terrain cycle (ATC) or a utility terrain vehicle (UTV) that

(a) is designed to travel on 4 or more low-pressure tires, endless tracks or a combination of low-pressure tires and endless tracks,

(b) has handlebars for steering, and

(c) has a seat designed to be straddled by the operator.

Guidance on All-terrain vehicle (ATV)

ATVs, commonly referred to as quads, four-wheelers, or quad bikes, are single-rider vehicles designed for off-road use, typically equipped with handlebars, straddle seating, and four low-pressure tires. Some models may use track conversion kits.

FIGURE 2: EXAMPLES OF ATV CONFIGURATIONS

ATVs lack rollover protection structures (ROPS) and are generally not designed to accommodate seatbelts, making them unsuitable for high-risk industrial environments such as mines. Their design favours maneuverability and compactness but lacks critical safety features required under the Code. It is for these reasons that ATVs are prohibited within the permitted mine-area.

Alternate terms used for ATVs include:

- ***Quad***
- ***Four-wheeler***
- ***Quad bike***
- ***Quadricycle***

DEFINITION: Snowmobile
"Snowmobile" means a motorized vehicle that

(a) is designed for travel on snow or ice,

(b) has one or more steering skis,

(c) is self-propelled by means of one or more endless tracks driven in contact with the ground, and

(d) has a seat designed for the rider to sit astride.

Guidance on "Snowmobile"

Snowmobiles are tracked motorized vehicles specifically designed for travel over snow and ice, using endless track(s) for propulsion and steering skis for directional control. Riders operate the machine from a straddle position and use handlebars for control.

FIGURE 3: VARIOUS SNOWMOBILE CONFIGURATIONS

Alternate terms for snowmobiles include:

- ***Sled***
- ***Skidoo (brand name)***
- ***Snow machine***
- ***Snow scooter***
- ***Timber sled***
- ***Track sled***
- ***Snow dog***
- ***Motor sled***
- ***Skimobile***

Snowmobiles do not include ROPS or seatbelts and are only appropriate in mine settings where terrain and environmental conditions require their use. Additional controls such as

personal protective equipment (PPE), visibility aids, and specific training are necessary when operating snowmobiles on or near mine infrastructure.

DEFINITION: Utility terrain vehicle (UTV)

"Utility terrain vehicle" or "*UTV*" means a motorized vehicle, not including a golf cart or other low-speed vehicle, that

(a) is designed to travel on 4 or more low-pressure tires, endless tracks or a combination of low-pressure tires and endless tracks,

(b) has a steering wheel or steering stick, and

(c) has one or more seats not designed to be straddled.

Guidance on "Utility terrain vehicle (UTV)"

Utility terrain vehicles (UTVs) are multi-purpose, off-road motorized vehicles designed with four or more low-pressure tires or tracks, a steering wheel or stick, and non-straddle seating (bench or bucket-style).

FIGURE 4: EXAMPLES OF TYPICAL UTV CONFIGURATIONS

UTVs are sometimes referred to by trade names or descriptors such as:

- ***Gator***
- ***Side-by-side***
- ***Argo***
- ***Sherp***
- ***PistenBully***
- ***Snowcat / Sno Cat***
- ***Snow Trac***

UTVs used in mining applications are typically required to be equipped with rollover protective structures (ROPs) and seatbelts. While some UTVs do not come standard with ROPS, many models offer factory or certified aftermarket ROPS and must comply with regulatory standards before use in permitted mining areas.

Note: Some trade names (e.g., Argo, Side-by-side) may refer to vehicles that do not include ROPS by default. These vehicles may still qualify as UTVs if appropriately equipped.

FIGURE 5: ADDITIONAL UTV CONFIGURATIONS

General Guidance on Definitions

The term *endless tracks*, as used in the definitions of UTVs, ATVs, and snowmobiles, refers to a continuous loop of flexible material, typically reinforced rubber, composite, or rubber/metal hybrid that wraps around a series of drive sprockets, rollers, and idlers to provide traction, flotation, and propulsion in difficult terrain.

Endless tracks are designed to:

- Improve mobility over snow, mud, loose soil, and rough terrain
- Distribute weight more evenly than tires, reducing ground pressure
- Allow the vehicle to operate in conditions where wheeled vehicles would struggle or fail

Endless tracks are driven by the vehicle's powertrain and may replace wheels entirely (such as on a snowmobile), be installed in place of tires using track conversion kits (common for UTVs and ATVs used in winter conditions), or wrap around and be driven by the existing tires installed on the machine (See the Argo and PistenBulley for an example).

Key characteristics include:

- No visible joints or seams ("endless" refers to the continuous loop construction)
- Constructed with internal lugs, embedded cords, or metal reinforcements for durability
- May include cleats, paddles, or aggressive lug patterns for specialized traction

Endless tracks should be maintained according to the manufacturer's guidelines to ensure safe operation and prevent derailment, slippage, or component failure.

The term *handlebars*, as referenced in the definitions of all-terrain vehicles (ATVs), all-terrain cycles (ATCs), and snowmobiles, refers to the steering mechanism typically consisting of a horizontal bar mounted on a central steering column or shaft, gripped by the operator with both hands. Handlebar systems are used to control direction, braking, throttle, and other vehicle functions depending on the configuration.

Handlebars typically include:

- Throttle control (thumb lever or twist grip)
- Brake levers (usually on the right-hand side for front brakes, or both hands for dual-brake systems)
- Hand guards or protection shields
- Auxiliary controls, such as engine start/stop switches, lights, and sometimes gear selectors

Handlebars differ from steering wheels, which are found on UTVs and other enclosed or seated vehicles. The distinction is important for vehicle classification and safe operation, as handlebar-equipped ORVs are straddled by the operator and designed for active body positioning during use.

The term *other low-speed vehicles*, as referenced in the definition of utility terrain vehicles (UTVs), refers to motorized or electric vehicles that:

- Are not designed for high-speed travel or off-road terrain, and
- Do not meet the safety or durability requirements for use in rugged mining environments.

These vehicles typically lack features such as:

- Roll-over protective structures (ROPS)
- Off-road suspension systems
- Reinforced frames or undercarriage protection
- Engine braking or traction-assist features

Examples include, but are not limited to:

E-bikes (electric bicycles)	Lightweight, two-wheeled pedal-assist or throttle-powered vehicles designed for road or light-trail use.
Golf carts	Electric or gas-powered carts designed for low-speed operation on flat surfaces, usually with a maximum speed of under 20 km/h.
Mobility scooters	Personal mobility devices for medical or accessibility use.
Low-speed electric utility vehicles	Small, flat-deck or cabbed electric carts used in warehouses or industrial settings.

These vehicles may be useful for non-operational tasks such as inspections or travel on designated access routes, but they are not considered suitable for mining operations involving challenging terrain, variable weather, or high-risk environments.

Where such vehicles are permitted, the manager should ensure they are used only within their design limitations and that adequate risk controls (e.g., PPE, speed limits, supervision) are in place.

Chapter 2: Manager, Supervisor & Worker Responsibility

Prohibitions

4.8.4 The manager must ensure that all-terrain vehicles (ATVs) and all-terrain cycles (ATCs) are not used on the mine site.

Guidance on section 4.8.4

The reason for the prohibition on the use of all-terrain vehicles (ATVs) and all-terrain cycles (ATCs) within the permitted mine area is due to the recently documented higher amount of rollover related incidents and associated injuries. By design, ATVs and ATCs typically lack integral rollover protective structures (ROPs) and do not support the use of operator restraint systems, such as seatbelts, significantly increasing the risk of harm to the operator in the event of a rollover or loss of control.

In contrast, utility terrain vehicles (UTVs) are engineered to include these critical safety features such as factory installed ROPS and seatbelt systems while providing equivalent or superior functionality for operational tasks in the mining environment.

In exceptional circumstances where UTVs are not available, or the physical layout of legacy infrastructure precludes their use (e.g., narrow access routes, clearances, or turning radii designed for smaller platforms), the manager may authorize the operation of ATVs or ATCs up to the boundary of the permitted mine area. However, under no circumstances may ATVs or ATCs be operated within the permitted mine area, regardless of site-specific limitations or historical practices.

Manager's Responsibilities

4.8.5 (1) The manager must ensure that the operator of an off-road vehicle (ORV) is
- (a) under the supervision of a qualified person, and
- (b) trained for the work being performed using the off-road vehicle (ORV).

(2) The manager must ensure that procedures for the safe operation of off-road vehicles (ORVs) used for mining activities are developed, implemented and followed.

Guidance on section 4.8.5

Section 4.8.5 defines the manager's responsibilities regarding the use of off-road vehicles (ORVs) within a permitted mine area. The manager is accountable for ensuring that the worker's supervisor is a qualified person, as defined in the Mines Act. Furthermore, the manager must ensure that each ORV operator has received appropriate training specific to the vehicle being used and the nature of the work performed.

Training may be delivered through an internal (in-house) program developed by the mine operator or through an external provider, such as the Canada Safety Council Off-Road

Vehicle Training Program, provided the content is equivalent in scope and rigour. Regardless of the delivery method, training programs should address the following core competencies:

- Safe vehicle operation and handling techniques
- Pre-use inspections and mechanical awareness
- Obstacle identification and avoidance
- Route selection and navigation in variable terrain
- Understanding and application of rollover protective systems (ROPS)
- Appropriate use of personal protective equipment (PPE)
- Recognition and mitigation of environmental hazards
- Avalanche awareness and response (if applicable)
- Wilderness and remote area safety protocols
- Wildlife and animal hazard management
- Safe winching, towing, and vehicle recovery procedures
- Emergency response and incident reporting
- Communication protocols and equipment use
- Field Level Risk Assessments (FLRAs)

It is essential that procedures for both the safe operation of ORVs and worker training are developed, implemented, and maintained in accordance with Sections 1.11.1 and 1.11.2 of the Code. These procedures should be site-specific, risk-informed, and reviewed regularly to ensure effectiveness and regulatory compliance.

Supervisor's Responsibilities

4.8.6 (1) The supervisor must ensure

(a) that, prior to an operator operating an off-road vehicle (ORV), the operator has completed training on

(i) the specific type of off-road vehicle (ORV) that the operator will be using, and

(ii) the terrain on which the operator will be using the off-road vehicle (ORV), and

(b) that an operator of an off-road vehicle (ORV) is competent and authorized to do so.

(2) The supervisor must ensure that each off-road vehicle (ORV) is maintained in accordance with the operator's manual supplied by the manufacturer.

Guidance on section 4.8.6

Section 4.8.6 outlines the responsibilities of supervisors overseeing the use of off-road vehicles (ORVs) within a permitted mine area. The supervisor is responsible for verifying that each operator has completed training that is both vehicle specific and terrain specific, and that the operator is competent and authorized to use the assigned equipment in the work environment.

Operators must receive formal training in each distinct class of ORV they are expected to operate. For example, if an individual is required to use both a side by side (UTV) and a snowmobile during the course of their duties, separate training must be completed for each type of vehicle. It is critical to emphasize that recreational experience with ORVs is not an acceptable substitute for structured training in a controlled, professional setting.

Supervisors should also ensure the training provided addresses the specific terrain conditions encountered at the worksite. Terrain specific competencies should be evaluated, as operational risks differ significantly between, for example, groomed access roads and steep, rocky or forested terrain.

In addition to verifying training, the supervisor must assess the operator's competency to safely operate the ORV. This includes, but is not limited to, evaluation of factors such as:

- Medical conditions or physical impairments that may affect operation
- Signs of fatigue, intoxication, or drug use
- Mental readiness and judgment capacity
- Adherence to site-specific safety protocols and procedures

The supervisor is also responsible for ensuring the ORV itself is safe and fit for its intended use. Prior to deployment, the following considerations should be assessed:

Modifications:	Has the ORV been altered in any way (e.g., lift kits, track systems) that could affect stability, performance, or compliance?
Maintenance:	Does the ORV meet the minimum maintenance standards as specified in the manufacturer's operator manual?
Mechanical Condition:	Is the ORV in acceptable working condition, free of critical wear, damage, or defects?
Task Suitability:	Is the selected ORV appropriate for the specific task, load requirements, and terrain?
Safety Equipment:	Is the ORV outfitted with all required safety systems and accessories (e.g., ROPS, seatbelts, fire extinguisher, emergency supplies, communication devices)?

Supervisors should document these assessments where required and ensure that any deficiencies are rectified prior to vehicle use. Effective supervisory oversight is critical to preventing incidents and ensuring ORV use aligns with both regulatory obligations and site-specific risk controls.

Worker's Responsibilities

4.8.7 (1) A worker must not operate an off-road vehicle (ORV) unless the worker
- (a) has completed the training required under sections 4.8.5 (1) (b) and 4.8.6 (1) (a), and
- (b) is authorized by a qualified person.

(2) When operating an off-road vehicle (ORV), the worker must
- (a) maintain full control of the off-road vehicle (ORV), and
- (b) operate the off-road vehicle (ORV)
  - (i) in a safe manner at all times,
  - (ii) only within its intended work purpose, and
  - (iii) in accordance with the training referred to in subsection (1) (a).

Guidance on section 4.8.7

Operating an off-road vehicle (ORV) in a safe manner means the operator exercises control and judgment that minimizes the risk of harm to themselves, others, or the environment. Safe operation encompasses both the mechanical handling of the vehicle and adherence to site specific safety protocols.

Unsafe practices may include, but are not limited to:

- Operating the ORV at excessive speeds, particularly in confined or congested areas
- Traversing unstable or hazardous terrain without appropriate training or risk mitigation
- Performing maneuvers such as side-hilling on steep grades or navigating obstacles (e.g., deep ruts, loose scree, rocks, stumps, and trees) without adequate control
- Failing to adjust driving behavior based on weather conditions, visibility, or load characteristics

It is critical to recognize that an ORV used in professional, regulated environment differs significantly from recreational use. Professional ORV operation requires:

- Strict adherence to procedures and hazard assessments (e.g., FLRA)
- Use of PPE and safety equipment at all times
- Awareness of coworker proximity, wildlife interaction, and site-specific risks
- Compliance with training requirements and task-specific authorizations

Operators should not rely on prior recreational experience as a substitute for formal training and supervision within a mining or industrial setting. The operating context, expectations for hazard identification, and required controls are substantially more stringent in occupational environments.

Chapter 3: Transporting

Transporting

4.8.8 (1) The manager must ensure that transporting an off-road vehicle (ORV) is done in a safe manner, including ensuring that the off-road vehicle (ORV) is
(a) secured to a trailer while in transit, and
(b) not transported in or on the back of a truck.

Guidance for Section 4.8.8 (1)

Section 4.8.8(1) prohibits the use of sled decks, flat decks, or aftermarket transport racks mounted to the bed of pickup trucks for loading or transporting off-road vehicles (ORVs), including snowmobiles. This prohibition is based on a well-documented risk of injury during loading and unloading operations.

The use of elevated decks or ramps to load ORVs into the bed of a pickup truck presents several safety concerns:

Increased Fall Risk	Loading and offloading activities typically occur at height, where operators are required to balance on narrow ramps or uneven surfaces, increasing the potential for slips, trips, or falls.
Ramp Instability	Inadequately secured or unstable ramps can shift, collapse, or lose traction, particularly on icy or uneven ground, contributing to rollover or tip-over incidents.
Mechanical Failure	Overloading or improper mounting of sled decks or racks may result in structural failure or unintended movement of the ORV during transport.

In particular, the offloading of snowmobiles from sled decks mounted on trucks has been associated with multiple incidents and near misses, often due to ramp movement, misalignment, or operator missteps during descent.

Due to these hazards, this method of ORV transport is deemed incompatible with the expectations of safe work practices in a mining environment. ORVs must be transported using purpose-built trailers or other engineered solutions that allow for safe loading and unloading in accordance with manufacturer guidelines and site-specific hazard controls.

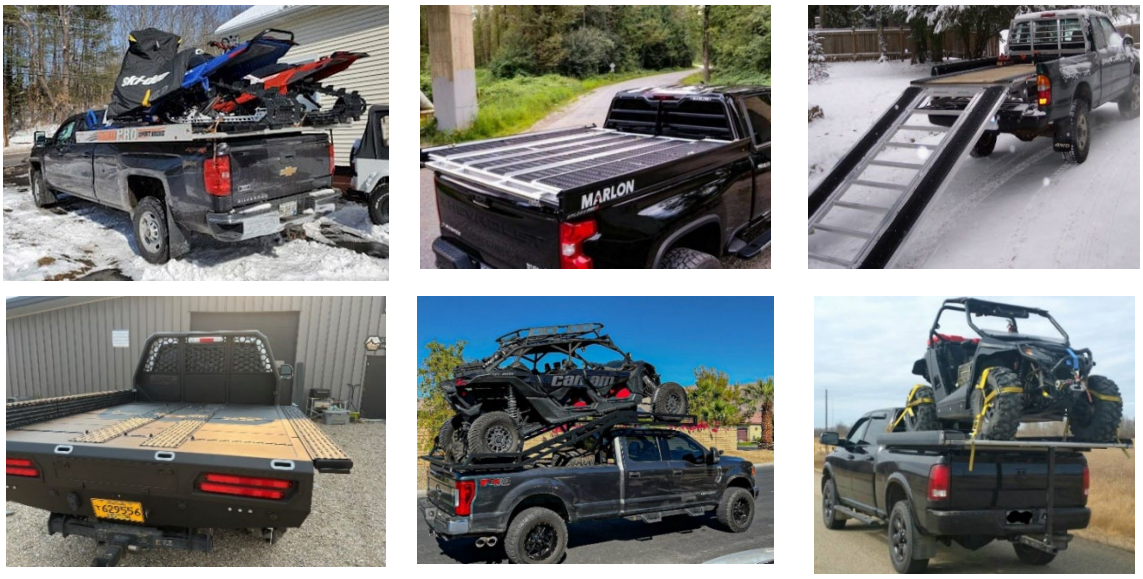

FIGURE 6: PROHIBITED TRANSPORTATION

Off-road vehicles (ORVs) must be secured to transport trailers using load rated restraint systems designed to prevent unintentional movement during transport, including while traversing uneven terrain or rough access routes. All securing systems must be appropriately rated for the weight and dynamic forces expected during transport operations.

Acceptable load-rated securing devices include:

- Ratchet straps with appropriate working load limits (WLL)
- Load binders (lever or ratchet type)
- Super Clamps (specifically designed for snowmobiles or similar applications)
- Fixed mechanical securing devices (e.g., wheel chocks, anchor plates)
- Quick binders or cam-style tensioners
- Truck-grade tie-down straps
- Chains rated for cargo securement
- Rope, provided it is load-rated for the application
- Any combination of the above, where redundancy and stability are required

All devices used must be inspected prior to each use for signs of wear, damage, or degradation. The method of securement should prevent forward, backward, and lateral movement of the ORV under normal and emergency transport conditions. Securement should comply with applicable standards (e.g., NSC Standard 10 Cargo Securement requirements) where relevant.

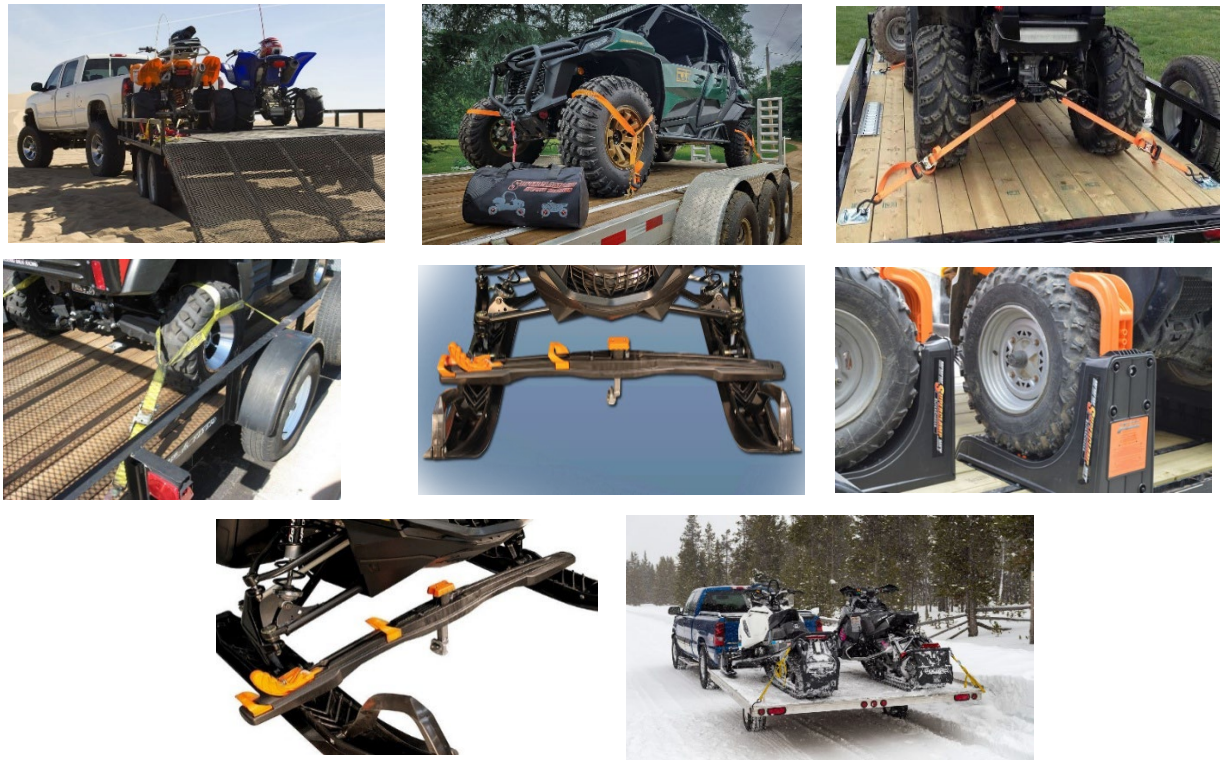

FIGURE 6: ACCEPTABLE LOAD-RATED SECURING DEVICES

4.8.8 (2) The manager must ensure that loading or unloading an off-road vehicle (ORV) on or off a trailer is done in a safe manner, including ensuring that
- (a) a loading ramp is secured to the trailer,
- (b) the load rating of the loading ramp is not exceeded, and
- (c) the loading ramp is wide enough, is at a suitable angle and has an appropriate grip surface for the off-road vehicle (ORV) tires or tracks to properly grip and not slip.

Guidance on section 4.8.8 (2)

When offloading off-road vehicles (ORVs) from transport trailers, the operation should take place in a designated laydown area or in a widened section of the road or trail. This facilitates safer vehicle maneuvering, provides adequate space for truck and trailer turnaround, and ensures unimpeded access to the mine site.

Loading ramps must be mechanically secured to the trailer using load-rated devices such as straps, pins, or locking mechanisms that prevent unintended disengagement and minimize ramp movement during loading or unloading. Improperly secured ramps pose a

significant risk of dislocation under load, which can result in vehicle rollover or operator injury.

All ramps must:

- Display a clearly visible and manufacturer-stated load rating
- Be used within their rated capacity at all times
- Be inspected prior to use for structural damage, wear, or deformation

The manager is responsible for ensuring that all ramps are appropriately sized and suited to the specific ORVs being loaded or offloaded. This includes:

- Full contact support under the ORV's tires, tracks, or skis (No overhang or unsupported tread is permissible)
- Sufficient ramp width and structural integrity to support dynamic loading
- A high traction surface (e.g., expanded metal, rubber matting, or grip tape) to prevent wheel or track slippage during ascent or descent
- Smooth surfaced materials such as plywood or dimensional lumber are not acceptable as they do not provide adequate traction and may contribute to loss of control.

For snowmobiles and other ORVs equipped with skis and tracks or tires, ramp surfaces should accommodate carbide runners without binding or gouging. The ramp should allow for smooth and controlled loading and offloading, preventing interference or sudden resistance that could destabilize the operator or equipment.

If access roads or trails become too narrow or unstable to safely support continued passage of the trailer and tow vehicle (e.g., due to slope geometry, tight switchbacks, soft ground, or constrained visibility), the ORV should be unloaded at the last safe turnaround or widened point.

Under no circumstance should an operator attempt to navigate a trailer through a section of trail that poses a rollover, jackknife, or entrapment hazard.

Operators and supervisors should plan ahead by:

- Conducting a pre-trip assessment of trail width and conditions
- Identifying safe offload and turnaround points along the route
- Using spotters or signage where visibility is limited
- Complying with site specific access control and hazard management procedures

Chapter 4: Operational Use

Use of Off-road Vehicle

4.8.9 (1) Despite section 6.19.2, the manager must ensure that
- (a) a logbook system is provided for each off-road vehicle (ORV), and
- (b) before an off-road vehicle (ORV) is used, it is inspected by the operator who, in the logbook,
  - (i) notes the condition,
  - (ii) notes any unsafe conditions, and
  - (iii) in the case of a qualified person making repairs, notes any repairs made and if the off-road vehicle (ORV) is safe to operate.

Guidance for 4.8.9 (1)

All off road vehicles (ORVs), irrespective of weight, must be assigned a logbook for the purposes of inspection, maintenance tracking, and hazard documentation. The logbook serves as a formal record of the ORV's operational condition and maintenance history and must be readily accessible for review by authorized personnel, including mines inspectors.

While the logbook is not required to be physically stored with the ORV, it must be immediately retrievable upon request, whether in physical or digital format (e.g., app-based systems or centralized maintenance tracking software). For ease of access and compliance verification, it is recommended that a copy—physical or digital—be stored in or near the vehicle, consistent with practices used for mobile equipment logbooks.

The logbook should be used by qualified persons to document the following:

- Identification and description of any unsafe conditions or defects
- The corrective actions taken to resolve these conditions
- Any repairs or modifications made to the ORV
- A post repair assessment confirming whether the ORV is safe to return to service

Following any maintenance or repair activity, the qualified person performing the work should document:

- A clear description of the work completed
- The date and time of the repair
- Their name and certification (as applicable)
- A written confirmation of whether the ORV is fit for continued operation

Maintaining an accurate and up to date ORV logbook is a critical component of mechanical integrity management and regulatory compliance. Logbooks should be reviewed regularly as part of the mine's preventative maintenance and hazard control program.

4.8.9 (2) The manager must ensure that before an off-road vehicle (ORV) is used, it is outfitted with

(a) a whip antenna that is fitted with a flag and lamp high enough to be visible to the drivers of all vehicles, or

(b) a flashing light mounted above the cab of the off-road vehicle (ORV).

Guidance for 4.8.9 (2)

Section 4.8.9 (2) addresses the requirement for enhanced visibility of off-road vehicles (ORVs) operating within the mine site. The use of either a whip antenna, a strobe light, or both is acceptable; the selection is at the discretion of the mine manager based on site-specific operational risks and visibility requirements. There is no requirement to install both unless deemed necessary by the manager's risk assessment.

The primary purpose of these visibility aids is to improve the visibility of ORVs, which are typically smaller and lower in profile than other mobile equipment (e.g., haul trucks, excavators, or graders) operating on-site. Enhanced visibility is particularly critical in:

- Areas with limited sightlines (e.g., corners, intersections, or hilly terrain)
- Locations where mixed traffic between ORVs and heavy equipment occur
- Narrow exploration or access trails where line-of-sight is restricted

The height of the whip antenna should be determined by the manager based on the ORV's operating environment and the expected interaction with larger vehicles. In areas where ORVs are not expected to share space with heavy mobile equipment, shorter whip antennas may be acceptable. However, where interaction with high-profile vehicles is anticipated, the whip must be of sufficient height to ensure visibility.

Whip antennas are available in various lengths and configurations. When selecting a shorter whip, care should be taken to ensure it remains visible from a practical distance and is not obstructed by the ORV's structure or surrounding terrain.

Strobe lights may be used in place of or in addition to whip antennas. When used, strobe lights should be:

- Clearly visible in daylight conditions
- Mounted in a position that maximizes 360-degree visibility
- Maintained to ensure proper function, with periodic checks as part of pre-use inspections

Whether whip, strobe, or both are used, visibility enhancement devices should be included in the ORV's inspection and maintenance program to ensure continued reliability and effectiveness.

Visibility is a critical component of vehicle safety in all mine site areas—including exploration trails, haul roads, and active work zones and should be evaluated as part of the site's broader traffic management and collision avoidance strategy.

4.8.9 (3) The manager must ensure that any modification to an off-road vehicle (ORV) that could impact its structural integrity or stability is certified by a professional engineer before it is used.

Guidance for 4.8.9 (3)

Modifications to off-road vehicles (ORVs) can significantly alter their structural behavior, handling characteristics, and overall safety performance. Alterations such as lift kits, oversized tires, engine performance enhancements, or aftermarket components may introduce unintended stress concentrations or change the vehicle's center of gravity, thereby compromising critical systems including the frame, suspension, steering, and braking assemblies.

To mitigate these risks, any modification that may affect the structural integrity, dynamic stability, or safe operating condition of an ORV must be reviewed and certified by a professional engineer (P.Eng.) registered to practice in British Columbia. This ensures that the modified vehicle continues to meet applicable safety standards and remains suitable for use within the mining environment.

Throughout this guidance document, OEM (Original Equipment Manufacturer) is defined as a company that designs and produces parts, components, or complete products that are used in another company’s product. These parts are typically made to the original specifications and quality standards and may be sold under the OEM’s name or rebranded by the purchasing company. OEM products are often contrasted with aftermarket parts, which are made by third-party manufacturers.

Examples of modifications that may require engineering certification include, but are not limited to:

- Installation of lift kits that alter suspension geometry or ground clearance
- Use of oversized tires that exceed manufacturer-specified dimensions
- Engine performance enhancements, such as turbochargers or tuning modules
- Installation of aftermarket rollover or falling object protective structures (ROPS/FOPS)
- Addition of track conversion kits in place of wheels
- Upgrades to braking systems beyond OEM configurations
- Addition of passenger seating or platforms, such as two-up conversion kits or utility bed seating arrangements

These modifications should be assessed not only for mechanical compatibility but also for their impact on:

- Load distribution and frame stress
- Suspension and steering articulation
- Brake force balance and stopping distance
- Roll stability and tipping thresholds
- Operator/passenger safety in rollover scenarios

Engineering documentation should include a signed certification statement, design rationale, and, where applicable, supporting calculations or manufacturer compliance references.

All certified modifications must be logged in the ORV's maintenance record and reviewed during pre-operational inspections and risk assessments. Unauthorized or uncertified modifications must not be permitted for use on a mine site.

4.8.9 (4) The manager must ensure that the use of an off-road vehicle (ORV) with an operator cab is only permitted if the windows and doors of the operator cab are kept installed and in good condition.

Guidance for 4.8.9 (4)

Where off-road vehicles (ORVs) are originally equipped from the factory or dealership with doors, windshields, or other enclosure components, these features are considered part of the manufacturer's safety design and must not be removed. These components provide protection from environmental hazards, debris, and rollovers, and may also contribute to operator restraint and structural integrity during dynamic operation.

If such components are damaged, removed, or rendered inoperable, the ORV must not be returned to service until the parts are repaired or replaced in accordance with manufacturer specifications. Use of an ORV without these features when originally equipped may compromise operator safety and violate intended vehicle design parameters.

In cases where doors or windshields have been installed as aftermarket accessories, the manager must ensure that:

- The components are appropriate for the specific make and model of the ORV
- They are securely affixed, structurally compatible, and do not interfere with visibility or emergency egress
- They are maintained in good condition and remain installed unless removed for a valid operational reason and documented under a risk assessment

Managers are responsible for establishing inspection and maintenance procedures to ensure that enclosure components remain serviceable and are not inadvertently removed or bypassed during routine operations.

4.8.9 (5) The manager must ensure that when an off-road vehicle (ORV) is being used, the operator and passengers, if any, wear

(a) appropriate personal protective equipment, as determined by a risk assessment,

(b) an off-road vehicle (ORV) helmet that meets the requirements set out in section 22 of the Off-Road Vehicle Regulation, B.C. Reg. 193/2015, other than while underground in an underground mine,

(c) a seatbelt, except in the case of a snowmobile, and

(d) any personal protective equipment recommended in the owner's manual that does not conflict with the requirements of paragraphs (a) to (c) of this subsection.

Guidance for 4.8.9 (5)

Section 4.8.9 (5) establishes the minimum personal protective equipment (PPE) requirements for workers operating off-road vehicles (ORVs) on a mine site. In addition to the baseline requirements outlined in this section, Part (a) requires a task and environment-specific risk assessment to determine whether enhanced or additional PPE is necessary. This assessment must be conducted prior to ORV use and periodically reviewed based on changes in terrain, environmental conditions, or work activity.

Except where ORVs are operated underground (where alternative head protection may be specified), CSA- or ANSI-approved helmets must be worn at all times while the ORV is in motion. Helmets must be:

- Properly fitted and secured using the manufacturer's retention system
- Rated for motorized vehicle use (e.g., ATV/motorcycle helmet with DOT, or Snell certification)
- Inspected regularly for damage or degradation and replaced in accordance with manufacturer recommendations

All ORVs equipped with occupant seating must be fitted with seatbelt systems that meet applicable safety standards, such as those defined by Transport Canada, Society of Automotive Engineers (SAE), or original equipment manufacturer (OEM) specifications.

Use of seatbelts is always mandatory while the ORV is in operation.

Where a risk assessment identifies the need for specialized restraint systems (e.g., 4-point or harness systems), the selected system must meet or exceed the protection provided by the OEM seatbelt and be installed in accordance with recognized engineering practices

In cases where an ORV is not originally equipped with a seatbelt, the mine manager is responsible for ensuring a compliant restraint system is installed prior to use

The manager must also ensure that seatbelt systems are:

- Maintained in serviceable condition, free from fraying, damage, or mechanical wear
- Inspected regularly as part of the ORV's pre-use checklist or formal inspection program
- Replaced immediately if defects or deficiencies are identified

Failure to use appropriate PPE or restraint systems significantly increases the risk of serious injury or fatality in the event of a rollover, collision, or ejection and is considered non-compliant with mine site safety standards.

4.8.9 (6) The manager must ensure that the operator's manual of an off-road vehicle (ORV) is kept with the off-road vehicle (ORV) and maintained in a readable condition.

Guidance on section 4.8.9 (6)

The manager must ensure that each off-road vehicle (ORV) is equipped with a complete and readable copy of the OEM's operator manual that is kept with the vehicle at all times. This is critical for enabling workers and supervisors to access important technical and safety information in the field.

Operator manuals must:

- Be present in hard copy with the ORV (An electronic version (e.g., on a phone, tablet, or mobile app) may be used for convenience but does not substitute the requirement for an on-board, physical copy)
- Be legible, intact, and up to date, without missing sections, excessive wear, or unapproved modifications
- Be readily available for inspection by regulatory personnel upon request

The operator's manual provides essential guidance on:

- Safe operating limits, including terrain restrictions, maximum load ratings, and environmental limitations
- Preventive maintenance schedules, service intervals, and fluid specifications
- Emergency procedures, fault diagnosis, and troubleshooting
- Equipment-specific safety requirements, such as tire pressures, belt tensioning, braking systems, and restraint systems

Ensuring operator access to the manual is a fundamental component of equipment safety, compliance with regulatory expectations, and due diligence in risk management.

In addition to the regulatory requirements outlined in section 4.8.9, the following operational best practices should be implemented to support safe and effective use of ORVs in mining environments:

Speed Control	ORVs must be operated at speeds appropriate for the terrain, visibility, load, and environmental conditions. Posted speed limits must be followed, and operators should reduce speed when navigating turns, inclines, or congested areas.
Radio Communication	All ORVs operating in active work zones should be equipped with two-way radios or equivalent communication devices. Radio use is critical for traffic control, coordination with other vehicles, and emergency communication in remote areas.
Reduced Visibility Conditions	Operating ORVs at dawn, dusk, or during fog, snow, or low-light conditions requires additional caution. Use of headlights, whip flags with lamps, and reflective PPE is recommended to enhance visibility.
Emergency Equipment	While section 4.9.3 of the Code outlines requirements for first aid kits and fire extinguishers, it is recommended that all ORVs be equipped with these items as standard practice, regardless of classification or weight.
Spark Arresters	All internal combustion engine-powered ORVs should be fitted with certified spark arresters to reduce the risk of fire, particularly in dry forested or grassy terrain.
Vehicle Licensing and Compliance	Where applicable, ORVs should be registered and insured in accordance with the Off-Road Vehicle Act and Regulation (B.C. Reg. 193/2015). Licensing, decals, and insurance documentation should be kept current and available for inspection.

Chapter 5: Rollover Protection Structure

4.9.11 (3) Side by side utility task vehicles (UTVs) must have a ROPS that conform to OSHA29 BFR1928.53 certified ROPS or Canadian Standards Association, Standard B352.095 or another standard as accepted by the chief inspector.

Guidance on section 4.9.11 (3)

Section 4.9.11 (3) requires that all side-by-side utility terrain vehicles (UTVs) operated within the permitted mine area be equipped with a certified Rollover Protective Structure (ROPS) that complies with one of the following recognized safety standards:

- *Canadian Standards Association (CSA) Standard B352.0-95* – Rollover protective structures (ROPS) for agricultural, construction, earthmoving, forestry, industrial, and mining machines
- *Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1928.53* – Protective enclosures for wheel-type agricultural tractors - test procedures and performance requirements.
- *Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1928.52* – Protective frames for wheel-type agricultural tractors -- test procedures and performance requirements.
- *International Organization for Standardization (ISO) Standard 3471* - Earth-moving machinery — Roll-over protective structures — Laboratory tests and performance requirements
- *Society of Automotive Engineers (SAE) J2194_201611* - Roll-Over Protective Structures (ROPS) for Wheeled Agricultural Tractors

ROPS is an engineered, load-rated structure designed to protect the operator and any passengers during a rollover event. When used in conjunction with a seatbelt, the ROPS forms a protective envelope that helps prevent the vehicle occupants from being ejected or crushed by the ORV or other equipment in the event of an overturn.

To confirm ROPS compliance:

- Check the vehicle's data plate or compliance label, typically affixed to the frame near the driver's compartment, roll cage, or dashboard area. This plate should indicate the applicable standard (CSA or OSHA) and confirm that the structure is certified.
- Alternatively, refer to the manufacturer's operator manual, which will indicate the design standard for the installed ROPS and any limitations on its use (e.g., removal, modification, aftermarket accessories).

If the ROPS has been retrofitted, repaired, or replaced, documentation from a professional engineer certifying compliance with an approved standard must be retained and available for inspection.

Manufacturers often publish this information on their technical specification sheets or product data books, which should be included in site documentation for the ORV.

Important Considerations:

- Any modifications to the ROPS, such as drilling, welding, repair, or installation of non-approved accessories (e.g., aftermarket roofs, racks, or lighting), may invalidate the certification and compromise structural integrity.
- A certified ROPS is only effective when seatbelts are worn properly. Operators and passengers must always use seatbelts when the ORV is in motion.

Links to standards referenced in 4.9.11 for ROPS:

CSA B352.0-95 – Rollover protective structures (ROPS)

OSHA 29 CFR 1928.53 – ROPS for Agricultural Tractors

ISO 3471 – Earth-moving machinery – Roll-over protective structures – Laboratory tests and performance requirements

It is the manager's responsibility to ensure that all UTVs in use are equipped with certified ROPS and that they remain in good condition, unmodified, and compliant with applicable standards throughout their service life.