Ministry of Labour, Immigration, Training and Skills Development

Overview of 2023 Amendments to Regulation 854 (Mines and Mining Plants)

To: Mining Vehicle Powertrain Conference

By: Ministry of Labour, Immigration, Training and Skills Development

Brian Hanulik, Senior Policy Advisor
Kyle Watson, Provincial Mining Specialist

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Overview of Amendments

- On April 11, 2023, the Minister announced the amendments to Regulation 854 (Mines and Mining Plants).
- Amending regulation O. Reg. 69/23 is posted on e-Laws and the amendments have been incorporated into Regulation 854. Additional information can be found on the Regulatory Registry.
- The amendments came into force on:

July 1, 2023

- Updates to standards (s. 1, 1.1, 30, 71, 119.1, 195, 228, and 251)
- Changes to ground control sections (s. 6 and 72)
- Ladderways on surface (s.48)
- New section for IPCs (s. 51.1) and other hoisting updates (s. 226, 232, and 248)
- Vehicles on rails (s. 103.1 and 103.2)
- Modular training updates (s. 11.2.3 and 11.3)
- Battery charging stations (s. 261)

September 1, 2023

- Management of change (s. 5)
- Supervisor duties (s. 63 and 64)
- Seismic Risk Management (s. 71.1)
- Explosives (s. 121, 123, 124, 125 and 129)
- Airborne Hazard Management (s. 182)
- Diesel-Powered Equipment, Air Flow and Elemental Carbon OEL (s. 183-183.4)
- Ventilation & Heat/Cold Stress (s. 252-255, 286)
- Reagents, Eyewash, Antidotes (s. 268-270, 282)

What Led to Changes to Diesel Equipment/Airborne Hazard Sections?

Open for Business

Mining companies wanted changes that adopted a “air quality” (as opposed to “air quantity”) approach to ventilation

Mining Review Recommendations

2015 final report included recommendations relating to airborne hazards and OELs, management of change

Worker Health

Labour and others have raised concerns with that the previous OEL for DPM was too high

Other Jurisdictions

Opportunities to increase consistency across Canadian jurisdictions; compare with international jurisdictions (OELs)

Regulatory Modernization

Modern approaches to regulatory tending to favour “performance based” over “prescriptive” approach

Keeping Current

Opportunity to align with updated CSA Standard, updated fuel standards, current technology, etc.

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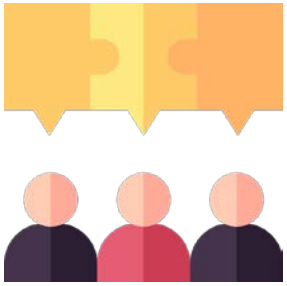
Who Did We Consult With?



Mining Legislative Review Committee (MLRC)

- Provides consensus-based recommendations and advice to the Minister about occupational health and safety issues related to the mining sector.
- Develops proposed amendments to Regulation 854 and guidelines to assist stakeholder compliance in collaboration with the Ministry
- MLRC subcommittees, such as the Ventilation and Industrial Hygiene Subcommittee, assist in the development of subject specific recommendations and guidance materials.

Other Stakeholders

- Submissions from stakeholders through the Ontario Regulatory Registry (July 28 to September 15, 2021).
- Targeted stakeholders discussions and meetings

What sections of Regulation 854 have changed?

Key requirements regarding airborne hazards and diesel-powered equipment that have been amended include:

Section 182	Airborne hazard management program
183	General requirements for diesel equipment
183.1	Airflow rates for diesel equipment used underground
183.2	Occupational exposure limit for elemental carbon
183.3	Worker exposure testing
183.4	Tailpipe testing of diesel equipment

Section 182

Airborne hazard management program

Employers at mines and mining plants must develop and maintain an airborne hazard management program.

- The program shall:

- Set out measures to eliminate or control airborne hazards identified as part of the workplace risk assessment and address issues including testing, monitoring or sampling.
- Be developed in consultation with the joint health and safety committee (JHSC) or health and safety representative (HSR), if any.
- Be reviewed periodically (at least annually) to ensure its effectiveness
- Provide workers with information and instruction appropriate to their role.

Section 182

Airborne hazard management program

Rationale:

- Allows workplaces to adopt a comprehensive program to suit their needs
- Builds off of existing requirements that address airborne hazards
- Similar approach to water management and traffic management program requirements
- Increases awareness of airborne hazards and makes regulation more transparent
- Implements one of the recommendations from the 2015 Mining Health, Safety and Prevention Review final report

Section 183

Diesel Equipment – General (CSA Standard)

Diesel-powered equipment used underground must meet the requirements in CSA Standard M424.2 “Non-Rail-Bound Diesel-Powered Machines for use in Non-Gassy Underground Mines”.

- Reg. 854 now references the current (2022) version of the standard

Rationale:

- Standard has now been adopted in its entirety
  - Prior to September 1, the sections dealing with engine certification rates had been exempted
- Allows applicable certification rates to be used to determine air flow rates in Ontario underground mines, similar to other Canadian jurisdictions

Section 183

Diesel Equipment – General (Records)

Underground mines must maintain records for each piece of diesel-powered equipment used underground that contain the following information:

- make, model and serial number
- rated power, rated engine revolutions per minute (RPM), and maximum fuel injection rate
- ventilation rate as certified in accordance with CSA M424.2-22
- make, model and serial number of emission control devices
- capacity of both the fuel and hydraulic fluid tanks

Rationale:

- Less prescriptive format of records while still requiring similar information
- Ministry's Diesel Equipment Form can still be used as a template

Section 183

Diesel Equipment – General (Other Information)

Employers must keep and maintain information about:

- volume of air flowing in haulage ways and workings where the equipment is operating; and
- total ventilation requirements for the equipment when it is operating in a single continuous course of air.

As well:

- information must be provided directly to the operators or be readily accessible
- Each piece of diesel-powered equipment must have the airflow posted in a location on the equipment that is visible to and readable by the operator

Rationale:

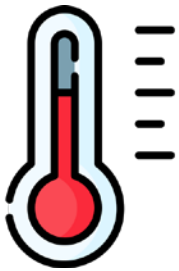
- Less prescriptive format while keeping the previous requirements in a chart of procedures

Section 183

Diesel Equipment – General (Diesel Fuel)

Diesel fuel used in equipment underground must meet one of these three standards:

1. Canadian General Standards Board CAN/CGSB-3.517-2020 Diesel Fuel
2. Canadian General Standards Board CAN/CGSB-3.520-2020 Diesel fuel containing low levels of biodiesel (B1-B5)
3. Canadian General Standards Board CAN/CGSB-3.522-2020 Diesel fuel containing biodiesel (B6-B20)



All diesel fuel used underground, regardless of what fuel standard applies, must have a minimum **Flash Point of 52°C.**

Section 183.1

Airflow rates for diesel equipment

Where diesel powered vehicles are operated underground, a mechanical ventilation system must produce a flow of air in accordance with the following rules:

1. **If equipment is certified in accordance with CSA Standard M424.2:**
   The flow of air needs to be at least equal to the recommended ventilation rate on the certificate of homologation provided by CanmetMINING, Natural Resources Canada.

2. **If equipment is not certified:**
   The flow of air needs to be at least **0.06 cubic metres per second** for each kilowatt of power of the equipment (known as the 100cfm rule).

Section 183.1

Airflow rates for diesel equipment

3 **If equipment is modified with a DPF or after-treatment device, but not certified or recertified under CSA M424.2 after modification:**

The employer may determine a suitable flow of air, in consultation with the JHSC or HSR, if any, that is based on:

- The applicable rates for the equipment prior to modification,
- Good engineering practices, and
- The results of testing, including emission levels produced after the installation of the DPF or after-treatment device.

Any DPF or after-treatment device is used on diesel equipment underground must be maintained in accordance with the manufacturer's recommendations.

Section 183.1

Airflow rates for diesel equipment

4 **If more than one piece of diesel-powered equipment is operating in a single continuous course of air:**

The flow of air must be at least equal to the cumulative ventilation rates as determined under the new rules.

Rationale:

- More flexible approach that allows air flow to be determined based on actual equipment operating (not “one size fits all”)
- New approach focussed on air quality not air quantity
- Improves consistency with other Canadian jurisdictions
- Encourages adoption of newer technology (diesel engines, after treatment devices, etc.)

Section 183.2

Occupational Exposure Limit (OEL) for Elemental Carbon

The time-weighted average (TWA) exposure of a worker to elemental carbon shall not be more than:

Previous	Current
0.4 milligrams per cubic metre of air (**total carbon**)	**0.12** milligrams per cubic metre of air (**elemental carbon**)

Rationale:

- Elemental carbon can be more accurately measured at low concentrations and is a more accurate measure of engine emissions
- Consistent with the Ministry's 2018 consultation on a OEL for total carbon that would potentially apply to all workplaces
- Ontario's limit is now one of the lowest in North America

Section 183.3

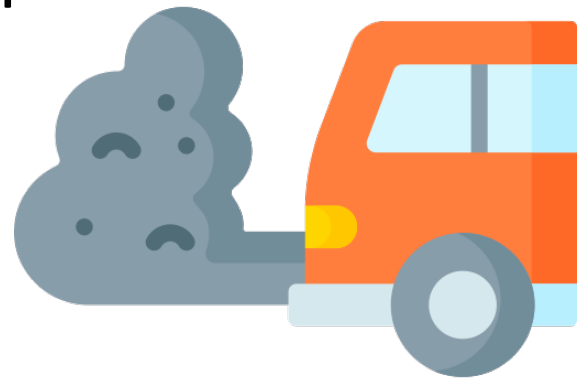
Air Flow and Worker Exposure Testing

- The volume of air flowing in underground haulageways and workings where diesel equipment is used must be tested at least weekly.
- A worker may also request that the employer test the personal exposure of **carbon monoxide (CO), nitrogen dioxide (NO_2), or elemental carbon.**
- Test results must be recorded and maintained; kept readily available and shared with the JHSC or HSR, if any, on request.
- If worker exposure tests indicate exposure to CO or NO_2 more than the limit set out in section 4 of Reg. 833 or elemental carbon more than the limit set out in section 183.2, the employer must:
  - investigate the cause and take remedial action, if possible
  - notify the affected worker(s) and the JHSC or HSR, if any
  - re- test and confirm that the concentrations do not exceed the applicable limits.

Section 183.4

Equipment and Tailpipe Testing

- Measures and procedures for testing undiluted exhaust from diesel-powered equipment must be developed in consultation with the JHSC or HSR, if any
- Testing must be conducted under consistent conditions and carried out, as far as is practical, under a full load
- Exhaust testing must be performed both routinely (once per month) and more frequently if required (either by the manufacturer and/or after any repairs are made to the engine or exhaust system)
- Employers must ensure that **undiluted exhaust from diesel-powered equipment contains less than 600 parts per million by volume of CO and less than 60 parts per million by volume of NO_2**
- Test results must be recorded and kept readily available at the mine site



General Ventilation and Heat/Cold Stress

- Ventilation systems must still provide an **oxygen content of at least 19.5%**, as well as:

  - clear workplaces of contaminants after a blast,
  - not recirculate contaminated air,
  - be independent of air supplied to a drill or machine, and
  - be initiated prior to workers entering a workplace.

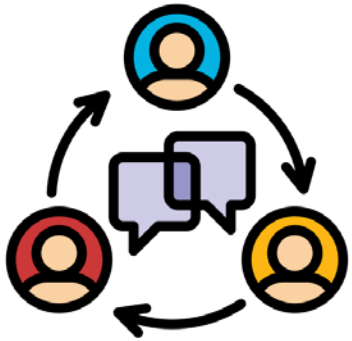
- Mines and mining plants must develop and maintain written procedures to manage the hazards related to heat stress and cold stress in the workplace.

Rationale:

- Streamlined into one provision (section 252) to simply and clarify requirements

Management of Change

Applies to the following changes:



- Construction or design of a mine or mining plant.
- Construction of a major structure or system at a mine or mining plant.
- Introduction or use of a new mining technique, method, technology or process.
- Introduction or use of new equipment.
- A major addition to, or major alteration of, one of the above.

Before proceeding with a change listed above, owners must develop a management of change procedure that sets out how:

- Associated hazards or potential hazards will be evaluated and reviewed
- JHSCs and HSRs will be notified of the proposed changes
- Changes will be authorized and how that authorization will be communicated to workers.

Management of Change

Rationale:

- Builds on previous requirements that owners ensure engineers prepare certain documents before proceeding with the construction of, alteration to or installation of prescribed structures or equipment
- Engineer role has been maintained but allows others to be involved in managing workplace changes, as may be appropriate.
  - Could include hygienists, equipment specialists, management system specialists, assigned operations and maintenance personnel and/or JHSC members or HSRs
- Any relevant drawings, plans and specifications still need to be kept readily available at the mine site.

Questions?