HAZARD ALERT

Workers fatally injured by runs of materials in mining operations

Uncontrolled runs of materials continue to cause serious injuries and fatalities in Ontario mines.

This hazard alert highlights where runs of materials occur, why they happen, notable fatal incidents, and the critical controls required to prevent worker exposure.

What is a run of materials?

A run of materials (also referred to as a run of muck) occurs when ore, waste rock, slimes, tailings, or other bulk material moves unexpectedly and uncontrollably due to gravity. These events are typically sudden, forceful, and often involve water, creating a high-risk situation for workers in the vicinity.

Runs of materials are generally low frequency but high consequence events — often resulting in crushing, burial, or pinning injuries.

Where it can happen

Runs of materials can occur in both underground and surface mining operations, including:

Surface and Processing Areas

- Truck dump chutes
- Conveyors
- Bins and hoppers
- Stockpiles

Underground Operations

- Loading pockets
- Crushing stations
- Ore and waste passes
- Draw points
- Conveyors
- Backfilling operations
- Stopes
- Mucking slimes or saturated material
- Chutes

Why it happens

The primary force behind material movement is gravity. The risk of failure can be influenced by:

- Material properties (size, shape, cohesion)
- Water content (wet or saturated material)
- Temporary or steep slopes
- Hung-up or bridged material
- Non-routine work activities

Water is a critical risk factor. While small amounts of moisture may help material bind, excessive water can turn fine material into a slurry that behaves like liquid. Incident investigations consistently show that wet or saturated material is present in most run-of-material events.

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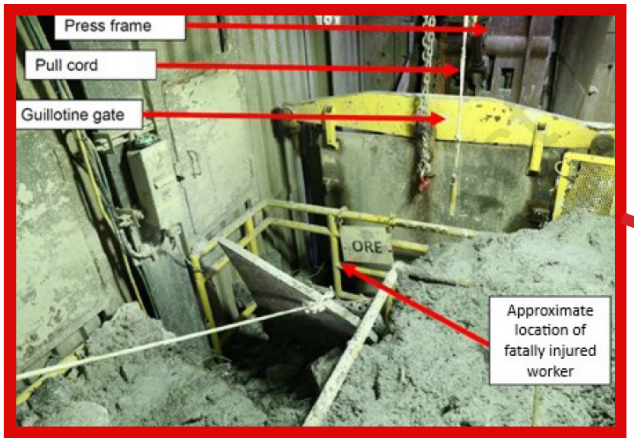
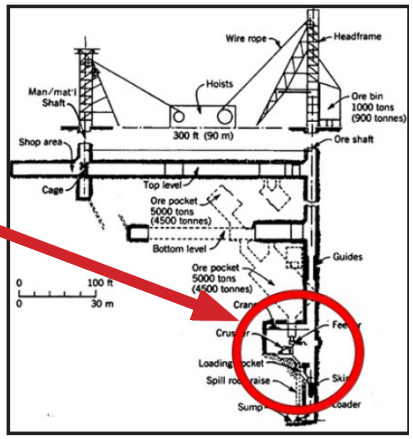
Notable fatal incidents in Ontario mines

Runs of materials into a loading pocket, May 27, 2020

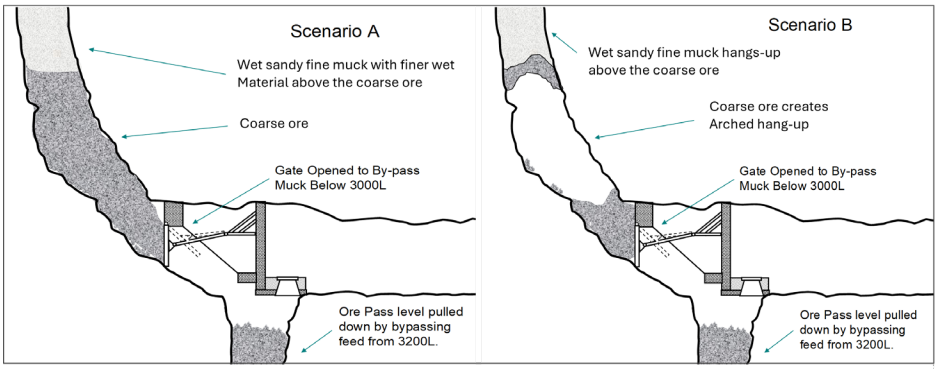
A contract worker was fatally injured in an underground mine when a run of materials consisting of blasted ore, water and concrete flowed into the loading pocket where the worker was standing to check the level of material while the ore pass is being drawn to expose the next section of the wall of the ore pass to be rehabilitated. The run of materials partially buried and pinned the worker against the steel railing.

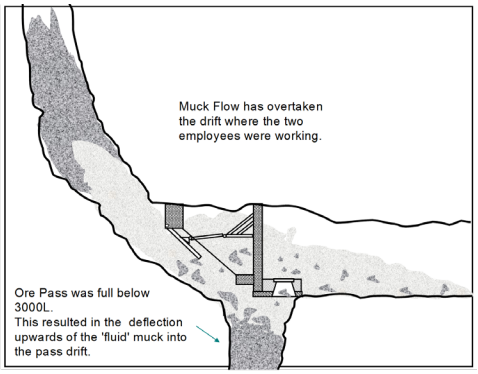




Runs of muck in an ore pass, June 08, 2011

Two (2) workers were fatally injured in an underground mine when they were buried by a violent run of muck in the ore pass which consisted of broken ore, slimes and water. The workers were drawing down the ore pass when the muck inside the pass got hung up and then let go causing a sudden burst of material through the control gate where the workers were located.





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Runs of muck at a stope draw point, July 10, 2014

A scoop tram operator was fatally injured in an underground mine when a run of muck occurred at the draw point of a stope. The operator was found buried outside the equipment in a "no-go (or non-entry)" zone for personnel past a safe-limit sign painted on the wall of the draw point. As a protocol in a non-entry stope remote mucking operation, the scoop tram operator should come off the equipment before the safe-limit sign and on to a remote stand to operate the equipment remotely. The only time an operator would come off the remote stand and approach the stope brow is when something is broken. Evidence of a broken water spray nozzle was found in the vicinity of the equipment following the incident.

The minimum distance of "no-go" zone safe-limit sign (red paint) on the wall from the brow could be 2 or 2.5 times the draw drift height.

The minimum distance of the remote stand from the muck pile toe at the brow = typical drift height + scoop length + clearance allowance (e.g., 1 m) from the scoop back bumper while the bucket is at the toe of the muck pile.

Before

After

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How to prevent runs of materials

To prevent runs of materials, employers must ensure the following controls are in place and followed:

Planning and procedures

- Develop risk-based procedures for non-routine or infrequent tasks
- Establish written procedures before, during, and after material removal
- Ensure procedures address water inflow, material condition, and potential run-out zones

Risk assessment

- Conduct field-level risk assessments for each task step
- Re-assess risks when conditions change (e.g., water presence, material movement)

Water management

- Evaluate and control water inflow into ore passes, stopes, bins, and stockpiles
- Maintain and follow a written water management program

Worker separation and controls

- Install and maintain physical guarding and barriers
- Clearly define and enforce no-go zones
- Use remote operation where required
- Prohibit entry into run-out zones without authorization and controls in place

Communication and training

- Communicate material and water conditions to all affected workers
- Provide training and awareness on run-of-material hazards and controls
- Reinforce expectations during pre-task and pre-shift discussion

Legislative requirements

Employers have specific duties under Ontario legislation, including:

- **Occupational Health and Safety Act, s.25(2)(h):** Employers must take every precaution reasonable in the circumstances to protect workers.
- **Regulation 854 – Mines and Mining Plants**
  - **s.5.1–5.3:** Risk assessment and hazard management
  - **s.84(1)(2):** Written procedures when workers may be endangered by moving bulk material
  - **s.84(3)(4)(5):** Practices for designing the site to reduce the risk of run of material
  - **s.87.1(1):** Written water management program for underground mines
- **Regulation 420/21**: Employers must notify the Ministry of Labour, Immigration, Training and Skills Development of an unexpected or uncontrolled run of material, water, or slimes exceeding one cubic metre that could endanger a worker.

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Resources and support

Guidance on Water Management in Mines is available to assist workplace parties in understanding and meeting the requirements of Section 87.1(1) of Regulation 854 and controlling water-related risks associated with runs of materials.

How Workplace Safety North can help

Workplace Safety North offers confidential support to Ontario mines, including:

- Hazard-specific risk assessments
- Review of water management programs
- Development and review of non-routine work procedures
- Supervisor and worker training
- Post-incident and near-miss consultation

For more information on identifying and controlling risks from runs of materials, **contact your local health and safety specialist**.