# MINING SILICA CONTROL TOOL

**THIS DOCUMENT** is for Q or G permit holders who produce sand, gravel, and construction aggregate materials; it is intended to increase awareness about silica, its associated health effects, and the Mining Silica Control Tool™

## WHAT IS SILICA?

Silica is the second most common mineral on Earth. It consists of silicon and oxygen atoms, which make up nearly all of what we call "sand" and "rock". Quartz is the most common form of crystalline silica and is found in varying amounts in almost all types of rocks, sands, clays, shales, and gravel.

Respirable Crystalline Silica (RCS) is smaller than the width of a human hair and can enter the deepest parts of the lungs.

## WHO IS AT RISK OF EXPOSURE?

RCS is hazardous when it becomes airborne. Workers can disturb silica-containing materials through common operations, including drilling, hauling, crushing, and screening. Workers who may be exposed to respirable crystalline silica include:

- Heavy Equipment operators (e.g. haul trucks, front-end loaders, excavators, water trucks)
- Crushing, Screening, and wash plant operators
- Drillers and Driller Helpers
- Groundsperson/Labourers
- Quality Control Lab and Sample Collectors
- Blasters and blaster helpers
- Welders/Fabricators
- Field Mechanical and Electrical Maintenance

## HEALTH EFFECTS OF EXPOSURE

Breathing in RCS can cause serious lung diseases such as silicosis, lung cancer, pulmonary tuberculosis, and chronic pulmonary disease. Exposures may also be related to the development of autoimmune disorders, chronic renal diseases, and other adverse health effects.

Silicosis is a serious, irreversible (but preventable) lung disease which can lead to death. There are three main types of silicosis:

1. **Chronic silicosis** is the most common form and tends to develop after 10 or more years of exposure to crystalline silica at low levels. Symptoms can range from very mild to disabling or even fatal.
2. **Accelerated silicosis** can occur with higher levels of crystalline silica exposures over a period of 5 to 15 years. Symptoms are the same as chronic or ordinary silicosis, except that they appear sooner and can progress rapidly.
3. **Acute silicosis** can occur after only weeks or months of exposure to very high concentrations of crystalline silica. Death occurs within weeks, as the lungs become filled with fluids

Workers with silicosis may initially have no symptoms, but over time may experience worsening shortness of breath, severe cough, and weakness as the disease progresses.

## WHAT IS THE MINING SILICA CONTROL TOOL™?

The *Mining Silica Control Tool™* is a resource specifically designed for the mining industry. It serves to assist in performing appropriate risk assessments and implementing effective controls and safe work practices where RCS dust may pose an occupational hazard. By collecting data on RCS dust exposures resulting from various materials, tools, and tasks in mining operations, the Tool can predict expected worker exposures under similar conditions.

The tool utilizes an exposure model developed by the BC Construction Safety Alliance, incorporating data collected in B.C. by the mining industry and Occupational Health Inspectors with the Office of the Chief Inspector of Mines. The Mining Silica Control Tool™ aims to help BC Mines assess the risk of RCS dust exposures in the workplace and develop control plans to help reduce such exposures.

## WHO SHOULD USE THE SILICA CONTROL TOOL?

Currently, the tool is intended for use by BC's stone, sand, and gravel sector. Users of the tool should have a background and knowledge in identifying any potential or actual danger to health or safety in the workplace. You will need the WorkSafeBC Number associated with your legal company name to use the tool.

## WHY USE THE SILICA CONTROL TOOL?

The Tool provides an accessible option for the stone, sand, and gravel sector to enhance worker health and safety while assisting in achieving compliance with s.2.1.1 and s.2.1.3 of the *Health, Safety and Reclamation Code* (**HSRC**). The costs associated with using the tool are covered through your WorkSafeBC Premiums.

## WHAT DOES THE TOOL DO?

The Tool provides a user-friendly, step-by-step guide for assessing and controlling RCS exposures for each dust generating task. The steps include:

1. Visit *Mining.silicacontroltool.com* or scan the QR Code.
2. Create an account using your WorkSafeBC Number.
3. Select the task you want to assess. The tool will identify the expected exposure **without controls**.
4. Select the controls you plan to use at your site. The tool will then identify the expected exposure **with the controls and any PPE** that may be required.
5. The tool will produce the components of a process-specific **Exposure Control Plan** (**ECP**).

The Mining Silica Control Tool™ serves as a valuable resource for mines in conducting RCS dust risk assessments, selecting and implementing controls, and developing ECPs.

## CAN I CREATE MULTIPLE ACCOUNTS?

Only one account can be associated with your WorkSafeBC number. However, multiple users can access the account at the same time using the same login credentials. Users must ensure that multiple users do not edit the same Exposure Control Plan at the same time, as it may result in lost changes.

## HOW DOES THE TOOL APPLY ENGINEERING CONTROLS?

The mining version of the Silica Control Tool uses a site-wide approach to engineering controls aimed at reducing process-specific RCS exposures. This approach is employed because most workers will spend time in various locations on-site throughout their shifts. For example, water sprays installed on a crushing plant will decrease exposure for all workers at the facility, depending on their placement and proximity to the plant. Alternatively, workers conducting work nearby the plant may still be exposed to dust produced by the plant, even if they are not directly involved in its operation.

## HOW DOES THE TOOL BENEFIT BC MINES?

Based on the user inputs, the Tool identifies processes that may lead to exposures exceeding the allowable exposure limit. It provides information on how to bring the exposure within the acceptable limit and produces a corresponding Exposure Control Plan.

Other ways the tool can benefit mines includes:

- Help **ensure the health and safety** of workers engaged in RCS dust producing processes.
- Help **educate** mine management and workers.
- **Assist in compliance** with the requirements of the HSRC relating to assessing and controlling RCS dust exposures to below the allowable exposure limit.
- In some situations, **eliminate the need** for air monitoring tests for planned work processes.
- Preparation of **specific process-based ECP templates** that can be tailored for each mine.
- **Participation** in air sampling data collection can help expand the work activities, scope and circumstances most important to mine managers found in the Tool.

## HOW WILL THIS TOOL WORK IN BC MINING?

The Exposure Control Plan provided by the Tool outlines how the mine manager will protect workers from hazardous exposure to RCS dust. The ECP is utilized to assess the exposure risk for a particular silica process and to co-ordinate and communicate the steps that will be taken to mitigate the risk. **A new ECP is required for each identified type of silica process** at a mine. The ECP can assist in achieving compliance with s.2.1.1 and s.2.1.3 of the HSRC for the respective tasks. ECPs can be uploaded to your *MineSpace* account as a Code Required Report for the Workplace Monitoring Program.

## RESOURCES

- Carex Canada, "*Silica (Crystalline) Profile*"
- NIOSH, "*Silicosis: Learn the Facts!*"
- WorkSafeBC (WSBC), "*Controlling Risks*"

**Need help establishing a plan to manage silica exposure at your site?**

Visit **mining.silicacontroltool.com** to find out your exposure risk.

For more information please contact:
**Mine.OccHealth@gov.bc.ca**
or visit
**gov.bc.ca/mineshealthsafety**

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