1.0 PURPOSE

1.1 The purpose of this procedure is to minimize employee exposures to Respirable Crystalline Silica and to establish effective Industrial Hygiene (IH) controls for workers who are potentially exposed at or above the Michigan Occupational Safety & Health Administration (MIOSHA) Action Levels (ALs). This standard applies to normal operations, shutdown/turnaround operations, and major project work at the Michigan Refining Division (MRD).

2.0 SCOPE

2.1 This document applies to all contractors, subcontractors, and employees working on MRD owned, controlled, or permitted locations, as well as work performed under a contract to Marathon Petroleum Company, LP (MPC) MRD.

2.2 Both the General Industry standard and the Construction Industry standard have applications at the refinery and both have been incorporated into the requirements outlined in this plan.

2.3 The requirements of this Handling Plan have been summarized in Attachment D – Respirable Crystalline Silica Standard Flow Chart

3.0 PROCEDURE

3.1 Initial Determination

3.1.1 Determine if the material contains silica (in any form).

3.1.1.1 Refer to the material's Safety Data Sheet (SDS) to make this determination.

3.1.1.2 Common construction materials that contain silica include, but are not limited to; asphalt, brick, cement, concrete, drywall, grout, mortar, stone, sand (including sand blasting materials), and tile.

3.1.1.3 Other materials that have been found to contain silica in the refining industry include some forms of the following; refractory, catalysts, ceramic coatings, and insulation materials.

3.1.2 Determine if the activities being performed have a potential exposure to Respirable Crystalline Silica. Activities that are known to have potential exposure include, but are not limited to the following: (Refer to Attachment A for a complete list).

3.1.2.1 Sawing, cutting, drilling stone and concrete,

3.1.2.2 Abrasive blasting,

3.1.2.3 Refractory loading, chipping, dumping, gunning,

3.1.2.4 Demolition activities, or

3.1.2.5 Maintenance operations associated with construction activities.

3.2 Exposure Determination

3.2.1 If the task is listed in MIOSHA Part 690 (1926.1153) Table 1, utilize the table for specific control measures and respiratory protection requirements. See Attachment A for a modified version of Table 1 (This table was modified for formatting only).

3.2.2 For tasks not listed in MIOSHA Part 690 (1926.1153) Table 1, or where the control measures are not able to be fully implemented, additional monitoring is required.

3.2.2.1 Contractors performing specialty services (refractory work, catalyst handling, etc.) will be expected to provide MRD with exposure assessment information following one of the required methods below:

3.2.2.1.1 **Performance Option:** The employer must assess the 8-hour TWA exposure for EACH employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to respirable crystalline silica.

3.2.2.1.2 **Scheduled Monitoring Option**: The employer may sample a representative fraction of employees if they conduct similar tasks, on the same shift, in the same work area as long as the sampling includes the employee(s) who are expected to have the highest exposure to respirable crystalline silica. If this option is selected, reassessment shall be conducted in accordance with the following table.

If initial monitoring indicates that employee exposures are...	**Then...**
≤ 25 µg/m3	Discontinue monitoring for that representative task.
25 µg/m3 – 50 µg/m3	Repeat such monitoring within six months of the most recent monitoring.
≥ 50 µg/m3	Repeat such monitoring within three months of the most recent monitoring.

3.2.2.1.3 The employer must reassess exposures whenever there is a change in the production, process, control equipment, personnel, or work practices which may reasonably be expected to result in a change in exposure to respirable crystalline silica.

3.2.2.2 Exposure monitoring conducted by MRD will be conducted in accordance with the Marathon IH Exposure Assessment Methodology (EXAM) process (RSW-SAF-057-DT Industrial Hygiene Program), including utilizing an accredited laboratory, notifying employees of sampling results, and retaining documentation of all monitoring data.

3.2.2.2.1 Written notification of exposure assessment results will be communicated to affected employees within five working days and will include any corrective actions necessary to reduce employee exposure.

3.3 Control Measures

3.3.1 The use of alternatives to silica containing materials must be investigated in order to minimize the potential for employee exposure to respirable crystalline silica, without compromising quality or integrity of operations (i.e. abrasive blasting agents that do NOT contain silica, etc.).

3.3.2 Engineering controls, principally ventilation and wet methods, are the primary methods used to reduce employee exposure to respirable crystalline silica. Where engineering controls are not adequate to reduce exposures to less than the PEL, they must still be used to reduce exposures to the lowest feasible level. Where engineering controls are not adequate, or while they are being installed, respiratory protection must be used.

3.3.2.1 Refer to Attachment A to determine the control measures and respiratory protection required.

3.3.3 Employee rotation cannot be used to reduce exposures to less than the PEL.

3.4 Respiratory Protection

3.4.1 All employees covered by this standard must be included in the Respiratory Protection Plan for MRD. The employer must provide appropriate respiratory protective equipment and other personal protective equipment for employees exposed to respirable crystalline silica.

3.4.1.1 Refer to RSW-SAF-070-DT Respiratory Protection Plan for specific MRD requirements, including, but not limited to; medical surveillance, fit testing, selection, use, cleaning, disposal of cartridges, etc.

3.4.2 All contractors that are expected to wear respiratory protection must be included in their company's respiratory protection program.

3.5 Regulated Areas

3.5.1 Regulated areas must be established wherever airborne concentrations of respirable crystalline silica are, or can reasonably be expected to be, in excess of the PEL.

3.5.2 For all regulated areas, the area must be barricaded and warning signs (Attachment B: Danger Sign must be clearly visible from all access to the work area stating the following:

DANGER
Respirable Crystalline Silica
May Cause Cancer
Causes Damage to Lungs
Wear Respiratory Protection in this Area
Authorized Personnel Only

3.5.3 Access must be limited to individuals that are:

- required to be in the area,
- familiar with the requirements,
- following the control measures determined, and
- wearing respiratory protection (if applicable) to enter.

3.6 Housekeeping

3.6.1 Housekeeping is an additional control measure to lower potential exposure to respirable crystalline silica.

3.6.1.1 Utilize wet sweeping and/or HEPA-filtered vacuuming to minimize the likelihood of additional exposure.

3.6.1.2 DO NOT dry sweep or dry brush accumulated dust where it could disturb silica containing materials and add to the potential exposure.

3.6.1.3 DO NOT use compressed air to clean clothing or surfaces.

3.7 Medical Surveillance

3.7.1 Any employees who are required to wear respiratory protection for respirable crystalline silica exposure control for more than 30 days per year will be included in the MRD Silica Medical Surveillance Plan in accordance with the Corporate Employee Health Monitoring Examination Protocols Standard, HLT-2025.

3.7.2 Contractors must be included in their company's medical surveillance programs if applicable.

5.0 EXPOSURE CONTROL PLAN

5.1 Contractors may use the linked Exposure Control Plan Template (Attachment C) as a start to developing their ECP.

5.2 A written exposure control plan (ECP) must be established by each site contractor that continuously works at MRD and for each standalone project that could have respirable crystalline exposure, and must contain at least the following elements:

5.2.1 Description of the tasks covered,
5.2.2 Air monitoring results,
5.2.3 Description of all control measures, including; engineering controls, work practices, PPE, and respiratory protection used,
5.2.4 Description of the housekeeping measures used,
5.2.5 A description of the procedures used to restrict access to work areas, when necessary including minimizing cross-contamination and migration, and
5.2.6 Methods to inform other contractors working on site.

5.3 The ECP must be re-evaluated by each contract company at least annually and updated as necessary. If there are any changes a new ECP must be submitted to MRD Safety for approval and posting.

5.4 A competent person must be designated for each project to make frequent and regular inspections of job sites, materials, and equipment necessary to implement the written exposure control plan.

5.5 The ECP must be submitted to the MRD Site Industrial Hygienist for all tasks that could generate respirable crystalline silica exposures before work begins. This can be submitted along with your job/site specific safety plan (refer to RSW-SAF-060-DT Contractor Safety Procedure, Section 3.13 for more information).

5.6 The ECP must be readily available to covered employees, the MRD project coordinator, and MRD Safety upon request.

6.0 RESPONSIBILITIES

6.1 Site Industrial Hygienist

6.1.1 Review and evaluate the effectiveness of this Silica Handling Plan at least annually and updates as necessary.

6.2 Contractor Competent Person

6.2.1 Develop a site specific / company specific Exposure Control Plan as outlined in Section 5.0 and review and evaluate the effectiveness of this at least annually and update as necessary.

6.2.2 Determine tasks that have the potential exposure to Respirable Crystalline Silica.

6.2.3 Conduct and/or coordinate exposure monitoring for any tasks that are not listed in Attachment A or any that controls cannot be fully implemented.

6.2.4 Takes prompt corrective measures in the event that the ECP is not being followed.

6.2.5 Makes frequent and regular inspections of tasks covered by ECP.

7.0 TRAINING

7.1 Training for all covered MPC employees will be consistent with the requirements of the MIOSHA Silica standard and the OSHA Hazard Communication standard.

7.2 Contractors must provide training to their affected employees.

7.3 Training must include, at a minimum:

7.3.1 The health hazards associated with exposure to respirable crystalline silica,

7.3.2 Specific tasks that could result in exposure to respirable crystalline silica,

7.3.3 Specific control measures that are required to protect employees from potential exposure, including:

7.3.3.1 Engineering controls

7.3.3.2 Work practices including housekeeping and regulated areas

7.3.3.3 Respiratory Protection

7.3.4 The purpose of the medical surveillance program and who qualifies.

8.0 DEFINITIONS

8.1 ***Action Level (AL):*** A concentration of 25 micrograms per cubic meter of air (25 ug/m3) of respirable crystalline silica calculated as an eight-hour time weighted average.

8.2 ***Competent person (construction):*** An individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has the authorization to take prompt corrective measures to eliminate or minimize them.

8.3 ***Covered Employee:*** An employee who is included in a written Exposure Control Plan because exposure monitoring confirms results above MIOSHA Action Level of 25 ug/m3.

8.4 ***Employee Exposure:*** The exposure to airborne respirable crystalline silica that would occur if the employee was not using a respirator.

8.5 ***High-efficiency particulate air [HEPA] filter:*** A filter that is at least 99.97 percent efficient in removing mono-dispersed (a uniform collection of size) particles of 0.3 micrometers in diameter.

8.6 ***MPC Exposure Assessment Methodology (EXAM):*** – A comprehensive strategy for the qualitative and quantitative assessment, statistical analysis, addition of controls, and reassessment of occupational exposure risks.

8.7 **Objective data**: Air monitoring data from industry wide surveys/calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product/material/task/activity. Data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

8.8 ***Regulated area:*** An area, demarcated by the employer, where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

8.9 ***Respirable crystalline silica:*** quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the international Organization for Standardization (ISO) 7708:1995: Air Quality – Particle Size Fraction Definitions for Health-Related Sampling.

8.10 ***Respiratory Protection Factors (APFs):***

- APF 10 = Half Mask Respirator
- APF 25 = Loose Fitting Powered Air Purifying Respirator (PAPR)
- APF 50 = Full Face Respirator
- APF 1,000 = Full Face PAPR, Full Face Abrasive Blasting Hood, Full Face Supplied Air Respirator
- APF 10,000 = Full Face Self Contained Breathing Apparatus (SCBA)

8.11 **Permissible Exposure Limit (PEL):** A concentration of 50 micrograms per cubic meter of air (50 ug/m3) of respirable crystalline silica calculated as an eight-hour time weighted average.

9.0 REFERENCES

9.1 Michigan Occupational Safety and Health Administration (MIOSHA) Part 590 Silica in General Industry

9.2 Michigan Occupational Safety and Health Administration (MIOSHA) Part 690 Silica in Construction

9.3 RSW-SAF-060-DT Contractor Safety Procedure

9.4 RSW-SAF-057-DT Industrial Hygiene Program

9.5 Corporate Employee Health Monitoring Examination Protocols Standard, HLT-2025

9.6 RSW-SAF-070-DT Respiratory Protection Plan

10.0 ATTACHMENTS

10.1 Attachment A: Summary of MIOSHA Part 690 (1926.1153) Table 1

10.2 Attachment B: Danger Sign

10.3 Attachment C: Exposure Control Plan Template

10.4 Attachment D: Respirable Crystalline Silica Standard Flow Chart

11.0 REVISION HISTORY

Revision number	Description of change	Written by	Approved by	Effective date
0	New Procedure	A. Styes	J. Rabideau	07/11/2017
1	Corrected formatting issue in Section 3.5.1	A. Styes	J. Rabideau	08/03/2017
2	Annual Review. Updated Form-01 header information for approval requirements for any changes. Updated section 5.3 to reflect form changes.	A. Styes	A. Morales	09/01/2020

Attachment A

1926.1153 Table 1 (Modified for format only)
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
			Indoors or in an enclosed area	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Outdoor use of handheld power saws for cutting fiber- cement board (with blade diameter of 8 inches or less)	Use saw equipped with commercially available dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
			Indoors or in an enclosed area	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Outdoor use of Drivable saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that continuously feeds water to the cutting surface.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	Use a HEPA-filtered vacuum when cleaning holes.			
Outdoor use of Dowel drilling rigs for concrete	Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	Use a HEPA-filtered vacuum when cleaning holes.	Outdoors	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	Operate from within an enclosed cab and use water for dust suppression on drill bit.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.		Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
			Indoors or in an enclosed area	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	Use tool equipped with commercially available shroud and dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.		Indoors or in an enclosed area	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Handheld grinders for mortar removal (i.e., tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☐ APF 10 ☒ APF 25 ☐ APF 50 ☐ APF >50
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.				
Handheld grinders for uses other than mortar removal	Use grinder equipped with integrated water delivery system that continously feeds water to the grinding surface.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	Use grinder equipped with commercially available shroud and dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.		Indoors or in an enclosed area	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	Use machine equipped with dust collection system recommended by the manufacturer.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.			
Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant.	Operate and maintain machine to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Large drivable milling machines (half-lane and larger)	**For cuts of any depth on asphalt only:**				
	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.	Operate and maintain machine to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	For cuts of four inches in depth or less on any substrate:				
	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.	Operate and maintain machine to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant.	Operate and maintain machine to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points).	Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.				

Attachment A

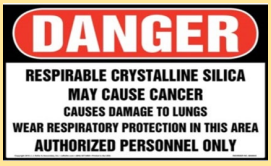
1926.1153 Table 1 (Modified for format only)

Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

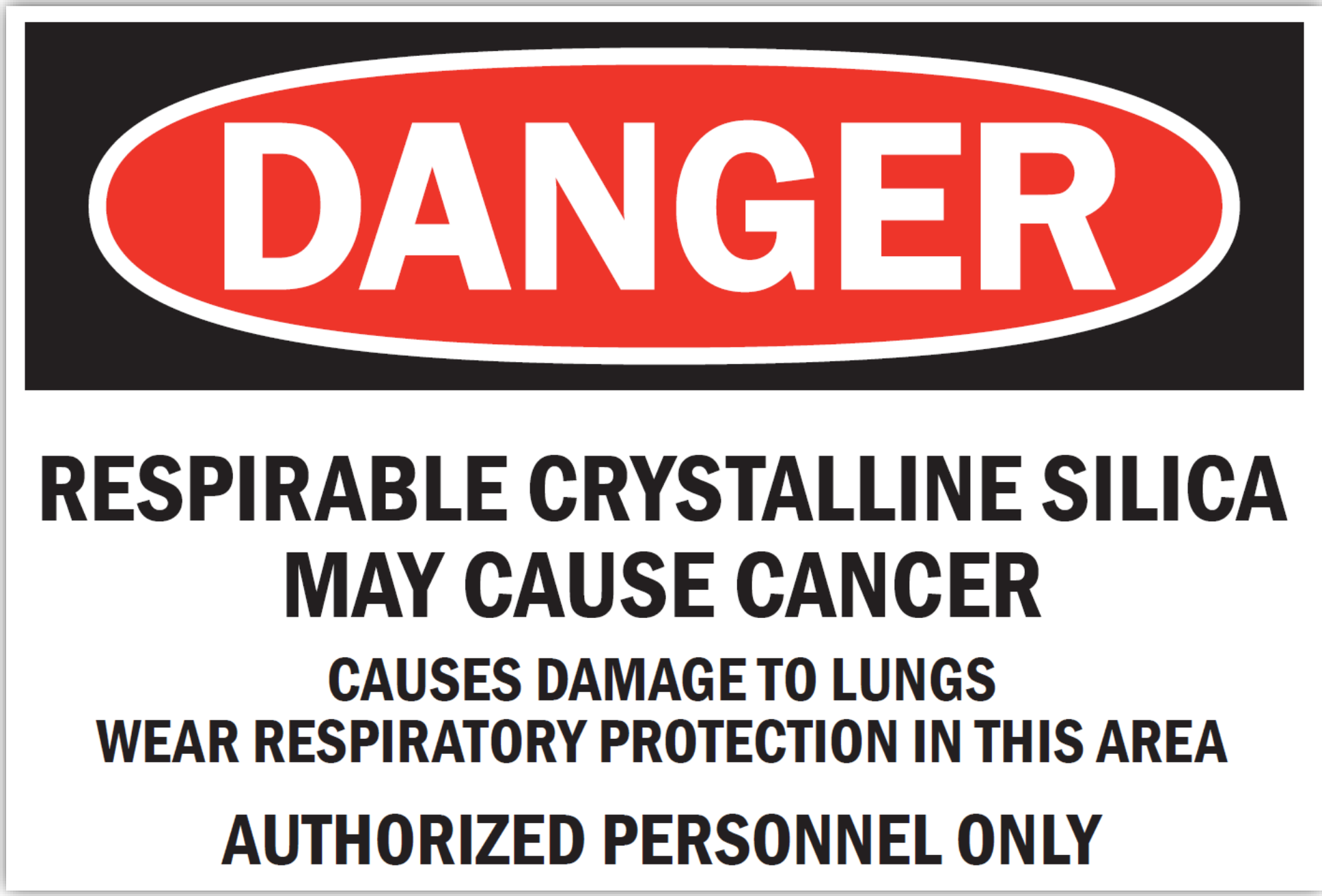
Task	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6]	
				< 4 hours	> 4 hours
Heavy equipment and utility vehicles used to abrade or fracture silica containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silicacontaining materials	Apply water and/or dust suppressants as necessary to minimize dust emissions.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50
	or				
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.			☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50

Attachment A

NOTES

NOTES:
1.) **Any deviation from Table 1** Tasks require air monitoring to determine control measures and respiratory protection requirements.
2.) Where an employee performs **more than one task on Table 1** during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.
3.) Engineering and Work Practice Controls are required to be **used at all times** unless the employer can demonstrate that such controls are not feasible.
4.) If engineering and work practice controls are inadequate to reduce exposures to below the PEL, they still need to be used to reduce employee exposure to the **lowest feasible level** and must be supplemented with the appropriate respiratory protection.
5.) When implementing the control measures specified in Table 1, each employer shall:
(i) For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to **minimize the accumulation of visible airborne dust;**
(ii) For tasks performed using wet methods, **apply water at flow rates sufficient to minimize release of visible dust**;
(iii) For measures implemented that include an **enclosed cab or booth**, ensure that the enclosed cab or booth:
(A) Is maintained as free as practicable from settled dust;
(B) Has door seals and closing mechanisms that work properly;
(C) Has gaskets and seals that are in good condition and working properly;
(D) Is under positive pressure maintained through continuous delivery of fresh air;
(E) Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better); and
(F) Has heating and cooling capabilities.
6.) Respiratory Protection **APF Levels:**
APF 10 = Half Mask APF 25 = Loose Fitting PAPR, Hood PAPR APF 50 = Full Face APF 1,000 = Full Face PAPR,
6.) Housekeeping **may NOT include dry sweeping or dry brushing** where it could contribute to the employee exposure unless wet sweeping, HEPA-filtered vacuuming or other methods are not feasible.
7.) **Compressed air may NEVER** be used to clean clothing or surfaces.
8.) Regulated areas will be established wherever airborne concentrations of respirable crystalline silica are, or can reasonably be expected to be, in excess of the PEL and **must be barricaded and warning signs** must be clearly visible from all accesses to the work area stating the following:

9.) Access must be limited to employees and/or contractors that are **required by work duties** to be present in the area, and are familiar with the requirements of this Exposure Control Plan.

Attachment B



Attachment C

Exposure Control Template

Refer to RSW-SAF-090-FORM01-DT for electronic version to

Company Name: _____

Person Completing the Plan, Title: _____

Designated Competent Person: _____ **Competent Person Phone #** _____

Type of Exposure Control Plan: **Date Review Due:** _____

☐ Annual for Nested Contractors **MRD Safety Approval** _____

☐ Project Specific **Date Approved:** _____

Project Name (if applicable): _____

Description of Task(s): _____

Task	Source of Control Measures [1,2]	Air Monitoring Results AL = 25µm/m3 PEL = 50µm/m3	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6] < 4 hours	Respiratory Protection [6] > 4 hours	Housekeeping Measures [7,8]	Access Restriction Methods [9,10]
Stationary masonry saws	☒ Table 1 ☐ Air Monitoring	Not Necessary if Table 1 Controls are being followed.	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		
Handheld power saws (any blade diameter)	☒ Table 1 ☐ Air Monitoring	Not Necessary if Table 1 Controls are being followed.	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		
					Indoors or in an enclosed area	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☒ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		
Outdoor use of handheld power saws for cutting fiber- cement board (with blade diameter of 8 inches or less)	☒ Table 1 ☐ Air Monitoring	Not Necessary if Table 1 Controls are being followed.	Use saw equipped with commercially available dust collection system.	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater.	Outdoors	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☒ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		

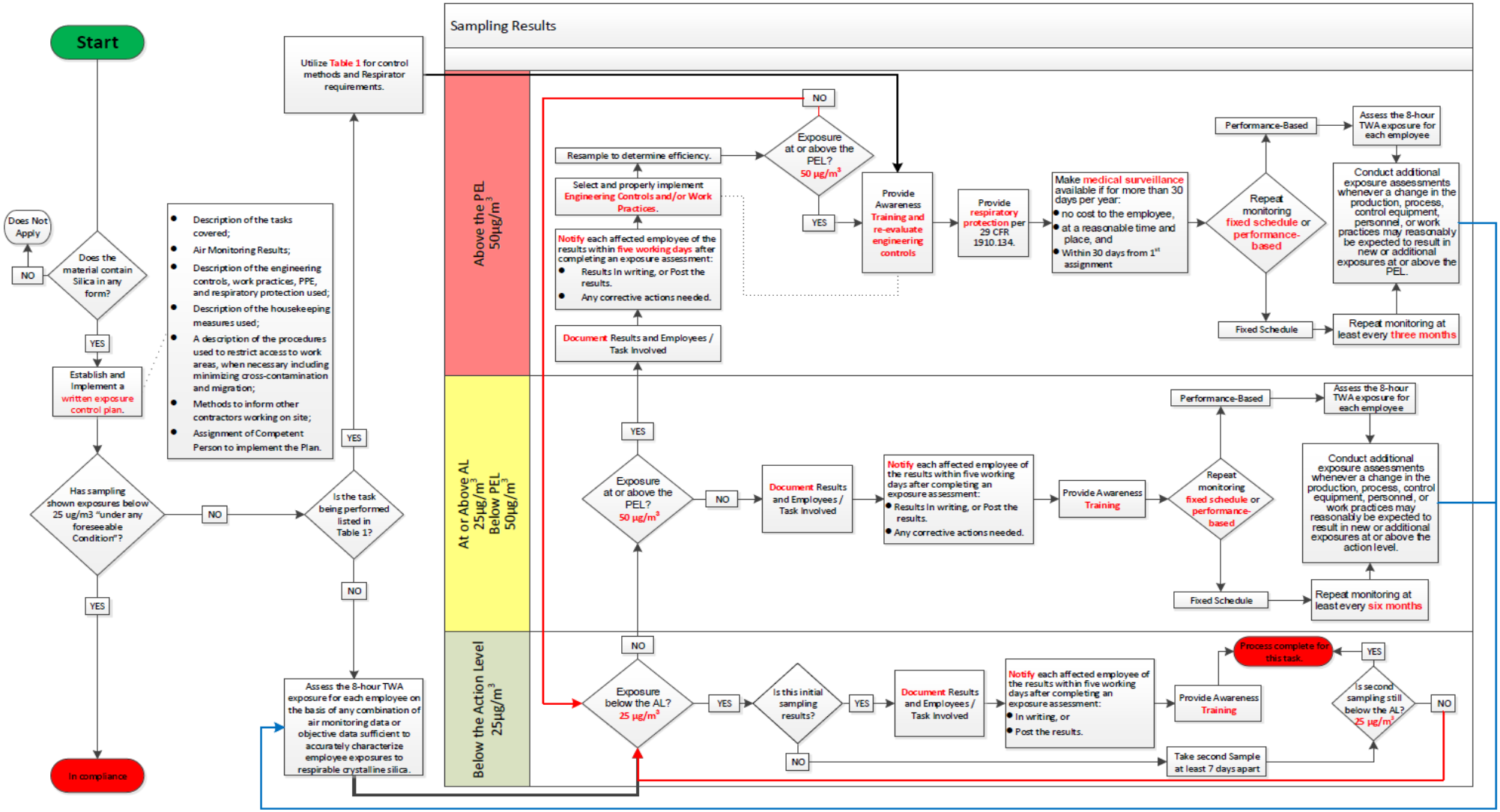
Task	Source of Control Measures [1,2]	Air Monitoring Results AL = 25µm/m3 PEL = 50µm/m3	Engineering Contols [3,4,5]	Work Practices Controls	Environment (if specified)	Respiratory Protection [6] < 4 hours	Respiratory Protection [6] > 4 hours	Housekeeping Measures [7,8]	Access Restriction Methods [9,10]
Removal / installation of silica containing insulation	☐ Table 1 ☒ Air Monitoring					☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		
Loading / unloading silica containg catalyst	☐ Table 1 ☒ Air Monitoring					☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		
Spraying ceramic coatings	☐ Table 1 ☒ Air Monitoring					☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50	☐ None ☐ APF 10 ☐ APF 25 ☐ APF 50 ☐ APF >50		

To create a company specific ECP:

1. Determine which tasks are routine.
2. Delete all other rows from template of tasks that aren't performed onsite.
3. If it's a Table 1 task, continue to fill out Housekeeping and Access Restriction Methods
4. If task isn't a 'Table 1' task, air monitoring will be required
5. Results of monitoring will determine
   a) Engineering Controls
   b) Work Practices
   c) Respiratory Protection
6. Continue to fill out Housekeeping and Access Restriction

Attachment D

RESPIRABLE CRYSTALLINE SILICA STANDARD FLOW CHART



Key Notes to Remember:

1. If there are any changes in production, process, control equipment, personnel, or work practices the may reasonably be expected to result in new or additional exposures, reassessment is required.
2. Awareness training requirements – Employee should be able to demonstrate knowledge of Health hazards, Tasks cover at this location, Control Methods, This standard, Identity of the site Competent Person, Purpose and description of the medical surveillance program.
3. Do not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.
4. Do not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air or No alternative method is feasible.