UCOR
United Cleanup Oak Ridge LLC

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UCOR
United Cleanup Oak Ridge LLC

OWNER: Safety, Systems, and Services	**PPD-IH-5205**	**REVISION: 5**
SUBJECT MATTER AREA: Industrial Hygiene	**PREPARER: Ryan Cunningham**	**Page 1 of 23**
PROCESS/PROGRAM DESCRIPTION	**CONCURRENCE/DATE:** **A. J. Reed 12/16/22** **[Approval Signature on File]**	
TITLE: **AIRBORNE SILICA HAZARD ASSESSMENT AND CONTROL**	**APPROVED BY/DATE:** **Walt Czekaj 12/14/22** **[Approval Signature on File]**	
USQD ☒ **UCD** ☐ **CAT X** ☐ **EXEMPT** ☐	**EFFECTIVE DATE: 1/12/23**	
USQD/UCD/CAT X No: PSW-MS-PPDIH5205-2136	**REQUIRED REVIEW DATE: 1/12/26**	
Exhibit L Mandatory Contractor Document: No ☐ **Yes** ☒	**If an Interim Procedure, Expiration Date:**	

This document is approved for public release per review by:

David Lannom 11/15/22

UCOR Classification and Information Control Office — Date

REVISION LOG

Revision	Effective Date	Description of Changes	Pages Affected
5	1/12/23	Intent change. Rearranged Sections A, B, C, D, E, and F. Redefined the Scope. Clarified when an "Exposure Control Plan" is required. Included a NOTE below Section A.1. Added an additional requirement of an "Exposure Control Plan." Further explained Competent Person duties. Added additional guidance to "Exposure Assessment and Sampling" section. Corrected NIOSH IDLH values in "Exposure Limits" section. Further defined who meets the qualifications for inclusion in Medical Surveillance. Removed "Ongoing Exposure Assessment," and "Required Controls" sections due to either being inapplicable or duplication of information within the document. Added IHHW and Attachment C to Section H.1. Added bullet point for Training being responsible for maintaining Silica Hazard Awareness Training information under "Record Keeping" Step K.3.	3-12, 14, 18
4	1/10/22	Intent change. Revised to clarify use of terms "Exposure Control Plan" verses "Compliance Plan". Clarify when a "Control Plan" is required. Replaced Section B, Industrial Hygienist, with Section B, Silica Exposure Control Plan. Added a definition for a "Silica Exposure Control Plan" (CAMS Issue IF-2022-0004). Deleted company tagline "an Amentum-led partnership with Jacobs".	4, 13
3	4/19/21	Intent change. Clarified that exposure levels are measured as 8-hour TWAs. Clarified silica medical surveillance requirements.	All
2	11/22/18	Intent change. Complete rewrite due to significant changes in silica regulations.	All
1	1/22/18	Intent change. Incorporate initial experience with implementation. Correct nonconservative medical surveillance trigger, CAMS item IF-2018-0044.	3-5, 8-12, 14-17
0	9/25/17	Initial Release. Flow-down of industrial hygiene program requirements from recently promulgated OSHA regulations 29 CFR 1910.1053 and 29 CFR 1926.1153.	All

PURPOSE

This Process/Program Description (PPD) communicates work requirements for identification, assessment, and control of respirable crystalline silica as required by 29 Code of Federal Regulations (CFR) 1926.1153 Respirable Crystalline Silica; 29 CFR 1910.1053 Respirable Crystalline Silica; 10 CFR 851, Worker Protection Program; PPD-EH-1745, *Worker Safety and Health Program*, PPD-EH-1400, *Integrated Safety Management System*, and applicable United Cleanup Oak Ridge LLC (UCOR) contract commitments.

SCOPE

This PPD applies to UCOR self-performed work, as well as UCOR subcontractor operations, with potential exposures at or above the Occupational Safety and Health Administration (OSHA) Regulatory Action Level (RAL) / American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) Time-Weighted Average (TWA), under any foreseeable conditions (e.g., loss of mechanical ventilation).

This PPD does **NOT** apply where exposures below the OSHA RAL/ACGIH TLV are expected or achieved without using Engineering or Work Practice controls.

This PPD does **NOT** apply to other Prime Contractor work performed in UCOR facilities, nor does this PPD apply to exposures resulting from processing of sorptive clays, e.g., addition of adsorbents incorporating silica-bearing clays to limit free liquid content of waste containers. Subcontractors shall contact their responsible Subcontract Coordinator (SCC)/Subcontract Technical Representative (STR) for assistance in understanding and complying with this procedure.

EXPECTATIONS AND STRATEGY

Provide requirements for safely working with respirable crystalline silica at UCOR locations.

OTHER DOCUMENTS NEEDED

- 29 CFR 1926.33, Access to Employee Medical Records
- 29 CFR 1926.57, Ventilation
- 29 CFR 1926.1153, Respirable Crystalline Silica
- PPD-IH-5151, *Respiratory Protection Program*
- PPD-IH-5418, *Industrial Hygiene Program*
- PROC-IH-5560, *Workplace Industrial Hygiene Sampling*
- Form-288, Medical Surveillance and Qualification Programs
- Form-1027, Job Hazard Analysis
- Form-2972, Competent Person Designation Form
- Form-3061, Industrial Hygiene Work Permit
- ACGIH, *TLVs for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs)*
- LEARN Module 31835, Silica Hazard Awareness
- LEARN Module 31836, Silica Competent Person Designation

ROLES AND RESPONSIBILITIES

A. Silica Exposure Control Plan

NOTE: The term "Exposure Control Plan (ECP)" is synonymous with "Compliance Plan" as used by OSHA in standards for cadmium, inorganic arsenic, and lead. The term ECP is used throughout this document to better align with the language used in the OSHA Silica Standard.

Industrial Hygienist

1. Develop a Silica ECP for all activities with potential exposures at or above the OSHA RAL/ACGIH TLV TWA, under any foreseeable conditions (e.g. loss of mechanical ventilation).

NOTE: The Project Industrial Hygienist (PIH) will make the determination if a work activity requires an ECP. OSHA outlines the following tasks that typically do not generate silica at or above the OSHA RAL/ACGIH TLV: mixing small amounts of mortar, mixing small amounts of concrete, using manual (non-powered) chisels, shears, and utility knives, using block or tile splitters, etc.

2. Ensure Silica ECP contains the following information as a minimum:

a. A description of tasks that involve exposure to respirable crystalline silica;

b. A description of engineering controls, work practices, and respiratory protection used to limit exposure to respirable crystalline silica for each task;

c. A description of housekeeping procedures used to limit employee exposure to respirable crystalline silica; and

d. A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors.

3. An Industrial Hygiene Work Permit (IHWP) may meet the content requirements of and serve as an ECP.

4. Review and evaluate effectiveness of Silica ECP at least annually and update as necessary.

B. Silica Competent Person

Silica Competent Person's Manager/ Supervisor

1. Designate Silica Competent Person on Form-2972, Competent Person Designation Form (LEARN Module 31836, Silica Competent Person Designation).

2. Silica Competent Person Qualification Requirements:

a. Capable of identifying existing and foreseeable respirable crystalline silica hazards in workplace and has authorization to take prompt corrective measures to eliminate or minimize identified hazards.

b. Possess knowledge and ability necessary to evaluate implementation of Silica ECP.

Competent Person

3. Perform frequent and regular inspections of job sites, materials, and equipment to ensure engineering controls, work practice controls, required respiratory protection, housekeeping measures, and procedures to restrict access in the workplace are implemented for the silica-generating task(s) outlined in the Silica ECP.

C. Training

Training Department

1. Address health hazards of respirable crystalline silica in hazard communications training including:

a. Kidney effects,

b. Cancer,

c. Lung effects,

d. Immune system effects (i.e., association with lung infections such as Tuberculosis).

Silica Worker / Silica Competent Person / Workers required by an IHWP/ECP

2. Complete LEARN Module 31835, Silica Hazard Awareness, covering:

a. Respirable crystalline silica health hazards,

b. Work tasks potentially resulting in exposure to respirable crystalline silica,

c. Measures to protect workers from exposure to respirable crystalline silica including:

i. Engineering controls,

ii. Administrative controls,

iii. Respirators to be used,

iv. Housekeeping procedures,

v. Personal hygiene practices

Silica Worker / Silica Competent Person / Workers required by an IHWP/ECP

d. Identity of Silica Competent Persons.

e. Purpose and description of medical surveillance program for Silica Workers.

f. Access to Safety Data Sheets (SDS) for masonry products, abrasives, and other materials that contain crystalline silica.

Silica Competent Person

3. Have a designation letter on file, Form-2972, with Training Department (LEARN Module 31836).

D. Exposure Assessment and Sampling

Industrial Hygienist

1. Implement controls outlined in the ECP/IHWP then assess exposure of each employee who is or may reasonably be expected to be exposed at or above 8-hour TWA of 25 $\mu g/m^3$ (OSHA RAL/ACGIH TLV), without regard to respiratory protection, on the basis of:

a. Air sampling data (document in the IH Sampling Database).

AND/OR

b. Objective data sufficient to accurately characterize employee exposure (may be summarized in the ECP/IHWP). Types of data and exposure assessment strategies that may qualify as objective data include:

i. Data from industry-wide surveys;

ii. Data provided by equipment manufacturers;

iii. Data provided by trade or professional associations;

iv. Exposure mapping (determining exposures associated with particular locations based on information obtained from sources that may include personal samples, area samples, and direct-reading instruments);

v. Calculations based on the composition of a substance;

vi. Calculations based on the chemical and physical properties of a substance (in those instances where a substance's physical and chemical properties demonstrate employee exposure to silica associated with a particular product, material, or a specific process, task, or activity); and

vii. The employer's historical air monitoring data.

Industrial Hygienist

2. Request air sampling to be performed as needed:

a. Per PROC-IH-5560, *Workplace Industrial Hygiene Sampling*.

b. Per National Institute for Occupational Safety and Health (NIOSH) Method 7500, Crystalline Silica by XRD.

c. To assess exposure for each employee on the basis of one or more personal samples that reflect exposures of employees on each shift, each job classification, and each work area involving respirable crystalline silica.

d. Where several employees perform the same tasks on the same shift and in the same work area, PIH may opt to only collect samples representative of worst-case scenario exposure.

Industrial Hygienist

3. Reassess exposure when:

a. A change in production, process, control equipment, or work practices are reasonably expected to result in new or additional exposure at or above the OSHA RAL/ACGIH TLV.

b. There is reason to believe new or additional exposures at or above the OSHA RAL/ACGIH TLV have occurred.

c. Improvements in production, process, control equipment, or work practices are made to reduce exposure potential.

E. Exposure Limits

1. ACGIH:

a. TLV: 8-hour TWA of 25 micrograms per cubic meter ($\mu g/m^3$) respirable (r)

b. Transient peak: 75 $\mu g/m^3$ (r)

c. Short Term Exposure Limit (STEL)/Peak Max: 125 $\mu g/m^3$ (r)

2. OSHA:

a. Permissible Exposure Limit (PEL): 8-hour TWA of 50 $\mu g/m^3$ (r) without regard to respiratory protection

b. Regulatory Action Level (RAL): 8-hour TWA of 25 $\mu g/m^3$ (r) without regard to respiratory protection

3. NIOSH:

a. Immediately Dangerous to Life and Health (IDLH): 25,000 $\mu g/m^3$ (cristobalite, tridymite); 50,000 $\mu g/m^3$ (quartz, tripoli)

F. Medical Surveillance

Worker Supervisor and Industrial Hygienist

1. Enroll Silica Workers in Medical Surveillance on UCOR Form-288, Medical Surveillance and Qualification Programs, or subcontractor equivalent within 30 days after initial assignment where respirators will be required for protection against silica for 30 or more days per year.

NOTE: Wearing a respirator for protection against silica at any time during a shift constitutes one day.

Worker Supervisor

2. Make initial (baseline) medical exam available at no cost to the worker within 30 days after initial assignment where respirators will be required to protect against silica for 30 or more days per year.

a. Silica medical exam in previous three years is acceptable in place of baseline exam.

Worker Supervisor and Industrial Hygienist

3. Make medical exam specific to requirements of this procedure available at no cost to workers:

a. Upon receipt of Industrial Hygiene (IH) sample results showing unprotected exposure to silica in exceedance of 8-hour TWA of 25 $\mu g/m^3$ (TLV).

b. Upon notification by employee of potentially work related signs, symptoms, or illness associated with exposure to silica.

4. Ensure Physician or other Licensed Health Care Professional (PLHCP) has a copy of 29 CFR 1926.1153, Respirable Crystalline Silica.

5. Provide PLHCP with:

a. Description of employee's former, current, and anticipated duties related to respirable crystalline silica exposure.

b. Former, current, and anticipated levels of occupational exposure to respirable crystalline silica.

c. Description of personal protective equipment (PPE) used or to be used by employee, including when and for how long employee used or will use PPE.

d. Information from records of employment-related medical examinations previously provided to employee and currently within control of employer.

Physician/PLHCP

6. Perform medical exam in accordance with 29 CFR 1926.1153, Respirable Crystalline Silica. See Attachment B, Medical Requirements.

7. Re-examine Silica Workers a minimum of every three years, or more frequently per PLHCP recommendation.

Worker Supervisor

8. Obtain written medical opinion from PLHCP meeting 29 CFR 1926.1153, Respirable Crystalline Silica, requirements within 30 days of medical exam. See Attachment B, Medical Requirements.

9. Ensure employee receives a copy of written medical opinion from PLHCP meeting 29 CFR 1926.1153, Respirable Crystalline Silica, requirements from PLHCP within 30 days of medical exam. See Attachment B, Medical Requirements.

10. **IF** PLHCP's written medical opinion indicates additional exam by specialist, **THEN**
employer make medical exam by specialist available within 30 days after receiving PLHCP's written opinion.

11. Provide specialist with information on 29 CFR 1926.1153, Respirable Crystalline Silica requirements. See Attachment B, Medical Requirements.

12. Ensure specialist explains results of medical exam to employee and provides employee and employer with written medical report within 30 days of exam. See Attachment B, Medical Requirements.

G. Sample Analysis and Employee Notification

Industrial Hygienist

1. Analyze samples per NIOSH 7500.

2. Employee Notification:

a. Provide written employee notification or post sample results in accessible location within 5 days of completion of assessment and per PROC-IH-5560.

b. Include corrective action to reduce employee exposure below 8-hour TWA of 25 $\mu g/m^3$ (OSHA RAL).

H. Implementation of Control Measures

Silica Competent Person/Work Supervisor

1. Implement controls per:

a. PPD-IH-5418, *Industrial Hygiene Program*

b. PPD-IH-5151, *Respiratory Protection Program*

c. Form-1027, Job Hazard Analysis

d. Form-3061, Industrial Hygiene Work Permit

e. Form-3062, Industrial Hygiene Hazard Worksheet

f. Attachment C, Recommended Controls

Silica Competent Person/Work Supervisor

2. Implement Engineering and Work Practice Controls to reduce and maintain employee exposure below 8-hour TWA of 25 µg/m^3 (TLV). See Attachment C, Recommended Controls.

3. **IF** Engineering and Work Practice Controls are insufficient to reduce exposure to or below 8-hour TWA of 25 µg/m^3 (TLV), **THEN**
continue use to reduce exposure to lowest feasible level and, if necessary, supplement with respiratory protection.

I. Prohibited Activities

Workers

1. Abrasive blasting with crystalline silica containing blasting agents, and abrasive blasting on substrates containing crystalline silica where other methods exist. Exemptions to this prohibition must be approved by IH Program Manager. If exemptions are approved, controls are required in accordance with 29 CFR 1926.57, Ventilation.

2. Dry sweeping or brushing crystalline silica-containing materials.

3. Use of compressed air for movement of potential crystalline silica-containing materials unless used in conjunction with a ventilation system that effectively captures dust created by compressed air.

J. Implementation Verification

Silica Competent Person

1. Perform frequent and regular inspection of job sites, material/debris, housekeeping, and equipment to verify implementation and compliance with Silica ECP requirements.

K. Record Keeping

Physician/PLHCP

1. Maintain the following records per 29 CFR 1926.33, Access to Employee Exposure and Medical Records.

a. Medical records.

i. Medical surveillance data for each employee covered by medical surveillance including:

- Name and social security number.
- Copy of written medical opinions by PLHCP and specialist.

Industrial Hygienist

b. Information provided to PLHCPs and specialists.

Industrial Hygienist

c. Air monitoring data including:

i. Date of measurement for each sample taken.

ii. Task monitored.

iii. Sampling and analytical methods used.

iv. Number, duration, and results of samples taken.

v. Identity of laboratory that performed analysis.

vi. Type of PPE worn by employees monitored.

vii. Name, badge number, and job classification of all employees represented by monitoring.

d. Objective data used to characterize employee exposure.

Training

2. Maintain Silica Competent Person designation information (Form-2972).

3. Maintain Silica Hazard Awareness information (LEARN Module 31835).

Attachment A
Definitions/Acronyms
Page 1 of 3

ACGIH – American Conference of Governmental Industrial Hygienists

CFR – Code of Federal Regulations

ECP – Exposure Control Plan

Exposure – The exposure to airborne respirable crystalline silica that would occur if a worker was not using respiratory protection.

HEPA (High-Efficiency Particulate Air) filter – A filter that is at least 99.97% efficient in removing mono-dispersed particles of 0.3 micrometers (μm) in diameter.

IH – Industrial Hygiene

IHWP – Industrial Hygiene Work Permit

ISO – International Organization for Standardization

LEARN – Local Education Administrative Requirements Network

MERV (Minimum Efficiency Reporting Value) – A consensus standard that rates the overall effectiveness of air filters. A higher MERV rating equates to finer filtration/greater retention. MERV range is from 1-to-16.

NIOSH – National Institute for Occupational Safety and Health

Objective Data – Information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating worker exposure to respirable crystalline silica associated with a particular product or material, or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or having a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in current operations.

Occupational Exposure Limit (OEL) – A general term referring to the maximum allowable airborne concentration of a hazard to which an individual can be occupationally exposed without defining the promulgating organization (Occupational Safety and Health Administration, American Conference of Governmental Industrial Hygienists, National Institute for Occupational Safety and Health, etc.).

OSHA – Occupational Safety and Health Administration

OSHA Regulatory Action Level (RAL) – A concentration of airborne respirable crystalline silica of 8-hour time-weighted average (TWA) of 25 $\mu g/m^3$, without regard to respiratory protection, calculated as an 8-hour TWA.

PPD – process/program description

Peak Max – Default short-term exposure limits (STEL) that apply to threshold limit value - time-weighted averages (TLV-TWA) which do not have a TLV-STEL. Peak exposure is a 15-minute STEL, represented by five times the TLV-TWA value, should not be exceeded at any time during a workday.

Permissible Exposure Limit (PEL) – The Occupational Safety and Health Administration established allowable concentration in air of a substance to which nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, for a 30-year working lifetime without experiencing adverse health effects. 29 CFR 1926.1153 establishes the PEL for respirable crystalline silica as 50 $\mu g/m^3$, without regard to respiratory protection, as an 8-hour time-weighted average.

Attachment A
Definitions/Acronyms
Page 2 of 3

Physician or licensed health care professional (PLHCP) – An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by this process/program description.

PPE – personal protective equipment

Project Industrial Hygienist (PIH) – A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards. This individual is either certified in the practice of industrial hygiene (IH) by the American Board of Industrial Hygiene (ABIH) or is current in all requirements of the UCOR Training Position Description (TPD) entitled "Project Industrial Hygienist."

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 ISO 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.

Short-Term Exposure Limit (STEL) – A 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hour TWA is within the threshold limit value – time-weighted average (TLV-TWA).

Silica Competent Person – An individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them, and possesses the knowledge and ability necessary to evaluate implementation of a Silica Exposure Control Plan.

Silica Exposure Control Plan – Provides a systematic approach for ensuring proper function of engineering controls and effective work practices that can prevent overexposures from occurring. Occupational Safety and Health Administration (OSHA) expects a written exposure control plan will be instrumental in ensuring employers comprehensively and consistently protect their employees. An Exposure Control Plan is roughly synonymous to an OSHA Compliance Plan.

Silica Worker – Workers required to wear respiratory protection for potential exposure to respirable crystalline silica for 30 or more days per year.

Specialist – An American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine.

Threshold Limit Value (TLV) – The occupational exposure limits promulgated by the American Conference of Governmental Industrial Hygienists (ACGIH). The TLV is the airborne concentration under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. In accordance with 10 CFR 851, UCOR is contractually obligated to comply with ACGIH TLVs. The TLV for Respirable Crystalline Silica is 8-hour time-weighted average of 25 $\mu g/m^3$.

Transient Peak – Default short-term exposure limits (STEL) that apply to threshold limit value – time-weighted averages (TLV-TWAs) which do not have a TLV-STEL. Transient increases in workers' exposure levels may exceed three times the TLV-TWA level for no more than 15 minutes at a time, on no more than four occasions spaced one hour apart during a workday.

TWA – time-weighted average

Attachment A
Definitions/Acronyms
Page 3 of 3

UCOR – United Cleanup Oak Ridge LLC

Worker – Term used to identify sections of the program description that apply to individuals who perform work solely under UCOR's direction such as staff augmentation subcontractors, contractually designated subcontractors, and UCOR employees.

Attachment B
Medical Requirements
Page 1 of 3

29 CFR 1926.1153

(h) *Medical surveillance*—**(1)** *General.* **(i)** The employer shall make medical surveillance available at no cost to the employee, and at a reasonable time and place, for each employee who will be required under this section to use a respirator for 30 or more days per year.

(ii) The employer shall ensure that all medical examinations and procedures required by this section are performed by a PLHCP as defined in paragraph (b) of this section.

(2) *Initial examination.* The employer shall make available an initial (baseline) medical examination within 30 days after initial assignment, unless the employee has received a medical examination that meets the requirements of this section within the last three years. The examination shall consist of:

(i) A medical and work history, with emphasis on: past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;

(ii) A physical examination with special emphasis on the respiratory system;

(iii) A chest X-ray (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconioses by a NIOSH-certified B Reader;

(iv) A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;

(v) Testing for latent tuberculosis infection; and

(vi) Any other tests deemed appropriate by the PLHCP.

(3) *Periodic examinations.* The employer shall make available medical examinations that include the procedures described in paragraph (h)(2) of this section (except paragraph (h)(2)(v)) at least every three years, or more frequently if recommended by the PLHCP.

(4) *Information provided to the PLHCP.* The employer shall ensure that the examining PLHCP has a copy of this standard, and shall provide the PLHCP with the following information:

(i) A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica;

(ii) The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica;

Attachment B
Medical Requirements
Page 2 of 3

(iii) A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and

(iv) Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the employer.

(5) *PLHCP's written medical report for the employee.* The employer shall ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed. The written report shall contain:

(i) A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment;

(ii) Any recommended limitations on the employee's use of respirators;

(iii) Any recommended limitations on the employee's exposure to respirable crystalline silica; and

(iv) A statement that the employee should be examined by a specialist (pursuant to paragraph (h)(7) of this section) if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

(6) *PLHCP's written medical opinion for the employer.* **(i)** The employer shall obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following:

(A) The date of the examination;

(B) A statement that the examination has met the requirements of this section; and

(C) Any recommended limitations on the employee's use of respirators.

(ii) If the employee provides written authorization, the written opinion shall also contain either or both of the following:

(A) Any recommended limitations on the employee's exposure to respirable crystalline silica;

(B) A statement that the employee should be examined by a specialist (pursuant to paragraph (h)(7) of this section) if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

(iii) The employer shall ensure that each employee receives a copy of the written medical opinion described in paragraph (h)(6)(i) and (ii) of this section within 30 days of each medical examination performed.

(7) *Additional examinations.* **(i)** If the PLHCP's written medical opinion indicates that an employee should be examined by a specialist, the employer shall make available a medical examination by a specialist within 30 days after receiving the PLHCP's written opinion.

Attachment B
Medical Requirements
Page 3 of 3

(ii) The employer shall ensure that the examining specialist is provided with all of the information that the employer is obligated to provide to the PLHCP in accordance with paragraph (h)(4) of this section.

(iii) The employer shall ensure that the specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report shall meet the requirements of paragraph (h)(5) (except paragraph (h)(5)(iv)) of this section.

(iv) The employer shall obtain a written opinion from the specialist within 30 days of the medical examination. The written opinion shall meet the requirements of paragraph (h)(6) (except paragraph (h)(6)(i)(B) and (ii)(B)) of this section.

Attachment C
Recommended Controls
Page 1 of 6

1. Ventilation systems:

- **a.** Designed and maintained to prevent accumulation and re-circulation of respirable crystalline silica dust.
- **b.** Perform preventive maintenance on High-Efficiency Particulate Air (HEPA) filter vacuums.

2. Mobile equipment cab, Control booth:

- **a.** Maintain as free as practicable from settled dust.
- **b.** Door seals and closing mechanisms function properly.
- **c.** Seals and gaskets intact and function properly.
- **d.** Maintain positive pressure through continuous delivery of fresh air.
- **e.** Air filter at least 95% efficient for particles in the 0.3-to-10 µm range (> MERV-16).
- **f.** Perform replacement of cabin air filters as determined by the applicable maintenance schedule.
- **g.** Functioning heating and cooling (as appropriate to season).

3. Wet methods:

- **a.** Apply water at flow rates sufficient to minimize release of visible dust.
- **b.** Maintain nozzles and piping to ensure adequate application of wetting agent.
- **c.** Wet wipe tools and equipment.

4. Work practices:

- **a.** Use products or materials without crystalline silica if feasible.
- **b.** Minimize generation of airborne respirable crystalline silica.
- **c.** Isolate workers from the work task where feasible; including moving workers upwind of silica generating tasks.
- **d.** Minimize accumulation of dust containing respirable crystalline silica.

5. Work area inspection criteria:

- **a.** Visible indication that dust control measures are/are not functioning as intended.
- **b.** Exhaust ventilation is present and preventing accumulation of visible airborne dust (indoors and/or enclosed areas).
- **c.** Housekeeping is satisfactory.

Attachment C
Recommended Controls
Page 2 of 6

Equipment/Task	Engineering Controls and Work Practice Control Methods
1. 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 the manufacturer's instructions to minimize dust emissions.
2. 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.
3. Handheld power saws for cutting fiber-cement board (with blade diameter of eight 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 that provides the air flow recommended by the tool manufacturer, or greater, and a filter with 99% or greater efficiency and filter-cleaning mechanism.
4. 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.
5. Drivable saws	Use saw equipped with integrated water delivery system that continuously supplies water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.
6. Rig-mounted core saws or drills	Use saw equipped with integrated water delivery system that continuously supplies water to cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.

Attachment C
Recommended Controls
Page 3 of 6

Equipment/Task	Engineering Controls and Work Practice Control Methods
7. 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. Dust collector that provides the air flow recommended by the tool manufacturer, or greater, and a filter with 99% or greater efficiency and filter-cleaning mechanism. Use HEPA-filtered vacuum when cleaning holes.
8. Dowel drilling rigs for concrete	Use shroud around drill bit with a dust collection system. Dust collector equipped with a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use HEPA-filtered vacuum when cleaning holes.
9. 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 dust at the discharge point from the dust collector. OR Operate from within an enclosed cab and use water for dust suppression on drill bit.
10. Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous wet stream or spray of water at the point of impact. 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. Dust collector that provides the air flow recommended by the tool manufacturer, or greater, and a filter with 99% or greater efficiency and filter-cleaning mechanism.

Attachment C
Recommended Controls
Page 4 of 6

Equipment/Task	Engineering Controls and Work Practice Control Methods
11. 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. Dust collector that provides 25 cubic feet per minute (CFM), or greater, air flow per inch of wheel diameter. Equipped with a filter 99% or greater in efficiency and a cyclonic pre-separator or filter-cleaning mechanism.
12. Handheld grinders for uses other than mortar removal	Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 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. Dust collector that provides 25 cubic feet per minute (CFM), or greater, airflow per inch of wheel diameter. Equipped with a filter 99% or greater in efficiency and a cyclonic pre-separator or filter-cleaning mechanism.
13. 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. 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. Dust collector that provides the air flow recommended by the tool manufacturer, or greater, and a filter with 99% or greater efficiency and filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in-between passes.

Attachment C
Recommended Controls
Page 5 of 6

Equipment/Task	Engineering Controls and Work Practice Control Methods
14. Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water combined with a surfactant. Operate and maintain machine to minimized dust emissions.
15. 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. 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. OR Use a machine equipped with supplemental water spray designed to suppress dust. Water combined with a surfactant. Operate and maintain machine to minimize dust emissions.
16. 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, conveyors, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.
17. 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. When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.

Attachment C
Recommended Controls
Page 6 of 6

Equipment/Task	Engineering Controls and Work Practice Control Methods
18. Heavy equipment and utility vehicles for tasks, such as grading and excavating, but not including: demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions. When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.