



Recent Silica Health Hazard Evaluations and OSHA Table 1

Michael Grant, ScD, CIH

Industrial Hygienist

National Institute for Occupational Safety and Health

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Outline

- Health Hazard Evaluation Program Overview
- OSHA Table 1
- Recent Silica Health Hazard Evaluations

Health Hazard Evaluation Program Overview

The Health Hazard Evaluation (HHE) program is a congressionally mandated program

- Responds to requests from employers, employees, unions, and government agencies
 - To evaluate chemical, physical, and biological hazards, and psychosocial stressors
- Provides a written report with findings and recommendations to employers and employees
- Involve employers and employees throughout the process
- Provided at no direct cost



The HHE program evaluates many types of situations

- Some common scenarios include:
 - Established hazards
 - Emerging hazards
 - Unknown hazards
 - Unique work processes with need of novel recommendations
- Holistic approach
 - Industrial hygiene
 - Medical section
 - Other, as needed



The HHE program is multidisciplinary

Medical

- Physicians
- Veterinarians
- Epidemiologists
- Behavioral Scientist
- Statistician

Industrial Hygiene

- Industrial Hygienists
- Ergonomist
- Safety Professionals

Support Staff

- Technicians
- Health communicator
- Writer editor
- Administrators

Can also involve, as needed:

- Engineers, Toxicologists, Chemists, Laboratory Personnel, other Subject Matter Experts

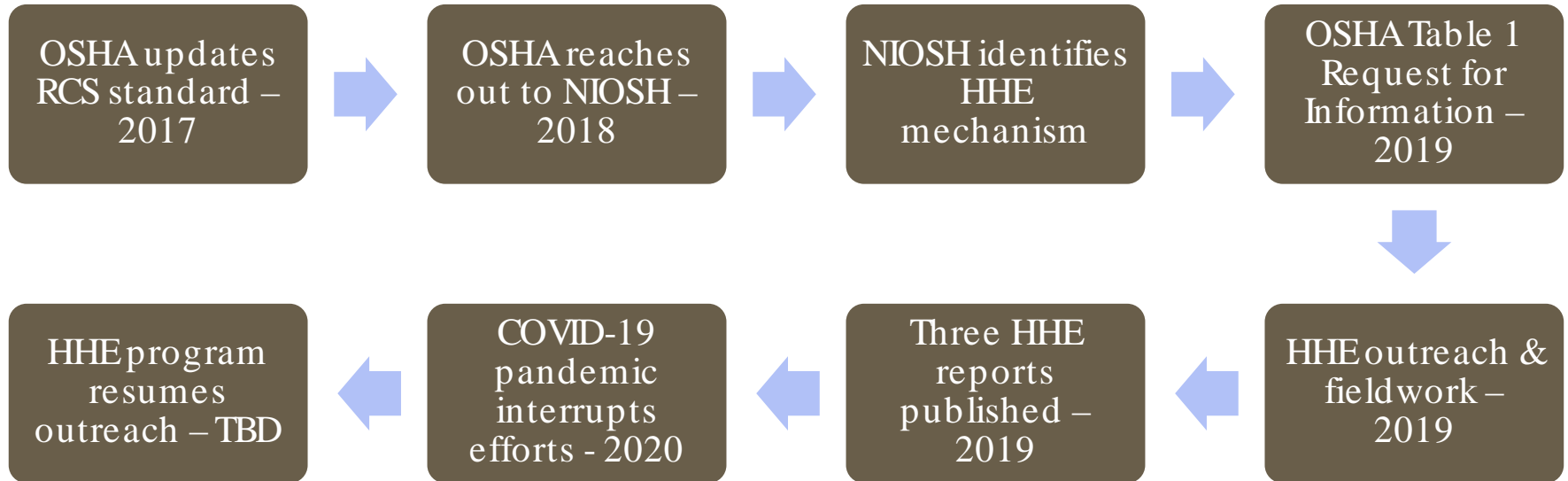
HHEs can be requested in multiple ways

- 3 current employees (can be confidential)
- Union
- Employer
- Requests for technical assistance
 - Other government agencies
 - State and local health departments



OSHA Table 1

Timeline of OSHA and NIOSH HHE activities



Recent Silica Health Hazard Evaluations

Recent silica HHEs covered a variety of tasks

HHE #1: Drywall sanding with vacuum controls

HHE #2: Dowel drilling with water controls

HHE #3: Micro trenching with vacuum controls

All three HHEs followed the same process

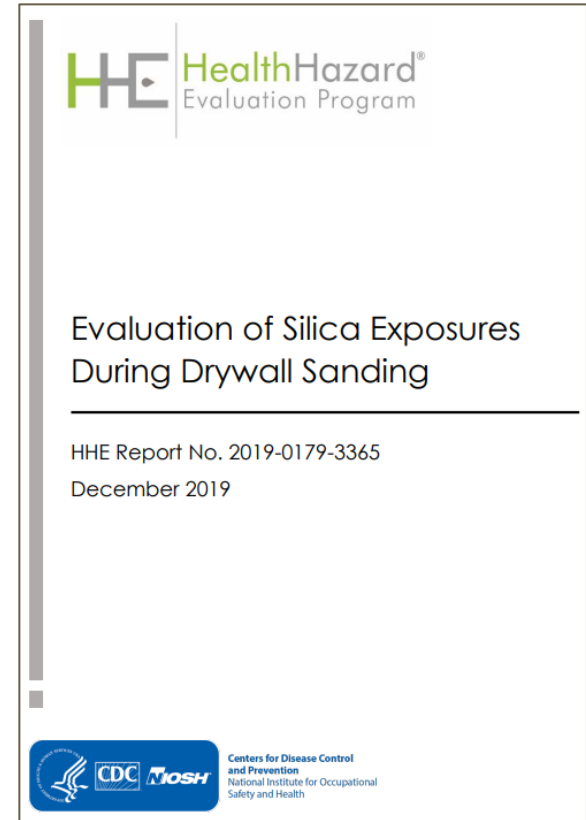


Exposure assessment methodology was the same for each project

- Personal air sampling for respirable dust (NMAM 0600) and RCS (NMAM 7500)
 - 3-piece 37-milimeter cassette with a pre-weighed with 5 μm PVC filter
 - Mesa Labs Model GK 2.69 high flow personal sampling cyclone
 - Run at 4.2 LPM
- Portable weather station to record wind direction and speed
- Examined and documented the engineering controls

HHE #1: Drywall sanding with one High Efficiency Particulate Air (HEPA) vacuum

- Drywall finishing company
- Commercial construction site
 - New construction
 - Residential units
- Crews of 8 and 9 workers
 - Unionized
- 8-hour shifts
 - Sampled during sanding (3 to 6 hours)



HHE #1: Drywall sanding with one High Efficiency Particulate Air (HEPA) vacuum



Powered sander connected to HEPA shop vacuum

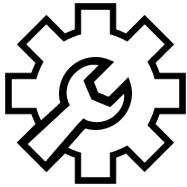
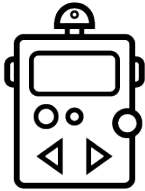


Hand sanding with pole sanders

Key findings from HHE #1: Drywall sanding with one HEPA vacuum

- Employees were not overexposed to silica
- 2 samples exceeded the TLV for respirable dust (same employee on two days)
- Vacuums were sometimes used improperly
 - Observed issues with filter replacement and emptying vacuum
- The voluntary respiratory protection program could be strengthened
- Most sanders did not have an engineering control and sanded by hand
 - One powered sander was connected to a HEPA vacuum

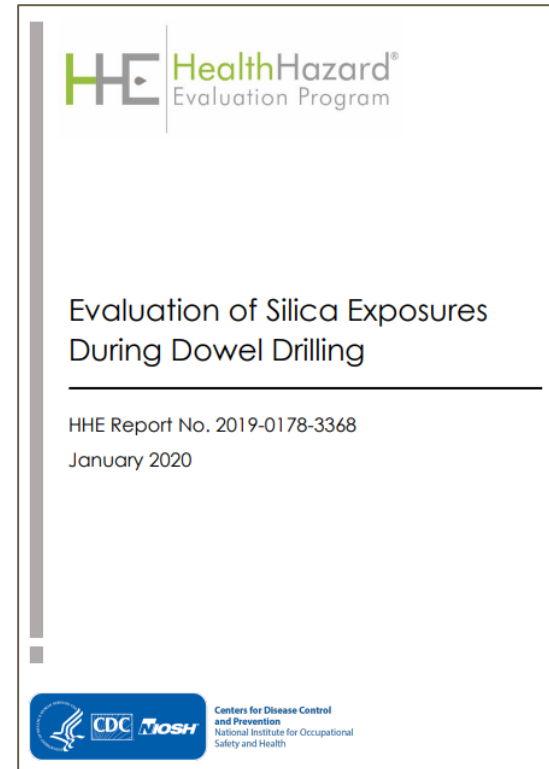
Major recommendations for HHE #1: drywall sanding



- Continue periodic exposure monitoring
- Improve vacuum care and maintenance
- Strengthen the voluntary respiratory protection program

HHE #2: Dowel drilling with water controls

- State road construction site
- 2 employees
 - Drill rig operator
 - Backhoe operator
 - Non-union
- Full shift sampling
 - Approximately 5 hours



HHE #2: Dowel drilling with water controls



Employee operating drill rig



Drill rig is on the arm of the backhoe,
Water reservoir on the front bucket

Key findings from HHE #2: dowel drilling with water controls

- The respiratory protection program could be improved
 - Drill rig operator wore a loose fitting PAPR with P-100 filters
 - Backhoe operator did not wear respiratory protection
- Drill operator had silica exposures over OSHA PEL on one day and over the OSHA AL on a second day
 - PAPR was protective for measured concentrations
- Samples of respirable dust did not exceed any exposure limits

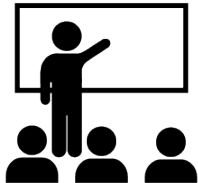
Major recommendations for HHE #2: dowel drilling with water controls



- Create a written respiratory protection program



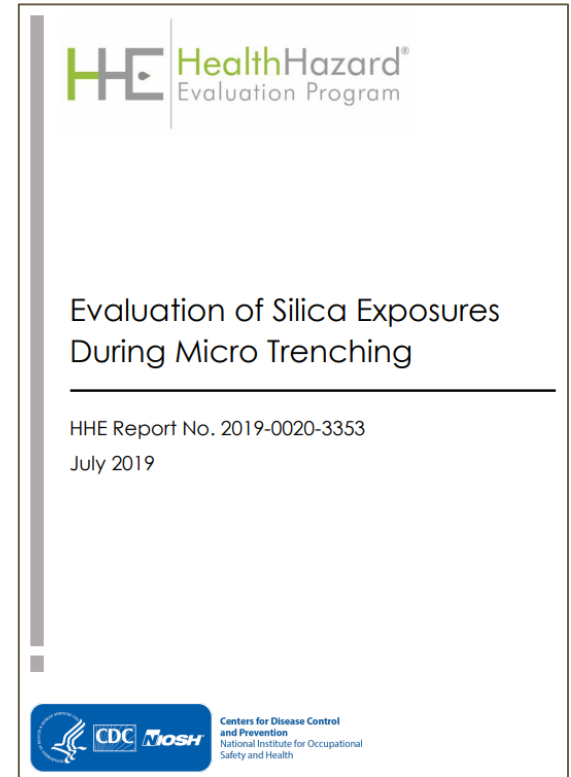
- Send drill rig operator for medical respirator clearance



- Train employees about respirator use and maintenance

HHE #3: Micro trenching with HEPA vacuum control

- Cutting small trenches in pavement to lay communications cables
- Residential street construction site
- Crew of 8 workers
 - Cutting trench, installing cables, emptying vacuum, filling the trench, loading the dumpster
 - Non-union
- 8-hour shifts



HHE #3: Micro trenching with HEPA vacuum control



Vacuum truck in background, micro trencher saw housing connects to the vacuum hose

HHE #3: Micro trenching with HEPA vacuum control



Vacuum truck was emptied onto a tarp next to a dumpster



Dust pile loaded into dumpster at end of day

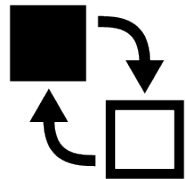
Key findings from HHE #3: micro trenching with HEPA vacuum control

- The vacuum truck appeared to control exposures
 - RCS was not detected in any samples (< LOD)
 - Low levels of respirable dust
- Emptying the vacuum and loading the dumpster produced the most visible dust
- Compliance with health and safety programs needs improvement
 - Respiratory protection
 - Hearing protection

Major recommendations for HHE #3: micro trenching with HEPA vacuum control



- Improve the existing respiratory protection program



- Explore other methods for loading the dumpster and cleaning the vacuum filter (these tasks caused the most dust)



- Create a hearing conservation program, if needed

Conclusions

- Major recommendations were:
 - Written safety programs
 - Training & compliance
 - Proper maintenance of engineering controls
- Continuing outreach in the future
- All reports are publicly available:
 - <https://www.cdc.gov/niosh/hhe/default.html>
 - Enter report number, author's name, or “silica” to find the reports

Contact Information:

- email: mgrant@cdc.gov
- office: 513-841-4441



For more information, contact CDC
1-800-CDC-INFO (232-4636)
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

