



STATE OF WASHINGTON

DEPARTMENT OF HEALTH
OFFICE OF ENVIRONMENTAL PUBLIC HEALTH SCIENCES
243 Israel Road SE • PO Box 47846 • Olympia, Washington 98504-7846
TDD Relay Service: 1-800-833-6388

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To: Peter Kowalski
Exposure Investigations and Statistics and Analysis Team
Science Support Branch
Agency for Toxic Substances and Disease Registry
770-488-0776
pek2@cdc.gov

From: Joanne Snarski
Principal Investigator
Site Assessments Program
Washington State Department of Health
360-236-3371
joanne.snarski@doh.wa.gov

Subject: Request for an environmental exposure investigation at Valley School site

This letter is a request from the Washington State Department of Health (Health) to the Agency for Toxic Substances and Disease Registry (ATSDR) for assistance completing an environmental exposure investigation at Valley School in Valley, Stevens County, Washington.

Site background

Valley School is an elementary school (kindergarten to eighth grade) in Stevens County, Washington. It has been in operation since the 1880s. The school has undergone several upgrades and expansions. In 1992, during an upgrade and repair of the roof, a large quantity of sand was found in the ceiling. Located directly across the street from Valley School is Lane Mountain Company (LMC) silica sand production facility. LMC is the largest silica sand production facility in the Northwest and has been in operation at their current site since 1961 [1].

Since 1992, Valley School District (VSD) and Northeast Tri-County Health District have received concerns from the community about exposure to dust from LMC and its potential impact on the health of students and staff at Valley School. At the request of VSD, Health prepared a letter health consultation, "Valley School Silica Exposure Status Update" on 8 January 2016. The goal of the evaluation was to:

- Characterize measured particulate matter less than 10 micrometers (PM₁₀) for crystalline silica at LMC near Valley School.

- Inform VSD and the community about next steps and recommendations to protect or reduce possible human exposure to silica.

Health concluded that, although there are some uncertainties, available data indicate that PM₄ silica concentrations at Valley School may be greater than 3 micrograms per cubic meter (µg/m³). This is the acceptable source impact level (ASIL) for crystalline silica in Washington State. Therefore, the concentration of respirable (PM₄) silica that students and staff are exposed to at Valley School may harm health.

Since the site poses a potential threat to students and staff, Health recommends an environmental exposure investigation (EI) at Valley School. An EI would consist of air monitoring that includes crystalline silica analysis of PM₄ samples. The Washington State Department of Ecology (Ecology), VSD, and Northeast Tri-County Health District are supportive of an environmental exposure investigation to address data gaps and determine if there is a health risk at Valley School [2,3].

Justification for environmental exposure investigation

1. Can an exposed population be identified?

Yes, there is an exposed population. VSD is located on one campus situated across the street from LMC. The district serves approximately 310 children and students ages 1 year to 18 years old on-site through their Early Learning Center, day care facility, kindergarten through 12th grade, and before and after school programs [4,5]. Valley School District also has athletic fields that are used by both the school and community groups for youth sports. In addition, the district employs 106 classroom teachers and staff [4].

2. Does a data gap exist that affects the ability to determine if a health hazard exists?

Yes, Health's Valley School letter health consultation concluded that a data gap exists. There are known limitations and uncertainties associated with the current dataset that affects the ability to determine if a health hazard exists:

- Some filter blanks had high silica levels. The blanks that showed high silica mass also had high gravimetric mass measurements (>30 µg) from their initial analysis. ATSDR noted positive bias in field blanks in the Federal Reference Monitor (FRM) data [6]. All blanks that had satisfactory initial gravimetric mass measurements also had satisfactory silica mass measurements.
- The Washington State ASIL is based on data from respirable particulates, which have a cutpoint of 4 microns in aerodynamic diameter (PM₄). Only PM₁₀ silica was measured and particulate matter less than PM₄ silica mass has not been confirmed. Since the only data available for review was collected on-site at LMC with an aerodynamic cutpoint of PM₁₀, we cannot conclude the concentration of respirable silica (PM₄) that students and staff may be exposed to at Valley School.
- FRM filters were collected on-site at LMC and not on the grounds of Valley School. No silica ambient air monitoring data has been collected from Valley School. However, if the crystalline silica to PM₁₀ mass ratios are considered to be similar at the two locations, crystalline silica concentrations at Valley School would be higher than those measured at the FRM location on the south side of LMC. Without crystalline silica

measurements from Valley School it is not possible to determine if the crystalline silica to PM₁₀ mass ratio is similar to that measured at LMC.

- Since silica is a common crustal constituent, silica measurements could also be influenced by other background features such as traffic patterns from nearby roads.
- The type of filter used (Teflon filter instead of polyvinylchloride filters), sample storage conditions, and holding time (age of the samples) before Washington State Department of Labor and Industries (LNI) crystalline silica analysis, may also contribute to sources of uncertainty and results variability.
- Data quality concerns with the silica data prevent a definitive finding regarding respirable silica concentrations at Valley School or other nearby locations. Depending on the major source of silica (traffic or silica processing), the FRM monitor may not represent the highest silica concentrations in the area.

3. Can an EI be designed to address this data gap?

Yes, an EI can be designed to address the data gap. The approach would use the method developed by Richards and Brozell for measuring PM₄ crystalline silica content [7]. This methodology consist of adapting the EPA high volume PM_{2.5} method samplers to collect PM₄ filtered samples [8]. These PM₄ samples are then analyzed with X-ray diffraction (XRD) using the NIOSH Method 7500 [9]. A similar approach was used for community exposure to ambient respirable crystalline silica near sand processing facilities in Wisconsin [10].

The EI would include air monitoring to specifically look for crystalline silica through the analysis of PM₄ samples at Valley School. Previous sampling efforts only included PM₁₀ samples. The PM₄ respirable crystalline silica data would be initially compared to the health standard of 3 µg/m³. The health standard is based on average exposure. If exposures on average are below the health standard, then exposures are not expected to be harmful. If they are above the standard, then further site specific evaluation of the exposure and its public health implications will be performed per ATSDR's Public Health Assessment Guidance Manual, Chapter 8.

4. How will the EI results impact public health decision-making for the site?

An environmental exposure investigation will respond to VSD and community concerns by determining if dust from LMC has the potential to impact the health of students and staff at VSD. Results and recommendations from the EI will be used to inform the potential need for future actions at VSD, LMC or from other state and local agencies to protect human health. Past activities have included:

- **Valley School District:** VSD has periodically kept students indoors during high wind events to reduce their exposure to dust. An EI will help VSD determine whether this or other actions are appropriate to protect students and staff.
- **Lane Mountain Company:** LMC has previously taken actions to reduce the amount of dust blowing onto the Valley School campus. LMC is actively participating in the stakeholder group and has stated they are willing to take other control steps if the EI results illustrate a need for additional action [2].

If you have any questions regarding this request please feel free to contact me at 360-236-3371 or 1-877-485-7316 or by email at joanne.snarski@doh.wa.gov.

Sincerely,

Joanne Snarski
Principal Investigator
Site Assessment and Toxicology Section

Cc: Lenford O'Garro, Department of Health
John Poffenroth, Department of Ecology
Phillip Peters, Labor and Industries
Kevin Foster, Valley School District
Matt Schanz, Northeast Tri-County Health District
Joe Scates, Lane Mountain Company
Debra Gable, ATSDR Region 10

Attachments

Letter of support from Northeast Tri-County Health District, Board of Health
Letter of support from Valley School Board

References

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