



Valley School playground with Lane Mountain facility in the background.

The Valley School campus is located across the street from Lane Mountain Company, a large producer of silica sand products in the Northwest since 1961. The school district, local and state health departments, and state environmental department, have been talking about air quality concerns with the facility since 1992. Different types of air monitoring, and changes to the Lane Mountain facility and the school campus have taken place over time, see page 5 of the full report for details.

What are the community's concerns?

The Valley School District expressed concerns about the potential effect of silica dust on its students and staff to the Northeast Tri County Health District, the Washington Departments of Health and Ecology, and Lane Mountain Company in 1992 and in 2008. These organizations have been communicating about potential dust impacts for many years.

What did ATSDR do?

ATSDR staff visited Valley in 2016 to discuss concerns of the school district, residents, and Lane Mountain managers. From July through September 2016, ATSDR measured four pollutants in air – PM_{10} , PM_4 , $PM_{2.5}$ and PM_4 crystalline silica – at nine locations throughout the area. We monitored air indoors and outdoors at the Valley School campus. We also monitored air outdoors in a nearby residential area, and at a more distant location west of Lane Mountain. We compared the measured concentrations with health comparison values from the World Health Organization, the U.S. Environmental Protection Agency (EPA), and the California Office of Environmental Health Hazard Assessment. When measurements were higher than health comparison values, then we compared the measured concentrations to documented health effect levels from scientific literature.

Air Exposures to Particulate Matter and Silica Dust Valley, WA

Summary of ATSDR's Exposure Investigation

In 2016 the Washington Department of Health asked ATSDR to do an exposure investigation to better characterize exposure to silica and particulate matter (PM) at the Valley School campus and in the community of Valley, WA. ATSDR responded by measuring four pollutants in air – PM_{10} , PM_4 , $PM_{2.5}$ and PM_4 crystalline silica. This is a summary of the [full ATSDR report](#).

The Bottom Line:

- ▶ Some people who breathe PM_{10} on the Valley School campus could have health problems including respiratory symptoms and aggravation of existing lung conditions like asthma. Our main concern is for sensitive populations such as adults and children that have preexisting health conditions related to breathing.
- ▶ Depending on conditions, students and staff who breathe PM_4 crystalline silica long term on the school campus or Valley residents who breathe PM_4 crystalline silica long term in the surrounding area could be at risk for health problems like silicosis, lung cancer, and other respiratory, kidney, and autoimmune diseases.
- ▶ The general population and the sensitive population of students, staff, or residents who breathe $PM_{2.5}$ on the school campus or in the surrounding area are not at risk for health problems because the levels of $PM_{2.5}$ measured were below health comparison values. Some individuals (e.g., people with asthma or those with cardiopulmonary conditions) are unusually sensitive to changes in air quality, and may still experience transient health effects on days with poorer air quality, regardless of whether concentrations were above health comparison values.
- ▶ PM_4 crystalline silica and PM_{10} were highest on the school campus when winds were from the southwest. Winds from the southwest are more common in the spring and summer. PM_4 indoors is about four times lower than outdoors. Thus, Valley School District can limit exposure by limiting outdoor activity on campus on days when there are strong winds from the southwest.



U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

What did ATSDR find?

In Valley, PM₁₀ and PM₄ crystalline silica were measured above their health comparison values, but PM_{2.5} was below.

ATSDR recognizes that some individuals (e.g. people with asthma or those with other cardiopulmonary conditions) are unusually sensitive to changes in air quality, and those individuals may still experience transient health effects during days with poorer air quality, regardless of whether amounts exceed health-based health comparison values.



Finding 1 – Some people who breathe PM₁₀ on the Valley School campus could have health problems including respiratory symptoms, and aggravation of existing lung conditions like asthma. Our main concern is for sensitive populations.

During 2014 - 2017 at the permanent PM₁₀ station, nine days measured 24-hour concentrations greater than the National Ambient Air Quality Standards for PM₁₀ (150 µg/m₃), and approximately 25% of days had concentrations greater than the 24-hour World Health Organization health comparison value for PM₁₀ (50 µg/m³).

Across all sites sampled, we measured PM₁₀ at amounts that could potentially harm some unusually sensitive individuals on 259 days of 1,200 days (21% of days measured). The PM₁₀ amounts on 8 days could potentially harm sensitive individuals, and on 1 day, the amounts were high enough to potentially harm healthy adults.

The amounts of PM₁₀ measured on Valley School Campus were highest when winds came from the southwest. These winds are more common in the spring and summer than other times of the year.



Finding 2 – Breathing PM₄ crystalline silica on the campus of Valley School and in the surrounding area presents a potential long-term public health hazard to students, staff, and residents.

The amounts of PM₄ crystalline silica measured on Valley School Campus were above health comparison values at all monitoring locations on the campus of Valley School as well as at two locations in the nearby community.

The amounts of PM₄ crystalline silica measured on Valley School Campus were highest when winds came from the southwest. These winds are more common in the spring and summer than other times of the year.

The amount of PM₄ measured inside the school was approximately four times lower than the amounts of PM₄ measured outdoors.

Long term inhalation of crystalline silica particles may cause silicosis and is associated with increased risk of lung cancer. In addition, it has been associated with other respiratory diseases such as chronic obstructive pulmonary disease, bronchitis, and emphysema, as well as kidney and autoimmune diseases.

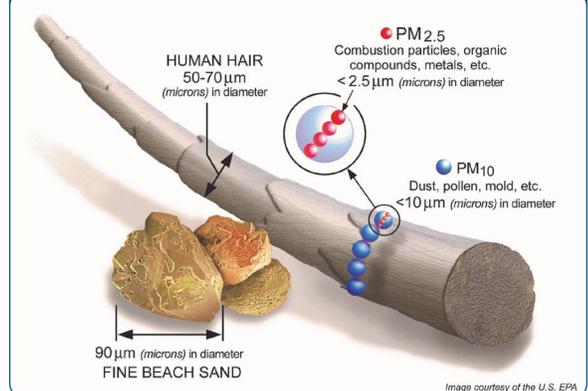
Health Comparison Values

For this EI, a health *comparison value* (CV) is the concentration of a substance – like PM₄ crystalline silica – in air that is unlikely to cause harmful health effects in people who have been exposed to it. Scientists compare measured amounts of a substance in the environment, or estimates based on measured amounts in the environment, to health comparison values.

If the amount in the environment is higher than the health comparison value, then the scientist will recommend that the substance be looked at more carefully in the health assessment process.

What is particulate matter (PM)?

Particulate matter (PM), is tiny pieces of solids or liquids that are in the air. The particles may include dust, dirt, soot, smoke, or drops of liquid. Particulate matter is described by the size of the particles in units called microns. The abbreviation is µm. In this investigation, we measured PM₁₀, PM₄, and PM_{2.5}. For health comparison, a human hair is 50 – 70 microns across. Image from EPA.





Finding 3 – Breathing PM_{2.5} on the campus of Valley School and in the surrounding area is not a public health hazard to the general and sensitive population of students, staff, or residents.

All 24-hour concentrations of PM_{2.5} were below the World Health Organization health comparison value for PM_{2.5} (25 µg/m³). The average PM_{2.5} concentration during the entire investigation was below the annual World Health Organization health comparison value at all sites but one.

Next Steps for PM₁₀ and PM₄ Crystalline Silica

- Ecology and Lane Mountain agreed in November 2017 to make changes that are expected to reduce the facility's impacts on the nearby community.
- Lane Mountain should confirm that the Autumn 2018 efforts to reduce emissions of PM₁₀ and PM₄ crystalline silica from their operations have resulted in reduced exposure to particulate matter and crystalline silica in the surrounding area.
- Lane Mountain should make permanent station PM₁₀ data available to Valley School District in real-time to assist the District in making decisions on when to limit outdoor activity of students and staff on the school campus.
- Lane Mountain should conduct regular calibration checks and audits of the permanent PM₁₀ monitor.
- Valley School District should limit outdoor activity on campus when concentrations of PM₁₀ are above 50 µg/m³ in outdoor air.
- If real-time PM₁₀ data are not available, Valley School District should limit outdoor activity on campus when there are strong winds from the southwest. If no wind direction measurements are available from Valley School, Lane Mountain should install a wind sock to inform decision makers about wind directions.
- If you have health concerns about this exposure talk with your doctor.

ATSDR will

- Give the report to the Valley School District, the EPA, Ecology, EI Participants, and other community members as requested.
- Meet individually with EI participants to discuss the information provided in this report and the data collected on their respective properties.
- Meet with interested stakeholders to discuss this report.
- Meet with the Valley School District and Ecology to discuss changes made through the 2017 Administrative Order issued by the Ecology to Lane Mountain Company.

If requested, ATSDR will work with the Valley School District, Ecology, and the EPA to consider options to reduce exposures in the Valley, WA.

What is crystalline silica?

Silica is the scientific name for sand. Silica is very common, it occurs naturally in our environment, and it has many uses. One form of silica, called crystalline silica, is produced by the Lane Mountain facility. People who are exposed to crystalline silica for long periods of time (typically more than 10 years) or have a heavy exposure over a short period of time may have health effects.



Air monitoring equipment on Valley School Campus.

How can I learn more about the air investigation in Valley, WA?

For more details about ATSDR's findings, see our companion report "**Ambient Airborne Exposures to Particulate Matter and Silica Dust in Valley School, Valley, WA.**"

If you have questions or comments, call ATSDR environmental health scientist, Debra Gable, at **206-553-1796** or our toll-free number at **1-800-CDC-INFO**.

About ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency of the U.S. Department of Health and Human Services (HHS). ATSDR works with other agencies and tribal, state, and local governments to study possible health risks in communities where people could come in contact with dangerous chemicals. For more information about ATSDR, visit our website at <https://www.atsdr.cdc.gov/>.