

US EPA ARCHIVE DOCUMENT



U.S. EPA Asbestos Assessment for El Dorado Hills

U.S. ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • SAN FRANCISCO, CALIFORNIA • MAY 2005

U.S. EPA and ATSDR Hold Asbestos Meetings Two Asbestos Reports to be Released

This fact sheet was developed by the U.S. Environmental Protection Agency (U.S. EPA) to summarize findings of its October 2004 sampling for personal exposures to asbestos at three schools and the El Dorado Hills Community Park.

The information summarized here will be presented during part of the joint community meeting with the Agency for Toxic Substances and Disease Registry (ATSDR) and U.S. EPA to be held on Friday, May 6, 2005, from 7:00 p.m. - 10:00 p.m., at the Community Services District Gym, 1021 Harvard Way, El Dorado Hills.

During the Friday meeting, ATSDR will present findings from its Public Health Consultation on asbestos exposures at Oak Ridge High School. El Dorado County will present information on the county's plans to address asbestos.

On the following day, Saturday, May 7, representatives of ATSDR and U.S. EPA will be available from 10:00 a.m. - 2:00 p.m., at the Community Services District Gym to talk with the public. Additionally, ATSDR will be making presentations on the health effects of asbestos.

A third asbestos report, the Garden Valley Road Study conducted by the State of California Department of Toxic Substances Control (DTSC), was released on April 8, 2005. DTSC will be doing outreach in Garden Valley to notify residents of the results.

The U.S. EPA, ATSDR and DTSC are working together to coordinate the release of their reports and to provide technical assistance to the El Dorado Hills community.

Asbestos Public Meeting

May 6, 2005 • 7:00 pm - 10:00 pm

Location: Community Services District Gym

Availability Session

May 7, 2005 • 10:00 am - 2:00 pm

Location: Community Services District Gym
1021 Harvard Way, El Dorado Hills

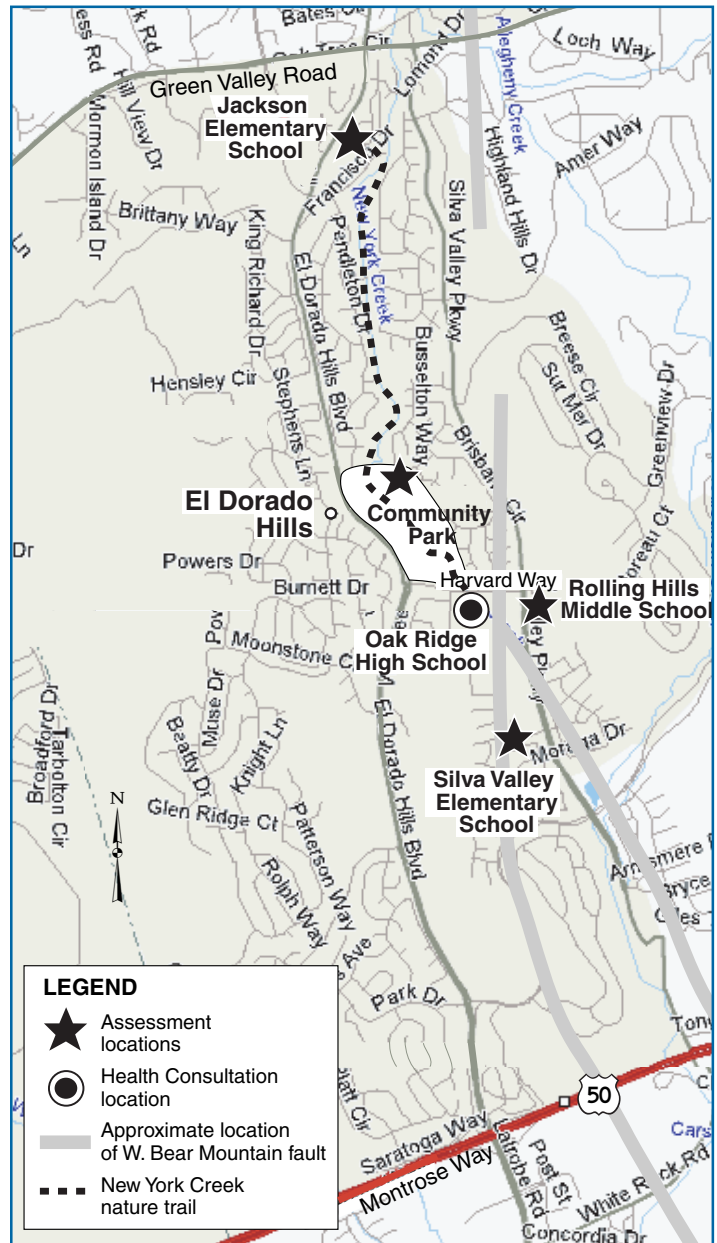


Figure 1: Assessment Locations and Health Consultation Locations

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What is NOA? Why is EPA Involved?

Asbestos occurs in rock and soil as the result of natural geological processes, often near earthquake faults, as in El Dorado Hills and other parts of California. Disturbance of naturally occurring asbestos (NOA), through construction or recreational activities, for example, can release asbestos fibers into the air and lead to exposure for people engaged in these activities.

In California, there are two types of asbestos fibers that occur naturally in rock formations: amphibole and serpentine. Although both amphibole and serpentine asbestos are toxic, many scientists believe that amphibole asbestos fibers, which are found along the fault zone in El Dorado Hills, are more toxic than those found in serpentine.

Exposure to airborne asbestos can cause lung cancer and mesothelioma (a cancer of the lining of the chest cavity); it can also cause other life-threatening non-cancer diseases of the lungs and chest cavity.

Four factors that increase the risk of contracting asbestos-related disease are: (1) higher levels of asbestos fibers in the air, (2) higher frequency of exposure, (3) longer duration of exposure, and (4) the time that elapses after exposure.

What Was EPA Asked to Do?

In September 2003, U.S. EPA received a petition under the Superfund Law (also known as CERCLA) to assess asbestos exposure at public areas in El Dorado Hills near Oak Ridge High School. The petition was prompted by discovery of asbestos in the soil at Oak Ridge High School. U.S. EPA began working with State and local agencies to develop workplans and conduct the asbestos assessment.

What Sampling Areas Were Included in EPA's Assessment?

U.S. EPA's assessment was conducted at Silva Valley Elementary School, Rolling Hills Middle School, the Community Park, the New York Creek Nature Trail, and Jackson Elementary School. U.S. EPA focused on public areas where asbestos exposures to children could occur.

Why Did U.S. EPA Focus on Exposures to Children?

Children's activities often create higher personal exposures to dust, which may contain asbestos in NOA areas. The exposure of children to asbestos is of particular concern because their longer life expectancy exceeds the latency period for asbestos-related disease.

The Assessment - What Did U.S. EPA Do?

The purpose of the assessment was: (1) to measure personal exposures to asbestos during simulated sports and recreational activities of children and adults, (2) to determine which kinds of asbestos were present during exposure, (3) to collect nearby asbestos air samples outside the area of activity, and (4) to compare personal asbestos exposure levels during activities with the nearby asbestos air samples collected outside the areas of activity.

Previous U.S. EPA studies across the country indicated that the best way to measure exposures to asbestos in air was to perform personal monitoring during dust-generating activities. The asbestos content of the air samples from this monitoring provides a measure of personal exposure; this technique is called "activity-based personal air monitoring."

For the El Dorado Hills assessment, U.S. EPA simulated baseball, basketball and soccer games at the schools and the Community Park, running and biking on the New York Creek Nature Trail, playing in the children's playground at the Community Park, and gardening in the Jackson Elementary School garden. During the assessment, U.S. EPA personnel simulating these activities wore personal air samplers to collect dust from the breathing height of children and adults. Stationary air samplers were also set up to collect nearby asbestos samples outside the area of activity.

Understanding Risk

Asbestos occurs naturally in many Sierra foothill counties, including El Dorado County, as well as in many other parts of California. In any area of naturally occurring asbestos (NOA), it is likely there will be some low level risk associated with background concentrations of asbestos.

This is similar to the everyday risk that everyone experiences from different environmental factors such as air pollution in urban areas or earthquakes in earthquake-prone areas. It is impossible to completely eliminate these risks.

Reasonable and appropriate steps should be taken to reduce potential asbestos exposure. There are simple and practical steps that the entire community—county government, school districts, community services providers, business leaders and the public—can take to help manage this issue.

U.S. EPA conducted this activity-based personal monitoring from October 2 to October 10, 2004. Over 400 air samples were collected and approximately 180 soil samples. The air samples were analyzed by an internationally accepted technique (ISO 10312) for measuring asbestos fiber dimensions and identifying mineralogy.

What Did EPA Find?

U.S. EPA analyzed the asbestos fibers in two ways: PCME and AHERA. PCME is the acronym for a type of microscope used in asbestos investigations; AHERA is an acronym for the asbestos in schools regulation.

PCME fibers [1] are longer than 5 microns and are the basis for most health studies related to cancers in humans caused by asbestos exposure. PCME fibers are used by both U.S. EPA and Cal/EPA in asbestos cancer risk assessments.

U.S. EPA also measured total fibers, both short and long, called AHERA fibers, because there is some scientific concern that shorter fibers are important for non-cancer asbestos-related diseases.

U.S. EPA found that asbestos fibers were present in almost all El Dorado Hills air samples, whether from sports and play

OVERVIEW OF RESULTS U.S. EPA Activity-Based Asbestos Exposure Sampling • October 2004

Location & Activity Scenario	Long Fibers (PCME) [1, 4]			Total Fibers (AHERA) [2, 4]		
	Ratio: Personal Exposure to Reference [3]	Average of Personal Exposure (f/cc)	Average of Reference Concentration (f/cc)[5]	Ratio: Personal Exposure to Reference [3]	Average of Personal Exposure (s/cc)	Average of Reference Concentration (s/cc)[5]
New York Trail, <i>Child Biking Scenario</i>	43	0.0336	0.0008	23	0.0564	0.0024
New York Trail, <i>Adult Jogging Scenario-B</i>	39	0.0212	0.0005	28	0.0439	0.0016
<i>Adult Jogging Scenario-A</i>	12	0.0197	0.0017	10	0.0347	0.0036
North Field Baseball Diamond, Community Park <i>Child Baseball Game</i>	22	0.0171	0.0008	21	0.0513	0.0024
South Field Baseball Diamond, Community Park <i>Child Baseball Game A</i>	22	0.0168	0.0008	217	0.5307	0.0024
<i>Child Baseball Game B</i>	5	0.0089	0.0017	37	0.1333	0.0036
Soccer Field, Community Park <i>Child Soccer Game</i>	16	0.0087	0.0005	11	0.0175	0.0016
Toddler Playground, Community Park, <i>Typical Child Play Scenario</i>	10	0.0067	0.0007	60	0.0816	0.0014
Silva Valley Baseball Diamond, Silva Valley Elementary School <i>Child Baseball Game A</i>	9	0.0062	0.0006	7	0.0144	0.0021
<i>Child Baseball Game B</i>	7	0.0032	0.0005	5	0.0066	0.0012
<i>Baseball & Maintenance</i>	4	0.0024	0.0006	NS	0.0041	0.0021
Rolling Hills Basketball Court, Rolling Hills Middle School <i>Child Basketball Game</i>	4	0.0017	0.0005	3	0.0043	0.0012
Rolling Hills Soccer Field, Rolling Hills Middle School <i>Child Soccer Game</i>	3	0.0013	0.0005	NS	0.0017	0.0012
Jackson Elementary School <i>Child Basketball Game</i>	3	0.0026	0.0010	3	0.0075	0.0022
Southern Reference, average.			0.0008			0.0021
Northern Reference, average.			0.0009			0.0021

Notes:

Statistical significance of elevated exposure determined by Z-test (AHERA) - "NS" = not significant

[1] PCME fibers = fibers longer than 5 microns with a width between 0.25 and 3 microns, and an aspect ratio (length to width) greater than 3:1

[2] "AHERA fibers" = fibers longer than 0.5 microns with an aspect ratio greater than 3:1 (Note this differs somewhat from the strict AHERA fiber definition.)

[3] Ratio = average asbestos concentration from personal samples collected during simulated activity divided by the average asbestos concentration from "reference" samples collected the same day at locations removed from the influence of the activity.

[4] Fiber counts are from direct analysis of PCM filters using ISO 10312 procedure.

[5] Reference Concentration refers to the average asbestos concentration measured on the same day by 5 stationary monitoring stations. These reference stations were located in the general study area, but outside of the zone of influence by the activity.

activities or from samples collected nearby, but outside the areas of the activity sampling. The dominant fiber type for most air samples, especially for the longer PCME fibers, was amphibole (mainly actinolite and tremolite). However, short chrysotile fibers were also present at high levels from activities at the Community Park baseball fields and at the children's playground.

U.S. EPA's results showed that personal exposure levels of asbestos were significantly higher during most sports and play activities as compared to nearby asbestos air samples taken outside the areas of activity.

U.S. EPA's validated data paints a consistent picture concerning asbestos fibers detected in air samples. A subset of U.S. EPA's data will be released before the May 6, 2005 community meeting. Copies will be available at the Information Repositories identified below and at the public meeting on May 6, 2005, and at the U.S. EPA's Availability Session on May 7, 2005.

Table 1 summarizes the comparative results. The values in Table 1 represent the amount by which personal asbestos exposures were greater than those nearby asbestos reference air samples collected outside the area of activity (the values come from the ratio of activity-based readings compared to those taken nearby, but outside the area of activity).

What Do the Results Mean?

U.S. EPA's results show that engaging in a variety of sports and play activities in the areas tested can expose individuals participating in those activities to significantly elevated levels of amphibole asbestos. In some cases, especially at the Community Park baseball fields, elevations in short-fiber chrysotile exposures were also observed.

U.S. EPA observed that play within the children's playground at the Community Park can generate elevated exposure levels for the children playing there. U.S. EPA also found that even when there is no activity at the toddler playground, asbestos levels there are higher because of activities elsewhere in the Community Park.

In most cases, these exposure levels are of concern because of the potential for long-term development of asbestos-related diseases.

U.S. EPA's concern is further heightened because this preliminary conclusion may not fully account for the higher toxicity of amphibole asbestos, as well as other uncertainties related to short-term, intermittent exposures early in life. Therefore, the actual risk potential may be higher - although current Agency risk assessments cannot specify exactly how much higher.



Figure 1: Contractor in protective gear simulates baseball activity

However, U.S. EPA does know that the risk of contracting an asbestos related disease increases with exposure, and that higher exposure and greater frequency and duration of exposure increases the risk. Because of their longer life expectancy, children have more time to develop asbestos related diseases that typically have a decades-long latency period and are therefore at higher risk than adults.

The Agency is recommending that all parties—federal/state/local government, the community and the private sector—work together to find ways to reduce these elevated exposures.

What Happens Next?

National Experts Panel - In the light of the risk uncertainties, and to help us understand the significance of these elevated exposures, U.S. EPA is putting together an independent panel of experts in the field of human health as it relates to asbestos to further evaluate U.S. EPA data.

Activity-Based Asbestos Sampling in Other Areas - U.S. EPA will be conducting limited activity-based asbestos sampling, similar to what was done in El Dorado Hills, in another NOA area in California, outside of El Dorado County. This sampling, and off-road vehicle activity asbestos sampling U.S. EPA is conducting at the Clear Creek Management Area in San Benito County, will be used to expand the knowledge base on the significance of NOA exposures in California.

Coordination with State and County Agencies - U.S. EPA will continue to coordinate with State and County agencies to address NOA exposures through regulatory and voluntary actions.

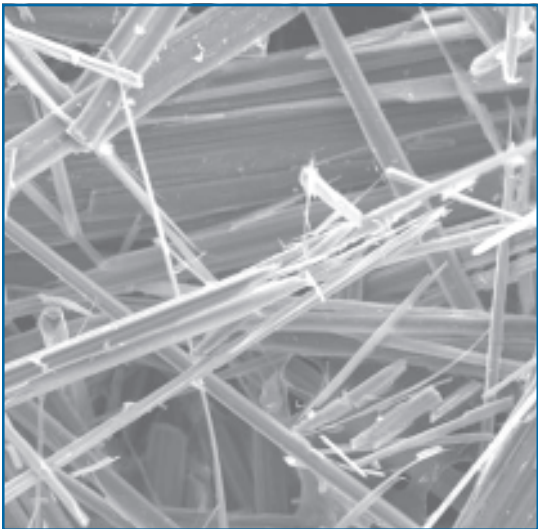


Figure 2: Amphibole asbestos fiber seen through a powerful microscope

Communication with the Community - U.S. EPA will continue to meet with the informal Community Advisory Committee and other stakeholders and community members to explain our data and steps that are being taken to control asbestos exposure.

Summary

U.S. EPA found asbestos fibers in almost all El Dorado Hills air samples, including those collected nearby, but outside the area of activity. In general, personal asbestos exposures from simulated sports and play activities were significantly elevated over levels observed in the nearby asbestos air samples taken outside the area of activity. The dominant asbestos fiber type detected was amphibole, which is considered to be more toxic than chrysotile.

U.S. EPA is concerned about long term health effects from asbestos exposure. The long term health effects related to intermittent, high level, environmental exposure to amphibole asbestos cannot be quantified, particularly when that exposure occurs at an early age.

However, we do know that the risk of contracting an asbestos related disease increases with the following factors: (1) higher levels of asbestos fibers in the air, (2) higher frequency of exposure, (3) longer duration of exposure, and (4) the time that elapses after exposure.

The exposure of children to asbestos is of particular concern because their longer life expectancy exceeds the latency period for asbestos related disease.

U.S. EPA believes that action is needed to reduce asbestos exposures. We know that there are ways to accomplish this goal. The entire community – regulators, schools, community service providers, the private sector, and the public – needs to get involved in solving this problem.



MAILING LIST COUPON

Naturally Occurring Asbestos in California — El Dorado Hills mailing list

Release my information for a local community group contact list: Please delete my contact information:

Name: _____

Address: _____ Phone: _____

City: _____ State/ ZIP: _____

E-mail address: _____

U.S. EPA and ATSDR Hold Asbestos Meetings Two Asbestos Reports to be Released

For More Information

U.S. EPA documents are available at El Dorado County libraries

The U.S. Environmental Protection Agency will maintain local information repositories, with copies of documents related to our work on naturally occurring asbestos, at two branches of the El Dorado County Library:

El Dorado County Library
Oak Ridge High School branch
1120 Harvard Way, El Dorado Hills

El Dorado County Library
Main branch
345 Fair Lane, Placerville

Selected documents are available from the USEPA's web site at <http://www.epa.gov/region09/toxic/noa>. Please contact the Superfund Records Center at 415-536-2000 to request paper copies.

Please contact the people below if you have any questions or concerns

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