

# HS & PH

## Hazardous Substances & Public Health

Healthy People in a Healthy Environment

## The Community Environmental Health Project in Libby, Montana

### An Overview of ATSDR Assistance to an Asbestos-Exposed Community

Jeffrey A. Lybarger, MD, Office of the Assistant Administrator, with B. Kathy Skipper, MA, Office of Policy and External Affairs

From 1924 through 1990, vermiculite ore was mined and milled from Zonolite Mountain in Libby, Montana. This ore was contaminated with tremolite asbestos. Tremolite asbestos is an asbestiform mineral that causes adverse health effects when inhaled (see story on page 6). In fall 1999, the Agency for Toxic Substances and Disease Registry (ATSDR) was asked by the U.S. Environmental Protection Agency (EPA) and Senator Max Baucus (MT) to determine the extent of asbestos-related exposures in the Libby area and to address community concerns.

ATSDR collaborated with other agencies to develop a Libby Community Environmental Health Project. Major components of the project include the following:

- ◆ A testing program, under which 6,149 people were evaluated for evidence of possible asbestos-related abnormalities. The first round of testing occurred in 2000. Initial results released in summer 2001 showed that 159 (48%) of 328 former W.R. Grace employees had pleural abnormalities. Twenty-four percent of test participants who reported exposure to asbestos through six or more potential pathways had pleural abnormalities. Six (5%) of 122 participants who reported no apparent exposure to asbestos had pleural abnormalities. During summer 2001, an additional 1,158 people were tested.
- ◆ A mortality review, which compared death rates for residents of the Libby area with those in Montana and the United States for selected diseases associated with exposure to asbestos. The review found that for the 20-year period evaluated (1979–1998), asbestosis mortality in the Libby area was approximately 40 times higher than in the rest of Montana and 60 times higher than in the rest of the United States.
- ◆ A CT (computed tomography) scan study is evaluating whether CT scans would provide a significant improvement over evaluations using chest radiographs in identifying lung problems associated with asbestos exposure. CT scans are sensitive radiographs that are analyzed by computer. Scans deliver a much greater exposure to radiation than standard radiographs do.
- ◆ A Toxicological Profile for Tremolite Asbestos, which describes the health effects of exposure to tremolite asbestos. The ATSDR peer-reviewed toxicological profiles identify and review the key literature that describes a hazardous substance's toxicologic properties.
- ◆ A case series, which involves a review of medical records, radiographs, and CT scans of selected patients with asbestos-related disease. The case series will help to increase knowledge about the more severe, clinical aspects of asbestos-related illness, especially among people with only environmental (not work-related) exposure to asbestos.

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- ◆ **An asbestos-related disease registry** is planned. The registry will list individuals with asbestos-related disease or those individuals at high risk for asbestos-related disease because of their exposure to asbestos. Information on any new therapies or diagnostic tools developed will be shared with persons listed in the registry. The registry will also be used to help policy makers and researchers prepare for treating persons who have asbestos-related illnesses.
- ◆ **Community education** at Libby has been a cooperative endeavor. EPA, ATSDR, and state and local governments have provided education on asbestos, asbestos exposure, and asbestos-related diseases. An “ask EPA” column in the local newspaper is also used for ongoing education.
- ◆ **Health provider training** included a grand rounds presentation (a) to review the epidemiology and pathogenesis of nonmalignant lung disease from exposure to tremolite asbestos and (b) to discuss the clinical manifestations and diagnosis of nonmalignant asbestos-related lung diseases. Training sessions were held to review the purpose of screening evaluations for asbestos-related lung diseases and discuss appropriate diagnostic followup of screening abnormalities, identify practical approaches to medical management, and discuss education and risk communication strategies for patients with asbestos-related diseases. ❖

## Libby Tests: Lung Abnormality Rates High

Summarized by Paula S. Stephens, Office of Policy and External Affairs

As part of the Libby [Montana] Community Environmental Health Project, asbestos medical testing occurred July 5, 2000, through November 2, 2000. As project sponsor, the Agency for Toxic Substances and Disease Registry (ATSDR) tested 6,149 people using a protocol developed with the Montana Department of Public Health and Human Services and the Lincoln County Department of

Environmental Health. Other agencies involved in the Libby project are the U.S. Environmental Protection Agency and the Montana Department of Environmental Quality.

Beginning in March 2000, ATSDR met with area residents to solicit their health concerns and discuss the planned testing. Testing was advertised to the community, and potential participants were screened by telephone. Former W.R. Grace workers from the Libby area and other people who lived or worked in the Libby area for 6 months or more before December 31, 1990, were eligible to participate in testing.

ATSDR interviewed participants face-to-face to obtain information about their health, how long they had lived in the Libby area, their possible exposures to asbestos or vermiculite through work or recreation, and their smoking history. ATSDR performed a lung function test, and those participants who were 18 years of age and older also had chest radiographs.

Three radiologists, called “B readers,” checked the chest radiographs for lung abnormalities and found that 994, or 18%, of the 5,590 adults tested had pleural (lining of

the lungs) abnormalities. Pleural abnormalities are believed to be an indicator of exposure to asbestos. These abnormalities can be seen even with low levels of asbestos exposure. The occurrences of pleural abnormalities increased in older participants and in those who had lived longer in the Libby area.

The pleural abnormality rate for groups within the United States who have had no known asbestos exposure ranges from 0.2% to 2.3%.

A key finding was that those participants with higher levels of exposure had higher occurrences of



**Lungs Affected by Asbestosis**

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pleural abnormalities. For example, 159 (48%) of 328 former W.R. Grace employees had pleural abnormalities. Of those participants who reported exposure to asbestos through six or more potential pathways (through household, employment, or recreational contact), 24% had pleural abnormalities. Of those tested who reported no known exposure to asbestos, 5% had pleural abnormalities.

Three risk factors were strongly associated with participants having pleural abnormalities:

1. Former W.R. Grace/Zonolite workers. The risk of having a pleural abnormality was almost 8 times greater for former W.R. Grace/Zonolite workers in comparison with people of the same age who did not work for the company.
2. Household contact with a W.R. Grace/Zonolite worker. The risk was 3.3 times greater for females who had household contact with these workers in comparison with women who had no household contacts with these workers.
3. Males. The risk for men was 5 times greater than for women.

Both children and adult participants were offered spirometry, or lung function, tests. Test results were interpreted by an on-site pulmonologist. Being a current smoker was the strongest risk factor for moderately to severely restricted air flow in and out of the lungs. Restricted breathing capacity was found in 5.7% of former W.R. Grace workers. No children tested had restricted lung function.

Participants and their designated primary care physicians have been notified of the test results. An electronic archive of the chest radiographs will be set up at Montana's state health department.

## Analysis of Mortality Statistics in Libby

**Steve Dearwent, MPH, Division of Health Assessment and Consultation**

The Agency for Toxic Substances and Disease Registry (ATSDR), in cooperation with the Montana Department of Public Health and Human Services, analyzed mortality statistics for Libby, Montana, for

the 20-year period from 1979–1998. Death certificate data were reviewed to generate an accurate representation of mortality potentially associated with historical exposure to asbestos in the Libby community. Underlying causes of death recorded on death certificates included nonmalignant respiratory diseases, lung cancer, mesothelioma, digestive cancers, and diseases of pulmonary circulation.

The decedents' places of residence at time of death were mapped using a geographic information system (GIS). Baseline population estimates and age stratification data were derived using GIS to generate standardized mortality ratios. Mortality statistics from the underlying causes of death were compared with mortality statistics for the state of Montana and the overall U.S. population.

For the 20-year period reviewed, mortality in Libby due to asbestosis was approximately 40 to 60 times higher than expected. Mortality resulting from mesothelioma was also elevated. However, it was difficult to precisely evaluate the degree to which mortality attributed to mesothelioma was elevated, because statistics on this extremely rare cancer are not routinely published at the state and national levels. This initial mortality review was released on December 12, 2000; personnel in the Montana Department of Public Health and Human Services' Office of Vital Statistics subsequently uncovered more applicable deaths in the Libby area. Information about these decedents is being included in a reanalysis of the data. The reanalysis will include an evaluation of potential pathways of exposure (occupational vs. nonoccupational). The reanalysis will also more accurately portray mortality in Libby as well as delineate the differences in risk among individuals who worked in the vermiculite mining and milling operation compared with community members who lived near these activities.



## Asbestos-Contaminated Vermiculite: A National Issue

**Tim Walker, MS, RS, CIH, Division of Health Assessment and Consultation**

In 1881, miners searching for gold unearthed a mica-like material from an area outside of Libby, Montana. At the time, they did not know what they had uncovered. It was not until 1919 that Edward Alley, a local businessman from Libby, discovered the unique properties of this material. While he was walking through an abandoned mine, his torch contacted the surface of the mine, resulting in an expansion or “popping” of the ore into a material later known as vermiculite. This unique material was marketed for many uses, such as loose-fill insulation, a fertilizer carrier, a soil conditioner, and an aggregate in many products such as gypsum wall board and numerous construction products.

Vermiculite ore from Libby was mined beginning in the 1920s. In 1963, W.R. Grace purchased the mine and expanded operations. During the 1960s–1980s, millions of tons of vermiculite ore were shipped to 30 states and six foreign countries.



**Vermiculite Ore**

The ore from Libby was contaminated with asbestos, and evidence of adverse health effects began to appear in workers employed at the mine, mill, and refining processes in Libby. Investigations in the 1980s found that those workers had increased rates of asbestosis, mesothelioma, and lung cancer. At a fertilizer plant in Marysville, Ohio, that received ore from Libby, asbestos-related lung abnormalities were identified among workers. During early mining operations in Libby, airborne levels of asbestos were measured at levels >100 fibers per cubic centimeter (f/cc) of air. In downtown Libby, concentrations of airborne asbestos exceeded the federal Occupational Safety and

Health Administration (OSHA) permissible exposure limit of 0.1 f/cc.

In 2000, as the U.S. Environmental Protection Agency (EPA) initiated clean-up actions in Libby, and as the Agency for Toxic Substances and Disease Registry (ATSDR) began health screening of former workers and residents, an effort was under way throughout the United States to investigate facilities that received asbestos-contaminated ore from the W.R. Grace mine. Approximately 300 sites across the country were identified as possible recipients of the vermiculite ore. Working with EPA, ATSDR has begun to evaluate all of these sites to determine whether asbestos contamination is present at levels that pose a public health risk.

Of all types of vermiculite processing facilities, exfoliation plants are most likely to have resulted in the greatest amounts of environmental contamination and exposure. Exfoliation plants heated the vermiculite ore to approximately 2,000°F (1,093°C), creating the expanded vermiculite used for a variety of products, including loose-fill insulation in homes. Significant concentrations of asbestos fibers might have been released into communities near these plants through stack emissions. ATSDR is evaluating past exposure to airborne asbestos around these plants by looking at asbestos-related disease rates.

Current exposure to asbestos-contaminated vermiculite is also being assessed at the facilities that received Libby vermiculite ore. EPA and ATSDR are working together to gather information on these sites. Where appropriate, environmental sampling of the air and soil is being conducted to assess the current level of exposure around former vermiculite facilities. In addition, the National Institute for Occupational Safety and Health (NIOSH) is evaluating active vermiculite facilities that are receiving ore from mines other than Libby.

Collecting environmental data is only the first step in the identification process. Current exposure models used to assess risk to asbestos in air and soil do not incorporate much of the knowledge acquired during the last 15 years. Much has been learned regarding asbestos fiber types and biologic mechanisms. This information needs to be incorporated

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into any future exposure models to give meaningful information regarding risk. In addition, environmental sampling methodologies must be developed to best measure and collect the kind of information that will be useful to health professionals who are assessing the data. The ultimate goal of this effort is to identify sites where unacceptable exposures to asbestos might be occurring, so that exposure at these sites can be mitigated to a safe level. ATSDR will work with EPA and other federal agencies to serve affected populations by providing health education and meeting other needs as appropriate.

## On the Tremolite Trail in Minneapolis

**Tannie Eshenaur, MPH, Environmental Health Division, Minnesota Department of Health, St. Paul, Minnesota**

A vermiculite-processing facility operated for over 50 years in Northeast, a residential neighborhood of Minneapolis, Minnesota. From 1937 until 1989, Western Mineral Products received raw vermiculite ore via railroad from Libby, Montana, and processed the ore into vermiculite insulation (Zonolite), fire-proofing (Monokote), and other vermiculite products. In 1963, the Zonolite Company of Libby, Montana, was acquired by W.R. Grace; W.R. Grace acquired the Western Mineral Products Company in 1966.

The Western Mineral Products plant operated two expansion furnaces to exfoliate the ore into lightweight vermiculite products. Ore shipment records dating back to 1958 show that the mine received >8,500 tons of ore in 1959; by 1988, that amount had decreased to <1,000 tons. The ore was gravity-fed into the furnaces at a rate of up to 2,400 pounds per hour, then heated to a temperature of 2,000°F (1,093°C), causing water trapped in the ore to expand or “pop.” The expanded vermiculite was then separated from any unexpanded material, known as stoner rock. The finished product was cooled, dampened, and bagged, or further screened into several size ranges for specific applications.

The unexpanded stoner rock was piled outside the plant building and labeled “free crushed rock.”

Local residents were encouraged to take the rock to use on their own properties for fill material. The warm piles of stoner rock waste were a favorite place for neighborhood children to play. In 1989, the facility closed, the furnaces and all equipment were removed, and the site was sold. The building is now used by several small businesses.

According to mineral analyses conducted by W.R. Grace, the stoner rock contained between 2% and 10% friable tremolite asbestos. In February and April 2000, the U.S. Environmental Protection Agency (EPA) and the Minnesota Pollution Control Agency (MPCA) collected surface soil samples at the site as part of a national evaluation of facilities that received ore from the Libby mine. Amphibole asbestos was found at levels as high as 20% by volume, prompting further investigation. Tremolite asbestos was visible on the ground at both the site and at neighboring homes as small, grayish grains or bundles with a fibrous component.

In September 2000, EPA determined that the presence of visible tremolite asbestos in the neighborhood was an immediate health threat to area residents. EPA contractors inspected properties and removed visible surface contamination from the yards and driveways of >20 homes. Emergency response action continued in summer 2001. EPA is also planning remediation of the Western Mineral Products industrial property.

In the 1970s, the plant operated 24 hours per day, 5 days per week, and typically employed 10–20 people. The operation was described as “very dusty.” Before 1971, minimal pollution control equipment was in place. Bag-house filters were installed in 1972. In the 1970s, airborne asbestos fiber concentrations inside the building often

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**Pieces of Vermiculite, With a Paper Clip for Size Comparison**





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exceeded existing Occupational Safety and Health Administration (OSHA) limits. Dust permeated the building, and concentrations above OSHA limits were found even in nonwork areas such as the lunch room. Former plant workers have been notified by letter about the possible health risks resulting from exposure to asbestos. Through an agreement with W.R. Grace, these workers are being offered health screening in two area clinics.

The Minnesota Department of Health (MDH), under a cooperative agreement with ATSDR, completed an initial health consultation identifying health concerns related to asbestos exposure from the Western Mineral Products site. The health consultation described exposures of former workers, family members of workers, and area residents. Some residents used the free crushed rock in their yards or played in the rock piles as children. Residents living near the plant might have been exposed to airborne fibers from the plant's three vent stacks on or near the roof of the four-story building. In the late 1960s and early 1970s, area residents complained that dust from a roof vent was settling on lawns, on cars, and inside homes. MDH staff members are now focusing on better quantifying exposure estimates for residents. An air dispersion model of plant emissions was developed with help from scientists at MPCA. Information from the Libby site will also be critical to the risk assessment process.

Community health education activities have had an important role in communicating information to neighbors of the site and to former workers at the plant. MDH has maintained contacts with community leaders and neighborhood associations to ensure that people are informed of activities at the site and to respond to the community's concerns. In addition, MDH organized a committee of local health professionals to assist in providing local physicians with guidance for meeting the medical care needs of the residents.

Finally, MDH has begun an investigation to identify and characterize individual asbestos exposures among community members. Six field staff members are visiting neighbors who live within a ½-mile radius of the plant to gather information about household residents and offer property inspections. Former

residents of the area and others who might have been exposed are also being identified and will be interviewed by telephone. In the future, MDH hopes to conduct follow-up health investigations to determine any health outcomes that might have occurred as a result of vermiculite processing in Northeast Minneapolis.

A comprehensive effort is under way to address the needs and concerns of the community at the Western Mineral Products site and to mitigate the ongoing threat to the health of the community. ❧

## The Health Effects of Asbestos

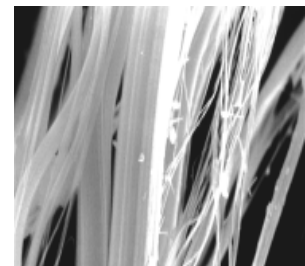
Compiled by Pascale Krumm, PhD, Office of Policy and External Affairs

Asbestos is a fibrous substance classified as a human carcinogen. Asbestos fibers might enter the body through inhalation or ingestion. Because the body cannot break down or eliminate asbestos fibers once they enter the lungs or body tissues, the fibers become trapped, causing serious health problems. Exposure to asbestos can lead to signs of lung abnormalities (pleural plaques) or to scarring of the lung tissues (asbestosis) and two types of cancer (lung cancer and mesothelioma).

The risk for asbestos-related disease depends on many factors, including type of asbestos fiber, level of exposure, duration of exposure, and smoking history of the person. The latency period for these diseases ranges from 10 years to 30 years. Following is a description of the three known asbestos-related diseases.

◆ **Asbestosis** is a serious, chronic, noncancerous respiratory illness.

Asbestosis causes scarring of the lung tissues, making breathing more difficult as the scarring increases. The disease can lead to heart failure. Asbestosis is usually caused by chronic occupational



**Asbestos Fibers**

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exposure to asbestos. No effective treatment exists for asbestosis, and the disease might be disabling or fatal.

- ◆ **Lung cancer** accounts for about 50% of all asbestos-related diseases. Studies have shown that asbestos workers are five times more likely to develop lung cancer than are workers who are not exposed to asbestos. In addition, asbestos workers who smoke are 50 to 90 times more likely to develop lung cancer in comparison with nonsmokers who are not exposed to asbestos. In the United States, only 14% of patients with lung cancer survive for 5 years (1).
- ◆ **Mesothelioma** is a cancer of the lining of the chest or abdomen. Mesothelioma is a rare cancer—about 200 cases are diagnosed in the United States each year. Mesothelioma is incurable and is usually fatal within 1 year after diagnosis. The majority of mesotheliomas are caused by exposure to asbestos. Mesothelioma accounts for 10% to 18% of deaths among workers exposed to asbestos.

## Reference

1. DeVita VT, Hellman S, Rosenberg SA, editors. Principles and practices of oncology. 6th edition. Philadelphia: Lippincott Williams & Wilkins; 2001.

## Breathe Easy

**Maria Teran-Maclver, RN, MSN, Division of Health Assessment and Consultation**

“Breathe Easy: Ten Tips for Taking Care of Yourself if You Have Asbestos-Related Disease” (see shaded box) was developed for the many concerned citizens of Libby, Montana, who either have respiratory symptoms of asbestos-related disease or who have a family member experiencing symptoms.

In 2000, the Agency for Toxic Substances and Disease Registry developed a testing program to detect and characterize the health effects of exposure to asbestos in affected community members. Many communication efforts were launched to educate and persuade community members to participate in the testing. However, many citizens feared that if they were tested and found to have physical changes related to asbestos exposure, it was somehow tantamount to the confirmation of a “death sentence.” As a mortality report would confirm later in the year, residents had a good reason to fear—death from asbestos-related disease in Libby for the 20-year period reviewed was approximately 40 to 60 times that of the rest of the United States.

However, evidence of asbestos exposure (such as pleural plaques) does not mean that asbestos-related disease must follow. Most importantly, the person exposed can help reduce the risk for a

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### Breathe Easy: Ten Tips for Taking Care of Yourself if You Have Asbestos-Related Disease

1. **Get regular health checkups.**
2. **Stay away from smoke and smokers.**
3. **Avoid situations that expose you to respiratory infections.**
4. **Keep a diary of when you have trouble breathing.**
5. **Stay indoors when air pollution or pollen counts are high.**
6. **Avoid breathing pollutants that can aggravate your breathing.**
7. **Eat a healthy diet.**
8. **Drink plenty of fluids (unless your health care provider has you on fluid restrictions).**
9. **Get a balance of rest and exercise.**
10. **Get a flu shot every year.**

Developed by Maria Teran-Maclver, RN, MSN, Division of Health Assessment and Consultation; Kris Larson, MEd, CHES, Division of Health Education and Promotion; and Pat Cohan, RN, St. John's Lutheran Hospital Asbestos Clinic, Libby, Montana.



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more serious illness by quitting smoking. Smoking exponentially increases the risk for health problems such as cancer among people exposed to asbestos. The Breathe Easy information was created to help community members develop a sense of self-empowerment so that even if they were diagnosed as having a disease such as asbestosis, they still could have some control over their condition. Community members can help manage their conditions with simple common-sense activities.

The Breathe Easy information was introduced in a well-attended health information session during a comprehensive community conference in Libby. The information was later distributed in the local clinic at which the >6,000 participants in the testing program were evaluated. "Breathe Easy: Ten Tips for Taking Care of Yourself if You Have Asbestos-Related Disease" provided important information to members of the community by targeting one of their fears—a complete lack of control over their own health.

## Coming Soon: Asbestos Web Site

A new Web site devoted to asbestos will soon be available on the Internet. The site will include links to ATSDR documents and information on asbestos.

Watch for it on the ATSDR Web page: [www.atsdr.cdc.gov/](http://www.atsdr.cdc.gov/)

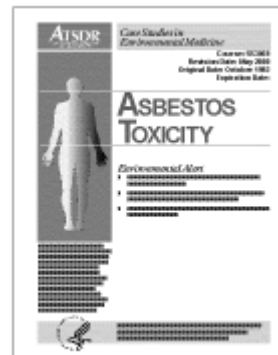


## Case Studies in Environmental Medicine

ATSDR's *Case Studies in Environmental Medicine: Asbestos Toxicity* is being updated in winter 2002. It will be available on the Internet at [www.atsdr.cdc.gov/HEC/CSEM/](http://www.atsdr.cdc.gov/HEC/CSEM/) and in print (see contact information).

The case studies series is a key part of the agency's health professional education strategy.

The case studies are available free of charge to educate and inform health professionals and the general public about hazardous substances. The case studies are accredited and offer continuing medical education (CME), continuing nursing education (CNE), and continuing education unit (CEU) credits. In the near future, the case studies will also offer continuing health education specialist (CHES) credits.



### Contact Information

To order a print version of the revised *Case Studies in Environmental Medicine: Asbestos Toxicity* when it becomes available, write to or fax the Continuing Education Coordinator, ATSDR/DHEP, 1600 Clifton Road, NE (MS E-33), Atlanta, GA 30333; fax: 404-498-0061

## The Revised Asbestos Toxicological Profile

ATSDR's *Toxicological Profile for Asbestos* has been updated. Contact ATSDR, Division of Toxicology, 1600 Clifton Road, NE (MS E-29), Atlanta, GA 30333 (telephone: 1-888-42-ATSDR or 1-888-422-8737; fax: 404-498-0057; e-mail: [atsdric@cdc.gov](mailto:atsdric@cdc.gov)) for ordering information.



## Internet Resources: Asbestos



### Government Resources

[www.atsdr.cdc.gov/ToxProfiles/phs9004.html](http://www.atsdr.cdc.gov/ToxProfiles/phs9004.html)  
(Public health statement for ATSDR's *Toxicological Profile for Asbestos*.)

[www.atsdr.cdc.gov/NEWS/asbestosinfo2.html](http://www.atsdr.cdc.gov/NEWS/asbestosinfo2.html)  
(ATSDR's Resources for Information on Asbestos and Asbestos-Related Disease fact sheet.)

[www.atsdr.cdc.gov/NEWS/asbestosexposure2.html](http://www.atsdr.cdc.gov/NEWS/asbestosexposure2.html)  
(ATSDR's Questions and Answers, Exposure to Asbestos fact sheet.)

[www.atsdr.cdc.gov/NEWS/asbestosinhalation2.html](http://www.atsdr.cdc.gov/NEWS/asbestosinhalation2.html)  
(ATSDR's Questions and Answers, Exposure to Asbestos in Insulation fact sheet.)

[www.atsdr.cdc.gov/NEWS/asbestosnoins2.html](http://www.atsdr.cdc.gov/NEWS/asbestosnoins2.html)  
(ATSDR's Questions and Answers, Exposure to Asbestos in Sources Other Than Insulation fact sheet.)

[www.osha-slc.gov/SLTC/asbestos](http://www.osha-slc.gov/SLTC/asbestos)  
(Occupational Safety and Health Administration's page on asbestos.)

[www.epa.gov/asbestos/index.htm](http://www.epa.gov/asbestos/index.htm)  
(U.S. Environmental Protection Agency's asbestos home page.)

[rex.nci.nih.gov/INFO\\_CANCER/Cancer\\_facts/Section3/FS3\\_21.html](http://rex.nci.nih.gov/INFO_CANCER/Cancer_facts/Section3/FS3_21.html)  
(National Cancer Institute's question-and-answer page on asbestos.)

### Nongovernment Resources

[www.lungusa.org/air/envasbestos.html](http://www.lungusa.org/air/envasbestos.html)  
(American Lung Association's short overview of asbestos.)

[www.conted.gatech.edu/courses/asbestos\\_abatement/asbestos\\_abatement.html](http://www.conted.gatech.edu/courses/asbestos_abatement/asbestos_abatement.html)  
(Georgia Tech's Division of Continuing Education asbestos abatement classes.)

[www.pp.okstate.edu/ehs/links/asbestos.htm](http://www.pp.okstate.edu/ehs/links/asbestos.htm)  
(Oklahoma State University's Environmental Health and Safety page on asbestos.)

[oncolink.upenn.edu/disease/mesothelioma/](http://oncolink.upenn.edu/disease/mesothelioma/)  
(University of Pennsylvania Cancer Center's site focusing on mesothelioma.)

## Calendar



### May 2–3, 2002

**Designing Modern Childhoods: Landscapes, Buildings, and Material Culture, An International, Interdisciplinary Conference, Berkeley, California.** Sponsored by the Center for Working Families, the Center for Childhood and Youth Policy, and other groups at the University of California Berkeley. Contact: Marta Gutman, Center for Working Families, University of California, 2420 Bowditch Street, MC5670, Berkeley, CA 94720-5670; telephone: 510-642-4867; fax: 510-642-7902; e-mail: [gutman@uclink4.berkeley.edu](mailto:gutman@uclink4.berkeley.edu).

### May 2–4, 2002

**Freedom and the Pioneering Spirit: Health Education in Action, Westin Hotel, Cincinnati, Ohio.** Sponsored by the Society for Public Health Education. More information is available at [www.sophe.org](http://www.sophe.org).



### May 20–24, 2002

**71st World Congress on Environmental Health and 51st Annual Educational Symposium of the California Environmental Health Association: Environmental Health—A Universe of Responsibility, San Diego, California.** More information is available at [ifeh2002.org](http://ifeh2002.org).



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May 21–25, 2002

**International Children's Conference on the Environment, Victoria, British Columbia, Canada. Sponsored by the city of Victoria, British Columbia, and the United Nations Environment**



**Programme (UNEP).** This conference will bring together 800 children, aged 10–12 years, from 115 countries to learn, share experiences, voice their concerns, and join a worldwide environmental network to promote positive action. Contact by telephone: 250-995-0225; e-mail: [info@iccCanada2002.org](mailto:info@iccCanada2002.org); Web site: [www.iccCanada2002.org](http://www.iccCanada2002.org).



June 5–7, 2002

**20th National Conference on Health Education and Health Promotion: Strengthening America Through Health Education and Health Promotion, New Orleans, Louisiana.** Sponsored by the Centers for Disease Control and Prevention and the Association of State and Territorial Directors of Health Promotion and Public Health Education. The conference themes are emerging challenges, threats, epidemics, and opportunities; health policy and environmental change; innovative approaches to personal health; and technology, media, and communications. More information is available at [www.astdhppe.org/conf20/20confindex.htm](http://www.astdhppe.org/conf20/20confindex.htm).



ASTDHPPE



## Courses



### Deep South Center for Occupational Health and Safety

Contact: Melinda L. Sledge, The Deep South Center for Occupational Health and Safety, University of Alabama Birmingham, School of Public Health, Birmingham, AL 35294-0022; telephone: 205-934-7178; e-mail: [dsc@uab.edu](mailto:dsc@uab.edu); Web: [www.uab.edu/dsc](http://www.uab.edu/dsc).



**PREPARING FOR AN OCCUPATIONAL SAFETY AND HEALTH (OSHA) INSPECTION.** Tuition: \$85. Upcoming course date: May 10.

**RESPIRATOR FIT TESTING WORKSHOP.** Tuition: \$125. Upcoming course date: May 13.

**COMBINED SPACE ENTRY AND RESCUE.** Tuition: \$450. Upcoming course dates: May 15–17.

**TEN-HOUR OSHA GENERAL INDUSTRY COURSE.** Tuition: \$225. Upcoming course dates: May 16–17.

### Georgia Institute of Technology

Georgia Tech Continuing Education, 613 Cherry Street, Swann Building, Atlanta, GA 30332-0385; telephone: 404-385-3502; fax: 404-894-7398; e-mail: [conted@gatech.edu](mailto:conted@gatech.edu); Web: [www.conted.gatech.edu/home/index.html](http://www.conted.gatech.edu/home/index.html).



**HAZMAT TECHNICIAN COURSE (HAZ-110).** Course fees: \$900 (registration), \$975 (due 2 weeks before course date); upcoming course dates: May 13–17.

**HAZMAT TECHNICIAN EMERGENCY RESPONSE ANNUAL REFRESHER COURSE (CLASSROOM OPTION) (HAZ-112).** Course fees: \$195 (registration), \$225 (due 2 weeks before course date); upcoming course date: May 31.

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## North Carolina Occupational Safety and Health Education and Research Center

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**ASBESTOS OPERATIONS AND MAINTENANCE.** Course fee: \$350; upcoming course dates: May 6–7.

**ASBESTOS IDENTIFICATION BY POLARIZED LIGHT MICROSCOPY (PLM).** Course fee: \$975; upcoming course dates: May 14–17.

**CERTIFIED HAZARDOUS MATERIALS MANAGER REVIEW.** Course fee: \$700; upcoming course dates: May 20–23.

**NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) PULMONARY FUNCTION TECHNICIAN TRAINING REFRESHER.** Course fee: \$235; upcoming course date: May 28.

**NIOSH PULMONARY FUNCTION TECHNICIAN TRAINING.** Course fee: \$425; upcoming course dates: May 29–31.

**DOMESTIC PREPAREDNESS: AWARENESS LEVEL.** Course fee: \$100; upcoming course date: May 30.

**DOMESTIC PREPAREDNESS: OPERATIONS LEVEL.** Course fee: \$100; upcoming course date: May 30.

**DOMESTIC PREPAREDNESS: TECHNICIAN LEVEL.** Course fee: \$200; upcoming course date: May 31.✱

## Books

*Documentation of the Threshold Limit Values and Biological Exposure Indices*, 7th edition. Published by the American Conference of Governmental Industrial Hygienists (ACGIH).

The 7th edition provides the basic rationale for the development of (a) threshold limit values (TLVs) for chemical substances and physical agents and (b) biological exposure indices (BEIs) for selected chemicals. The 7th edition is now available in a user-friendly five-volume format. ACGIH is also developing a CD-ROM version; visit the ACGIH Web page ([www.acgih.org](http://www.acgih.org)) for updates on CD-ROM version availability.

### Ordering Information

- ◆ *Documentation of the Threshold Limit Values and Biological Exposure Indices*, 7th edition. ACGIH 2001. Five-volume set; 3,022 pages. Publication no.: 0100Doc.
- ◆ *Documentation of the Threshold Limit Values for Chemical Substances*. ACGIH 2001. Three-volume set; 2,760 pages. Publication no.: 0100DocCS.
- ◆ *Documentation of the Biological Exposure Indices*. ACGIH 2001. Single binder, 368 pages. Publication no.: 0100DocBEI.
- ◆ *Documentation of the Threshold Limit Values for Physical Agents*. ACGIH 2001. Single binder, 184 pages. Publication no.: 0100DocP/A.

*Documentation of the Threshold Limit Values and Biological Exposure Indices* can be ordered online at [www.acgih.org/store](http://www.acgih.org/store), by e-mail at [customerservice@acgih.org](mailto:customerservice@acgih.org), or by calling Customer Service at 513-742-2020.✱



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