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## Polychlorinated Biphenyls (PCBs) in Building Materials, Questions and Answers

May 10, 2010 -Recently published guidance by the United States Environmental Protection Agency (EPA) and Massachusetts Department of Public Health (MDPH) has highlighted the presence of polychlorinated biphenyls (PCBs) in certain materials in many buildings constructed or renovated between 1950 and 1978. Earlier this year, air, dust, and soil samples were analyzed for the presence of PCBs in a subset of 18 municipal buildings, including the schools constructed or renovated between 1950 and 1978. Analysis of outdoor caulk samples from three locations (Town Office Building, Clarke Middle School, and Estabrook Elementary) indicated PCBs were in excess of the federal limit for remediation. Due to limitations in the air sampling methods, conclusive test results which would provide the basis for specific exposure control efforts in the schools were not obtained. The Lexington Office of Community Development, Health Division is in communication with the MDPH regarding a follow-up PCB testing effort that should provide accurate, actionable data on indoor air quality in the Clarke and Estabrook schools. Limiting the possibility of PCB exposure to children in the interim period and keeping town residents, teachers, and staff informed are top priorities as this potential problem is studied and resolved.

### **What are PCBs?**

PCBs are semi-volatile persistent organic chemicals that consist of up to 209 different “congeners”, or chemicals. Commercial mixtures of PCBs, often referred to by the trade name Aroclor, were widely used in a variety of applications (dielectric fluids for transformers and capacitors, heat transfer fluids, additives in sealants and plastics, etc.). They were banned from production by the Federal Toxic Substances Control Act (TSCA) in 1978, but due to their chemical stability, low-flammability, and durability, PCBs are considered ubiquitous in the environment. Humans are primarily exposed to PCBs through food because of their ability to bioaccumulate in the tissues of fish and other animals.

### **Why are there PCBs in municipal buildings such as schools and office buildings?**

Certain building materials produced between 1950 and 1978 contained PCBs, including window caulking, fluorescent light ballasts, floor mastic, and seal joints between masonry units. The durability, low-flammability, and insulating qualities of PCBs are the primary reasons these chemicals were included in these products. The Massachusetts School Building Authority reported that 53 percent of over 1,800 school buildings surveyed in the state were built between the 1950s and 1970s. Thus, it is possible PCBs are present in many buildings in Massachusetts.

### **How are people exposed to PCBs found in building materials?**

Recent exposure assessment research indicates that PCBs found in deteriorating, flaking caulk that is not intact and burned out light ballasts can volatilize and migrate into indoor air and dust, as well as outdoor soil. Possible exposure opportunities to building inhabitants include inhalation of PCB-contaminated air, dermal contact with PCB-contaminated caulk and soil, and incidental ingestion of PCB-contaminated dust and soil.

### **How do the PCBs get from the caulk to the air?**

Based on the chemical properties of the PCBs, they are able to “off-gas” from the caulk into the air. This process occurs more easily in very hot temperatures. As the material degrades or gets flakey over time, it is necessary to seal the caulk to decrease the surface area from which the PCBs can off-gas. There is less “off-gassing” at room temperatures than in the summer sun.

### **Have schools and buildings in Lexington been tested for the presence of PCBs?**

Yes. The initial round of PCBs testing consisted of air, dust, soil, and caulk samples taken from a total of 18 municipal buildings and schools. While testing is not required by law, if it is undertaken and detection of PCBs in excess of 50 parts per million (mg/kg) in non-liquid PCB products are observed, remediation and decontamination are mandated according to federal law (TSCA). PCB levels above the 50 parts per million limit were found in exterior window caulk at the Town Office Building, Clarke Middle School, and Estabrook Elementary. The Public Facilities Department has appropriated funding for 2010 and 2011 devoted to repair and/or remove deteriorating caulk at sites exceeding the TSCA threshold. In the interim period, the Office of Public Facilities will continue to monitor intact caulk for any signs of degradation as recommended by EPA and MDPH. The air sampling procedures undertaken were not consistent with the EPA-recommended methods necessary to determine if the levels of PCBs present in indoor air in schools are high enough to pose undue health risks to schoolchildren. The testing methods and results necessary to guide interventions were not obtained and another round of testing is planned for this summer under the direction of a different environmental consultant specifically experienced with this issue.

### **What health effects are associated with exposure to PCBs?**

The development of toxic effects resulting from exposure depends on the concentration of the PCBs, as well as the frequency and duration of the individual’s contact with the substance. Based on a combination of occupational, epidemiological, and animal studies, PCBs have been characterized as “probable human carcinogens” by the EPA and the International Agency for Research on Cancer (IARC). Other non-cancer adverse health effects associated with exposure to PCBs may include skin irritation, liver damage, and impacts on the immune, reproductive, nervous, and endocrine systems.

### **Are our children safe being in these buildings?**

Yes. Based on the testing results obtained from non-Lexington schools built prior to 1978 in which PCBs are present in building materials, the levels of PCBs in the air are below levels of concern. Direct contact with the caulking materials should be limited, but the primary concern is when the caulk is cracked and flaking. In this case the exposure to the PCBs occurs through ingestion or inhalation of caulk and contaminated dust.

**How are town officials continuing to respond to this issue?**

The Lexington Board of Health and Health Director have consulted MDPH, US EPA, Agency for Toxic Substances and Disease Registry (ATSDR), the US Public Health Service, and other experts with experience in dealing with PCBs in building materials. All have concluded that another round of indoor air testing conducted in accordance with EPA regulations for inhalation exposure to PCBs in children is required. Tests will be conducted this summer and upon analysis of results, control measures will be implemented to address sources of PCB contamination in Lexington's schools and buildings.

As a preventive measure, Public Facilities personnel will monitor the condition of the caulk and deteriorated caulk will be sealed.

**Who should Lexington residents contact for more information on this issue?**

There are several resources available to those who want to learn more about the PCB in building material issue. The MDPH Bureau of Environmental Health can be contacted by phone at 1-617-624-575, and an MDPH informational booklet on this issue can be found at the following website: [http://www.mass.gov/Eeohhs2/docs/dph/environmental/exposure/pcbs\\_guidance.pdf](http://www.mass.gov/Eeohhs2/docs/dph/environmental/exposure/pcbs_guidance.pdf). EPA resources include the EPA Regional PCB Coordinator, Kim Tisa, who can be reached by phone at 1-617-918-1527, as well as the PCB in Caulk Hotline at 1-888-835-5372. The EPA has also posted informational materials on their website: <http://www.epa.gov/pcbsincaulk/>. Lexington town officials in the Office of Community Development, Health Division can be reached by phone at 781-862-0500 x 200 or by email at [gcody@lexingtonma.gov](mailto:gcody@lexingtonma.gov).