

transformers and capacitors, as well as for many other industrial uses. PCBs are very stable and are very resistant to heat and degradation. Most PCB use was banned and phased out in the late 1970s because PCB mixtures were found to be toxic and accumulated in the environment including water, soil, fish and birds. Mineral oil, which is normally considered harmless, was the replacement of choice for use in most electrical equipment.

Why is it in the soil in some substations?

PCB mixtures were used in transformers, capacitors and other equipment found in substations, although it has been replaced by mineral oil. Over time, fires or mechanical failure may have caused leaks or spills of these materials, which migrated into the soil in the surrounding yard. This is not unusual in an industrial setting. PCB and/or mineral oil may also be found in some equipment in substations, but this represents a spill hazard and not an excavation hazard; and most PG&E equipment is identified with stickers so you can tell what kind of oil it contains:

Less than 5 ppm PCB is indicated by a blue sticker stating less than 5 ppm PCB.

Less than 50 ppm PCB is indicated by either a blue sticker with no concentration mentioned; a silver sticker; or repair system label or manufacture date after July 1979.

Assume 50-499 ppm PCB for all other equipment unless lab tests show otherwise.

Is PCB or mineral oil harmful?

Health effects of PCB depend on the amount and type you are exposed to, how long you are exposed, the way you are exposed (inhaling vs. ingesting vs. absorption through the skin) and your individual tolerance. The most common effect of exposure to PCB is an acne-like rash called chloracne that can develop when PCB contamination comes in direct contact with the skin. Inhalation of high concentrations of PCB smoke or dust can irritate the respiratory passages. Long term exposure to high levels of PCB through ingestion, inhalation or absorption through the skin can cause liver damage and possibly cancer, a lowered immune response, damage to the nervous system and endocrine system, and reproductive effects. There are no identified hazards associated with occupational exposure to mineral oil, although contact can cause a rash in some people, and ingestion of large amounts is not advisable. Luckily, neither PCB nor mineral oil is very volatile, so inhalation of vapors is not considered a significant hazard; however, at very high temperatures such as after a fire potentially hazardous smoke and vapors can be generated.

PCB is listed on the California Prop 65 hazard communication list as both a reproductive hazard and carcinogen. Mineral oil is not listed on Prop 65.

What is Proposition 65?

The Safe Drinking Water and Toxic Enforcement act of 1986 (Proposition 65) requires the Governor to develop a list of toxic chemicals. It also requires California businesses to warn the public and their employees of potential exposure to these chemicals that result from their operations. PCB is on the list because it poses both a cancer and reproductive risk. Before starting activities that disturb the soil, the access points should be posted with warning signs stating Caution: This site contains substances identified by the State of California under Prop 65 as carcinogens and reproductive hazards. Authorized entry only.

How does exposure occur?

Since PCB was so commonly used in industry and since it tends to remain stable in the environment and in animals, most people in urban areas are exposed to low levels. When working with contaminated soils, the primary exposure concern is skin contact. Other ways humans are exposed to PCBs are through ingesting contaminated food or water, by inhaling contaminated dust or smoke or by handling liquid product. PCB is very stable, so ingestion and direct contact are more of a risk than inhalation. Other than immediately after a fire or explosion, it is unlikely to be found in the air unless contaminated dust is created by aggressive soil disturbance. Walking through a substation yard doesn't create an exposure. If PCB is present, disturbing the soil or handling it directly with bare skin creates a risk of exposure. Typically, the concentrations found in substation soil do not present a significant health risk, as long as proper work practices and good hygiene are used. Proper work practices include minimizing dust generation. Good hygiene practices include washing exposed areas of skin prior to eating, drinking, smoking or applying cosmetics; and not carrying excessive dust out of contaminated areas on your clothes, shoes and equipment.

Can a doctor tell me if I have been exposed?

PCB exposure can be detected by testing blood or urine, or by conducting liver function tests. However, these tests are only useful in detecting damage done over time by repeated or prolonged exposure.

□ Does the government regulate PCB or mineral oil levels in the environment?

The California Department of Occupational Safety and Health (Cal/OSHA) regulates exposure to two types of PCB – one containing 42% chlorine and one containing 54% chlorine - in the workplace. The Cal/OSHA Permissible Exposure Limit (PEL) are 1 milligram PCB/cubic meter of air breathed and 0.5 milligram PCB/cubic meter of air breathed, respectively, averaged over an eight-hour shift. Other agencies such as the Regional Water Quality Control Board, the Department of Fish and Game, and the Environmental Protection Agency (EPA) require very strict monitoring to ensure that PCB does not contaminate water supplies, waterways, soil or the food chain. Mineral oils are much less strictly regulated, since the primary risk is simply that oil, if released in large enough quantities, can cause environmental harm.

What happens when contamination is found in the soil?

When PCB or oil contamination is found on a site at a significant level, studies (such as air monitoring) are done to figure out the extent of the problem. Any soil sampling or clean up that is carried out should be in consultation with an environmental or safety professional. Site specific data (soil sampling and air monitoring) should be shared with employees before work begins. The concentration of PCB and mineral oil in the soil at most substations is low enough that it is not likely to present an inhalation hazard if proper work practices are used, although the soil is considered contaminated and not suitable for agricultural or residential use.

What can be done to reduce exposure to PCB?

Contaminated soil can be removed or temporarily covered over with clean soil, plastic or pavement. After working in soil/dusty environments, ensure that any exposed skin is thoroughly washed, especially before eating, drinking, smoking or applying sunscreen or lip balm. Best practice is to use disposable wipes or waterless cleaner and a clean rag to prevent contaminating local water supplies and water ways. Conduct regular housekeeping by cleaning off hand tools if they have been exposed to soil. Keep vehicle and equipment speed under 10 mph when operating on unpaved surfaces. Use wet methods (keep the soil damp) to control dust when excavating or for soil disturbance. Keep any soil piles covered with plastic or sprayed with water, especially during windy conditions. Remove and clean your shoes to avoid bringing contaminated soil inside a building or to your vehicle. When manually digging in soil, wear impermeable nitrile or rubber gloves and consider wearing disposable coveralls to decrease the chance of accidental ingestion and to keep PCB-contaminated dust out of clean areas. Coated impermeable coveralls are most appropriate in this case. These should be put in leak-tight containers after use and disposed of as directed by the local Environmental Specialist. When excavating, move the bucket or shovel blade as close to the deposit location as possible. Never allow contaminated soil to free-fall from excessive heights. Do not use compressed air to blow soil or dust off surfaces, equipment or clothing, and never shake off soiled clothing. Brush, wipe or HEPA-vacuum off clothing instead. Soiled work clothes should be washed separately from other clothing. Do not incinerate PCB or mineral oil, since the smoke and products of combustion are toxic. For question, please contact your local Environmental Specialist or Safety Program Consultant, or call the SH&C Help Line at 8-223-8700.

The following reliable resources are available for additional information:

The Center for Disease Control: !! HYPERLINK "<http://www.atsdr.cdc.gov/tfacts17.html>"

¶ <http://www.atsdr.cdc.gov/tfacts17.html>

The Environmental Protection Agency: !! HYPERLINK

"<http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/about.htm>"

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KEY LEARNING QUESTIONS:

Who is responsible for ensuring a safe and healthful work environment? ♂ (Answer a)

Every employee.

The Company CEO.

The local safety committee.

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