Statement of Shira Kramer, Ph.D.
Press Conference on Proposed Burn Pit Legislation
House Triangle, Capitol Hill
June 11, 2009

Epidemiology International

The open, uncontrolled burning of solid and liquid wastes (including plastics, paper, wood, metals, oils, fuels, paint, and human wastes), generates some of the most harmful chemicals known to man, and represents an unacceptable health risk. The chemicals that are generated include: dioxins; polycyclic aromatic hydrocarbons (or PAHs); and volatile organic compounds such as benzene and vinyl chloride. Burning of waste also generates smoke, which contains particulate matter and ash, which are further threats to human health. Chemicals such as PAHs, dioxins, and metals, adsorb onto the particulates and ash in smoke, which facilitates deep inhalation of these chemicals into the lungs. After inhalation, these chemicals are absorbed and transported into the tissues of the body. Many of these chemicals, such as dioxins, are stored in the body's fat cells, accumulating over time and remaining in the body for many years.

The chemicals produced by open air burning of waste products are proven human toxicants, and have been associated with a wide range of adverse effects on numerous body systems and tissues, including cancer.

Dioxins, a class of chemicals produced as a by-product of combustion, are highly toxic chemicals, even at very low concentrations, and accumulate in bodily tissues. Epidemiological and medical research has established that exposure to dioxins causes cancer, hepatotoxicity, endocrine disease, neurological damage, cardiovascular disease, reproductive toxicity, a skin disease called chloracne, birth defects, and impairments to immune system functioning. Numerous types of cancers are caused by exposure to dioxins, including lymphoma, soft tissue sarcoma, leukemia, and cancers of the respiratory and digestive tracts. Dioxins were a component of Agent Orange, a Vietnam-era defoliant responsible for causing cancer, diabetes, neurobehavioral effects, and autoimmune diseases among the soldiers who sprayed this herbicide during the war.

PAHs are a large class of chemicals produced from the burning of fuels and the incomplete combustion of organic materials such as paper, wood, and garbage. PAHs are

toxic in their own right, and many PAHs, in the presence of other chemicals such as dioxins, enhance the toxicity of those chemicals. Mixtures of PAHs are established human carcinogens, and they cause mutations in DNA, birth defects, and damage to the liver and immune system. PAH mixtures have been known to cause cancer for over 200 years, and are among the most potent carcinogens known to man.

Volatile organic compounds, released during open burning of petroleum products, plastics, and other wastes, include a number of chemicals such as benzene, toluene, xylenes, vinyl chloride, methylene chloride, and 1,3-butadiene that readily evaporate into the air, particularly at high temperatures. Many VOCs are used as industrial solvents, and often are found in paints, pesticides, petroleum products, and numerous other applications. Vinyl chloride is a particularly harmful VOC that is released from the burning of plastics, and benzene is a chemical so toxic that it is generally assumed that there is no safe level of exposure. Vinyl chloride, benzene, and other solvents such as 1,3-butadiene are classified as known human carcinogens, causing leukemia, lymphoma, myeloma, brain and central nervous system malignancies, liver cancer, and cancers of the respiratory tract. VOCs also cause neurological and sensory impairments, respiratory tract irritation, damage to the hematopoietic and immune systems, and birth defects.

Uncontrolled burning of wastes produces smoke and ash that contain the types of chemicals I have previously discussed, as well as other species such as metals, toxic gases, and infectious agents. These particles and gases in smoke create an irritant environment which can cause a variety of acute health hazards such as cough, respiratory distress, asthma, and eye and skin irritation. These acute health effects represent sentinel events which indicate that a harmful exposure is present. Sentinel events should trigger remediation in order to minimize further exposure and mitigate risks for the numerous health effects such as cancer.

Many of the chemical by-products and particulates generated from waste burning interact synergistically, meaning that the toxicity of the mixture of chemicals and particulates

is greater than that of the individual chemicals. There is a large body of epidemiological literature examining individuals who live in close proximity to waste incinerators and industrial facilities that burn wastes. These populations have experienced increased risks of adult and pediatric cancers, respiratory diseases, birth defects, and fetal mortality. The health risks will be more severe among individuals who reside near sites where open air uncontrolled burning of waste is conducted.

In summary, there is irrefutable evidence that there are serious and dangerous health risks associated with exposure to the by-products of waste burning, particularly if the wastes are burned in open burn pits with no emission controls. The health risks associated with these exposures are beyond debate, and I am in full support of proposed legislation banning these practices.