

How Should the Federal Government Address the Health and
Environmental Risks of Coal Combustion Waste?”

House of Representatives Committee on National Resources
Subcommittee on Energy and Mineral Resources Hearing

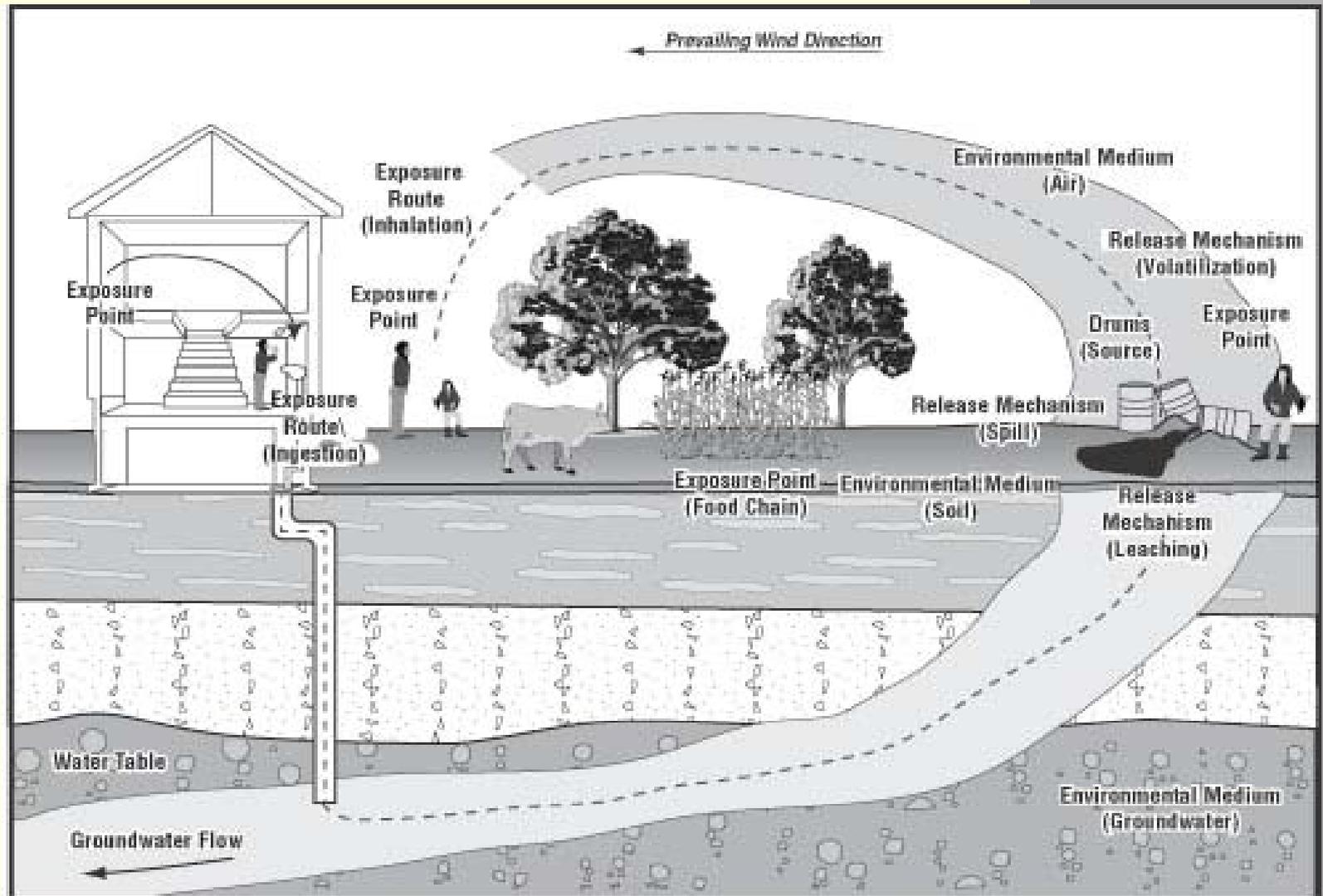
June 10,2008

Testimony of Thomas A. Burke, PhD, MPH
Professor, Johns Hopkins University Bloomberg School of Public Health

Assessing the Risks

- Coal combustion waste is a complex mixture of well-documented hazardous substances.
- The amount produced annually in the US exceeds 120 million tons or enough to fill a million railroad coal cars (NRC 2006).
- The types and severity of the health effects of constituents range from benign and cosmetic effects to changes in organ or system function to cancer.
- The volume, potential for environmental transport, and potential adverse effects present a challenge to public health.

CCW Pathways of Exposure



Case Example: Anne Arundel County

- The county health department has sampled the drinking water wells of nearby residents
- Concentrations of aluminum, arsenic, beryllium, cadmium, lead, manganese, and thallium at levels above primary and secondary drinking water standards in some wells

Health effects of coal combustion waste (CCW) constituents

CCW Constituent	Health Effect(s) of Concern (Exposure by Ingestion)	Information Source
Aluminum	Neurological	ATSDR 2007
Antimony	Longevity, changes in blood glucose and cholesterol	EPA IRIS
Arsenic	Cancer, hyperpigmentation, keratosis of skin	EPA IRIS
Barium	Nephropathy	EPA IRIS
Beryllium	Gastrointestinal	EPA IRIS
Boron	Decreased fetal weight	EPA IRIS
Cadmium	Significant proteinuria	EPA IRIS
Cobalt	Blood	ATSDR 2007
Copper	Gastrointestinal	ATSDR 2007
Fluorine	Cosmetic fluorosis of teeth	EPA IRIS
Lead	Neurological	CDC 2005
Manganese	Neurological	EPA IRIS
Mercury	Kidney	ATSDR 2007
Molybdenum	Increased uric acid levels	EPA IRIS
Nickel	Decreased body and organ weight	EPA IRIS
Selenium	Selenosis – hair and nail loss	EPA IRIS
Strontium	Bone growth and mineralization	EPA IRIS
Thallium	Change in blood chemistry	EPA IRIS
Zinc	Decreased red blood cell copper and enzyme activity	EPA IRIS

Underestimating Risks?

- Methods are available to assess health risks from exposure to mixtures of chemical substances, however, current regulatory strategies were not designed to consider such mixture exposures.

Conclusions

- Coal combustion waste is a complex mixture that can become mobilized in the environment, depending on site characteristics and disposal methods used.
- People are exposed through multiple means including inhalation, direct contact, and ingestion. Exposures may occur indoors and outdoors.
- Current approaches to evaluating health risks are limited and may underestimate the true risks to exposed communities.
- Health effects of exposure will be underestimated unless the potential cumulative impacts of the multiple toxic components of the mixture are considered together.
- Prevention of exposure through better management of the waste is ultimately the most sound public health approach.