COAL ASH

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Production of Coal Ash

US power plants produced 131 million tons of waste in 2008.

Waste Product: Coal ash is largely made up of ash and other unburned materials that remain after the coal is burned in a power plant to generate electricity. These industrial wastes also include the particles captured by pollution control devices installed to prevent air emissions of particulate matter (soot), metals, and other gaseous pollutants from the smokestack.

Difference between coal ash and coal: As the coal is burned, its volume is much reduced. The concentrations of metals and other minerals that remain in the ash can increase up to four or five times by volume. Elements such as arsenic, chlorine, copper, mercury, selenium, and zinc are found in much higher concentrations in the ash compared to coal.

Human Health Effects of Some Coal Combustion Waste Pollutants

(those marked in bold have been found in Kingston coal ash above public health safety levels)

Aluminum	Lung disease, developmental problems
Antimony	Eye irritation, heart damage, lung problems
Arsenic	Multiple types of cancer, darkening of skin, hand warts
Barium	Gastrointestinal problems, muscle weakness, heart problems
Beryllium	Lung cancer, pneumonia, respiratory problems
Boron	Reproductive problems, gastrointestinal illness
Cadmium	Lung disease, kidney disease, cancer
Chromium	Cancer, ulcers and other stomach problems
Chlorine	Respiratory distress
Cobalt	Lung/heart/liver/kidney problems, dermatitis
Lead	Decreases in IQ, nervous system, developmental and behavioral problems
Manganese	Nervous system, muscle problems, mental problems
Mercury	Cognitive deficits, developmental delays, behavioral problems
Molybdenum	Mineral imbalance, anemia, developmental problems
Nickel	Cancer, lung problems, allergic reactions
Radium	Increased risk of cancer
Selenium	Birth defects, impaired bone growth in children
Thallium	Birth defects, nervous system/reproductive problems
Thorium	Increased risk of cancer
Uranium	Increased risk of cancer
Vanadium	Birth defects, lung/throat/eye problems
Zinc	Gastrointestinal effects, reproductive problems

Kingston Respiratory Problems: A third of the people living near Kingston coal disaster report respiratory problems, and about half have experienced increased stress and anxiety, according to a TN Depart of Health survey.

Report on EPA Health Effects Data: One out of every 50 Americans living near landfills or ponds used to store ash or sludge from coal-fired power plants has a high risk of getting cancer from drinking water contaminated with arsenic. The report says that environmental contamination from the storage sites could last for a century or longer. The standard acceptable cancer risk is 1 in

100,000. The residents also are at higher risk for exposure to lead which can damage the central nervous system.

Health Effects of Coal Ash Contaminated Water on Other Life:

- Can decimate fish, bird, and frog populations.
- Can deform aquatic animals.

Radioactive Contamination of Dredged Kingston Ash

Duke University Analysis: Researchers have found high level of arsenic and elevated levels of radioactive radium in the Kingston coal ash dredged from the Emory River which they say "raises questions about the safety of storing ash." Concern grows that the dredging has disturbed the Oak Ridge nuclear weapons complex legacy radioactive sediments underlying the Kingston coal ash in the Emory River, contaminating the ash with strontium, cesium, uranium, plutonium and other non-radioactive metals trapped in the sediments, largely mercury and possibly PCBs.

"Beneficial" Uses of Coal Ash

42% of coal ash marketed for other purposes: Coal ash which has been stored dry has been used for other purposes. Coal ash reuse is a $1 billion industry.

- gypsum wallboard
- cement products
- landfill for construction projects
- other uses.

Agricultural Uses: In 2007, 50 tons went for agricultural uses despite EPA warning about its high levels of arsenic. In agriculture, one study found that crops grown in soil with a composition weight of 5% to 20% coal fly ash showed toxic levels of arsenic.

Coal Ash and Roads: TN Department of Transportation (TDOT) currently uses about 20,000 tons each year from the TVA Cumberland coal plant to make concrete. TDOT reports that the Kingston coal ash does not meet standards for road building because its water content is too high.

EPA and the Federal Highway Administration approve the use of fly ash in certain road construction applications such as a supplement to cement in concrete, as an aggregate component in both concrete and asphalt paving, as fill material in embankments and roadbeds, as a stabilizing agent for soils and aggregate bases, and in flowable fills. The potential for leaching toxic chemicals into water supplies greatly increases when coal ash is used as a base of dirt roads or not properly bound.

TVA's Coal Ash Management

TVA Coal Ash Management: TVA, in its efforts to keep operating costs to a minimum, determined that the cheapest method for coal ash disposal was to store the waste on-site in retention ponds. Coal ash when stored in a pond cannot be used for other purposes. TVA decided against the more expensive method of dry ash disposal because it concluded the market for dry ash was limited, and it did not want to pay for the cost of shipping the dry ash to a customer.

Most TVA Coal Plants Use Retention Ponds: 6 of 11 TVA Coal Plants put ash in ponds similar to the one used at its Kingston plant.

No Liners: None of TVA coal ash retention ponds has a liner. The ponds leach directly into groundwater. Again, TVA chose this method to avoid extra cost.

Coal Ash Regulation

Current Regulation

- Coal ash retention ponds and landfills are not subject to federal regulation.
- Coal ash ponds and landfills are mainly regulated through state solid waste permitting with little state oversight even though they have high level of toxics. Coal ash landfills are subject to less regulation than municipal landfills despite higher levels of toxic heavy metals.
- 58% of coal ash is disposed of in landfills. Only 43% of these landfills nation-wide have landfill liners or monitors to ensure that ash and its contents do not seep into underground aquifers

EPA Regulation History

- March 2000 - EPA highlighted risks posed by coal waste in landfills and concluded that coals wastes have the potential to present danger to human health and the environment. It drafted a proposal for a national standard.
- 2003 - EPA identified over 70 sites nationwide where fly ash and similar coal power plant waste has contaminated surface and groundwater. EPA warned that the number of cases of contamination nationwide is underestimated due to poor state records and lack of groundwater monitoring.
- 2004 - EPA announced a delay in making a decision on new coal ash regulations for 18 months .
- 2006 - National Science Foundation urged EPA to begin regulation of coal ash.
- 2007 - EPA released a national risk assessment on coal fly ash disposal and identified runoff from coal ash as a high risk factor.
- 12-2008 - Kingston Coal Ash Disaster
- 1-2009 - EPA administrator vowed to regulate coal ash at confirmation hearing.
- 5-2009 - EPA takes over oversight of TVA's cleanup of the Kingston Coal Ash Disaster.

State Regulations: State agency regulators over solid waste have been one of the main opponents to federal regulation of coal ash. Electric utilities and the coal industry have safely relied on state regulators to resist the regulation of coal ash as a hazardous waste. State regulators base their attack on the hazardous waste designation on the results of flawed laboratory leach tests and have ignored calls from the National Research Council to make major changes in these tests.

State Allow Open Dumping of Coal Ash: If a coal ash "passes" the flawed test or the state waives the test if it calls the coal ash use as "beneficial", the state allows filling of quarries or mines as a "structural fill" or an "alkaline adaptation". It is nothing more than open dumping, outlawed under the unenforced federal waste law, RCRA, which is being paraded as "beneficial use."

Needed Minimal Federal Standards - not now required by state:

- Isolate the waste from water,
- Cover it and monitor it sufficiently,
- Adequate cleanup standards and financial assurance to ensure problems are detected and addressed.

Possible Hazardous Waste Designation

EPA Evidence Mounts: The U.S. EPA has found that coal ash waste leaches selenium, arsenic, boron, and barium at levels sufficient to classify it as a hazardous waste. A hazardous waste designation, at a minimum, would require utilities to add liners coal ash landfills or to ship waste to a designated toxic waste landfill.

Widespread Problem: The EPA identified 44 potentially dangerous coal ash impoundment sites in its 2009 national survey.

Opposition: Coal ash waste is the second largest waste stream in the United States, after municipal garbage. Utility associations, such as the Utility Solid Waste Activities Group, have successfully lobbied state environmental agencies to require minimal if any regulation of coal waste.

Candidate Sites for Landfilling TVA's Coal Ash

No "Beneficial Uses" for Kingston Ash: Once ash material becomes saturated, the reactivity and fineness properties that make it useful in concrete are lost.

TVA Request for Proposals: TVA sent out a request for proposal in February seeking bids from companies interested in the loading, transportation and storage of the fly ash. TVA said it will evaluate the test results before awarding final contracts. TDEC and EPA must approve TVA's final plans for off-site disposal.

Cumberland County: The Smith Mountain Solutions has submitted a proposal to Cumberland County for construction of a coal ash landfill on Smith Mountain.

Roane County: In March**,** Roane County commissioners gave initial approval to reactivate a 69-acre landfill off Highway 70 in the Midtown area. The County Commission approved taking $62,000 from the county's rainy-day funds to pay for needed permits and engineering for the site. Part of the landfill is lined. TVA, state, and federal officials inspected the site and found that it "passes muster." The landfill, unused since 1997, is three miles from the ash disaster.

Georgia and Alabama: TVA shipped coal ash by rail to Class I landfills in Mauk, Georgia and Uniontown, Alabama to test ash loading and offsite disposal using railroad cars. The counties where the ash is going have large African-American populations and high poverty rates, raising questions of environmental justice. Several companies competed for the rail contract. The two chosen vendors will load and ship 15 rail cars filled with ash. The two-week test of using rail cars to remove the ash began under an agreement with state and federal regulators.

PA Rejects TVA Coal Ash: TVA had explored shipping the Kingston coal ash to "reclaim" abandoned mines in Pennsylvania. PA state officials stated that the state has strict standards for the kind of materials that can be buried in the state, and TVA's coal ash does not meet PA's requirements for "beneficial use."

Other mentioned sites:

Athens in McMinn County, TN,
Oneida in Scott County, TN.

The Obed Watershed Community Association has as its purpose the protection and enhancement of the natural and cultural heritage of the Obed River watershed within Cumberland County. Louise Gorenflo, OWCA community educator, produced this fact sheet. Those wanting to join this membership organization or more information may contact Dennis Gregg, OWCA Director at 484-9033 or at 185 Hood Drive, Crossville, TN 38555.