



## Dangerous Disposals: Keeping Coal Combustion Waste Out of Our Water Supply

For more information,  
please contact  
**Mayra Quirindongo** at  
(202) 289-6868

Each year, America's coal-fired power plants and industrial facilities produce approximately 130 million tons of coal combustion waste (CCW), the residue left behind when coal is burned. That's enough waste to fill a train of box cars stretching from Washington, D.C., to Melbourne, Australia.<sup>1</sup> Because CCW contains pollutants like arsenic, mercury, lead, and other toxic substances, its disposal carries many risks. Without proper monitoring and safeguards, disposing of toxic coal combustion waste can pose serious dangers to nearby ground and surface waters—and the people who rely on these sources for safe drinking water.

Given our national dependence on coal as a source of energy, the problem of disposing of CCW is one we will face for many years to come. Because CCW contains toxic chemicals such as arsenic and mercury that can cause serious health problems—especially in children—this is a problem we cannot ignore. But just as we have made strides to reduce the danger of air pollution from power plants, we can also act to reduce the danger presented by what is left at the bottom of the stacks.



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### Health Hazards of Coal Combustion Waste

There are multiple types of coal combustion waste, including coal ash (fly ash, bottom ash), flue gas desulfurization waste (waste created when the exhaust from smokestacks at coal-burning facilities is treated to remove sulfur), and boiler slag (molten coal ash collected from the bottom of coal-burning furnaces). This waste contains toxic chemicals such as aluminum, arsenic, boron, cadmium, chromium, lead, manganese, molybdenum, selenium and sulfate—pollutants that can cause cancer, birth defects, reproductive problems, damage to the nervous system and kidneys, and learning disabilities in children.

For some types of CCW there are alternative uses as raw material for construction products such as concrete, plaster, and wallboard. When directed toward these “encapsulated uses,” the dangerous chemicals in the waste are not subject to erosion and leaching into the environment, but unfortunately the majority of CCW is not disposed of in this way.

### Toxic Waste in Landfills and Surface Impoundments Seeps into Drinking Water

The majority of coal combustion waste produced each year is disposed of in landfills or surface impoundments (artificial ponds into which CCW mixed with water is dumped).

When water mixes with CCW in a landfill, such as when it rains, toxic chemicals from the waste dissolve in the water. This polluted water, called leachate, can then spread underground, contaminating groundwater and surface waters.

CCW disposed of in surface impoundments is intentionally mixed with water to create a sludge that can be more easily transported through a pipe from the coal-burning facility to the site where it will be dumped. Some of these CCW facilities are lined with a layer of clay or other material at the bottom to prevent pollutants from getting into the soil and the groundwater, but others are not. Across the nation, 40 percent of landfills accepting coal waste and 80 percent of surface impoundments do not have liners that would prevent leachate from infiltrating nearby water supplies. Even facilities with liners are not guaranteed to be safe, as liners can and do fail.

CCW contamination presents a serious risk to drinking water supplies near landfills and impoundments, whether they are public water systems, domestic drinking water wells, or springs. According to an EPA draft report, pollution from coal combustion waste dumps and lagoons has contaminated surface water and groundwater at up to 24 sites in 13 states.<sup>2</sup>



## “Reclaiming” Mines with Dangerous Coal Waste

After mining activities at a site are completed, mining companies cannot simply abandon the area; they must take steps to repair some of the environmental damage caused by the mining, a process referred to as reclamation. The “reclaiming” of the mine often involves filling it with a type of CCW called coal ash.

Filling mines with coal ash is considered a convenient and low-cost way to dispose of huge amounts of coal ash. The ash is supposed to improve drinking water quality in the area by neutralizing the acidity in mines and controlling the release of toxic chemicals, but this so-called “beneficial” use of coal ash is risky. If the ash is not sufficiently alkaline, it will not neutralize the acidic environment in the mine. And if there is significant water flow within the mine from rainwater infiltration or groundwater flow, the water may dissolve the toxic chemicals in the ash itself and then carry these chemicals into nearby groundwater and surface waters.

Further, because this type of reclamation is often done without the proper safeguards, the process of reclaiming the mine—advertised as protecting those living in the surrounding communities—may instead cause significant harm to their health.

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## Are There CCW Toxics In Your Drinking Water?

The table below lists the most common pollutants released by CCW landfills, surface impoundments, and minefills, along with their negative health effects.

Contaminant	Negative health effects	Drinking water quality criteria concentration (mg/liter)
Aluminum	Bone or brain disorders, especially in people with kidney disease and in children.	0.2
Arsenic	Cancer of the bladder, kidneys, liver, lungs, prostate, and skin.	0.01*
Boron	Harm to male reproductive organs, birth defects.	7
Cadmium	Kidney damage	0.005*
Chromium	Hexavalent chromium can cause stomach ulcers, convulsions, kidney and liver damage, and can increase the risk of cancer.	0.1*
Lead	Nervous system, brain and kidney damage; miscarriage. Learning and behavioral problems in children.	0.015*
Manganese	Changes in the brain and nervous system; learning problems and poor coordination in children.	0.05
Molybdenum	Pain and inflammation of the joints.	0.2
Selenium	Nausea, vomiting, diarrhea. Long-term exposure can cause hair loss, nail brittleness, and neurological problems.	0.05
Sulfate	Laxative effect. To prevent dehydration, water with high levels of sulfate should not be used in infant formula.	250

Sources: Agency for Toxic Substances and Disease Registry, and U.S. Environmental Protection Agency.  
\*Enforceable water quality standard.

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### What You Can Do

Let the government know that you want them to protect the health and safety of your family and community by minimizing the threats posed by CCW. Contact your state Department of Environmental Protection (DEP) and demand that they:

- Require full geochemical and hydrological studies of each project as a condition of disposal permit approval;
- Immediately inventory all CCW landfill, minefill, and surface impoundments in the state in order to identify environmental impacts, including an assessment of water quality around the minefills—and publish the results; and
- Require frequent water monitoring for arsenic and heavy metals at all CCW disposal sites, including inactive sites, and set limits for the levels of these dangerous pollutants allowed under water discharge permits for such sites, if your state doesn't currently have those limits.



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<sup>1</sup> [http://action.earthjustice.org/earthjusticeaction/alert-description.tcl?alert\\_id=9709845](http://action.earthjustice.org/earthjusticeaction/alert-description.tcl?alert_id=9709845)

<sup>2</sup> U.S. EPA, Damage Case Assessments under RCRA for Fossil Fuel Combustion Wastes [Draft], November 2005