

The Impacts on Water Quality From Placement of Coal Combustion Waste In Pennsylvania Coal Mines



CLEAN AIR TASK FORCE

COAL COMBUSTION WASTE DISPOSAL IN PENNSYLVANIA

In a multi-year study, the Clean Air Task Force (CATF) examined 15 coal mines where coal ash was placed under the Pennsylvania Department of Environmental Protection's (PADEP) Coal Ash Beneficial Use Program, which encourages the placement of coal combustion waste (CCW) in active and abandoned mines. The study concludes that the state's beneficial use program, whose primary goal is to improve the environmental condition of mines by adding of massive quantities of CCW, is failing:

- At 10 of the 15 minefills examined in the study, monitoring data indicate the coal ash contaminated groundwater or streams.
- At three minefills, contamination of streams and/or groundwater was occurring, but the cause of the pollution could not definitively be traced to the ash because of the lack of monitoring data.
- At one of the minefills, water quality improved for acid mine parameters, but water quality decreased for contaminants found in ash.
- At only 1 of the 15 minefills was water quality improvement found. However, since water monitoring was terminated shortly after placement, it is unknown whether the improvement was temporary.

Consequently, CATF found that placing large amounts of CCW in mines is a dangerous practice that appears to be causing toxic levels of contamination. The report recommends that permits allowing this industrial waste to be placed in mines require safeguards to minimize adverse



Pennsylvania generates over 9 million tons of coal combustion waste a year, the third largest producer in the country.

environmental impacts and threats to human health.

CCW is a toxic industrial waste produced by coal-burning power plants. Pennsylvania is the third largest US producer of this waste, generating over 9 million tons per year. CCW contains hazardous chemicals including aluminum, chloride, iron, manganese, sulfate and toxic trace elements such as arsenic, selenium, lead, mercury, cadmium, nickel, copper, chromium, boron, molybdenum and zinc.

For over 20 years, PADEP has been promoting placement of large volumes of CCW in active and abandoned coal mines to address acid mine drainage, increase soil fertility, and fill mine pits and voids. PADEP has permitted approximately 120 CCW minefills throughout the state.

THE CLEAN AIR TASK FORCE REPORT

The CATF report shows that placement of CCW in mines can produce significant pollution. For example:

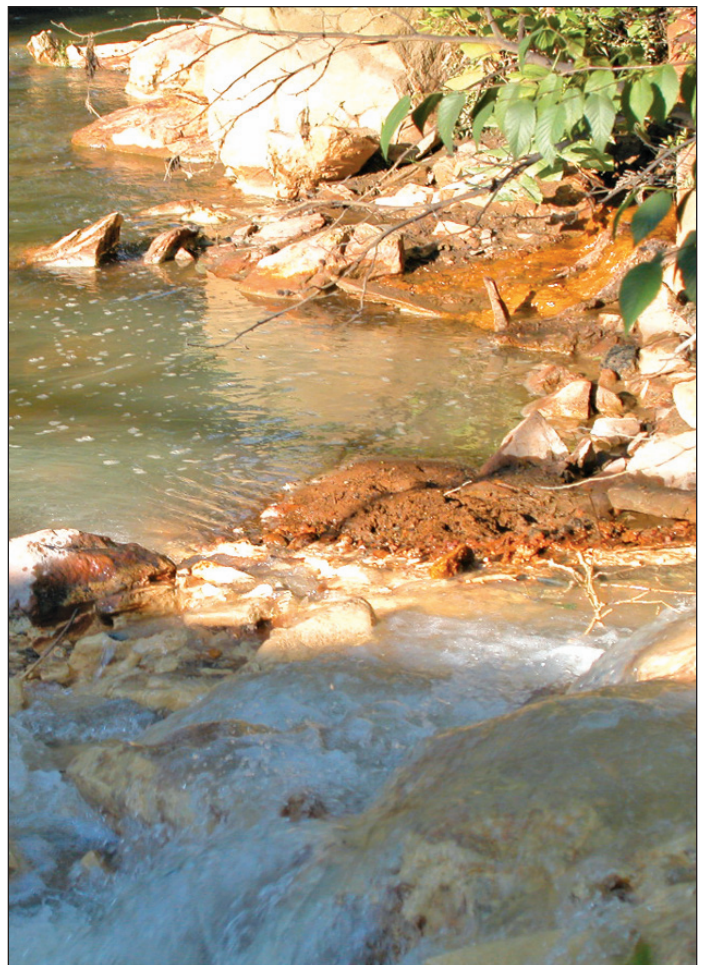
- At the Ernest Mine where more than 1.5 million tons of CCW have been placed, water contaminated with lead (9.7 times the federal drinking water standard), cadmium (almost 15 times the standard) and chromium (2.4 times the standard) has been discharging into surface water.
- At the McDermott Mine where 316,000 tons of CCW were placed, cadmium and selenium have been measured 76 times and 36 times higher than water quality standards, respectively, at mine discharges. An offsite spring used as a domestic water supply had to be abandoned due to pollution from the site.
- At the Swamp Poodle Mine where 214,000 tons of CCW were placed, arsenic rose to 389 times the drinking water standard, cadmium to 46 times the standard, and lead and selenium to four to nearly seven times the standard in groundwater.
- At the Ellengowan and BD Mines, lead has been measured up to 39 times and cadmium up to 32 times federal drinking water standards in mine pools downgradient of four pits containing more than 16 million tons of CCW.

Recent congressional concern about CCW disposal in mines led to a 2006 National Academies of Science (NAS) report entitled *Managing Coal Ash Residue in Mines*. The NAS concluded that certain safeguards, not required by the PA program, are essential to protect health and the environment, including adequate characterization of both the CCW and the mine site, adequate monitoring of the ash after placement, isolation from water, cleanup standards, and meaningful public participation in the permitting process. Furthermore, the NAS recommended that no placement of CCW in mines should occur if other safer reuse alternatives exist, such as incorporation of ash into concrete and other products.

US EPA has also expressed serious concern over CCW minefilling. In its 2000 Regulatory Determination on Wastes from the Combustion of Fossil Fuels, the Agency stated:

“We are aware of situations where coal combustion wastes are being placed in direct contact with ground water in both underground and surface mines. This could lead to increased releases of hazardous metal constituents as a result of minefilling. Thus if the complexities related to site-specific geology, hydrology, and waste chemistry are not taken into account when minefilling coal combustion wastes, we believe that certain minefilling practices have the potential to degrade, rather than improve, existing groundwater quality and can pose a threat to human health and the environment.”

US EPA concluded, and the NAS concurred, that enforceable federal regulations are necessary to guarantee that state programs minimize the threats from minefilling, but the Agency has not yet taken action to promulgate federal standards.



Coal combustion waste disposal sites in PA are contaminated with toxic levels of arsenic, cadmium, selenium and other pollutants.

RECOMMENDATIONS TO PADEP

CATF's report carefully examined the PA CCW minefilling program and found it lacking in critical respects, including the failure to recognize degradation from the use of CCW. The report recommends PADEP:

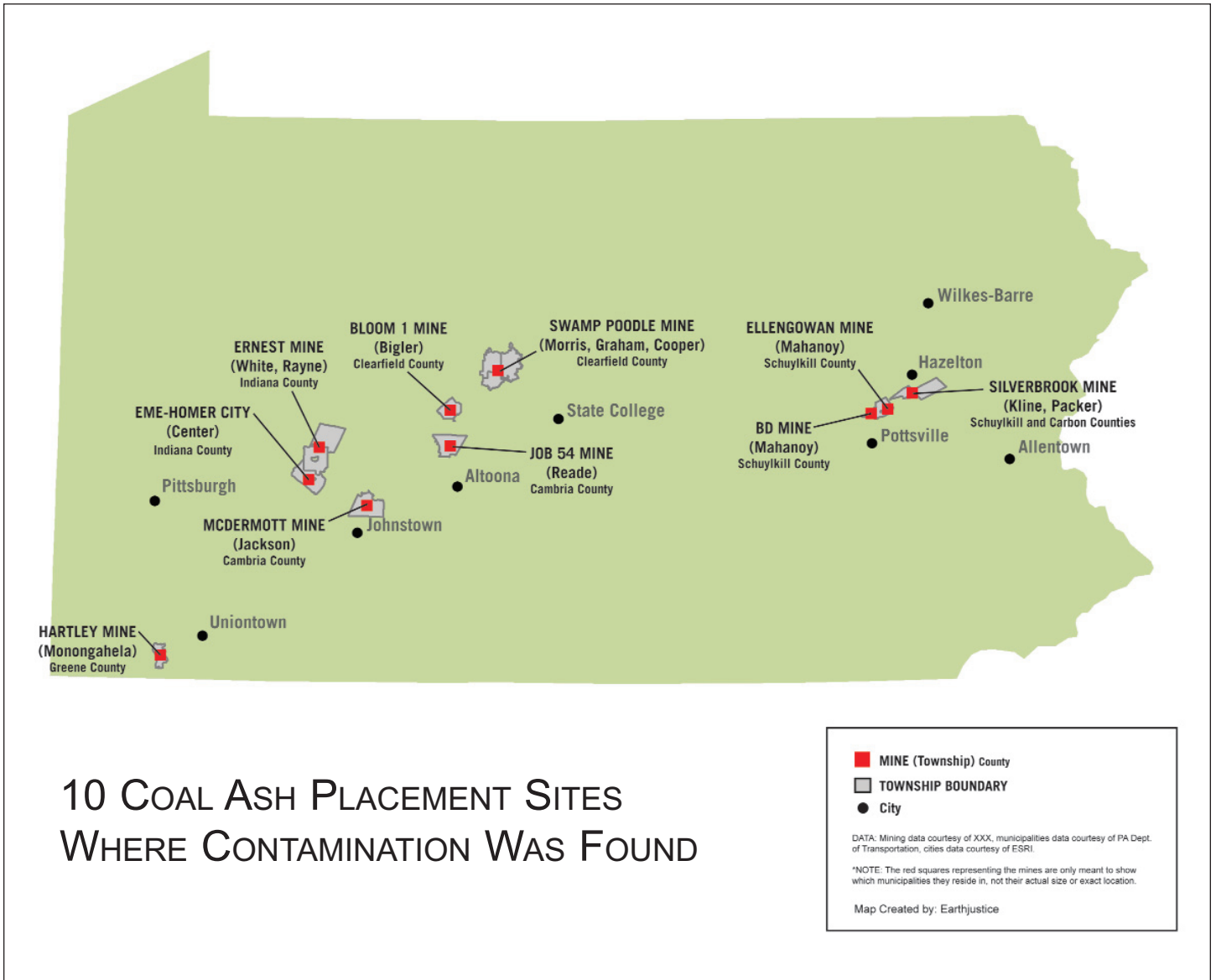
- Require accurate and thorough waste and site characterization prior to permitting the use of coal ash in mines.
- Integrate waste and site characterizations and update them as new information becomes known to ensure effective monitoring.
- Require comprehensive, long-term water quality monitoring at all coal ash mine placement sites.
- Include enforceable corrective action standards for coal ash parameters in all coal ash mine placement permits and address degradation that occurs.
- Issue NPDES permits that monitor and control ash contaminants in surface discharges from sites.
- Require financial assurance that addresses potential long-term water quality problems at coal ash mine placement sites.

- Require isolation of coal ash from groundwater at all coal ash placement sites.
- Update its permit system with a better organized, more publicly accessible modern database.
- Require that all coal ash placement permits in mines actually achieve a measurable beneficial result.
- Require ecological monitoring at all coal ash mine placement sites as a condition of the permit.
- Establish enforceable requirements for coal ash placement permits in state regulations to replace the current system of unenforceable guidance documents.
- Conduct a statewide programmatic review of its coal ash beneficial use program to determine whether any coal ash minefills permitted by the state pose a threat to health or the environment and reevaluate the purpose and justification for this program.
- Establish a program to promote the safe reuse of coal ash, prior to issuing or renewing permits for coal ash minefills, and only if such safe and beneficial recycling is unavailable, permit placement of CCW in mines.



Coal combustion waste disposal in Pennsylvania has caused tremendous problems across the state. Currently there are approximately 120 CCW minefills in Pennsylvania.

WHERE IS CONTAMINATION OCCURING FROM THE PLACEMENT OF COAL COMBUSTION WASTE?



“... We believe that certain minefilling practices have the potential to degrade, rather than improve, existing groundwater quality and can pose a threat to human health and the environment.”

-US EPA

“Thus the committee concludes that the presence of high contaminant levels in many CCR [coal combustion residue] leachates may create human health and ecological concerns at or near some mine sites over the long term.”

-National Academies of Science