

**DISASTER IN WAITING**  
**Toxic Coal Ash Disposal in Surface Impoundments**

**Environmental Integrity Project**  
**January 7, 2009**  
**(updated February 9, 2009)**

The massive spill of toxic coal ash<sup>1</sup> from TVA's Kingston plant in Tennessee just before Christmas dramatized how unsafe disposal practices can damage the environment and threaten the health of residents downstream. But according to data reported by the industry to the U.S. Environmental Protection Agency's (USEPA) Toxics Release Inventory (TRI), power plants dump millions of pounds of toxic metals that are contained in coal ash into wet surface impoundments every year. Based on USEPA's analysis, approximately 74% of these impoundments are unlined, increasing the risk that toxic pollutants like arsenic and lead will leach into groundwater or nearby rivers and streams.<sup>2</sup>

Between 2000 and 2006, the power industry reported depositing coal ash containing more than 124 million pounds of the following six toxic pollutants into surface impoundments: arsenic, chromium, lead, nickel, selenium, and thallium.<sup>3</sup> These pollutants are present in coal ash, prone to leaching from ash into the environment and can be highly toxic at minute levels (parts per million or billion) to either humans or aquatic life, or both.<sup>4</sup> More information about the health effects of each contaminant can be found in Appendix I.

Table B identifies those plants that report disposing of the largest volumes of each pollutant over the same period. At many plants, the amounts dumped into surface impoundments—which are essentially open, wet lagoons significantly exceed the disposal volumes at the Kingston facility. The data does not minimize the tragic consequences of the Kingston spill; rather, it suggests that many other communities are also at risk, whether from sudden spills or the slow leaching of toxic pollutants from coal ash into the surrounding environment.

- USEPA samples measured arsenic levels far above drinking water standards in nearby waterways after the spill from Kingston's surface impoundment.<sup>5</sup> Yet according to TRI data, at least twenty facilities reported depositing more arsenic in coal ash impoundments than Kingston. The top five facilities reporting the

---

<sup>1</sup> Coal ash is also commonly referred to as coal combustion waste or CCW.

<sup>2</sup> 65 Fed. Reg. 32214, 32216 (May 22, 2000) (reporting that 26% of all surface impoundments have liners).

<sup>3</sup> See Table A, Industry-Wide Disposal of Arsenic, Chromium, Lead, Nickel, Selenium, and Thallium in Surface Impoundments and Landfills.

<sup>4</sup> See Nat'l Research Council, Nat'l Academies, *Managing Coal Combustion Residues in Mines* 81–104 (2006), available at [http://books.nap.edu/catalog.php?record\\_id=11592#toc](http://books.nap.edu/catalog.php?record_id=11592#toc).

<sup>5</sup> Appalachian Voices, *Results of ICP-OES Analyses of the TVA Ash Spill Samples Collected 12-27-08 from the Emory River*, 1, [http://www.appvoices.org/resources/Preliminary\\_TVA\\_Ash\\_Spill\\_Sample\\_Data\\_AppVoices\\_December%202008.pdf](http://www.appvoices.org/resources/Preliminary_TVA_Ash_Spill_Sample_Data_AppVoices_December%202008.pdf) and Shaila Dewan, *Metal Levels Found High in Tributary After Spill*, *N.Y. Times*, Jan. 2, 2009, A12.

most disposal of arsenic into surface impoundments are the Stanton Energy Center in Orlando, Florida;<sup>6</sup> the Gaston and Gorgas steam plants in Alabama; the Gibson generating station in Owensville, Indiana; and TVA's Paradise plant in Drakesboro, Kentucky. Between 2000 and 2006, the Stanton Energy Center reported depositing more than *10 times* the arsenic placed in the TVA Kingston impoundment over the same period.

- The Kingston plant reported disposing of 582,000 pounds of chromium in surface impoundments between 2000 and 2006. But according to TRI data, the JM Stuart plant in Manchester, Ohio, tops the list for chromium disposal in impoundments, reporting 1,510,000 pounds between 2000 and 2006. The Gaston and Stanton plants are second and third, followed by the Gibson station, and the Wansley plant in Roopville, Georgia. A total of 16 facilities reported disposing of more chromium in surface impoundments than Kingston.
- The Stanton Energy Center in Orlando disposed of nearly 1,000,000 pounds of lead in surface impoundments between 2000 and 2006, or about 3 times the amount reported in Kingston for the same period. The Gibson Station and Paradise plant were the second and third largest source, followed by the Ghent Station in Ghent, Kentucky, and the JM Stuart plant in Ohio. Nineteen plants reported releasing more lead to surface impoundments than Kingston.
- The Stanton, Gibson, Paradise, Ghent and JM Stuart plants reported the largest releases of nickel to surface impoundments between 2000 and 2006. Another fifteen plants disposed of nickel in amounts greater than Kingston between 2000 and 2006.
- The Bruce Mansfield plant in Pennsylvania disposed of more than 167,000 pounds of selenium in impoundments between 2000 and 2006, or almost 4 times the amount reported by Kingston. Selenium is highly toxic to fish, and has been measured at levels exceeding toxicity standards for aquatic life at the Kingston site.<sup>7</sup> A total of 15 facilities report releases of selenium between 2000 and 2006 that exceed amounts disposed of in the Kingston impoundment.
- Interestingly, the Kingston facility reported no disposal of thallium in impoundments between 2000 and 2006, although thallium was measured at levels exceeding drinking water standards following the December spill. Only 26 plants

---

<sup>6</sup> After this report was released, Stanton Energy Center in Orlando, Florida informed EIP that the company mistakenly reported to the USEPA that their coal combustion waste is disposed of in a surface impoundment. Stanton Energy informed EIP that their coal combustion waste is actually deposited in a dry landfill. Stanton Energy intends to submit a revised Toxic Release report with the USEPA.

<sup>7</sup> Appalachian Voices, Results of ICP-OES Analyses of the TVA Ash Spill Samples Collected 12-27-08 from the Emory River, 1, [http://www.appvoices.org/resources/Preliminary\\_TVA\\_Ash\\_Spill\\_Sample\\_Data\\_AppVoices\\_December%202008.pdf](http://www.appvoices.org/resources/Preliminary_TVA_Ash_Spill_Sample_Data_AppVoices_December%202008.pdf).

reported any disposal of thallium in surface impoundments between 2000 and 2006.

At least 64 facilities appear in the “Top 50” list for surface impoundment disposal of two or more of the six toxic chemicals studied in this report.<sup>8</sup>

Readers may want to keep several points in mind when reviewing the attached data. The analysis is limited to disposal in surface impoundments, since wet disposal of toxic ash in lagoons that are typically unlined increases the risk that toxic metals will leak into groundwater or nearby waterways.<sup>9</sup> As Table A indicates, surface impoundments account for about 40% of total disposal, but other “drier” landfills may also pose real risks. For example, USEPA’s list of proven damage sites from CCW documents that landfills in New York, Michigan, Wisconsin and Indiana have contaminated underlying groundwater.<sup>10</sup> This includes instances such as the Superfund action in Pines, Indiana to address contamination of multiple residential drinking water wells by the Yard 520 coal ash landfill. In addition, it is possible that some estimates in this report include toxic constituents from wastewater treatment residues in addition to those found in coal ash.

The risks from impoundments and other types of disposal have been magnified by the complete failure of the USEPA to require safe disposal practices. These standards should, for example, ensure that disposal facilities are properly sited (away from proximity to groundwater or surface water); that toxic components of fly ash are properly characterized; that landfills are lined and leachate collected to prevent the escape of pollutants; that monitoring is rigorous and frequent enough to provide early warning of offsite migration; and that the industry assumes full financial responsibility for cleanup costs.<sup>11</sup> USEPA proposed to regulate coal ash as a hazardous waste in 2000, but backed down under pressure from industry in the same year.

Finally, it bears repeating that the Kingston spill of an estimated one billion gallons of water laden with toxic ash is a disaster, and that residents affected by this calamity need immediate relief. But the industry’s own reports show that toxic metals are piling up in even greater volumes from ash disposal at other surface impoundments throughout the U.S. (including at other TVA sites). The limited monitoring available shows that many of these facilities are already leaking their toxic cargo into our groundwater, and into rivers and streams that the public has a right to enjoy.

If we continue to allow power plants to dump their coal ash into open pits, we ought not to be surprised when the bill comes due.

Table A of this report contains information on industry-wide disposal of arsenic, chromium, lead, nickel, selenium, and thallium in surface impoundments and landfills. Table B lists the top 50 facilities that dispose of the greatest volume of arsenic, lead,

---

<sup>8</sup> See Table C, Index of Facilities Appearing on Top 50 Lists.

<sup>9</sup> See Nat’l Research Council, Nat’l Academies, *Managing Coal Combustion Residues in Mines* 91(2006), available at [http://books.nap.edu/catalog.php?record\\_id=11592#toc](http://books.nap.edu/catalog.php?record_id=11592#toc).

<sup>10</sup> Office of Solid Waste, USEPA, *Coal Combustion Waste Damage Case Assessments* (July 9, 2007), available at [regulations.gov](http://www.regulations.gov) (enter Document ID “EPA-HQ-RCRA-2006-0796-0015”).

<sup>11</sup> See Appendix II for a more detailed discussion on safe disposal practices for coal ash.

nickel, selenium, and thallium in surface impoundments. Table C provides an index of facilities that appear in this report's top 50 lists. Appendix I provides information on the health effects of arsenic, chromium, lead, nickel, selenium, and thallium. Appendix II outlines safe management and disposal practices for coal ash, and Appendix III provides a history of USEPA's failures in the regulation of coal ash.