



# *Laid to Waste*

*The Dirty Secret of Combustion Waste  
from America's Power Plants*

**Citizens Coal Council  
Hoosier Environmental Council  
Clean Air Task Force**

*March, 2000*



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**Credits**

This report is made possible with funding from the John Merck Fund and Rockefeller Brothers Fund.

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# The Problem

*The electric power industry is the largest toxic polluter in the country. Producing electricity from coal and oil releases a wide range of pollutants into the environment. In addition to toxic air pollution from power plant smokestacks, large volumes of toxic chemicals are produced at coal and oil-fired power plants and included in millions of tons of solid and liquid wastes that are typically disposed of at or near the power plants that generate these wastes.*

## Coal and Oil Waste is Toxic

Combustion wastes are the solid and liquid waste left over from burning coal and oil to make electricity — ash, sludge, boiler slag, mixed together with a dozen or so smaller volume wastes. Every year, over 100 million tons of these wastes are produced at nearly 600 coal and oil-fired power plants. Seventy-six million tons are primarily disposed of at the power plant site in unlined and unmonitored wastewater lagoons, landfills and mines. These disposal units are operating under state rules that frequently are far less protective than rules for household trash.

- These wastes are highly toxic. They contain concentrated levels of contaminants like arsenic, mercury, chromium and cadmium that can damage the nervous systems and other organs, especially in children. Analyses performed for EPA show that some of these pollutants will eventually migrate and contaminate nearby groundwater. As an example, the excess **cancer risks** for children drinking groundwater contaminated with arsenic from power plant wastes have been found to be as high as **one-in-one hundred** — ten thousand times higher than the Agency's own regulatory goal of reducing cancer risks to less than one-in-one million.
- The toxicity is not just theoretical. We can point our finger to more than 60 places in the country where these wastes have degraded our public ground and surface waters beyond any use — consumptive, agricultural, industrial, or environmental. Fish consumption advisories in Texas and North Caro-



JEFF STANT



A. DENNIS LEMLY

ABOVE: Rain causes coal ash to seep into groundwater.

LEFT: Mosquitofish: normal vs. deformed by coal combustion waste

lina have been directly linked to coal combustion waste disposal. Studies in South Carolina have documented multiple developmental, physiological and behavioral abnormalities in the nearly 25 species of amphibians and reptiles inhabiting wetlands associated with a coal ash disposal site. We know that this is just the tip of the iceberg.

- Current state rules are uneven and in some cases, non-existent. There are only a handful of states with adequately protective programs, and these protections do nothing to help the citizens of other states. A federal regulatory umbrella can level the playing field by requiring common safeguards.
- Low-income communities and people of color shoulder a disproportionate share of the health risks from these wastes. The poverty rate of people living within one mile of power plant waste facilities is twice as high as the national average and the percentage of non-white populations within one mile is 30 percent higher than the national average.





STEVE SMITH

Coal combustion waste fill site in close proximity to houses.

it, cleaning up the air does not mean that pollutants disappear. It means they are captured in lime, in fabric filters, in particulate matter collectors. Once captured, they stop being air emissions and start being a part of the unregulated, solid waste stream. Cleaning up the environment by regulating air emissions but not other waste streams is a lot like trying to fill up a balloon that has a hole in it. The job just cannot get done. For instance, the mercurial qualities of mercury mean that the element can move easily from one medium to another. Thus, if captured and disposed of

Similar high poverty rates are found in 118 of the 120 coal-producing counties, where power plant wastes increasingly are being disposed of in unlined, under-regulated mines, often directly into groundwater.

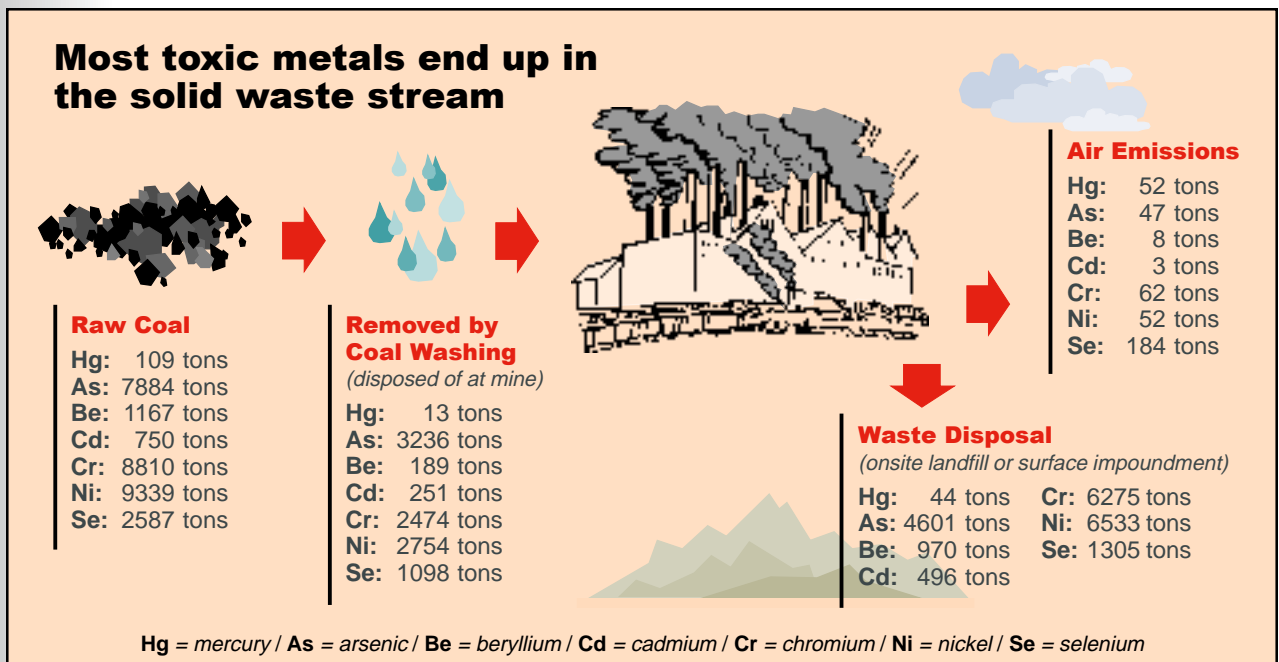
- Incredibly, disposal of these toxic solid and liquid wastes – 76 million tons per year of bottom ash, slag, and scrubber sludge are subject to **no federal rule whatsoever**, having been exempted from EPA rule by Congress for the past 20 years!

If EPA does not regulate this waste stream it will lose ground it has gained in cleaning up our air — and planned and likely future improvements in electric plant air emissions could be eroded. Make no mistake about

without special attention, mercury will simply re-enter the atmosphere.

Recently, “60 Minutes” aired a segment explaining how EPA ignored the possible impacts of a gasoline additive – MTBE – on drinking water when it approved the additive to reduce car emissions. EPA runs the risk of repeating that mistake here if it orders air emission clean up but lets the residual wastes be dumped with no environmental controls.

If the political exemption from regulating these wastes continues, the winner will be power plant owners who do not have to pay the real cost of environmental degradation caused by faulty handling of these wastes. The big losers are everybody else — particularly those who live in communities near these plants.



# The Solution

## Remove the Exemption— Regulate These Wastes

EPA has the authority to end the political exemption from regulation that today applies to coal and oil combustion wastes. After 17 years of delay and lawsuits, EPA is finally under federal court order to decide by March 10, 2000 whether these wastes should be regulated under the federal solid waste law, Resource Conservation and Recovery Act (RCRA). Unfortunately, despite overwhelming evidence supporting the need for environmental safeguards, EPA has made a preliminary determination in a March 1999 Report to Congress to **exempt** these wastes from control measures.<sup>1</sup>

EPA's own analysis and the agency record demonstrates that under today's solid waste management practices, contaminants such as arsenic, cadmium, chromium and selenium are leaching into groundwater, contaminating surface waters through runoff and direct discharge, and are being dispersed into the air by wind erosion and volatilization. As a result, the contaminant levels in groundwater near power plant waste disposal sites in some cases exceed primary and secondary federal drinking water standards and other health benchmarks. In addition, EPA's analysis and other peer-reviewed reports find that these facilities also threaten mammals, birds, fish and amphibians.



We are calling on EPA to designate these wastes as “hazardous” under RCRA, the Resource Conservation and Recovery Act. Coal and oil power plant combustion wastes require federal regulatory oversight because of the toxicity of their components, the demonstrated and documented danger they pose to public health and the environment. State rules are inadequate to control or mitigate these risks and dangers. The effect of a federal designation of these wastes as hazardous would be significantly tighter controls on disposal of these wastes in landfills and lagoons that lack minimal modern environmental controls such as liners, groundwater monitoring and leachate collection systems.

It's time for EPA to recognize power plant combustion waste disposal facilities for what they are: huge, unregulated toxic dumps. It's time for power plants to face the full cost of operating under *all* environmental performance standards, including solid waste disposal standards.

DAVID SCOTT



*Reptiles and amphibians living in sites contaminated with coal and oil combustion wastes have developmental, physiological and behavioral defects.*



DAVID SCOTT

## Background

The exemption of power plant combustion waste from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA) has been in place since 1980. The exemption is granted in the so-called "Bevill Amendment" to RCRA that excludes most coal and oil combustion wastes and other "special wastes" from hazardous waste rules, pending an EPA Determination to regulate.<sup>2</sup> Since 1993, EPA has been developing a Report to Congress and a draft Regulatory Determination as to whether so-called low-volume fossil fuel combustion (FFC) wastes that are co-managed with other wastes should be regulated as hazardous wastes. RCRA requires EPA to conduct a detailed and comprehensive study of the adverse effects on human health and the environment of the disposal and utilization of wastes generated from the combustion of fossil fuels.

Coal and oil combustion wastes will remain exempt from Subtitle C regulation until EPA makes a final Regulatory Determination. This Determination is due to be made by a court-ordered deadline of March 10, 2000. The facts can only support a determination to regulate these wastes under subtitle C of RCRA.

EPA recently proposed a commendable Determina-



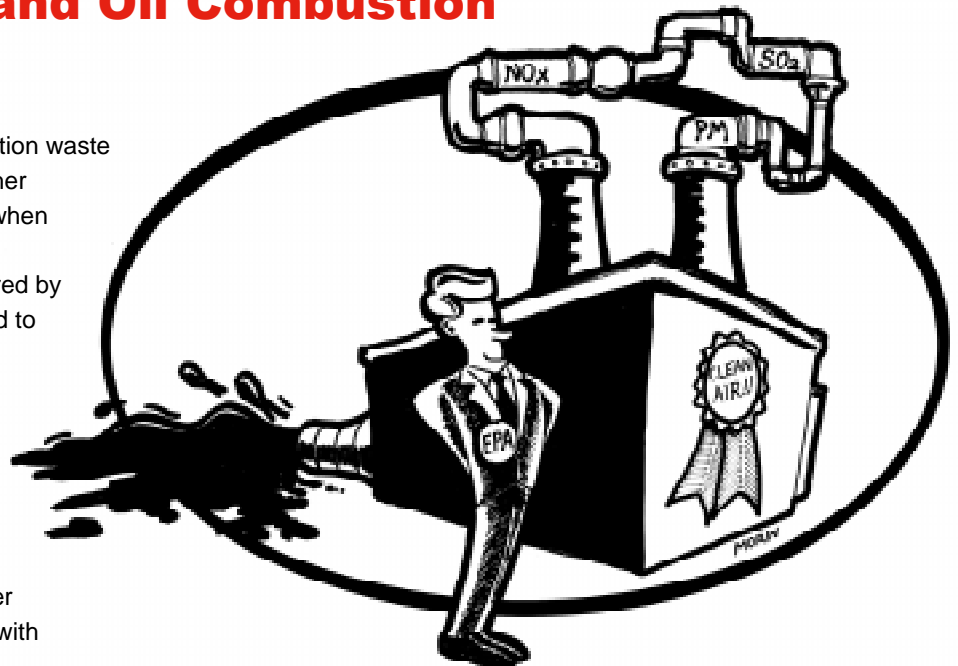
DAVID SCOTT

*100 million tons of solid and liquid wastes are generated each year from the combustion of coal and oil.*

tion to regulate cement kiln dust, another special waste under the Bevill Amendment.<sup>3</sup> Cement kiln dust is worthy of federal oversight, and certainly power plant combustion wastes merit federal regulation as well, since power plant combustion wastes present an even higher risk to human health and the environment. Table 1 lists the reasons EPA published in the Federal Register to support their Determination to regulate cement kiln dust.<sup>4</sup> As illustrated by Table 1, applying the same standards to coal and oil combustion wastes that were applied to cement kilns makes it clear that combustion wastes deserve regulation as well.

## What is Coal and Oil Combustion Waste?

Coal and oil power plant combustion waste is largely made up of ash and other unburned materials that are left when fossil fuels, like coal and oil, are burned. These wastes are captured by pollution control devices, installed to prevent emissions of particulate matter (soot) and other gaseous pollutants from the smokestack. Other combustion wastes are generated by other processes necessary to operate power plants, including cleaning the steam boilers. Most of these other wastes are liquid and are mixed with the solid ash wastes for disposal.



*EPA's plans to clean up pollution from power plants.*



**Table 1 — EPA’s Reasons for Regulating Cement Kiln Dust (CKD) Also Apply to FFC Waste**

<b>EPA’s Reasons for Regulating CKD</b>	<b>How These Reasons Apply to FFC Waste</b>
CKD contains listed metals and organics for which noncancer and cancer benchmarks have been established.	FFC waste contains similar constituents (especially metals) as CKD.
Listed constituents in CKD are high.	Similar constituents are higher in FFC waste.
There is a high potential for damage to groundwater from migration of listed constituents from CKD waste as demonstrated by 13 damage cases. Modeling results indicate human health risks of concern.	Groundwater degradation has been documented in 60 cases using the CKD damage criteria. Modeling of FFC waste indicates human health risks far higher than those estimated for CKD.
Metals in CKD are highly persistent in the environment.	Metals in FFC waste are equally persistent in the environment.
Constituents of concern in CKD waste are metals that do not degrade.	Constituents of concern in FFC waste are also metals that do not degrade.
Dioxins and furans in CKD waste can bioaccumulate.	Mercury in FFC wastes bioaccumulates to an even greater extent than dioxins and furans.
CKD is typically managed on-site in unlined and uncovered landfills and piles. Current management practices are similar to past practices that are inadequate to limit contaminant releases.	FFC waste is typically managed on-site in unlined and uncovered landfills and surface impoundments. Current management practices, including direct contact with groundwater, are also similar to past practices that are inadequate to limit contaminant releases.
In 1995, the cement industry generated an estimated 4.5 million tons of CKD waste.	In 1997, the utility industry generated an estimated 100 million tons of coal combustion waste.
EPA documented damage to groundwater and surface water at 16 sites, and 36 air violations.	EPA documented 5 damage cases for FFC waste; Hoosier Environmental Council documented 50 others.
State regulatory controls need to be improved as existing requirements vary substantially from State to State. The implementation of existing rules is uneven.	Existing requirements for FFC waste also vary substantially from State to State and implementation of existing authorities is “uneven” at best.

In addition to burning coal or oil, some power plants mix these fuels with other wastes and burn them together (known as co-firing). These other fuels often include a wide range of toxic or otherwise hazardous chemicals. Examples of these fuels can include auto shredder fluff (potential source of PCBs), oil combustion waste, railroad ties, plastics, tire-derived fuel and other materials.<sup>5</sup> The practice of co-firing hazardous materials with coal or oil at power plants introduces other types of toxic chemicals into the waste streams that could substantially impact the local area around the power plant. When co-firing, the stack emissions and combustion wastes of the power plant could resemble those of an uncontrolled hazardous waste incinerator. This is certainly an area that requires EPA’s attention.

Over 100 million tons of waste materials are generated during coal and oil combustion each year. About 76 million tons are disposed of while the rest is sold for manufacturing uses such as cement, wallboard and fill.<sup>6</sup> As stack emission controls become more effective, and the air becomes cleaner, the amounts and toxicity of these solid wastes is expected to increase. In order to reduce total releases of toxic pollutants to the environment, the EPA must act to regulate the entire waste stream from start to finish.

# Current Management Practices do not Prevent Releases of Toxic Combustion Wastes

Coal and oil power plant combustion wastes are typically disposed of in either landfills (for dry wastes) or surface impoundments (for liquid wastes).<sup>7</sup> Most of these facilities are unlined and are located at the same site as the power plant. Ideally these disposal units would prevent the wastes from entering the environment. Unfortunately, the level of protection afforded by these disposal methods varies greatly. In the real world, most wastes are disposed of in older surface impoundments that almost never have liners to prevent liquids from leaking (or leaching), underground leachate collection systems, or groundwater monitors. In some States, liquids from impoundments are not only allowed to percolate to the groundwater, the disposal units are actually designed to allow this.

Newer landfills offer the most protection to the public and the environment. Newer units are usually lined and have covers to prevent wind erosion and divert rainwater (thus reducing the generation of leachate from the waste). These units also usually have a leachate collection system as well as monitoring wells that sample groundwater around the site to make sure no contamination is occurring.

An industry survey of disposal units revealed that about 40 percent of the coal waste landfills and 80 percent of the coal waste surface impoundments do not have liners, and less than half the landfills and only one percent of impoundments have leachate collection systems.<sup>8</sup> In addition, there are also direct discharges to surface waters either by permitted discharges or overflow drainage from impoundments. Rarely, if ever,



JEFF STANT

*Coal combustion waste fill site where a pump is used to remove ground water.*

do permits limit the discharge of contaminants known to be in coal and oil combustion waste.

In addition to disposing of power plant combustion wastes in landfills and impoundments, many States where coal is mined have begun to dump tremendous amounts of combustion wastes into active unlined coal mines, and in some cases directly into groundwater. Typically, groundwater monitoring systems at the mine are completely inadequate for handling such a mass disposal program and no cleanup standards are enforced.

## Mercury Pathway Ignored by EPA Assessment

EPA's assessment failed to consider the most important pathway for mercury releases — the volatilization of mercury from landfills, impoundments, coal storage piles, fly ash and agricultural application. The disposal and use of waste products that contain mercury raises the question of whether these wastes stabilize the mercury or act as additional sources. Recent research suggests that mercury is not stable in most of these wastes and is subsequently emitted. The EPA report also fails to consider how future regulation of power plant air emissions may increase the concentration of mercury in the wastes.



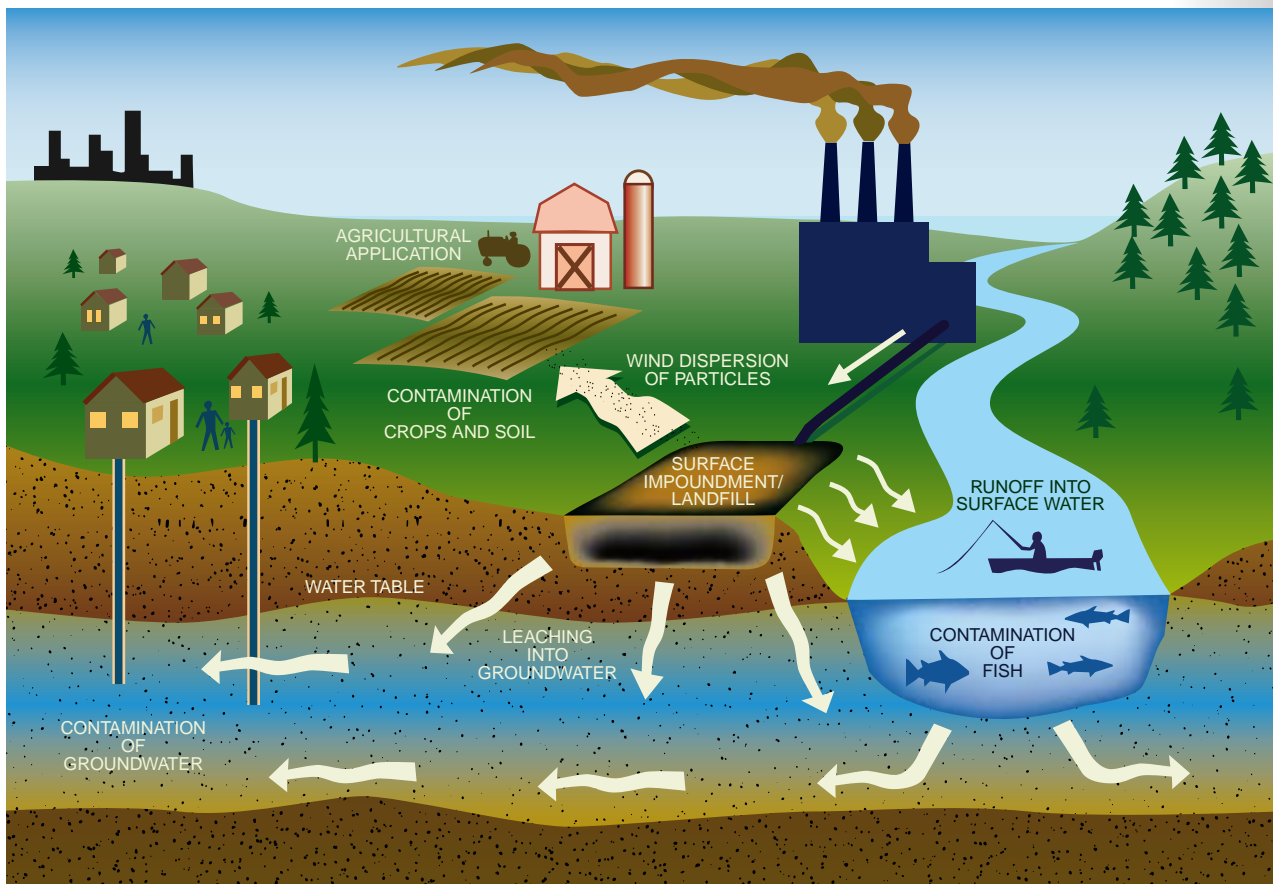
# Power Plant Combustion Wastes are a Threat to Public Health and the Environment

Power plant combustion wastes contain concentrated levels of numerous contaminants, particularly metals like arsenic, mercury, lead, chromium and cadmium, and radioactive elements found naturally in coal and oil.<sup>9</sup> Such organic compounds as polycyclic aromatic hydrocarbons have also been found in power plant wastes. If these contaminants enter the environment, either through dust, leaching into groundwater or from direct or overflow discharges into surface waters, they can contaminate drinking water supplies and accumulate in livestock and crops. People living in the vicinity of the power plant can be exposed to the pollutants in these wastes by ingesting groundwater into which the contaminants (especially metals) have leached, inhaling contaminants contained in windblown dust or from coming into contact with, or ingesting soils onto which these wastes have been applied.<sup>10,11</sup>

For children, soil ingestion, from coming into contact with dirt through play activities, is a particularly important route of exposure. People and wildlife are also exposed to selenium and mercury by eating contami-

nated fish from local waters affected by power plant wastes and air emissions. There are numerous examples of mercury fish consumption advisories in lakes and rivers in proximity to power plants. In Texas and North Carolina, selenium fish consumption advisories in certain reservoirs have been directly linked to power plant combustion waste disposal.<sup>12</sup>

Power plant combustion waste disposal has been documented as causing severe and potentially irreversible ecological damage.<sup>13</sup> The pollutants enter nearby surface water or farmland in water discharges from surface impoundments or overflow drainage systems and runoff from coal piles. Pollutants in their food chain may particularly affect amphibian, waterfowl and fish species. Some of the contaminants found in power plant wastes accumulate in animal tissues to levels hundreds of times higher than levels found in the environment. Deformities and even death in wildlife species have been documented after exposure to these pollutants.



# Health Risks from Combustion Waste Disposal are Above Typical EPA Action Levels

EPA assessed the human health impacts from toxic metals in FFC waste that leach from unlined landfills and surface impoundments and contaminate downgradient drinking water wells.<sup>14</sup> Many of these metals are known or suspected to cause cancer in humans. EPA found that if adults and children drink, over a period of years, an average amount of water contaminated with combustion waste, they have a higher risk



of cancer. These contaminants also persist in the environment and bioaccumulate in the food chain; they do not degrade over time. If children grow up in homes that use contaminated groundwater for their drinking water supply, they would be particularly vulnerable to the long-term effects, including cancer, associated with exposure to these contaminants. Appendix A summarizes the analyses that EPA did and the health effects of important pollutants found in combustion wastes.

According to the EPA Report, the average health risks to the public due to metals (including arsenic, nickel, chromium and selenium) from power plant FFC waste disposal units could be up to 10,000 times higher than EPA's allowable risk levels for cancer and other illnesses.<sup>15</sup> Some of the metals in FFC waste (like mercury) also impair the development of fetuses and children. As shown by Table 2, EPA's analyses show that power plant FFC wastes pose a threat to human health.



**Table 2 — Human Health Risks Associated with Power Plant Wastes (from EPA's Report to Congress)<sup>16, 17</sup>**

	Coal-fired combustion waste	Oil-fired combustion waste	FBC-fired combustion waste
<b>How People Are Exposed</b>	Do predicted risks exceed typical EPA action levels? <sup>a</sup>	Do predicted risks exceed typical EPA action levels?	Do predicted risks exceed typical EPA action levels?
<b>Groundwater<sup>b</sup></b>	YES	YES	YES
<b>Inhalation</b>	YES	NO	YES
<b>Agricultural Use</b>	NOT ASSESSED	NOT ASSESSED	NO
<b>Ingestion<sup>c</sup></b>	YES	YES	YES

<sup>a</sup> Typical action levels for EPA would be a one-in-one-million excess cancer risk or, for noncancer effects, a hazard quotient greater than 1.

<sup>b</sup> Exposure by ingestion of contaminated groundwater

<sup>c</sup> Exposure by ingestion of contaminated vegetables, soil, livestock and fish

FBC = Fluid Bed Combustion

# Who are the People Most At Risk?

Children living in the vicinity of power plants have the highest health risks. Adults are also at risk from contaminated groundwater and from inhaling dust from the facility. The poverty rate of people living within one mile of power plant waste facilities is twice as high as the national average and the percentage of non-white populations within one mile is 30 percent higher than the national average. Consequently, there may be other factors that make these people more vulnerable to health risks from these facilities. These include age (both young and old), nutritional status and access to health care. Also, these people are exposed to numerous other air pollutants emitted from the power plant smokestacks and possibly to air pollution from other nearby industrial facilities or lead paint in the home.

## Populations Most at Risk

	U.S. Population	Population Within 1 mile of Coal-Fired Power Plants
Total	271,000,000	836,097
Persons in poverty	34,500,000	162,100
Poverty rate	11.3%	20%
Children in poverty (under 18)	12,845,000	48,477
Percent non-white	17%	21.5%

Similar high poverty rates are found in 118 of the 120 coal-producing counties in America where power plant combustion wastes are increasingly being disposed of in unlined, under-regulated coal mine pits often directly into groundwater.

# Combustion Waste Disposal Contaminates the Environment

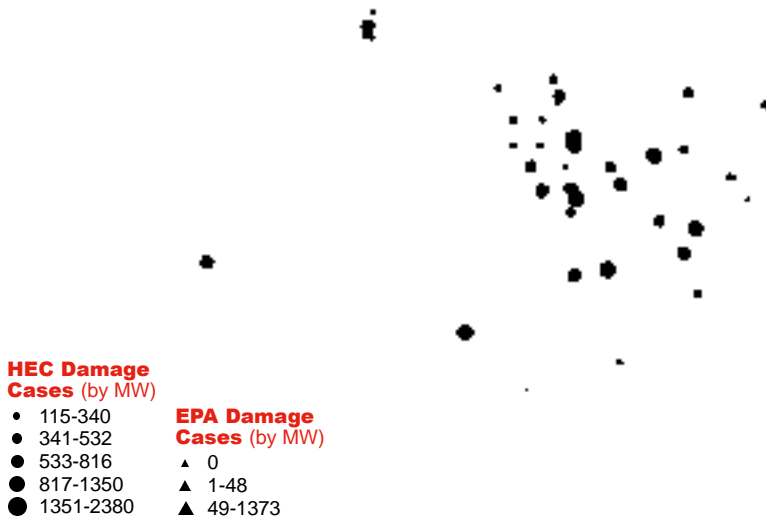
Over the past year, the Hoosier Environmental Council (HEC) has reviewed State records for about 60 coal and oil combustion waste disposal sites across the U.S. The records prove that metals and other inorganic pollutants from power plant combustion waste landfills and surface impoundments have contaminated groundwater near these facilities.<sup>18</sup> We believe this documented damage to be only the tip of the iceberg because we've found a problem everywhere we've



CHRISTOPHER ORRY / JOHN E. GAY

Catchment basin for coal ash landfill runoff drains into adjacent estuary.

## Damage Case Locations



MSB ENERGY ASSOCIATES

looked. Based on our experience to date, if there are groundwater monitoring data for a disposal site, it is likely to show contamination.

These “damage cases” document a significant and consistent degradation of water quality resulting from unregulated disposal of coal and oil combustion wastes, including exceedances of water quality standards to protect human health. To protect human health the EPA has established maximum contaminant levels (MCL) for



numerous pollutants, including many toxic metals. Secondary maximum contaminant levels (SMCL) have also been established to maintain the aesthetic quality of the drinking water (e.g. taste, odor). Water quality criteria (WQC) which are intended to protect aquatic life have also been established for some pollutants.

Even though MCLs and SMCLs have been established for most of the contaminants found in FFC waste, these contaminants were not routinely analyzed for in the damage cases. The sampling and analysis of various constituents is inconsistent from one damage case to the next because each State handles these cases differently. Analyses of more toxic constituents that are found at much lower concentrations are less likely to be conducted in the initial site investigations. Most of the available information from the damage cases indicates a predominance of contaminants that have secondary standards, such as total dissolved solids and sulfates, because these contaminants are easily measurable. Equally important, these measurements serve as indicators that more toxic contaminants are also leaching from the disposal site.

Summarized below are the results for 21 damage cases.<sup>19</sup> The amount of contamination varied from site-to-site, but the established criteria for these criteria were exceeded at almost all of the 21 sites.

## Examples of Damage

Two sites owned by the Tennessee Valley Authority (TVA) have been documented to be causing significant groundwater contamination. Power plant waste sites at TVA's Widows Creek and Colbert power plants have caused exceedances of drinking water and health advisory standards. At Widows Creek there have been exceedances for lead, iron, manganese, aluminum, sulfates and boron. The Colbert site has exceeded standards for sulfate, chromium, selenium, iron, molybdenum and boron. There are at least two Superfund sites associated with disposal of power plant FFC wastes: the Vitale Fly Ash Plant in Massachusetts and the Chisman Creek power plant in Virginia.

## Documented Contamination from 21 Sites

Pollutant	Exceeds Human Health Standard for Drinking Water <sup>1</sup>	Exceeds Taste & Odor Standards for Drinking Water <sup>2</sup>	Exceeds Acute Standards for Aquatic Life <sup>3</sup>	Exceeds Chronic Standards for Aquatic Life <sup>3</sup>
Sulfate	✓	✓	no standard	no standard
Total Dissolved Solids	no standard	✓	no standard	no standard
Boron	no standard	no standard	✓	✓
Manganese	no standard	✓	no standard	no standard
Iron	✓	✓	✓	✓
Sodium	✓	no standard	no standard	no standard
Chlorine	no standard	✓	✓	✓
Aluminum	✓	no standard	✓	✓
Arsenic	✓	no standard	✓	✓
Cadmium	no standard	no standard	✓	✓
Selenium	✓	no standard	✓	✓
Zinc	no standard	no standard	✓	✓
pH	no standard	✓	no standard	no standard

<sup>1</sup> defined as MCL, maximum contaminant level

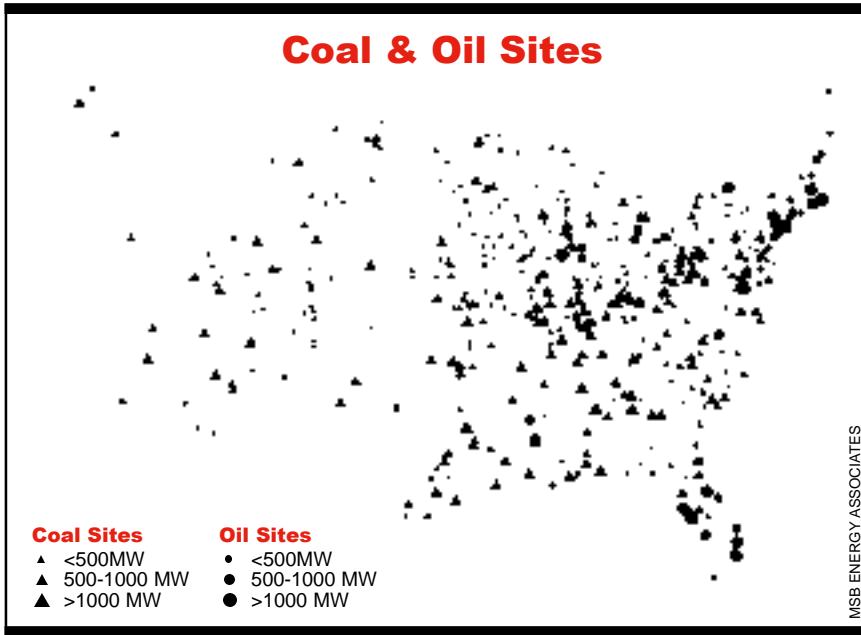
<sup>2</sup> defined as SMCL, secondary maximum contaminant level

<sup>3</sup> defined as WQC, water quality criteria

# State Oversight of Coal and Oil Combustion Wastes is Insufficient

As demonstrated by the number of damage cases and the extent of contamination found, State oversight of coal and oil combustion wastes is insufficient. Table 3

shows that State regulatory programs for power plant combustion wastes vary widely from State to State.<sup>20</sup> Some States require groundwater monitoring and



protective liners while others keep no records whatsoever of these disposal units. While basic design requirements apply to newly built units, old units are typically exempted from regulatory requirements. For this reason, there have been very few new disposal units built in the U.S for many years. Instead, the old units are expanded in ways that avoid control requirements that would apply to a new unit. Usually several different offices within the State have jurisdiction over these facilities, making it difficult to find information. These include the offices that deal separately with solid waste, hazardous waste, mining, water quality and in some cases, air quality.

**Table 3 — Sample of State Programs for Coal and Oil Combustion Waste**

State	Number of Damage Cases		Groundwater Monitoring Required?	Comments
	EPA Cases	HEC Cases		
Kentucky	0	1	Yes	Landfills are unlined but are required to monitor groundwater. No surface impoundments are lined.
Illinois	0	8	Yes, most sites	Some surface impoundments are lined, but State is not sure how many as there is no documentation.
Texas	0	4	No	State could not supply any information because a permit is not required for onsite management or if waste is disposed of on company land within 50 miles of the facility.
Iowa	1	1	No	Surface impoundment seepage is limited to 1/16 <sup>th</sup> of an inch a day, which is 10X more permeable than a typical landfill liner. There is neither groundwater monitoring nor liners at any surface impoundments. In 1998, State legislature rescinded requirements for leachate collection and liners at landfills.
So. Carolina	0	2	Yes	No surface impoundments are lined.
Alabama	0	2	Yes	No written records of management units and, according to state personnel, “no evidence” of liners.

## What Can EPA Do About this Problem?

In 1980, Congress specifically exempted coal and oil power plant combustion wastes from hazardous waste rules until such a time that EPA decides whether the exemption should be removed. In March 1999 EPA submitted a report to Congress in which they made a preliminary determination that combustion wastes should be exempted from Federal rules for hazardous wastes. Their reasoning was that State pollution control programs and voluntary efforts by industry to manage these wastes are sufficient. EPA has reached this preliminary

conclusion based solely on information supplied by the utility industry, but the environmental community has gathered substantial evidence showing that most State programs are not adequately regulating the disposal of FFC wastes.

These wastes should be characterized as hazardous waste and federally regulated under subtitle C of RCRA based on the risks combustion wastes pose to human health and the environment. State programs are too variable and are applied too unevenly to deal with this issue.



DAVID SCOTT

### We are calling on EPA to:

- Make a positive regulatory determination for coal and oil power plant combustion waste, as they did for cement kiln dust.
- Apply consistent Federal rules to combustion waste management units across the Nation to end the “subsidy” to power plants in those States where rules are less stringent and therefore less expensive.
- Require state-of-the-art controls for all units, both new and existing, to ensure protection of public health and the environment. These measures include liners and covers, siting requirements, groundwater monitoring, and cleanup requirements to ensure protection of our groundwater and surface water resources.
- Require reporting and record keeping that are sufficient to guarantee enforcement.
- Ensure that beneficial uses, such as agricultural applications, do not contaminate the environment.
- Ensure that minefilling does not degrade groundwater.



**Groundwater Contamination<sup>1</sup>**

Populations at risk evaluated by EPA	Human Exposure Pathways	FFC Waste Constituent of Concern	Potential Health Effects
Adult & children residents	Ingestion of groundwater contaminated by FFC waste constituents leaching from unlined disposal units	Arsenic	Known human carcinogen. Skin damage; circulatory system problems reported in humans; ingestion associated with lung, skin, bladder & liver cancer. <sup>2</sup>
		Chromium VI	Exposure to high levels in drinking water could result in allergic dermatitis over many years could experience allergic dermatitis. <sup>2</sup>
		Nickel	Certain forms are potential carcinogens. Consuming large amounts has been reported to cause lung disease in dogs & rats & to affect the stomach, blood, liver, kidneys, immune system & reproduction & development in rats & mice. <sup>2</sup>
		Selenium	People exposed to very high levels of selenium in have reported dizziness, fatigue, irritation, collection of fluid in the lungs, & severe bronchitis. The exact levels at which these effects occur are not known. Upon contact with skin, selenium compounds have caused rashes, swelling, & pain. If too much selenium is eaten over long periods of time, brittle hair & deformed nails can develop. People may also lose feeling & control in the arms & legs. <sup>3</sup>

**Non-Groundwater Contamination<sup>4</sup>**

Populations at risk evaluated by EPA	Human Exposure Pathways	FFC Waste Constituent of Concern	Potential Health Effects
Farmer & child of farmer	Wind dispersion & direct inhalation of contaminated dust particles from uncovered disposal units.	Chromium VI	EPA has classified chromium VI as known human carcinogen by inhalation. <sup>5</sup>
Adult resident, home gardener, farmer & child of farmer	Ingestion of fruits, vegetables, beef, & dairy contaminated by runoff, wind dispersion & direct deposition of waste, or use of waste as an agricultural soil amendment.	Arsenic	Known human carcinogen. Skin damage; circulatory system problems; ingestion associated with lung, skin, bladder & liver cancer. <sup>5</sup>
		Barium	Potential effects on blood pressure in humans, & both blood pressure & kidney function in animals. <sup>5</sup>
		Beryllium	EPA considers beryllium a probable human carcinogen of moderate to low potency. Causes intestinal lesions. <sup>5</sup>
		Thallium	A study on workers exposed on the job over several years reported nervous system effects, such as numbness of fingers & toes, from breathing thallium. Changes in blood chemistry in animals. <sup>2</sup>
Fisher	Ingestion of fish contaminated by runoff, direct discharge, & direct deposition of particles into surface water body near disposal unit; constituents then bioaccumulate in fish	Methylmercury	Methylmercury is a developmental neurological toxin that can cause subtle deficits in behavior & cognitive development that are difficult to measure until the children are older. Pregnant women & children that ingest above average amounts of fish are particularly at risk. In adults, methylmercury can interfere with the function of cerebellum & visual cortex. <sup>3</sup>

**Footnotes:**

<sup>1</sup> EPA, 1998. Technical Background Document for the Supplemental Report to Congress on Remaining Fossil Fuel Combustion Wastes: Ground-water Pathway Human Health. Risk Assessment Revised Draft Final. Office of Solid Waste. June.  
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**Endnotes**

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<sup>5</sup> Op. cit. U.S. EPA, 1999a.  
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