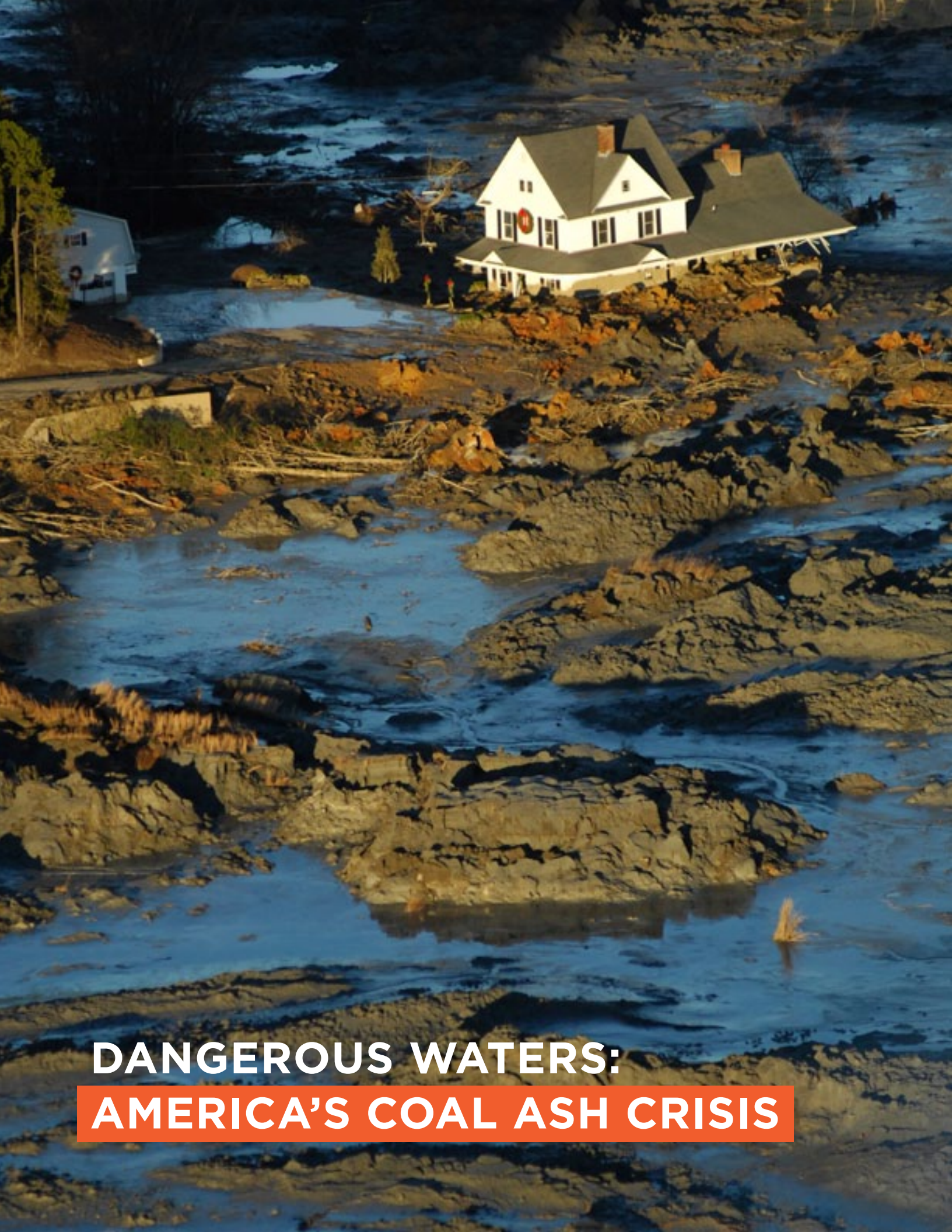

DANGEROUS WATERS:
AMERICA'S COAL ASH CRISIS

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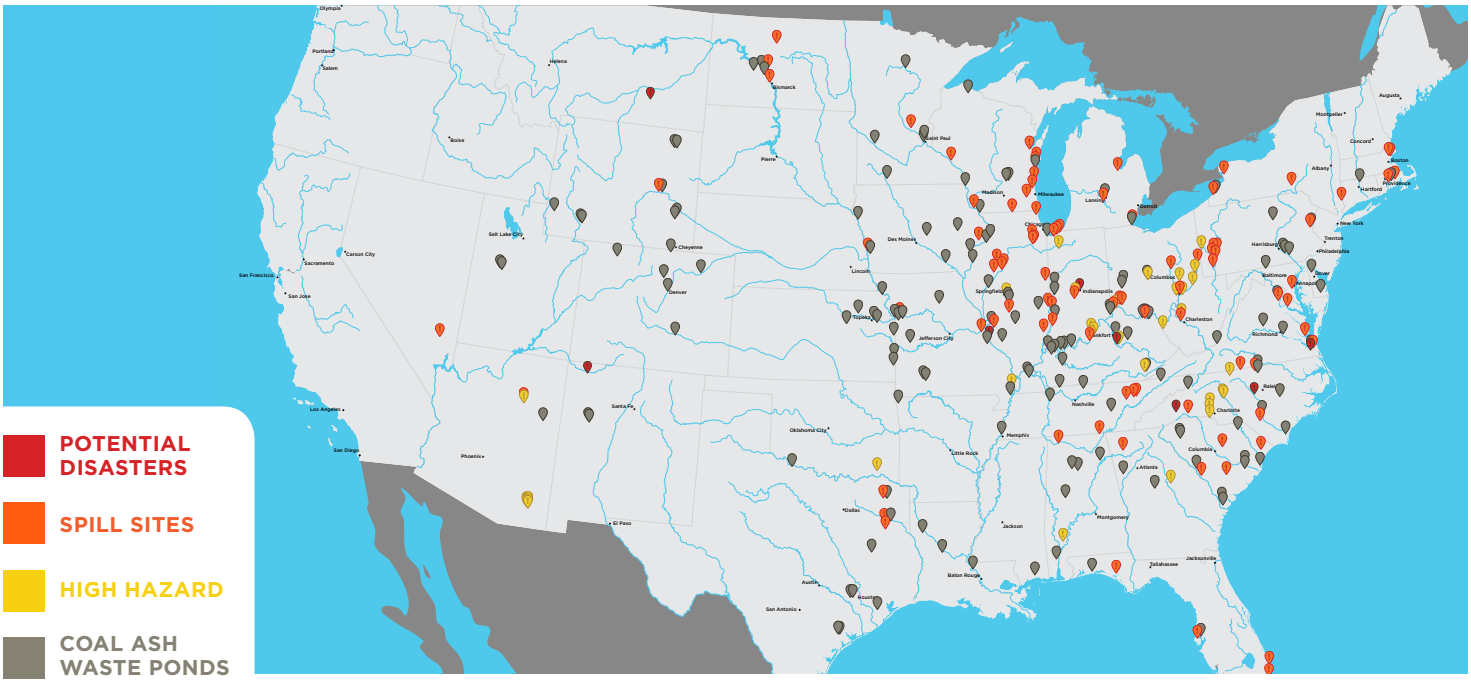


*THE EPA NOW ASSIGNS HAZARD RATINGS TO COAL ASH PONDS:
"HIGH HAZARD" INDICATES THAT AN IMPOUNDMENT FAILURE WOULD LIKELY CAUSE LOSS OF HUMAN LIFE;
"SIGNIFICANT HAZARD" INDICATES THAT AN IMPOUNDMENT FAILURE WOULD CAUSE SIGNIFICANT ECONOMIC, ENVIRONMENTAL, OR INFRASTRUCTURE DAMAGE.
VISIT HTTP://CONTENT.SIERRACLUB.ORG/COAL/WATER TO VIEW AN INTERACTIVE MAP OF THESE SITES.

DANGEROUS WATERS: AMERICA'S COAL ASH CRISIS

Each year, coal-fired power plants in the United States produce 140 million tons of hazardous solid waste, known as coal ash. Much of this waste is stored in more than 1,400 sites in 45 states. Coal ash pits vary widely, based on whether waste is stored in ponds (wet impoundments) or landfills (dry impoundments) as well as on their size and the level of hazard they present to human life.

Coal ash pits often reside adjacent to the power plants that produces their toxic contents. Because vast quantities of water are consumed in coal power generation, these power plants lie beside large sources of water, including our Great Lakes, aquifers, and many of our most important and iconic rivers.

Coal ash is the byproduct of coal combustion mixed with other hazardous compounds including those used to clean coal furnaces (imagine oven cleaner on an industrial scale). As technology has allowed power plants to capture more hazardous pollutants that would have gone into our air, these toxins — including mercury and arsenic — increasingly become part of the solid waste mixture that is coal ash. We have essentially traded one form of toxic pollution for another.

THE RISKS OF COAL ASH

When coal ash spills, leaks or leaches into nearby groundwater or waterways, the toxins contained within pose serious health risks to nearby communities. In fact, the Environmental Protection Agency (EPA) found that living near certain coal ash ponds is significantly more dangerous than smoking a pack of cigarettes a day.

A person living within one mile of an unlined coal ash pond that co-disposes of coal refuse has a 1 in 50 lifetime risk of cancer — more than 2,000 times higher than the EPA goal for cancer risk. According to the EPA, 1.54 million American children live near coal ash storage sites.[1]

Coal ash contains many toxic contaminants, including arsenic, lead, mercury, hexavalent chromium, and

selenium, as well as aluminum, barium, boron, and chlorine. These toxins can cause cancer, heart damage, lung disease, respiratory distress, kidney disease, reproductive problems, gastrointestinal illness, birth defects, and impaired bone growth in children. In short, coal ash toxics have the potential to damage every one of our major organ systems.

NO FEDERAL SAFEGUARDS

Incredibly, there are no federal standards for the storage and disposal of coal ash to protect communities and waterways from coal ash pollution; no federal standards exist for monitoring groundwater or reporting coal ash pit integrity or pollution. What exists in place of a strong, uniform standard is a disjoined and ineffective jumble of state-based regulations.

Many coal ash dumps lack basic safety features and regular inspections, leaving communities at risk of large-scale disasters like those in Kingston, Tennessee (see box: The Kingston Disaster) and North Carolina (see section: The Dan River Spill). Far more common than a full impoundment failure, however, are the unreported slow leaching of coal ash and pond overflows that pollute our water. Many states do not require owners to line coal ash ponds or monitor nearby groundwater. The EPA has confirmed water contamination from coal ash in every state where coal ash is stored — more than 200 cases in all. However, because there are no federal standards to require reporting, the full picture of coal ash pollution and the damage it causes remains murky.

PUBLIC DEMAND FOR COAL ASH PROTECTIONS

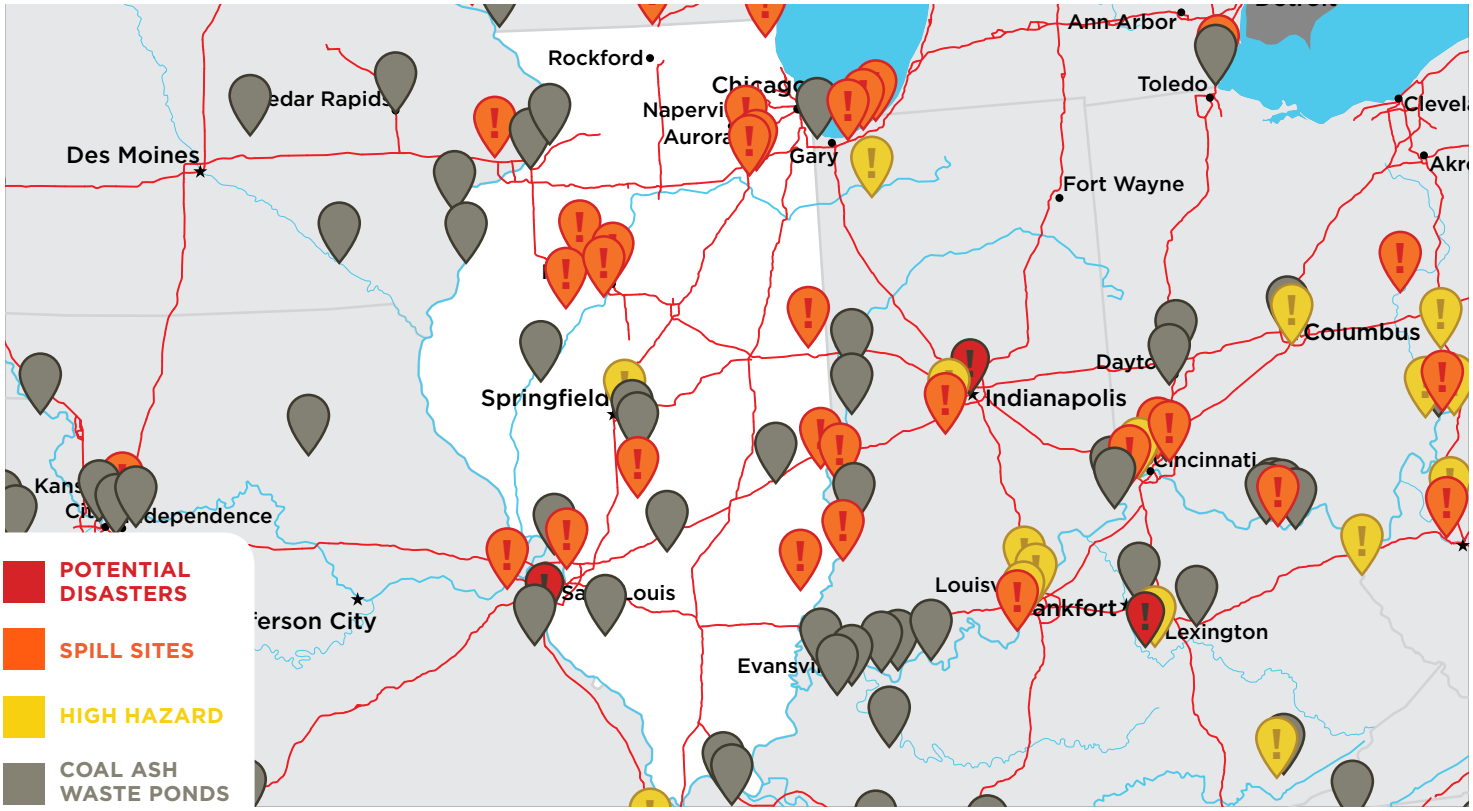
As part of a settlement with affected communities and environmental groups, the U.S. Environmental Protection Agency must finalize new federal standards for the disposal of coal ash by the end of 2014.

Communities on the frontlines of the coal ash fight, as well as public health and environmental groups, are calling for strong, federally enforceable protections for public health and safety. These safeguards should include:

- Phasing out dangerous wet impoundments and cleaning up and closing existing ponds;
- Ensuring coal ash landfills are properly lined and that groundwater around the sites is monitored for contamination;
- Requiring owners to clean up coal ash contamination before it enters drinking water and waterways;
- Requiring owners to provide “financial assurance” in order to protect the community and taxpayers from the cost of cleanup.

THE KINGSTON DISASTER

On December 22, 2008, a massive coal ash dam failed at the Kingston Fossil Plant in Kingston, Tennessee, releasing a river of toxic coal ash sludge into the surrounding community. In what is the largest toxic waste spill in U.S. history, 1.1 billion gallons of toxic sludge poured across 300 acres of land, damaging or destroying 40 homes, and polluting the Emory and Clinch Rivers. Already the Tennessee Valley Authority has spent more than $1 billion in clean-up efforts, and the total economic impact of the spill is estimated at upwards of $3 billion.



THE TOXIC LEGACY OF COAL ASH IN ILLINOIS

With 58 operating coal ash dams and 15 "legacy" ponds that still pose a danger to adjacent communities, Illinois ranks first in the nation in total number of coal ash ponds. Taking only active coal ash ponds into account, Illinois ranks second in total surface area for its coal ash ponds with over 3.3 square miles of coal ash wet impoundments. After EPA inspections of 38 Illinois coal ash ponds for structural stability, the agency rated 16 ponds in the state in "poor" condition. Only 3 of the 38 ponds inspected were rated "satisfactory."

Despite the substantial threat these numerous large coal ash sites pose to Illinois communities, state protections are sorely lacking. State regulation does not require liners or groundwater monitoring for all coal ash sites, and the Illinois Environmental Protection Agency (IEPA) recently found that only a third of the state's coal ash ponds are lined or monitored.

A 2010 IEPA assessment categorized 10 active coal ash sites in Illinois as having "high" to "very high" potential to contaminate nearby drinking water sources. Coal ash has already been found to have contaminated groundwater countless times at all 15 site across the state that have been studied. Harmful pollutants discovered at these sites include arsenic, boron, chloride, iron, lead, manganese, mercury, nitrate, elevated pH, selenium, sulfate, and thallium.[2]

Sites where contamination has been found are Powerton Station, Duck Creek Station, Hennepin Power Station, Havana Power Plant, Vermilion Power Station, Hutsonville Power Station, Wood River Power Station, Coffeen/White & Brewer Fly Ash Landfill, Lakeside Power Station, Joppa Power Station, Prairie Power Pearl Station, Ameren-Meredosia, Waukegan, Venice Plant, and Joliet 29, Marion Plant, and Joliet 9 Generating Station.[3]

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	✓
Liners Required for New Sites*	None	None
Site Construction in Water Table Prohibited*	None	✓
Financial Assurance Required	✓	✓

**REQUIRED ON AN AD HOC BASIS BUT NOT UNIFORMLY BY LAW.*

Following major coal ash spills in Tennessee and North Carolina, the IEPA is moving forward with new rules for coal ash ponds. However, the state's proposed rules fall short of protecting Illinois communities from the serious harm that coal ash pits pose. For example, while the rules would require a facility to take corrective action if the site is found to be contaminating groundwater, they would not require that the site be closed. Further, the rules would not require complete removal of waste when a coal ash pit is retired. Many of the state's coal ash pits are located in floodplains or other sensitive areas. Allowing toxic coal ash to remain, rather than requiring it be moved to lined landfills, represents an unacceptable risk to nearby communities.

Local activists and environmental groups in the state have also called for owners to provide financial assurances for all coal ash pits, so communities don't get stuck with the bill for cleanup along with a phase out of coal ash wet storage and a move to dry landfill storage; an assessment of all sites for potential breaches and dam failures; and greater public engagement including public comment on plans to correct and close pits, and public IEPA meetings to address community concerns.[4]

Due to documented water impacts and lax regulation, Sierra Club, Environmental Law & Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment filed legal action before Illinois's Pollution Control Board to force plant operators to clean up ash ponds that are causing unsafe levels of arsenic, antimony, boron, chloride, iron, lead, manganese, mercury, nitrate, selenium, sulfate, and thallium in groundwater resources.

Coal ash throughout Illinois, and in particular at the E.D. Edwards coal plant owned by Dynegy (detailed in the following section of this report), pose serious concerns for public health and the safety of our waterways, groundwater, and drinking water sources. The ongoing challenges that communities face in remedying the problem of coal ash pollution — in Illinois and in all states where coal ash is stored — point to the need for strong federal safeguards.

ILLINOIS: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**84**
High-Hazard Sites	**2**
Significant Hazard Sites	**22**
Documented Cases of Water Contamination or Spills	**20**

DISASTER WAITING TO HAPPEN: THE E.D. EDWARDS COAL PLANT

The outdated and unlined E.D. Edwards coal-fired power plant in Bartonville, owned by Dynegy, lies on the banks of the Illinois River. It has operated for more than 50 years and still pollutes central Illinois communities including Peoria, Bartonville, Pekin and East Peoria.

Throughout its half century of operations, the E.D. Edwards plant has stored large amounts of coal ash dangerously close to the Illinois River. The accumulated toxic coal ash currently sits in an 89-acre, 32-foot-deep pond near the plant and has caused documented groundwater contamination around the site. This legacy of pollution has left the Illinois River "impaired" for mercury, leading the state of Illinois to post fish consumption warnings.[5]

> "It is disheartening to know that polluters are given a free pass to discharge toxic metals into our waterways. The Illinois River, Pekin Lake and our other local fishing spots define summertime here in Peoria. We boat, we fish and we recreate in that water. Right now, the fish that come from the Illinois River is too dangerous to eat. Our families and our rivers deserve better than toxic pollution."
>
> *— Jacob Leibel, Peoria Resident and member of the Central Illinois Healthy Community Alliance*

By the company's own reported data, the E.D. Edwards plant discharges over four million gallons of coal ash wastewater into the Illinois River *each day*. The ash discharge — a cocktail of bottom ash and fly ash — carries with it toxic metals like arsenic, lead and mercury. To date, the Illinois Environmental Protection Agency has failed to place limits under the plant's water discharge permit on the amount of dangerous heavy metal pollution that the E.D. Edwards plant can send from its ash ponds into the river.[6]

ASH POND SAFETY RISKS

The Illinois River is already designated as an impaired waterway because of mercury contamination. Active coal-fired power plants are the largest sources of these toxic pollutants nationally.

The E.D. Edwards coal plant sits on the Illinois River upstream from recreational areas where families gather, including Pekin Lake and fishing sites along both sides of

E.W. EDWARDS'S COAL ASH POND	
Number of Coal Ash Ponds	**1**
Total Known Capacity	**587,000,000 gallons**[7]
Hazard Level	**Signficiant**[8]
Known Groundwater Contamination	**Sulfate, iron, manganese**
USEPA Geologic Vulnerability Rating	**Very High**
Dam Safety Permit Required for Pit?	**No**
USEPA Potable Well Contamination Potential	**High**

the river. The Edwards plant puts the health of families who enjoy Peoria's resources at risk by discharging toxic polluted water.

UNCERTAINTY ABOUT THE FUTURE, DYNEGY'S RESPONSE TO A POTENTIAL COAL ASH DISASTER

Dynegy, a Texas-based energy company, took over ownership of the E.D. Edwards coal plant in late 2013 after decades of ownership by Ameren.

Dynegy requested a variance from the Illinois Pollution Control Board (IPCB) to have until 2020 to comply with Illinois's Multi-Pollutant Standard, established in 2006 to require reductions in life-threatening air pollution from Illinois coal plants. The company claimed that complying with Illinois's common-sense clean air standard would cause it undue financial hardship. The IPCB voted three to one in favor of granting the variance, with the dissenting opinion of IPCB Chair Deanna Glosser doubting Dynegy's claims of financial hardship.

Dynegy's history of bankruptcy and mismanagement begs the question of how the company would financially or environmentally handle a coal ash disaster at the E.D. Edwards coal ash pit. Local residents are wary of Dynegy's track record for coal ash in the State of Illinois because the coal ash pit at Dynegy's retired Vermilion coal plant is also fouling local water.

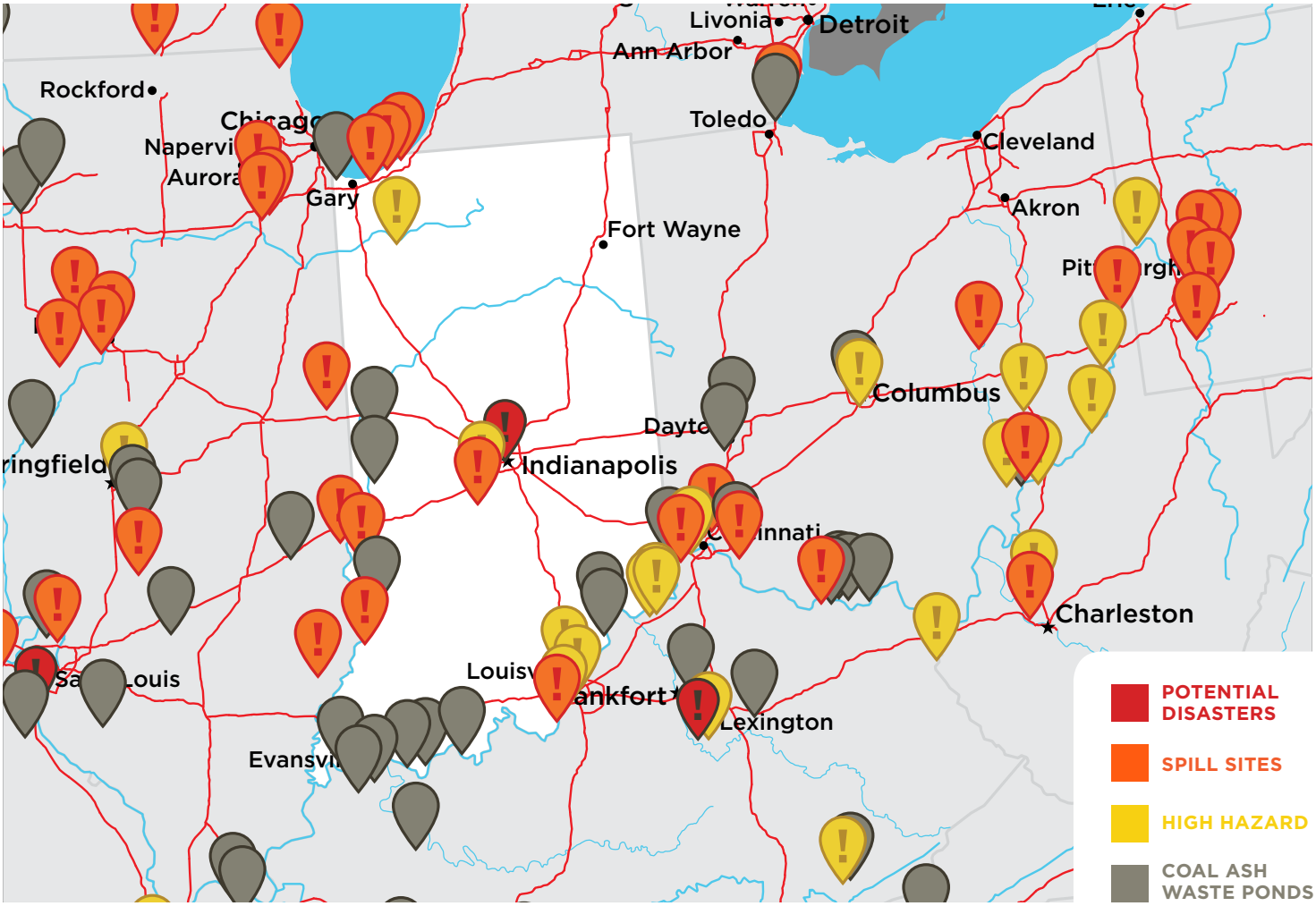
In the company's quarterly report to the U.S. Securities Exchange Commission in summer 2013, Dynegy explained that it has been doing "hydrogeologic" investigations at the Vermilion coal plant site, and results have shown that the coal ash pits are affecting groundwater in the area.[9] This leaking coal ash pit is also close to Illinois's only National Scenic Waterway, the Middle Fork Vermilion River.

Residents across the State of Illinois have been spurred to action after witnessing the coal ash catastrophe unfold along the Dan River in North Carolina. In order to keep the burden of cleanup off the shoulders of small Illinois communities, a strong state coal ash rule that will determine how and when utilities close and clean up dangerous coal ash pits is vital.

At statewide hearings on the Illinois coal ash rule, residents living in near coal ash pits have asked the IPCB to require the removal of coal ash from failing pits to high and dry landfills, allow for the assessment and prevention of damage to rivers and lakes, and provide more opportunity for public input. They are also urging a requirement that power companies provide financial assurances so that taxpayers aren't left paying the bill for coal ash disaster clean-up.

Illinoisans — and all Americans — deserve strong, federally enforceable coal ash protections. They will continue to work for change at the state level, but the U.S. Environmental Protection Agency must act to protect the health, safety and financial future of all communities put at risk from coal ash pollution.

> "Illinois's aging coal ash pits were built in places they never should have been — over mine voids and in floodplains of rivers. Our state can't afford to take on the liability and expense for more groundwater contamination from ash pits or clean up after one of these toxic dinosaurs collapses into one of our rivers. Governor Quinn and our state regulators have the opportunity right now to enact rules that will prevent disaster and ensure the utilities are taking responsibility."
>
> *— Traci Barkley, Water Resources Scientist with Prairie Rivers Network*



THE TOXIC LEGACY OF COAL ASH IN INDIANA

Coal-fired power plants in the Hoosier State produce a whopping 9.5 million tons of coal ash waste each year, making it second in the nation in the amount of coal ash it generates. Indiana has more operating coal ash ponds than any other state in the nation.[10]

Indiana has some of the weakest protections for residents, property, and water quality from the dangers of coal ash. According to Earthjustice:[11]

1. State regulations fail to require the safe disposal of coal ash and to require appropriate safeguards, such as pond liners to protect groundwater, groundwater monitoring, regular inspections, emergency response plans, and design of levees and dams by professional engineers.
2. Indiana's record of spills and drinking water contamination is among the worst in the nation: 15 contaminated sites and spills, including a Superfund site involving contaminated wells in the Town of Pines that has still not been cleaned up.

The state has an alarmingly poor record of coal ash dam safety and water contamination, lacking many basic protections against coal ash pollution. In fact, of the 41 coal ash dams inspected by the U.S. Environmental Protection Agency in Indiana, 25 (60 percent) were rated in "poor" condition.

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	None
Liners Required for New Sites	None	None
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	✓

There have been two major spills from coal ash ponds at the Eagle Valley Generating Station in Martinsville (each involving upwards of 30 million gallons of contaminated water) and two spills at the R.M. Schahfer in Wheatfield. Coal ash pollution has contaminated groundwater at 11 sites, including at the Town of Pines, where leaking coal ash from a nearby pond contaminated drinking water with arsenic, boron, molybdenum and other toxic substances, requiring installation of a public water system and leading to the town being designated a federal Superfund site.

Safeguards to protect the public from coal ash disasters like those that took place in Tennessee and North Carolina are nonexistent in Indiana. Indiana has no requirement that coal ash dams be designed by a professional engineer, no requirement to inspect dams, no reporting requirements, no inundation mapping in case of floods, no requirement for emergency action plans, and no financial assurance requirements.

Similarly, state law fails to protect drinking water and surface water from the leaching of toxic chemicals from coal ash. The state does not require groundwater monitoring or liners at all ponds and landfills. Regulations even fail to prohibit dumping of coal ash directly into the water table.[12]

Indiana's 11 documented cases of water contamination by coal ash pollution, the poisoning of an entire town's drinking water, its four large ash pond spills, and 25 coal ash dams with "poor" ratings are the direct result of the state's lack of safeguards. You will also read in the following section about the risks to the health and safety of the surrounding community posed by the Harding Street Station in Indianapolis. Together these sites — and dangerous coal ash sites across the country — show the need for strong, federally enforceable protections.

INDIANA: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**78**
High-Hazard Sites	**5**
Significant Hazard Sites	**37**
Documented Cases of Water Contamination or Spills	**15**

DISASTER WAITING TO HAPPEN: HARDING STREET COAL ASH

For more than 50 years, Indianapolis Power & Light's (IPL) Harding Street coal-burning power plant has sent toxic pollution into the air, land, and water of Indiana's largest urban area. Located just 15 minutes from downtown Indianapolis, IPL's Harding Street plant is the biggest polluter in Marion County – responsible for 88 percent of industrial toxic emissions reported to the U.S. Environmental Protection Agency's Toxic Release Inventory.[13] More than 35,000 people live within three miles of the plant.[14]

For as long as IPL has been burning coal on the south side of Indianapolis, it has been dumping toxic coal ash waste into unlined ponds located adjacent to the Harding Street plant. The plant's five coal ash ponds, two of which are rated "high hazard" by the U.S. Environmental Protection Agency for their potential to cause loss of human life in the event of a dam breach, sit just a stone's throw from the White River and lie upstream from nearby neighborhoods. According to EPA records, above-ground levees holding back the coal ash are more than 17,000 feet long and up to 48 feet high.[15] When full, the ponds could contain more than 310 million gallons of coal ash and contaminated water.[16]

THREATS TO DRINKING WATER

Though the Harding Street plant has long disposed of its waste in coal ash ponds, IPL does not monitor groundwater adjacent to these ponds or report results to state or federal agencies. Historic records from the Marion County Public Health Department show groundwater contamination in monitoring wells at the perimeter of the ash ponds in the 1980s.[17] According to J. Russell Boulding, a geologist hired by the Hoosier Environmental Council, concentrations of arsenic were twice the EPA standard for drinking water and mercury levels were 20 times over the standard. Boron results were three times EPA's child health advisory for drinking water.[18]

> "The nearest residential area, a neighborhood known as Sunshine Gardens, is located only 1.5 miles downstream from the Harding Street Station coal ash ponds.
> Many residents of this neighborhood rely on groundwater wells for their drinking and household water.
> The water wells used by residents of this neighborhood are located in the same White River outwash aquifer that lies below the Harding Street Station."
>
> —*Hoosier Environmental Council*

"The high concentrations of signature coal ash contaminants arsenic and boron dating from the late 1980s suggest that contaminants have been migrating from the ash ponds for a considerable amount of time," Boulding said in his March 2014 report. "Given the highly permeable character of the sand and gravel aquifer, contaminants may have migrated well beyond the perimeter monitoring wells in the [past] twenty-five years."

Boulding concluded that contamination could potentially have spread to private drinking water wells in the Sunshine Gardens neighborhood and could even pose a threat to the city's major drinking water wells nearby. In April, the Marion County Public Health Department agreed to test private wells in the area for boron, a marker of coal ash contamination.[21] The Sierra Club is calling for further investigation to determine the extent of groundwater contamination under the ponds and how far it has traveled. Residents have a right to know whether their drinking water is contaminated today and, if not, that it will be protected from future spread of contamination.

DANGEROUS HIGH HAZARD PONDS

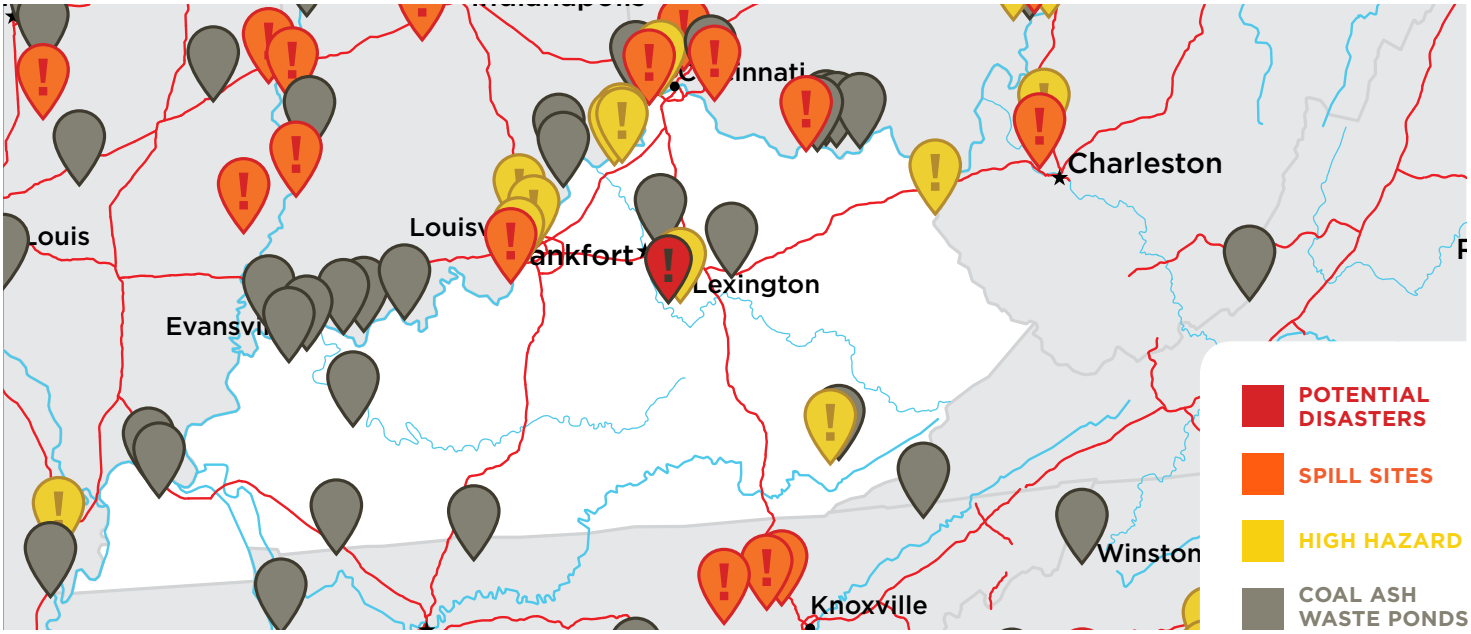
Between 2009 and 2013, the EPA launched investigations into the structural safety of coal ash ponds nationwide.[22] The assessment rated two Harding Street coal ash ponds as "high hazard" and rated all six Harding Street coal ash ponds in "poor" condition. Despite experiencing two 30 million-gallon coal ash slurry spills at its Martinsville power plant in 2007 and 2008, IPL had no written maintenance program and no emergency action plan for the Harding Street ash ponds in 2010. According to the engineering consulting firm CDM, which conducted the assessment for EPA, a breach at Pond 2 or Pond 4 could "cause property damage at an adjacent stone quarry and possibly result in quarry worker's loss of life." A failure of ash ponds 2 or 3 also could send toxic coal ash into Lick Creek and White River, harming the river environment and potentially causing property damage or loss of life in communities downstream.[23]

The Harding Street coal ash ponds are located in the White River's 100-year flood plain, which is connected to the city's well-field protection areas downstream. According to the Hoosier Environmental Council, a large flood could wash coal ash pollutants into surrounding neighborhoods and the well-field protection area, which is designed to protect groundwater that supplies drinking water throughout the city.[24]

MERCURY-CONTAMINATED FISH

Fish in the White River are already contaminated with mercury, making many fish unsafe for children and young women to eat.[25,26] Pollution controls that will reduce mercury coming from power plant smokestacks will transfer more mercury into coal ash waste, putting White River and other waterways at even greater risk if coal ash is not safely handled and disposed in ways that don't contaminate Indiana's water.[27]

THE HARDING STREET STATION COAL ASH PONDS	
Number of Coal Ash Ponds	**8**
Total Known Capacity	**310,000,000 gallons[19]**
Hazard Level	**High (Ponds 2 and 4)[20]**
Known Groundwater Contamination	**High levels of mercury, arsenic and boron**



THE TOXIC LEGACY OF COAL ASH IN KENTUCKY

Kentucky is both a leading coal-burning and coal ash producing state, generating more than nine million tons of toxic coal ash annually. The state is home to 48 coal ash ponds, eight of which are rated high hazard. Kentucky has the third largest coal ash storage capacity in the nation — 64,000 acre-feet or enough toxic sludge to cover the Churchill Downs Racetrack, home to the Kentucky Derby, under 800 feet of toxic sludge.

Yet, state agencies that should be protecting the health of residents from coal ash toxins require virtually no safeguards at coal ash sites. Incredibly, 20 of the state's 48 coal ash dams were not designed by professional engineers. Only 32 of Kentucky's dams have been inspected by the U.S. Environmental Protection Agency (EPA) to date, and power plant owners admit engineers do not presently monitor 30 of the 48 dams.[28]

There are no regular reporting requirements after construction, except for certificate renewal every five years; and coal ash sites have been able to operate with expired licenses. Historically, operators have not always been required to provide financial assurances in the event of a spill, potentially leaving Kentuckians on the hook for the cost of cleanup. Kentucky regulation does not require emergency action plans or inundation maps (that show how the surrounding communities would be affected by a dam breach). These represent an incredible failure of oversight, especially given the presence of eight high-hazard dams that would likely take human lives in the event of failure.

Groundwater contamination from coal ash dumping has already been documented at five sites in Kentucky, including high levels of arsenic, boron, manganese,

KENTUCKY: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**48**
High-Hazard Sites	**8**
Significant Hazard Sites	**18**
Documented Cases of Water Contamination or Spills	**5**

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	None
Liners Required for New Sites	None	None
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	None

nickel, and sulfate. It is likely that contaminants are present at many more sites but go undetected, because the state does not require liners (that prevent leaching of coal ash toxins into the ground) at all coal ash ponds nor does the state prohibit dumping coal ash waste directly into the water table [See Mill Creek: Disaster in Slow Motion].[29]

Toxic dust from coal ash landfills is also a public health threat to communities near coal plants in Kentucky. The LG&E Cane Run Generating Station near Louisville, KY stores enormous mountains of coal ash on site. For years, toxic dust clouds and odors have blown from the facility into the community next to the plant. The Louisville Metro Air Pollution Control District has repeatedly responded to the toxic dust with notices of violations and fines, but residents continue to be plagued by blowing ash.

Because Kentucky regulations do not require groundwater monitoring at all coal ash dump sites, Kentuckians are left in the dark about the full extent of contamination and the risks they face but, according to EPA calculations, coal ash landfills and ponds are responsible for all land releases of arsenic, chromium, and mercury in Kentucky.[30]

Because of lax regulation and poor oversight by the state — including allowing virtually unlimited discharge of toxic coal ash pollutants and allowing coal ash ponds to operate under long-expired permits[31] — Kentuckians are put at significant risk from coal ash pollution.

As part of a national investigation, the following section details the coal ash ponds at E.W. Brown Generating Station in Harrodsburg, Kentucky and the risks local families face from these ponds' toxic contents. Given the failure of state regulators — in Kentucky, and indeed across the United States — to create and enforce common-sense safeguards that would protect public health and waterways, it's time for the U.S. Environmental Protection Agency to issue strong, federally enforceable protections.

MILL CREEK: DISASTER IN SLOW MOTION

Beginning in 2013, time-lapse photography from a camera attached to a tree across the Ohio River from Louisville Gas and Electric's Mill Creek Generating Station captured a year's worth of images showing dangerous coal ash wastewater pouring unabated into the Ohio River. An unlined waste pond storing toxic coal ash is the source of the pollution.

The Mill Creek coal plant and its associated coal ash pond are 500 feet from a large residential development and 1,000 feet from a middle school. Despite this close proximity; Kentucky law does not require LG&E to test its coal ash wastewater for toxic pollutants such as mercury.

"It's devastating to think that this could have been going on for more than 20 years. It's like the North Carolina or West Virginia spills but in slow motion, with no one to stop it."

— SIERRA CLUB ORGANIZER THOMAS PEARCE, WHO HELPED INSTALL THE HIDDEN CAMERA.

PILING ON A PROBLEM: E.W. BROWN'S COAL ASH POND & PROPOSED LANDFILL

The E.W. Brown Generating Station in Harrodsburg, Kentucky is a nearly 60-year-old coal-burning plant less than 30 miles from Lexington.[32] Operated by Kentucky Utilities and owned by Louisville Gas & Electric, the plant maintains a 126-acre main coal ash pond. The massive unlined pond, built with the coal plant in 1957, was an unregulated dumping site for coal ash waste, which is the by-product resulting from burning coal.[33]

Over the last few years, the pond has stopped receiving coal ash, but the site remains unlined and still contains about 26 million tons of ash. The E.W. Brown plant and its coal ash ponds, located over an already fractured, highly permeable and vulnerable region, are leaking contaminants into the surface and groundwater, threatening public health and violating state and federal laws.[34]

Tests on the water show arsenic contamination at more than 14 times the amount determined safe for Kentucky drinking water. About a dozen springs southeast of E.W. Brown's ponds are discharging contaminants into nearby Herrington Lake, which has shown unhealthy levels of mercury. Further, two local springs contained boron at levels exceeding the U.S. Environmental Protection Agency's Health Advisory for Children. Herrington Lake flows into the Kentucky River, one of the most polluted waterways in the United States.[35]

DAM SAFETY RISKS

The Kentucky Department for Environmental Protection's Division of Water has also deemed the 126-ft. pond dam a high hazard structure, meaning that if it failed it would cause deaths and seriously damage property and transportation routes. However, Kentucky Utilities has failed to act on this looming threat.[38]

PROPOSED LANDFILL

Kentucky Utilities has proposed to construct a coal ash landfill larger than 105 acres on top of the E.W. Brown's main coal ash pond.[39] The long-term impacts of placing a landfill on top of a coal ash pond are unknown, and the design raises serious questions about long-term stability and continued pollution from the site, especially given the ongoing contamination of the groundwater. The landfill could drive contaminants deeper into the groundwater, making it more difficult to take action and stop the problem.[40]

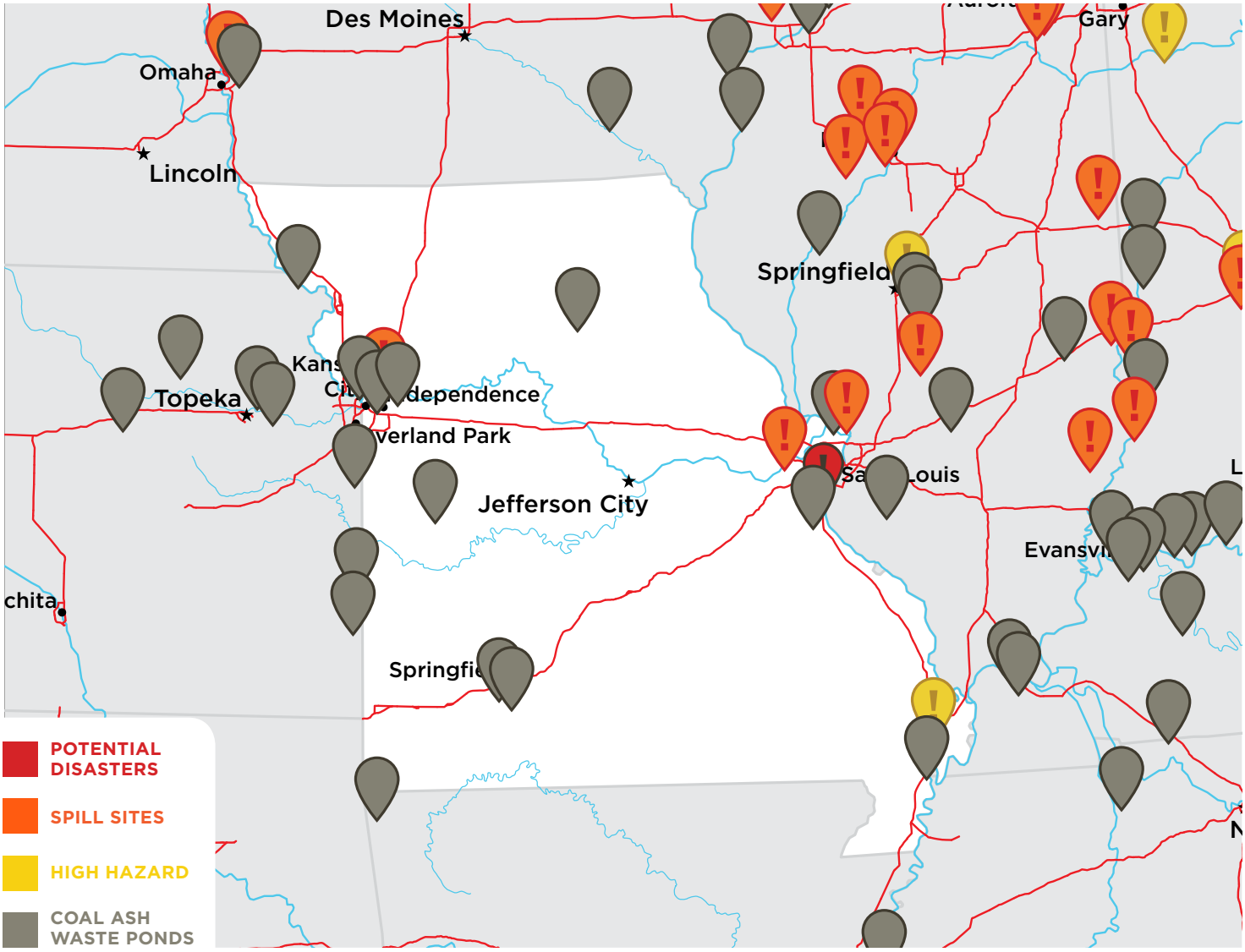
WHAT'S AT STAKE?

The proposed landfill would pile tens of millions of tons of coal ash on top of the leaking pond, which is less than a quarter of a mile from vacation homes and other residential neighborhoods surrounding the 2,300-acre Herrington Lake.[41] Built by Kentucky Utilities in 1925 as a hydroelectric dam, the lake is now a major recreational and fishing area, drawing families and vacationers seeking to enjoy the marina views, local eateries, boating, and other water sports.

E.W. BROWN'S COAL ASH POND	
Number of Coal Ash Ponds	**3**[36]
Total Known Capacity	**Undetermined**[37]
Hazard Level	**High (2 ponds)**
Known Groundwater Contamination	**Arsenic at more than 14 times safe level, boron, mercury, and selenium**

A LEGACY OF CONTAMINATION

Both LG&E and Kentucky Utilities are owned by PP&L (Pennsylvania Power & Light), a large corporate offender that is also responsible for coal ash pollution in Montana at its Colstrip plant.[42] Like E.W. Brown, the Colstrip plant's ponds and containment system have been leaking for decades, contaminating the groundwater. Also in Kentucky, a hidden camera operation revealed that LG&E's Mill Creek plant has been constantly dumping coal ash wastewater into the Ohio River for a year. Google Earth images also show many years worth of snapshots that captured an outflow into the river.[43]



THE TOXIC LEGACY OF COAL ASH IN MISSOURI

Only the largest, most dangerous of Missouri's 32 coal ash ponds are regulated for dam safety. Coal ash ponds with a whopping 170 million gallons of capacity (enough to fill the entire National Mall in Washington D.C. with two feet of coal ash sludge) go virtually unregulated.

Key safeguards to protect the public are absent in Missouri. Regular state coal ash dam safety inspections are not required, nor is groundwater monitoring or liners at all coal ash ponds. Missouri regulations even fail to prohibit dumping directly into the water table. Half of Missouri's coal ash dams were not constructed by professional engineers.

One of Missouri's 39 coal ash pond dams is rated as a "High" hazard by the U.S. Environmental Protection Agency (EPA), meaning that failure is likely to take human lives, and five are rated as a "Significant" hazard, meaning that failure would cause economic and/or environmental damage. Six of Missouri's coal ash ponds also have an EPA Condition Assessment of "Poor," meaning that remedial action is needed.

Missouri is a coal-dependent state with especially lax groundwater monitoring requirements at coal ash ponds. Currently, the state's Department of Natural

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	✓
Liners Required for New Sites	None	✓
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	None

Resources has not exercised its authority to collect groundwater monitoring data at many coal ash ponds. Without this vital information, local residents are kept in the dark about the extent of potential drinking water contamination and the serious health risks they face.

Across state lines in Illinois, where Ameren has dumped coal ash in ponds for decades, monitoring required by the state revealed widespread contamination. There is no distinguishable difference in the type of coal ash ponds operated in Missouri and those in Illinois, but the lack of contamination data in Missouri puts Missourians in relatively greater danger.

The Missouri Department of Natural Resources (DNR) knew as early as 1992 that a 154-acre, unlined coal ash pond at Ameren's Labadie plant — the largest coal plant in the state and the 14th largest in the nation — had been leaking some 50,000 gallons of coal ash waste per day. It's believed the leaks went on for about two decades before media attention and public pressure triggered Ameren to take steps to address them. Ameren has not stopped the leaking of toxic coal ash at the source but has taken steps to reduce contamination into the environment.

The DNR has not required groundwater monitoring or cleanup, despite the threat to the local population that relies on groundwater for drinking water and agricultural use. The DNR also allowed the plant to continue operating under a 1994 permit, which should have expired in 1999, without issuing an updated renewal permit to require groundwater monitoring and cleanup.[44] The following section will detail the risks posed by proposed coal ash landfills at the Labadie site as well as two other Ameren plants, in particular the Meramec plant.

The state's apparent disregard for major health and safety concerns from massive coal ash dump sites and dams across the state is part and parcel of why we need strong, federally enforceable safeguards from coal ash pollution — for Missourians and all Americans.

MISSOURI: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**39**
High-Hazard Sites	**1**
Significant Hazard Sites	**5**
Documented Cases of Water Contamination or Spills	**4**

DISASTER WAITING TO HAPPEN: COAL ASH AT THE MERAMEC COAL PLANT

For the past 60 years, utility giant Ameren has dumped coal ash into unlined ponds at the Labadie, Meramec, Rush Island, and Portage Des Sioux coal-burning power plants located throughout the St. Louis metropolitan area. Ameren Corporation is heavily dependent on coal, drawing approximately 80 percent of its power from burning the dirty fossil fuel.

Today, Ameren is seeking approval from the Missouri Department of Natural Resources (DNR) to build new coal ash landfills at the Labadie, Meramec and Rush Island power plants. All are located in the floodplains of the Missouri, Mississippi and Meramec Rivers. The coal ash landfills at the Meramec and Rush Island plants would be built on top of unlined coal ash ponds where at least one instance of leaking coal ash toxins has already been confirmed. This risky — and unprecedented in Missouri — approach to coal ash disposal raises serious questions and concerns for the affected communities as well as families across Missouri.

The proposal to build a risky new landfill at the aging Meramec coal-fired power plant on the confluence of the Meramec and Mississippi Rivers is particularly alarming for area residents. Ameren began dumping coal ash into unlined ash ponds at the Meramec plant in St. Louis County in 1953. Since then, Ameren has used ten different ash ponds at the site.[45] Of the six ash ponds

> "We know that Ameren knows how to look for contamination, and when they look for it they usually find it."
>
> *—Maxine Lipeles, co-director of the Interdisciplinary Environmental Clinic at Washington University School of Law*[51]

remaining in active use, four are unlined and three date to the 1950s. In 2012, the U.S. Environmental Protection Agency (EPA) inspected the Meramec plant's six active ponds for structural stability and rated them all as "poor."[46]

ASH POND SAFETY RISKS

DNR has said that it intends to include groundwater monitoring requirements if and when it updates the expired water pollution discharge (NPDES) permits for the Labadie, Meramec, and Rush Island plants. Yet these permits are long expired — the Labadie plant expired in 1999, Meramec in 2005, and Rush Island in 2009 — and DNR's efforts to issue renewal permits have repeatedly faltered.

An Ameren report shows that the company found groundwater contamination at the Meramec site in 1988. Ameren's tests detected pollutants associated with coal ash,[48] including iron, boron, and manganese in concentrations that exceeded state limits for groundwater safety. Ameren's contractor even acknowledged that elevated levels of boron indicated that coal ash was leaking from the ponds.[49] This contamination was associated with one of the two ash ponds above which Ameren now proposes to build a coal ash landfill. While that ash pond is now apparently lined, there is no indication that any of the contamination has been cleaned up. Four of the six active ash ponds at the Meramec sites — including the other pond above which Ameren seeks to build its proposed coal ash landfill — are unlined.[50]

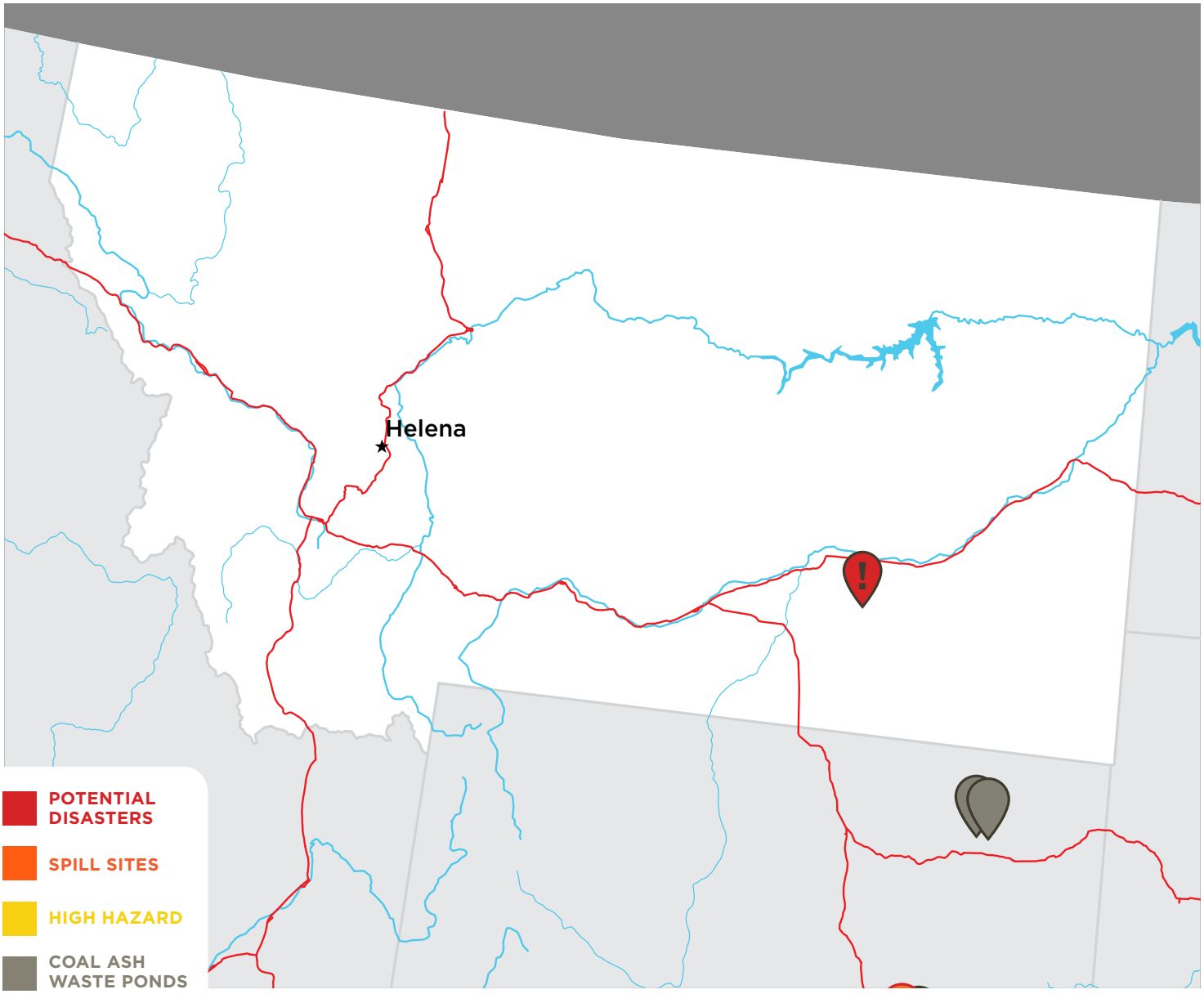
THE PUSH FOR WATER PROTECTIONS IN MISSOURI CONTINUES

The fate of Ameren's risky plans to build coal ash landfills on top of already-leaking, outdated ponds rests in the hands of the Missouri DNR. The agency can and should require groundwater monitoring and establish the structural integrity of the underlying ponds before Ameren can take steps to build these landfills. Ameren recently began voluntary groundwater monitoring at Rush Island, in order to develop a closure plan for the ash pond as part of its landfill proposal. DNR has asked for, but not yet received (as of May 2014) the results of the first quarterly groundwater sampling.

THE MERAMEC COAL ASH PONDS	
Number of Coal Ash Ponds	**10**
Total Known Capacity	**267,000,000 gallons**[47]
Hazard Level	**Low**
EPA Condition Assessment	**Poor**
Known Groundwater Contamination	**High levels of iron, boron, and manganese (1988). Current levels unknown due to lack of DNR groundwater monitoring**

Dedicated St. Louis residents have fought the risky proposed landfills for years, voicing concerns for the safety of their own groundwater wells that are likely to be contaminated by Ameren's coal ash leakage. In 2013, the Sierra Club and the Labadie Environmental Organization called on DNR to immediately require comprehensive groundwater monitoring of known and likely contamination at Ameren's Labadie, Meramec, and Rush Island coal-fired power plants.[52] In early 2014, the groups brought their concerns to Governor Jay Nixon, calling for a halt to all proposed coal ash landfill permits until comprehensive groundwater monitoring has been conducted at all existing coal ash ponds.

Missouri residents will continue to fight for even the most basic information and protection of their health and waterways from coal ash pollution. The long-standing serious concerns raised by Missourians and communities across the country who are put at risk by toxic coal ash show the need for strong, federally enforceable protections.



THE TOXIC LEGACY OF COAL ASH IN MONTANA:

Montana's coal ash ponds operate without sufficient safeguards and little or no oversight to ensure the health and safety of Montanans are protected. In 2003, the state's already weak standards for coal ash safety were removed entirely for new coal plants when Montana exempted coal-fired power plants from its Major Facility Siting Act (MFSA).

Even Montana's Department of Environmental Quality admits that this absolute lack of coal ash protections for future plants is "no longer appropriate." Yet attempts to bring coal ash back under the most basic program of monitoring and safety standards have failed thus far at the state level. Montana has no requirements for liners, groundwater monitoring, preventing leaching of toxic waste, financial assurance or clean up at any new coal ash sites and very limited authority at existing sites like Colstrip. The Colstrip power plant in Rosebud County is

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New Sites	None	None
Liners Required for New Sites	None	None
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	None

the site of most of the coal ash ponds in the state. These ponds are known to have been leaking almost since their inception. The details of the contamination of drinking water of the town of Colstrip and the subsequent legal settlements will be detailed in the following section. Contamination from coal ash sickened residents and continues to pollute ground and surface water near the plant.[53]

MONTANA: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**17**
High-Hazard Sites	**1**
Significant Hazard Sites	**3**
Documented Cases of Water Contamination or Spills	**6**

AN UNTOLD CATASTROPHE: THE COLSTRIP COAL PLANT IN MONTANA

For decades, the Colstrip coal plant in Colstrip, Montana has been leaking toxic coal ash waste into precious groundwater resources in dry Rosebud County, Montana. Local ranchers, whose families have been in Rosebud County since the 1800s, are dependent upon groundwater to sustain their cattle ranches, as Colstrip gets as little as 13 inches of rain a year.

The biggest individual owner of the Colstrip coal plant is Puget Sound Energy, the largest electric utility in Washington State. The second largest owner and operator of the plant is Pennsylvania- based PPL, headquartered in Allentown, Pennsylvania. In addition to the Colstrip coal plant, PPL also owns Louisville Gas & Electric, which operates the Mill Creek coal plant in Mill Creek, Kentucky that was recently exposed for releasing nearly unlimited amounts of toxic coal ash waste water into the Ohio River. PPL is establishing a pattern of allowing toxic coal ash waste into essential water bodies. The other Colstrip owners include: Avista Utilities in Spokane, Washington and Northern Idaho; Portland General Electric in Portland, Oregon; NorthWestern Energy, the largest electric utility in Montana; and PacifiCorp, one of the largest utilities in the country.

After nearly 40 years of plant operations, the Colstrip coal plant now has over 800 acres of waste ponds that contain toxic pollutants like boron and arsenic.[54] The waste ponds collectively leak over 360 gallons per minute of contaminated effluent into the underlying groundwater.[55] Due to contamination originating from the Colstrip site, the owners of the plant had to pay a $25 million settlement to neighbors and ranchers for contamination of their drinking water in 2008.[56] Additionally, the City of Colstrip has to pipe in fresh water from miles away and operate a separate drinking water system to ensure local residents are assured of the basic right to safe drinking water.[57] Aerial photographs and maps provided by the coal plant owners document that the plume of pollution has spread below the town of Colstrip.[58]

The U.S. Environmental Protection Agency has identified some of the Colstrip dams that hold back the toxic waste ponds as "high hazard dams."[59] According to the Environmental Protection Agency, a "high hazard dam" is one in which a "failure or mis-operation will probably cause loss of human life."[60] These dams should be evaluated by a government agency to ensure they are not at risk of breaching, and thereby causing yet another coal ash disaster. Yet no government agency has ever inspected these dams.

While the Colstrip plant was originally intended to utilize a "closed loop" system for its waste, meaning that any wastewater generated by the plant should stay within the plant compound, this is not the case. PPL tries to characterize their system as "closed loop" because they simply re-define containment. In a feeble attempt to control the spreading contamination, PPL has set up a system of pollution monitoring wells outside the suspected area of groundwater pollution. If these monitoring wells detect pollution, the plant operator attempts to stop the spread of the pollution by converting the monitoring wells to pump-back wells, where they simply pump the contaminated water back into the central waste ponds. The owners are now operating approximately 188 pump-back wells. Essentially, what PPL is doing is moving the goal posts. As soon as more contamination shows up on the perimeter, they move out the perimeter, thereby redefining containment.

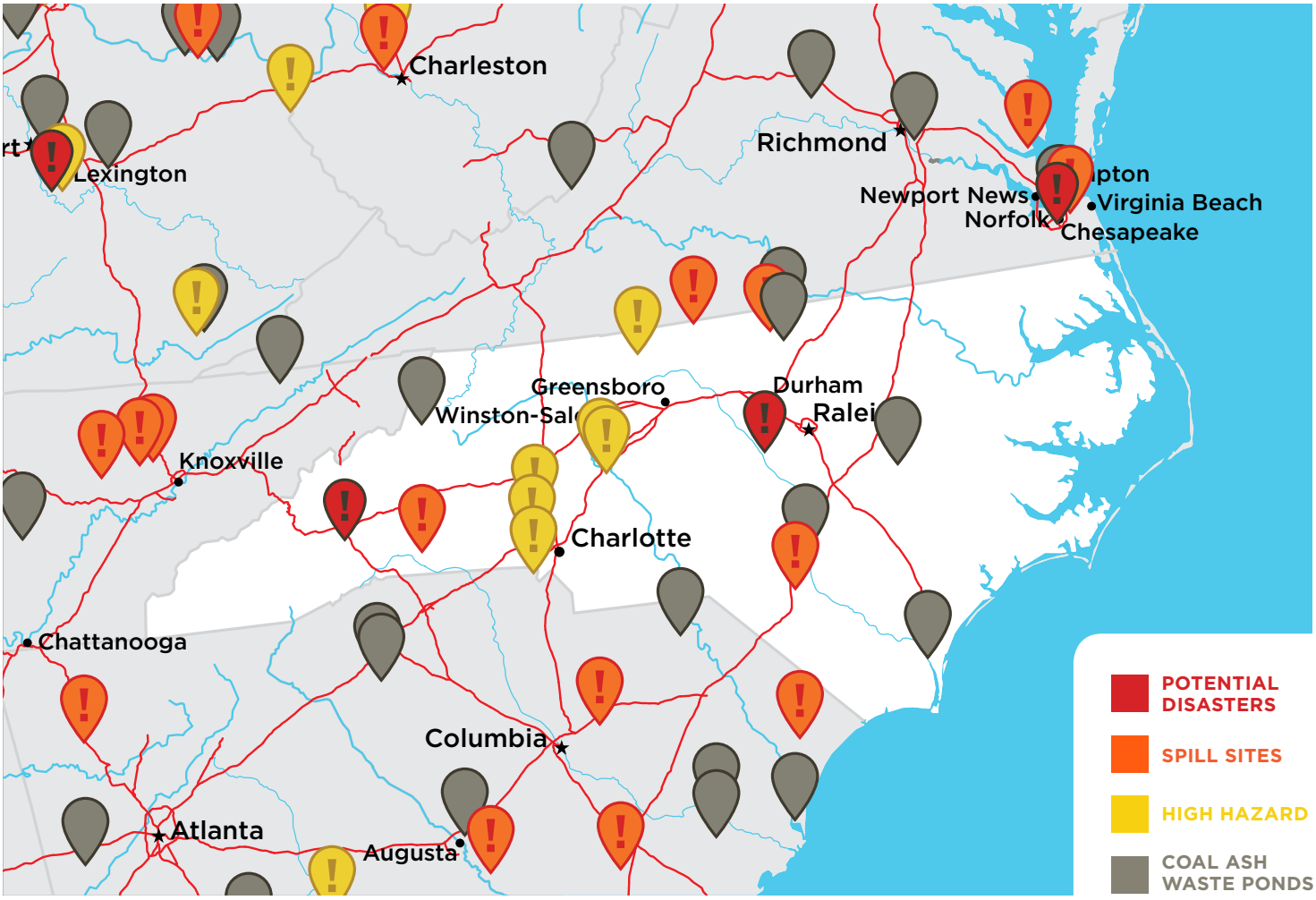
This is similar to PPL's bending of the law in Kentucky. PPL's current permit at the Mill Creek plant allows it to "occasionally" discharge its waste water into the Ohio. PPL has simply defined "occasional" to mean every day. PPL is establishing a pattern of distorting the law to avoid being responsible for its toxic pollution.

While water users in Montana must limit their well water withdrawals to 35 gallons per minute or 10 acre-feet annually, PPL is now pumping back nearly 1000 gallons per minute of groundwater into the waste water impoundments.[61] Collectively and often individually, Colstrip's monitoring wells far exceed legally acceptable levels of water withdrawals. Yet Colstrip is currently avoiding having to obtain essential water rights that are designed to sustain water use in the very arid environment of Eastern Montana, where groundwater is like gold.

This untold Colstrip disaster is another sad legacy in Montana's history of out-of-state corporations coming into Montana, stripping away the natural resources, and leaving a toxic site behind. The chemical conglomerate WR Grace, the Zortman-Landusky gold mine, the multinational ARCO and its Berkeley Pit have spoiled Montana with some of the nation's worst and most-expensive toxic waste sites. Montanans are slowly and reluctantly waking up to the fact that Colstrip may be Montana's next catastrophe.

PPL's coal-ash system is not working. Colstrip does not need one of PPL's high hazard dams to break for a catastrophe to occur. It is happening now, and has been going on for decades. Montanans and all Americans need strong, federally enforceable protections from the serious dangers posed by coal ash.

THE COLSTRIP COAL ASH PONDS	
Number of Coal Ash Ponds	**9**
Total Known Capacity	**Unknown**
Hazard Level	**High**
Known Groundwater Contamination	**boron, sulfate, heavy metals**



THE TOXIC LEGACY OF COAL ASH IN NORTH CAROLINA

Power plants in North Carolina create an enormous amount of coal ash—5.5 million tons annually. The state is among the top-ten largest producers of coal ash in the nation, playing host to 26 enormous coal ash dams. The average coal ash dam in North Carolina is over six stories tall (62 feet) and can store nearly 65,000 acre-feet—the equivalent of 32,000 Olympic-sized swimming pools—of toxic coal sludge.

Dam safety, however, appears to be a low priority for North Carolina regulators. State law does not require operators to submit regular reports, nor does it ensure that the public is free from financial responsibility if a dam fails. So lax are the protections that North Carolina created loopholes for operators of coal ash dams to avoid submitting emergency action plans in case of a catastrophic failure.

When millions of gallons of coal ash sludge and contaminated water spilled into the Dan River in February 2014, it was not the first time that North Carolinians faced toxic dangers from coal ash at the hands of Duke Energy, which owns and operates 14 coal plants in the state. Duke Energy has previously been responsible for coal ash contamination of Mountain Island Lake, which is the drinking water source for more than over 800,000 people in the Charlotte area.

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	✓	None
Liners Required for New Sites*	None	✓
Site Construction in Water Table Prohibited	✓	✓
Financial Assurance Required	None	✓

**NO NEW COAL ASH POND SITES ARE ANTICIPATED.*
TABLE CITATION - HTTP://EARTHJUSTICE.ORG/SITES/DEFAULT/FILES/NC-COAL-ASH-FACTSHEET-1112.PDF AND HTTP://WWW.EPA.GOV/OSW/NONHAZ/INDUSTRIAL/SPECIAL/FOSSIL/SURVEYS2/INDEX.HTM

Meanwhile, Duke Energy's coal ash pollution in Sutton Lake is estimated to kill more than 900,000 fish every year.[62] In Asheville, where local activists are calling for the retirement of the Asheville coal plant, old coal ash ponds are known to leach toxic chemicals into groundwater and the French Broad River.

Duke Energy and North Carolina's Department of Environment and Natural Resources (DENR) have known about contamination and dangerous coal ash storage pits for years. Yet neither Duke Energy nor the state took action to clean up the waste pits and protect state waterways or residents, until concerned local activists began calling for transparency and clean up.[63]

In addition, recent reports have shed light on just how far North Carolina Governor Pat McCrory (a former Duke Energy employee) and DENR have gone to protect the interests of Duke Energy. This includes initiating lawsuits against Duke Energy for coal ash pollution in order to block actions by environmental groups and then attempting to quickly settle those cases with small fines that amount to a pittance for the energy giant, while shielding Duke Energy from full public disclosure of wrong-doing.[64] A federal criminal grand jury is now investigating how Duke Energy and the State have handled coal ash.

Since the Dan River spill, state regulators and Duke Energy have come under enormous scrutiny and are beginning to change their tune. In fact, one month after the disaster and just days after an Associated Press public records inquiry, North Carolina regulators cited five more Duke Energy power plants for lacking required storm water permits: Belews Creek Steam Station, Cliffside Steam Station, Lee Steam Electric Plant, Roxboro Steam Electric Power Plant, and Sutton Steam Electric Plant.

State regulators and Duke Energy are finally beginning to move reluctantly toward implementing a modicum of protection and transparency —but neither goes far enough to provide the safeguards that all North Carolinians deserve when it comes to clean drinking water and the health of their families. Still, without strong, enforceable federal protections, North Carolina's waterways and communities remain at risk from toxic coal ash pollution.

NORTH CAROLINA: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**37 at 14 sites**
High-Hazard Sites	**29**
Significant Hazard Sites	**2**
Documented Cases of Water Contamination or Spills	**All 14 sites (plants)**

DISASTER WAITING TO HAPPEN: THE ASHEVILLE COAL ASH LAGOONS

In October 2012, conservation groups filed suit to protect North Carolina communities from toxic groundwater contamination at 14 coal-fired power plants with outdated, unlined coal ash ponds. The lawsuit sought the enforcement of state law that requires industrial polluters to stop groundwater contamination and cleanup existing pollution. In January 2013, conservation groups in North Carolina issued the first of several Notices of Intent that they would sue Duke Energy under federal law to protect North Carolina communities from unlawful pollution at Duke's outdated, unlined coal ash ponds.

Today, local communities are still waiting for justice and for Duke Energy to clean up these sites, among the most important of which is the Asheville Plant coal ash lagoons in Arden, NC, just minutes from Asheville and Lake Julian, along the French Broad River.

The Asheville coal ash lagoons include two massive coal ash dams, each roughly the height of an eight-story building with the capacity to hold nearly half a billion gallons of toxic coal ash sludge. In July 2012, Duke Energy acquired the Asheville Plant and its coal ash ponds in a merger with Progress Energy.[65]

Groundwater monitoring at the site shows persistent contamination that exceeded state limits. Among the contaminants are thallium and selenium. Thallium is a poison and suspected carcinogen that is highly water-soluble and can enter the body through the skin. It is odorless and nearly tasteless, making it difficult to detect and identify. Exposure to selenium can cause illness, neurological damage, and even death; it is also extremely toxic to fish at low doses.

THE ANCHOR OF WESTERN NORTH CAROLINA'S TOURIST ECONOMY

The French Broad River, which cuts through the heart of Asheville and offers world-class outdoor recreation, is one of North Carolina's most iconic landmarks. Asheville and its river are also the anchor of the tourist economy of western North Carolina.

Tourism dollars and jobs are incredibly important to the local economy. Asheville's leisure and hospitality sector topped all other sectors in terms of job growth (8.9 percent) between 2012 and 2013, helping the metro region significantly outpace both the state and the

> "The French Broad River is a world class recreation destination, and we no longer want to see it used as a dumping ground for toxic coal ash."
>
> —*Hartwell Carson of the French Broad Riverkeepers*

nation in job growth for the 12-month period.[68] In 2012, tourists spent $834 million in Buncombe County, of which Asheville is the county seat; tourism brought in nearly $80 million in local and state tax receipts.[69]

The Asheville coal ash lagoons, which visibly loom above I-26 and the French Broad River, are both rated "high hazard" and in the event of a dam breach, would almost certainly result in loss of human life and a permanently altered landscape and economy for the area.

THE STRUGGLE TO PROTECT NORTH CAROLINIANS CONTINUES

The battle to hold Duke Energy accountable through the courts seemed all but over after DENR inserted itself, in what many believe was an attempt to block citizen suits. DENR quickly proposed a settlement to the suit that would allow Duke Energy to pay a miniscule fine and not require the company to clean up the site.

The Southern Environmental Law Center, on behalf of Sierra Club, Waterkeeper Alliance, and Western North Carolina Alliance, pushed back and won the right for its clients to intervene in the litigation and protest the state's sweetheart deal with Duke Energy.

In a separate action on behalf of the same groups as well as Cape Fear River Watch, on March 6, 2014, a Wake County Judge ruled that Duke Energy must take immediate action to eliminate the sources of groundwater contamination that are currently violating water quality standards at all 14 of its coal-fired power plants in the state. Even after the massive Dan River coal ash spill, however, Duke Energy immediately appealed the decision and filed a motion to stay the ruling. Ironically, the State also appealed the ruling, insisting that it did not have the authority to require Duke to "take immediate action."

Duke Energy recently signaled that it is considering phasing out coal power generation at the Asheville Plant, as well as moving away from dangerous wet storage of coal ash. Community leaders and activists have applauded the news, but remain committed to holding Duke Energy and state regulators accountable for an end to coal ash pollution and a full cleanup at sites across the state.[70]

Both the dangers posed by the Asheville coal ash lagoons and the difficulties local residents have faced in ending water contamination at the site and protecting their families highlight the need for strong, enforceable federal safeguards for communities like Asheville against coal ash pollution.

THE ASHEVILLE COAL ASH LAGOONS	
Number of Coal Ash Ponds	**2**
Total Known Capacity	**906,000,000 gallons***
Hazard Level	**High**
Known Groundwater Contamination	High levels of boron, chloride, chromium, iron, manganese, selenium, thallium, arsenic, lead, and pH
Dam Safety Risks	Both of the site's coal ash dams are unlined, allowing coal ash toxins to leach into groundwater. In 2010, the older dam (constructed in 1964) was also found to be in "poor" safety rating by structural engineers.[66] In 2012, the newer of Duke's two coal ash lagoons at Asheville suffered a major breach at an internal dike, causing a 60 foot by 25 foot blowout. Fortunately, the breach did not result in a release of coal ash, but Duke had to dewater the coal ash lagoon immediately and conduct emergency repairs.[67]
What's at Stake?	The French Broad River cuts through the heart of Asheville and is a world-class tourism destination, bringing nearly $1 billion dollars to the area each year.

**HTTP://WWW.SOUTHEASTCOALASH.ORG*

DISASTER WAITING TO HAPPEN: THE CAPE FEAR COAL ASH LAGOONS

The Dan River coal ash spill drew North Carolinians' attention to dangerous and outdated coal ash ponds and dams across the state, but the outdated infrastructure is not the only threat North Carolina's rivers, lakes, and streams face. Just weeks after the Dan River spill, clean water advocates discovered that Duke Energy improperly pumped more than 60 million gallons of untreated coal ash waste water directly from its ponds into the Cape Fear River, threatening drinking water safety, agriculture, and wildlife.

Duke Energy's Cape Fear coal-fired power plant and its five coal ash lagoons and dams sits alongside the Cape Fear River near Moncure, NC. The plant, originally built in 1923, was retired in 2012, yet its coal ash dams, built over the course of six decades, are arguably the most dangerous in the state.

Investigations conducted by the United States Environmental Protection Agency (EPA) as well as Waterkeeper Alliance and Cape Fear Riverkeeper have uncovered serious safety issues with the lagoons and dams, as well as unauthorized leaks from the toxic lagoons into groundwater and the Cape Fear River. According to the EPA report[71], all five ponds and dams are rated "in poor condition" because they were not built up to the recommended safety standards. EPA investigators classified the Cape Fear coal ash ponds and dams as more dangerous than even the Dan River ponds, one of which failed in February 2014.

The coal ash dam built in 1985 is particularly unsafe; it has cracked three times. Two of these cracks were identified in the EPA engineering report and the third crack was identified by investigations in 2014. This 2014 investigation, conducted by experts from Waterkeeper Alliance and Cape Fear Riverkeeper, revealed that Duke Energy was intentionally pumping more than 60 million gallons of untreated, concentrated coal ash wastewater out of the bottom of two of the ponds.[72,73] According to this same investigation, during the pumping the 1985 pond developed the third crack, more than 30 feet long and four inches wide.

The Cape Fear coal ash ponds sit just a few short miles upstream of where the communities of Sanford, Dunn and parts of Harnett county draw their drinking water from the Cape Fear River. Further downstream, the cities of Fayetteville, Fort Bragg and Wilmington also pull drinking water from the river. If any of the dams or ponds failed and a spill occurred, drinking water resources for more than a half million people in the region would be threatened. (431)

> "Even after the Dan River spill, Duke Energy chose to pump more than sixty million gallons of toxic coal ash wastewater into the Cape Fear River. This river gives us our drinking water. This river is a part of our heritage. We can't let Duke Energy ruin that."
>
> *— Kemp Burdette, Executive director, Cape Fear Riverkeeper*

Dam safety risks: Recent investigation and sampling conducted by Waterkeeper Alliance and Cape Fear Riverkeeper on March 13, 2014 confirms that the Cape Fear dams are leaking in numerous places. The pollutants leaking into the Cape Fear River and the canal between the coal ash ponds include aluminum, arsenic, boron, chromium, lead, manganese, nickel and zinc.

What's at stake? The communities of Sanford, Dunn, Harnett County, Fayetteville, Fort Bragg and Wilmington draw drinking water from the Cape Fear River downstream of the coal ash ponds and dams. In the case of a spill, drinking water resources for more than half a million people in Eastern North Carolina would be threatened.

The Cape Fear River is one of the longest rivers in North Carolina with the largest watershed basin in the state, running from the confluence of the Deep and Haw Rivers near Haywood, NC, all the way to Wilmington, one of North Carolina's most important coastal cities. The Cape Fear River is the only major river in North Carolina that flows into the Atlantic Ocean, opening into an estuary at Cape Fear and is part of the Intracoastal Waterway system.

"The [pumping] incident shows the importance of citizen involvement," said Frank Holleman, senior attorney for the Southern Environmental Law Center. "Had the Waterkeeper Alliance not been inspecting that site, it's likely that no one would have known it was happening, or DENR would not have found it until later and even more contaminated water might have been pumped into the river."

THE STRUGGLE TO PROTECT NORTH CAROLINIANS CONTINUES

The battle to hold Duke Energy accountable through the courts seemed all but over after DENR inserted itself, in what many believe was an attempt to block citizen suits. DENR quickly proposed a settlement to the suit that would allow Duke Energy to pay a miniscule fine and not require the company to clean up the site.

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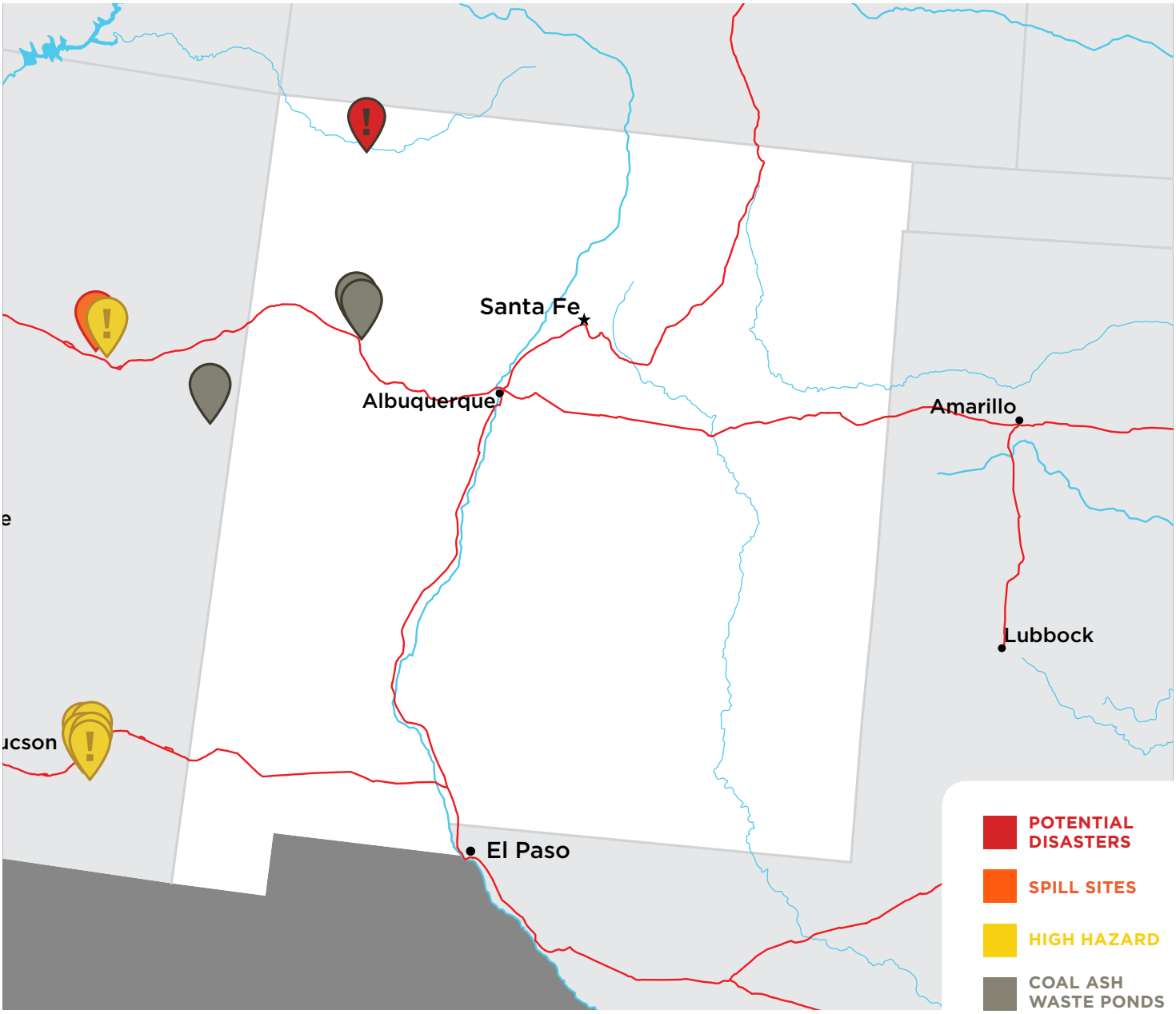
Both the dangers posed by the Cape Fear coal ash lagoons and the difficulties advocates have faced in ending water contamination at the site and protecting their families highlight the need for strong, enforceable federal safeguards for communities in Eastern North Carolina against coal ash pollution. (256)

THE CAPE FEAR COAL ASH LAGOONS	
Number of Coal Ash Ponds	**5**
Total Known Capacity	**953,000,000 gallons**
Hazard Level	**Significant**
Known Groundwater Contamination	**Levels of lead, boron, chromium, iron, manganese and sulfate exceed NC groundwater standards**[74]



THE TOXIC LEGACY OF COAL ASH IN NEW MEXICO

Coal-fired power plants in New Mexico generate 3.6 million tons of coal ash each year. New Mexico has 28 coal ash ponds at three plants, covering more than 165 acres of land. Three of these coal ash ponds have been rated "significant hazard." Many of the ponds are unlined or inadequately lined to prevent the release of contamination. The state of New Mexico requires no groundwater monitoring or financial assurances for coal ash dams.[75]

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	None
Liners Required for New Sites	None	None
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	None

NEW MEXICO: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**28**
High-Hazard Sites	**0**
Significant Hazard Sites	**2**
Documented Cases of Water Contamination or Spills	**2***

**SAN JUAN GENERATING PLANT AND FOUR CORNERS PLANT*

Multiple studies by Earthjustice found that groundwater and surface water near the Four Corners site contained high levels of numerous toxic chemicals (including concentrations of boron nearly twelve times higher than those found upstream) that could only reasonably be attributed to coal ash contamination.[76]

DISASTER WAITING TO HAPPEN: FOUR CORNERS POWER STATION

In the Four Corners region of New Mexico, Colorado, Arizona and Utah, the largest tribal reservation in the United States — belonging to the Navajo Nation — spans an expanse roughly the size of West Virginia. In the very northwest corner of New Mexico on the Navajo reservation lies the aging Four Corners Power Plant and a very large coal mine that produces over 7 million tons of coal each year.

In 1963, the Arizona Public Service (APS) entered into an agreement with the Navajo Nation to lease part of their land for the construction of the Four Corners Power Plant, located near Fruitland, New Mexico. Until December 2013, the plant consisted of five units that generated 2,040 megawatts of power[77] using coal supplied from the nearby BHP Billiton mine. In 1971, this mine also became the dumping grounds for coal's toxic byproduct, known as coal combustion waste or, more simply, coal ash. Since 1962, approximately 30 million of tons of coal ash from the plant have also been dumped in six (lined and unlined) inactive and active ponds near the power plant.

The Four Corners Plant is one of the largest in the West and sends most of the power it generates elsewhere — in fact the second largest stakeholder at the plant is the Los Angeles Department of Water and Power.[78] While massive amounts of coal and electricity are produced right on Navajo land, an estimated 16,000 Navajo families are without access to electricity.[79] The Navajo population is left without electricity and is instead burdened by the enormous pollution created by coal-fired electricity generation.

For nearly forty years coal ash from the Four Corners Power Plant was sent back to the mine and dumped into empty, mined out "disposal" pits that have no protective linings or barriers between the soil and the toxic coal ash. As of 2000, APS had disposed of between 50 and 55 million tons of coal ash waste from the Four Corners plant in the BHP Mine, covering approximately 230 acres of land. Since 2007, APS has disposed of ash in two large lined landfills near the plant. The larger of the two landfills rises 110 feet above natural grade.

Today, there is no federal regulation of coal ash, and APS has gone far too long without providing monitoring data and information about how the toxic ash is being stored at both the mine and at the plant itself. Without this critical information, the impacts of decades of toxic coal ash pollution on the environment and public health remain unknown. For many, the failure to protect local communities from coal ash is an environmental justice issue, as local activists seek answers to why swirling black dust stains livestock and clothing on windy days. Without access to information relating to coal ash, communities have been left with virtually no safeguards.

In 2007, available surface water data were analyzed to determine the impact of the Four Corners Plant's coal ash ponds on water quality in the Chaco River, which lies just 50 feet from some of the ponds and flows directly into the San Juan River Basin. The analysis found levels of boron, copper, lead, mercury and zinc in the water downstream from the coal ash ponds at levels harmful to livestock, aquatic organisms, and human health.[80] In fact, lead concentrations downstream from the plant's coal ash ponds are almost 50 times higher than the recommended standards to protect aquatic life. The only logical source for these high levels of toxins is the coal ash ponds that sit nearby.

For decades, testing was also conducted on the Chaco River both upstream and downstream from the coal ash disposal area in the Navajo Mine. The results indicated that coal ash contamination was reaching the river, and the degradation of water quality was alarming. Amounts of selenium downstream were nearly three times higher than upstream of the mine. For boron, the concentration was twelve times higher.[81] While the Chaco Wash is not currently designated as a source of drinking water, the water may be used for domestic purposes and for watering livestock. The increased downstream average boron levels are more than four times the New Mexico standard for drinking water. In addition, these levels are high enough to harm aquatic freshwater organisms in the river. Average downstream sulfate concentrations were more than four times the secondary drinking water standard and more than twice EPA's health-based drinking water advisory for sulfate.

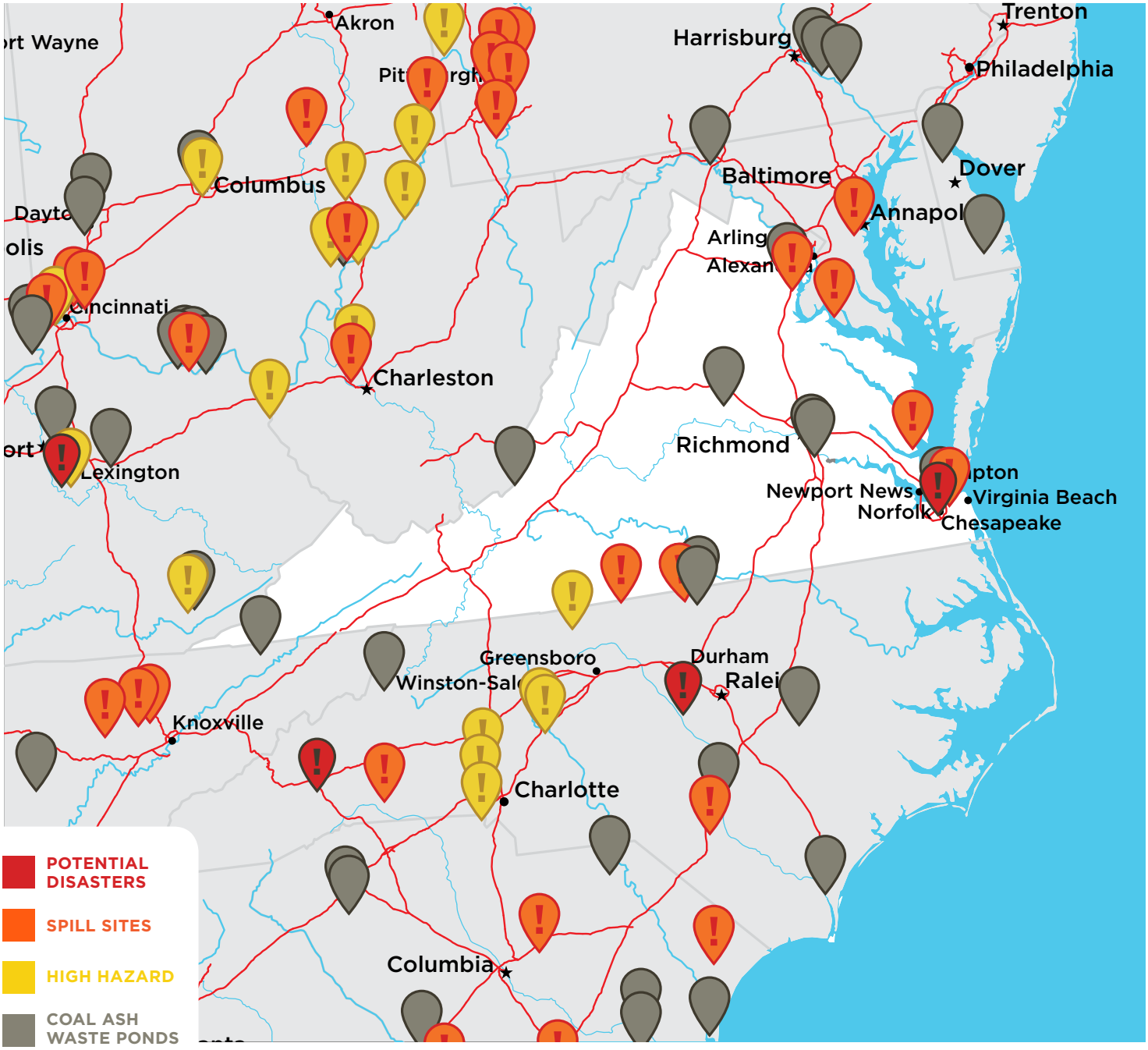
While testing on the Chaco River has shown dangerous levels of toxic coal ash contaminants, without a federal mandate regulating coal ash at Four Corners, the health and safety of downstream communities and nearby Navajo residents remain at risk. People who live near an unlined coal ash pond where ash is co-disposed with coal refuse and whose drinking water source is groundwater have a 1 in 50 chance of getting cancer from water contaminated by arsenic— a risk 2,000 times greater than the EPA's goal for reducing cancer risk to 1 in 100,000.[82] It should come as no surprise that many Dine' people suffer from chronic illness. These coal ash sites are neighbors to large numbers of Navajo people, putting their health and welfare in danger. Without health insurance, many Navajo people rely solely on Indian Health Services for health care at facilities across the Navajo Nation.[83]

Additionally, Navajo people use their local environment to gather medicines for ceremony and wellness. According to the Dine' Citizens Against Ruining the Environment, contamination from coal ash jeopardizes the Navajo people's ability of to practice traditional healings, which is embedded in their culture. Coal ash from the Four Corner Power Plant infringes on the ability to practice traditional living and ceremony.

It is clear the population bearing the biggest burden of the coal ash pollution at the Four Corners Plant and Navajo Mine are the many families living on the Navajo reservation. The overwhelming evidence of coal ash contamination from the Four Corners Power Plant and the lack of oversight and action from regulators illustrates the need for strong, federally enforceable protections from coal ash pollution for communities across the country, and for the Navajo people.

FOUR CORNERS POWER STATION	
Number of Coal Ash Ponds	**6 (both inactive and active)**
Total Known Capacity	**973,000,000 gallons***
Hazard Level	**Significant**
Known Groundwater Contamination	**High levels of copper, lead, zinc, boron, and mercury**

*HTTP://WWW.EPA.GOV/OSW/NONHAZ/INDUSTRIAL/SPECIAL/FOSSIL/SURVEYS/APS2.PDF



THE TOXIC LEGACY OF COAL ASH IN VIRGINIA

Virginia's 16 (retired and currently operational) coal-fired power plants have created a substantial toxic legacy in the Commonwealth in the form of coal ash contamination. This includes at least two federal Superfund sites in Virginia, one of which had the dubious distinction of inclusion on the National Priority List of the nation's most contaminated Superfund sites, and four other sites where coal ash contaminated groundwater or caused extensive ecological damage.[84]

STATE REGULATION	PONDS	LANDFILLS
Groundwater Monitoring Required for All New and Existing Sites	None	None
Liners Required for New Sites	None	None
Site Construction in Water Table Prohibited	None	None
Financial Assurance Required	None	None

Despite its history of coal ash contamination, the Virginia Department of Environmental Quality (VDEQ) does not require liners or groundwater monitoring at every coal ash site. And, while Virginia's coal ash dams are among the oldest (with an average age of over 40 years), state regulations do not require state inspection of coal ash dams or adequate reporting on dam condition by owners. Virginia also does not require owners to provide financial assurances, consequently taxpayers may be stuck with a hefty bill for clean up in the event of a coal ash spill.[85]

The coal ash pond at Dominion Energy's Chesapeake Energy Center in the Tidewater area is profiled in the following section as part of a national investigation by Sierra Club into the serious risks to public health posed by coal ash. The pond at the site is unlined, has been rated significant hazard, and was given a rating of "poor" for its structural integrity by EPA.[86]

VIRGINIA: SNAPSHOT OF COAL ASH RISKS & REGULATION	
Number of Coal Ash Ponds	**25**
Significant-Hazard Sites	**8**
Significant-Hazard Sites rated "Poor" by EPA	**2***
Documented Cases of Water Contamination or Spills	**6****

**AEP CLINCH RIVER POWER PLANT, CARBO, VA: DOMINION ENERGY CHESAPEAKE ENERGY CENTER, CHESAPEAKE, VA*
***COAL ASH CONTAMINATION HAS GENERATED AT LEAST TWO FEDERAL SUPERFUND SITES IN VIRGINIA, INCLUDING ONE ON THE NATIONAL PRIORITY LIST OF THE NATION'S MOST CONTAMINATED SUPERFUND SITES.*

DISASTER WAITING TO HAPPEN: DOMINION'S CHESAPEAKE ENERGY CENTER

The bottom ash and sediment coal ash pond at Dominion's Chesapeake Energy Center was found to have contaminated groundwater with arsenic as high as 30 times the drinking water standard for almost a decade. The power plant's clay-lined coal ash landfill also required corrective action to address groundwater contamination with arsenic, sulfides and vanadium in 2001.[87]

As Dominion looks to retire its Chesapeake Energy Center in the coming months, serious concerns remain about the fate of the plant's notorious coal ash ponds. As the recent Dan River spill in North Carolina shows, toxic sludge from a retired coal ash ponds (See Section: The Dan River Spill), known as "legacy ponds," pose as great a risk to public health as active coal ash ponds.

In fact, the risk may be greater, as less oversight by operators means old dams and other infrastructure can leak and weaken without being noticed.

Dominion has taken steps at its Chesterfield plant to move coal ash from dangerous unlined ponds to lined dry storage landfills. This should be the standard for all retired coal ash ponds — in fact, this should be the

standard to protect families in Virginia and across the United States. Groundwater monitoring should also be required as well as regular reporting at any new dry storage coal ash landfill.

In 2011, EPA gave a "poor" rating to the plant's ash and sedimentation pond. The pond is ranked a significant hazard, because a failure would release toxic coal ash to the Elizabeth River, which would flow into Chesapeake Bay. The pond is contained by an earthen dam and is unlined, holding fly ash, bottom ash, and leachate contaminated with arsenic from the coal-fired power plant. EPA identified the need to make "urgent" repairs to address slope failures at the pond.[88]

Local activists and environmental groups continue to seek justice, transparency, and greater protections from toxic coal ash pollution in Virginia. The example of Chesapeake Energy Center — and the related contamination of drinking water at Battle Creek Golf Course — illustrates the need for strong, federally enforceable protections.

DOMINION'S CHESAPEAKE ENERGY CENTER	
Number of Coal Ash Ponds	**1**
Total Known Capacity	**24,400,000 gallons**[91]
Hazard Level	**Significant**
Known Groundwater Contamination	**Arsenic 30 times higher than safe standard**[92]

THE BATTLEFIELD GOLF COURSE DISASTER

In spite of known contamination, beginning in 2002, Virginia Department of Environmental Quality (VDEQ) allowed Dominion to use 1.5 million tons of coal ash to construct the Battlefield Golf Course. The ash was dumped (with cement kiln dust as a "binding agent") on swampy fields less than two feet above a shallow groundwater table in the heart of a residential neighborhood, where many families relied on private wells for their drinking water. Dominion officials assured the Chesapeake Planning Commission that their ash was "as safe as dirt." The Chesapeake City Council and VDEQ gave the plan a green light as a "beneficial use" of coal ash under 9 VAC 20-85 waiving liners or covers that would have been required by the state's solid waste regulations.[89] The result was polluted drinking water for nearby residents.

In 2009, Dominion agreed to pay $6 million to provide city water to residents around the golf course who abandoned their wells. In 2012, nearly 400 residents filed a class action lawsuit seeking more than $2 billion in damages from Dominion and others. The suit claims the actions of these defendants contaminated their water and invaded their properties with clouds of coal ash dust. Test results filed with the suit found dangerous levels of lead, cadmium, nickel, vanadium, manganese, cobalt, and zinc in residential wells, and arsenic and beryllium in monitoring wells. According to the suit, which is still pending, constant exposure to toxic dust caused chronic obstructive pulmonary disease and asthma in ten residents, nine of them children. Pets and livestock were also harmed.[90]

PHOTO CREDIT: CATAWBA RIVERKEEPER

CASE STUDY: THE DAN RIVER SPILL

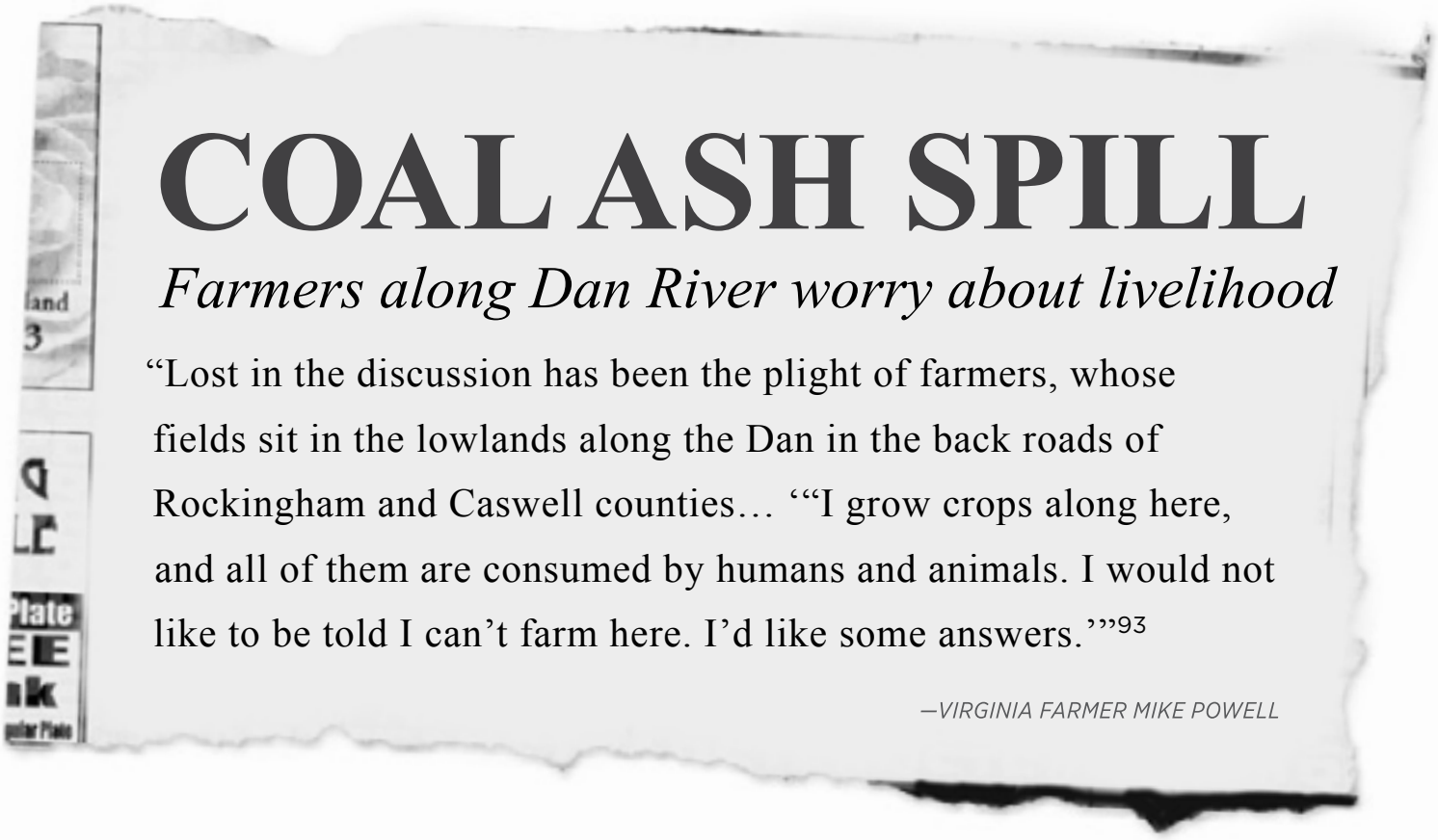
On February 2, 2014, a stormwater pipe burst underneath an unlined coal ash pit at a retired Duke Energy coal plant in Eden, North Carolina. The Dan River ran grey, as 39,000 tons of toxic coal ash and 27 million gallons of contaminated wastewater flowed into it, threatening the drinking water for eight counties downstream and coating the river bottom with toxic sludge for 70 miles.

For 24 hours after it was discovered, Duke Energy did not so much as issue a press release or inform the public about the massive spill. State officials initially told the public that state testing showed the water was safe to drink (in spite of the enormous spill of coal ash known to contain arsenic, selenium, lead, mercury, and many other toxic materials). They then backtracked and told the public that even direct contact with the water was not safe. Governor Pat McCrory, a former Duke Energy employee, waited more than a week to speak publicly about the disaster.

In all, it took Duke Energy nearly a week before workers were finally able to stem the flow of toxic coal ash into the Dan River. It was the third largest coal ash spill in our nation's history and contaminated the Dan River with dangerous levels of arsenic and other hazardous toxics. Months later, downstream communities continue to worry about the health risks — as well as the impacts on farming and tourism — from the toxic sludge.

PUBLIC DEMAND FOR SOLUTIONS

Just weeks after the spill, North Carolinians rallied at Duke Energy's Charlotte headquarters delivering



petitions from 9,000 Duke Energy customers and demanding the disaster be "Our Last Coal Ash Spill."

Polling of North Carolina voters from March 2014 found strong, across-the-board, support for new protections against future coal ash disasters — including stronger federal safeguards. Respondents from across the political spectrum said that Duke Energy should clean up all coal ash sites in the state, including the Dan River spill (90% support). The poll found similar support for requiring coal ash be stored away from water in specially lined landfills (88%) and regulating coal ash as a hazardous substance (83%).[94]

With mounting public pressure, both Duke Energy and state officials now promise significant action. But given their close ties and apparent priorities, North Carolinians — and indeed all Americans — would be well served by a new set of strong, enforceable safeguards for coal ash from the U.S. Environmental Protection Agency — protections that are due by the end of 2014 and that communities across the country desperately need.

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