POLICY BRIEF: MITIGATING COAL ASH GROUNDWATER CONTAMINATION IN INDIANA

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Coal ash spill, TN Copyright: BlairPhotoEVV 2016

Executive Summary

Indiana has the largest amount of coal ash ponds in the United States. Exposure to coal ash contaminants induce adverse health symptoms that progress into life-threatening conditions such as cancer and major organ complications. Where health is threatened, so is labor, and purchasing power. Coal ash contamination is a public health issue that requires immediate action to prevent an incapacitated society and to maintain regional economic stability. This policy brief yields 8 recommendations that the state of Indiana can adapt throughout its municipalities which include how to address coal ash disposal and treatment, initiate healthcare measures, engage civil society and private sector actors, strengthen regulatory frameworks, and implement a public education campaign.

1. Background

The Indiana water report (2020) identifies a need for the effective treatment of coal ash from seeping further into greater bodies of water supply. Despite federal mandates to mitigate coal ash contamination[1], Indiana still expels 6.8 million tons of coal ash into the air, land, and water at hazardous levels. The Environmental Protection Agency (EPA) defines coal ash byproducts in four categories: fly ash, bottom ash, boiler slag, and flue gas desulfurization material.

Fly ash consists of very fine powder. Bottom ash is coarse, heavier, and settles at the bottom of a furnace. Boiler slag is what happens to bottom ash when it meets water, which results in different size glassy looking pellets. Flue gas desulfurization material consists of materials that can look like wet sludge or a dry powder. For over 100 years, Indiana used coal to produce energy, discarding hazardous byproduct into unlined or thinly lined landfills known as coal ash ponds. With more than 80 ponds across the state, Indiana has the largest number of coal ash ponds among its sister states, making it a sizable contributor to the statistic that coal ash is one of the largest culprits of industrial waste in the United States. These ponds reside within the ground near coal processing plants, often just above underground aquifers that supply drinking water. Of the known ponds in Indiana, only two plan to close their coal ash pond, while several plan to keep the pond intact and place a cap over it to store it, a costly and ineffective method.[2] Gradually, the coal ash byproducts began seeping into the groundwater supply, eventually exceeding safety standards set forth by the EPA in some instances, jeopardizing human life, and the surrounding environment.[3] It is important for Indiana to effectively reduce its coal ash expulsion rate and phase out its use to prevent public health consequences that will weaken its current and future labor force. A robust labor force ensures continuity in the amount of purchasing power individuals have, income tax revenue that the state can collect, and a thriving business economy from citizens remaining in a state that they feel safe in.

2. Findings

Prevalence and Health Consequences

[1] Environmental Protection Agency. Disposal of coal combustion residuals from electric utilities rulemakings. Retrieved from https://tinyurl.com/db8va3k5

[2] Hoosier Environmental Council. (2020). *Our waters at risk part 2: The impact of coal ash on Indiana's water resources.* Retrieved from https://tinyurl.com/mr2zajaf

[3] Indiana Water Monitoring Council. (2020). *Indiana water report 2020, Indiana Water Monitoring Council.* Accessed March 4, 2022. https://tinyurl.com/23neaneh.

According to the Hoosier Environmental Council, most of the coal ash contamination in Indiana can be found within the floodplain of Lake Michigan, or one of the Indiana rivers.[4] Coal ash byproducts contain toxic chemicals including heavy metals, but also increases damage from specific heavy metals like lead, a well-known pollutant that cognitively impairs individuals for life.[5] Nobel Peace Prize winners Physicians for Social Responsibility caution that the closer people live to coal ash ponds, they have as much as 1 in 50 chances of being stricken with cancer. Carcinogenic chemicals found in coal ash include but are not limited to arsenic, boron, cobalt, and aluminum, all toxins that can cause a host of other physiological and neurological complications.[6] Complications from coal ash byproducts include birth defects, kidney, lung and respiratory diseases, heart damage, gastrointestinal tract problems, reproductive challenges, and impaired bone growth in children. In another environmental review of the effects of coal ash disposal, researchers found that people who live near coal ash ponds are at a higher risk for cardiovascular and physiological disease.[7]

Although the total risk of health effects of coal ash exposure has yet to be discovered, what is indisputable is that coal ash byproducts can have crippling effects on human development and well-being.

Solution Gaps

The federal mandates managed by the EPA require coal production sites to self-report their management of coal byproducts, as well as remediate hazardous conditions. Amendments to the rules includes a political appointee that oversees the reporting process. However, too few facilities report remediation efforts.

Assuming facilities that do report are reducing their expulsion of coal ash, there are not enough making use of recycling it, even though coal ash byproducts have been successfully repurposed in a variety of ways. The American Coal Ash Association (ACAA) has identified that overall coal ash recycling has declined.[8] The decline in recycled coal ash includes reduction in its use in agriculture to prevent soil runoff, cement production, building materials and concrete.

Policy solutions that can bring together better incentives for coal producers to reduce their outputs and phase out their usage while creating other job opportunities will help the state of Indiana increase positive environmental impact and social well-being.

3. Policy Recommendations

Given the vast health implications of coal ash and its presence throughout the state, the Indiana government can employ a multi-pronged strategy to mitigate damage, support critical public health intervention, and monitor ongoing developments. The

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[4] Hoosier Environmental Council. (2020). *Our waters at risk part 2: The impact of coal ash on Indiana's water resources.* Retrieved from https://tinyurl.com/mr2zajaf

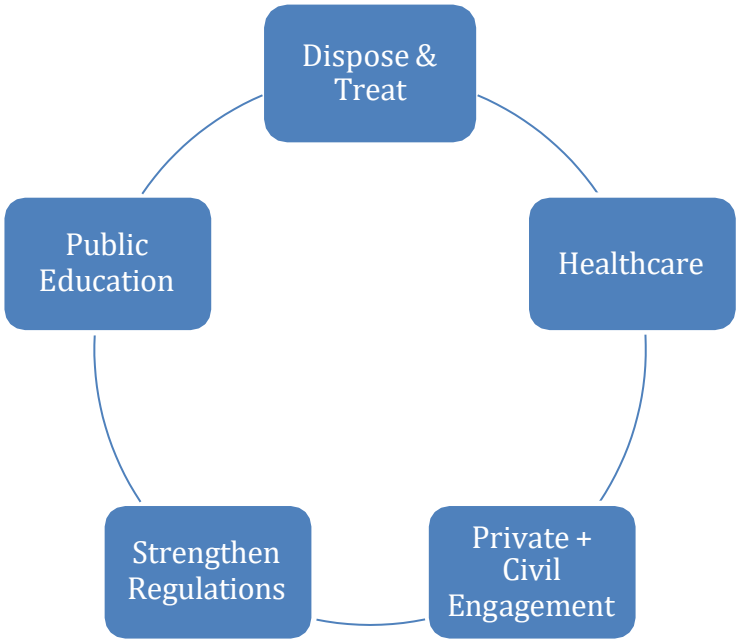
[5] McFarland, M.J., Hauer, M.E., Reuben, A. (2022). *Half of US population exposed to adverse lead levels in early childhood.* Proceedings of the National Academy of Sciences, *119*:11

[6] Physicians for Social Responsibility. Coal ash: Hazardous to human health. Retrieved from https://tinyurl.com/88cnmfux

[7] Petrovic, M., Fiket, Z. (2022) Environmental damage caused by coal combustion residue disposal: A critical review of risk assessment methodologies. Chemosphere, 299,1-16.

[8] American Coal Ash Association. (2020, December 15). *Fly ash use in concrete increases slightly as overall use of coal ash recycling rate declines.*[Press Release]. Retrieved from https://tinyurl.com/5cxky2uu

following policies are an interrelated coordinated strategy that Indiana state agencies can implement in lockstep, in accordance with their individual mandates. The following policy recommendations assume a spirit of collaboration to optimize and compliment government operations.



Disposal and Treatment Measures

1. **Subsidize coal ash removal:** Removal of coal ash is the best solution as a preventative measure to avoid widespread health risks. Coal ash removal costs can be subsidized by the government to ensure maximum efficiency in remediation within the quickest amount of time. This measure can be paired with strengthening regulatory frameworks to incentivize positive company action in lieu of future punitive measures.

2. **Treat contaminated waterways:** This measure can be implemented immediately and should continue alongside coal ash removal efforts that include subsidy assistance if treatment is a part of company removal plans. Clear definitions must be established for what types of water treatment is acceptable and should not be in place of coal ash removal.

3. **Repurpose remediated coal ash:** The removal of coal ash in all its forms creates an inventory of byproducts available for use. Coal ash removed from ponds can then be integrated in construction material to enhance sustainable infrastructure. Prior to repurposing coal ash, the government must ensure that the byproducts are properly protected within the repurposed product to prevent leakage that can also cause contamination.

Healthcare Measures

4. **Identify and target affected communities for social and medical services:** Each municipality within Indiana should identify a proximal radius to Indiana rivers close to communities that reside near coal ash ponds. Within these areas, the government can assess the greatest percentage of that population that needs

medical services. A proxy measure can be developed to track and identify eligibility of community members that require the greatest amount of medical care and immediate social service needs because of coal ash exposure. Ideally, this measure would be integrated into the existing healthcare structure to assist families with resources and monitor progress.

Private Sector and Civil Society Engagement

5. **Coordinate public-private- civil society partnerships to monitor and evaluate coal ash ponds that are either in the process of closing or are fully closed:** This measure will work well as a building block linking existing monitoring and evaluation happening at the private, civil society, and public levels. Guidance should be taken from the EPA CCR permit program to scale down and close coal ash ponds.[9]

Strengthen Regulatory Frameworks

6. **Increase investment in regulatory oversight and enforcement:** Funding should be allocated to expand the power of the political appointee established in the 2018 amendment of the CCR to include provisions for a full office dedicated to investigations, resolution coordination and policymaking.

7. **Establish fines for coal ash waste violations:** The expanded office for the political appointee can establish the fines for companies that do not comply with regulations set. As an extra incentive for coal companies to modify their behavior, fines would not be in effect until after a grace period that they must demonstrate concrete steps to resolve problematic operations.

Public Education Campaign

8. **Create and expand education initiatives about coal ash and the benefits of cleaner forms of energy:** Consumer education campaigns can inform Hoosiers about the dangers of coal ash exposure, ways in which the state is addressing the issue, as well as the economic, health, and environmental benefits to doing so. This education campaign should align well with the guidance document from the EPA sections on public participation.

With the implementation of a multi-pronged strategy, Indiana can boost the health profile of its citizens, reverse its negative environmental impact, and generate additional sources of revenue for the state treasury. The drawback to mitigating coal ash contamination is that it will take considerable effort for Indiana to have the manpower, expertise, and cooperation, of the business, government, technology, and education sectors as well as enforcement that can be a real deterrent to further contamination.

[9] Environmental Protection Agency. (2017). Coal combustion residuals state permit guidance document: Interim final. Retrieved from https://tinyurl.com/2p868d9r