



NORTHERN PLAINS
RESOURCE COUNCIL



DOING IT RIGHT

COLSTRIP'S BRIGHT FUTURE WITH CLEANUP

A joint research effort between Northern Plains Resource Council and International Brotherhood of Electrical Workers (Local 1638)

ABOUT

This study was authored by the Northern Plains Resource Council and International Brotherhood of Electrical Workers Local Union 1638 (in Colstrip, Montana), a partnership rooted in a shared philosophy that community and watershed health are interdependent and indispensable.

Northern Plains Resource Council (Northern Plains) is a grassroots conservation and family agriculture non-profit that organizes Montana citizens to protect our water quality, family farms and ranches, and unique quality of life. The organization was founded in 1972 by local ranchers, including ranchers in the Colstrip area, and community members who wanted to address the impacts that coal development would have on the water quality and livelihoods of central and eastern Montanans. Northern Plains continues to advocate for clean water and the health of the entire community.

International Brotherhood of Electrical Workers Local Union 1638 (IBEW Local 1638) represents the skilled, full-time maintenance and operation employees working at the Colstrip Power Plant. Most of its members reside in Colstrip and Rosebud County, and thus have a vested interest in the proper cleanup of the power plant site; reclamation of the land, and long-term watershed viability. The IBEW represents a workforce with a skillset available to remediate environmental impacts caused by the leaking ash ponds at the power plant site, which is timely given the impending shuttering of Units 1 & 2.

Contents

I. EXECUTIVE SUMMARY

1.1 Introduction 4

II. COLSTRIP

2.1 Power Plant Background 13
2.2 Talen's Proposal—Cleanup Required; Strategy Undecided 23
2.3 Who Pays? Colstrip Owners' Cleanup Costs 26

III. COAL ASH BASICS

3.1 What is Coal Ash? 28
3.2 Cleanup Strategies 32

IV. POLICY CONTEXT

4.1 Administrative Order on Consent, 2016 Settlement 41
4.2 Coal Combusion Residual Rule 42

V. CASE STUDIES

5.1 Asheville Plant (NC) 45
5.2 Riverbend Plant (NC) 50
5.3 Wateree (SC) 55
5.4 Little Blue Run (PA) 61

VI. ECONOMIC IMPACTS OF REMEDIATION

6.1 Cost Analysis 65
6.2 Cleanup Raises Local Tax Revenue 69
6.3 Remediation Jobs 70

VII. CONCLUSION 73

VIII. REFERENCES 75

I. EXECUTIVE SUMMARY

1.1 Introduction

Coal ash waste is polluting the groundwater in Colstrip, but cleaning it up could provide many jobs and other economic benefits while protecting community health.

This study was conducted to analyze the job-creation potential of cleaning up the groundwater in Colstrip, Montana, that has been severely contaminated from leaking impoundments meant to store the coal ash from the power plants (Colstrip Units 1, 2, 3 and 4). Unless remediated, this contamination poses a major threat to public health, livestock operations, and the environment for decades.

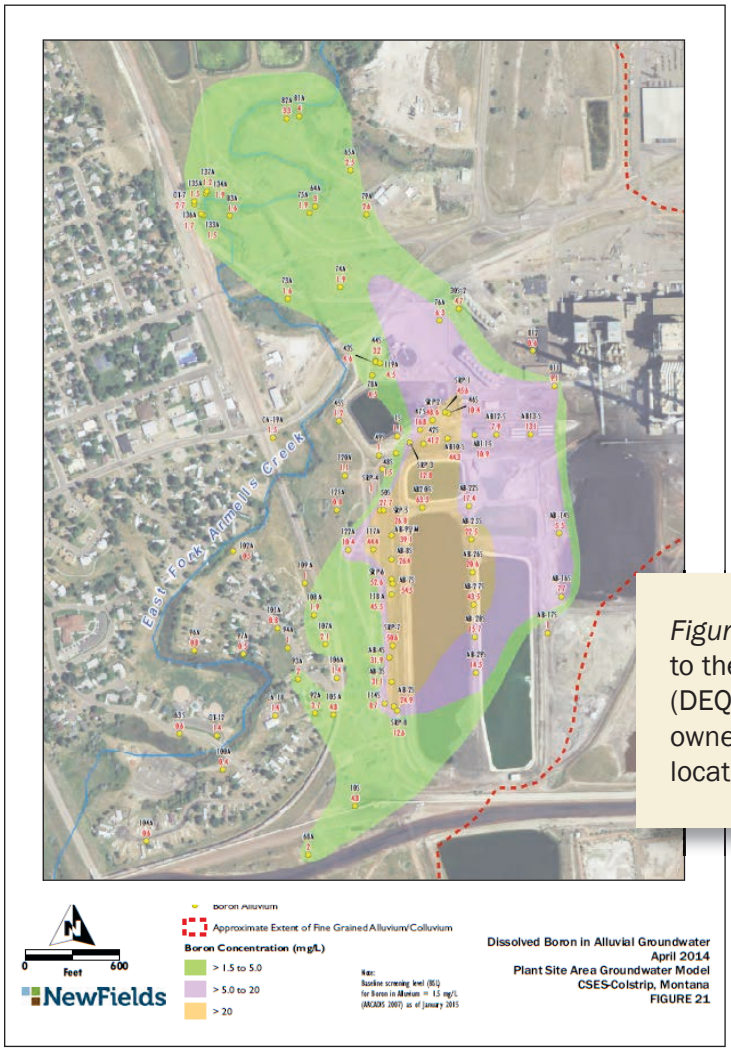
Communities benefit from coal ash pond cleanup but the positive impacts of cleanup can vary widely depending on the remediation approach followed. Certain strategies like excavating coal ash ponds and building a water treatment facility lead to more jobs, stabilized property values, and effective groundwater cleanup while others accomplish only the bare minimum for legal compliance.

This study demonstrates that, with the right cleanup strategies, job creation and environmental protection can go hand-in-hand, securing the future of the community as a whole.

UNLINED ASH PONDS LEAK

With 32 ponds totaling over 800 acres, the ***Colstrip ash pond complex is one of the largest in the United States*** and contains millions of tons of coal combustion residuals (or CCR), more commonly referred to as coal ash[1].

The ponds leak contaminated water into the ground at a rate of 367 gallons per minute, or 200,000,000 gallons per year[2]. Hundreds of wells currently pump this polluted water out of the ground and back to the ponds in an effort to keep the pollution plume from expanding further.



(Credit: Talen Montana LLC/Geosyntec Consultants, 2017)

> ***THE ASH PONDS LEAK 367 GALLONS PER MINUTE, OR 200 MILLION GALLONS A YEAR. THEY HAVE BEEN LEAKING SINCE THEIR CONSTRUCTION MORE THAN 30 YEARS AGO.[2]***

Figure 1: Groundwater contamination map submitted to the Montana Department of Environmental Quality (DEQ) by Colstrip plant owners. According to plant owners, boron serves as an indicator of the plume's location and concentration.

COAL ASH HEALTH RISKS

Coal ash introduces heavy metals and other pollutants like arsenic, hexavalent chromium, radium, selenium, and lead into the groundwater[3]. Arsenic, which causes bladder and kidney cancer as well as birth defects, is found in especially high levels in the groundwater surrounding many coal ash ponds[4,5]. Elevated exposure to other pollutants like selenium, molybdenum, sulfates and boron all pose dangers to livestock health.

COLSTRIP UNITS 1 & 2 TO CLOSE BY 2022

Pursuant to a series of lawsuits, the Colstrip plant owners will retire Units 1&2 by July 2022, close the associated Units 1&2 ash ponds (approximately 278 acres), convert to dry ash storage for the remaining Units 3&4, and remediate the groundwater contamination by 2049 [6,7].

Colstrip plant co-owner Talen Energy is in the process of submitting cleanup proposals for approval with the state of Montana. Thus far, they have proposed to cover the ponds with the coal ash left inside—also known as ***cap-in-place***—rather than remove the waste and contaminated soil, and expand its current groundwater capture system, augmented with freshwater injection wells[8,9,10]. Talen has not indicated whether it will hire the existing workforce to do the cleanup work or contract it out to non-local companies.

STOP THE LEAK, CLEAN IT UP

Fixing the pollution from leaking coal ash ponds involves two processes: stopping the source of pollution and remediating the impacted groundwater.

Point source control involves stopping the source of pollution, usually via **cap-in-place** (leaving coal ash waste material in the pond and covering the pond with a cap or final cover) or **excavation** (removing the ash and moving it off-site either to a secure landfill or to be recycled into concrete). Cap-in-place is the cheaper option, but many experts consider this an impermanent solution because seepage and contamination can still occur, and has at numerous sites, including the closed Stage One Evaporation Pond at Colstrip[11,12]. Excavation is costlier because it requires more labor-intensive stops, but is generally considered more effective at stopping further groundwater contamination quickly and permanently[13,14,15].

Groundwater remediation describes mechanisms for cleaning up existing contamination. At sites with massive leakage problems like Colstrip, **capture of the contaminated water** is often done with a series of wells that pump contaminated water to the surface for storage or reuse in the plant. Another approach is utilizing a **water treatment facility**, in which pollutants like heavy metals are removed from the contaminated groundwater; at Colstrip, this would be done in conjunction with groundwater capture[16].

WHAT HAVE OTHER STATES DONE?

This study looked at cleanup efforts at four other contaminated coal ash pond sites in the U.S. to evaluate the outcomes of different cleanup strategies in terms of job creation and cleanup efficacy.

As displayed in the table below (*Figure 2*), **cleanup operations at sites in North Carolina and South Carolina employed 50% - 90% of the plant's operating workforce.** Although this data set is limited, these findings reflect general industry knowledge and research that excavation, in particular, requires a large workforce.

Plant Name/ Location	Pond Size	Cleanup Jobs	Existing Plant Jobs	Cleanup Strategies
Riverbend Station (North Carolina)	69 acres	75	145	Excavation + Transport + New Treatment Plant + Water Treatment
Asheville Plant (North Carolina)	76 acres	190	200	Excavation + Transport + Water Treatment
Belews Creek[206] **(North Carolina)**	283 acres	163	300	Cap-in-place + New Treatment Plant
Colstrip Station (Montana)	~800 acres	Unknown	388	Cap-in-place + Expand Capture System

Figure 2: Comparison of ash pond size, cleanup strategies, and workforce size. For background on these numbers, please refer to sections 2.1, 5.1, and 5.2.

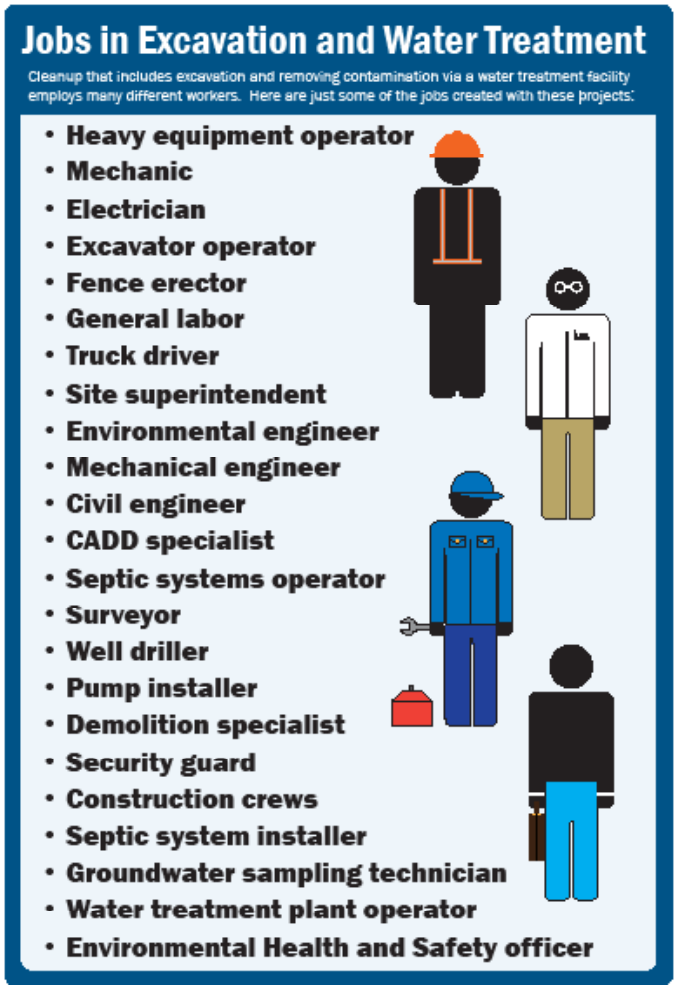
RESPONSIBLE CLEANUP CREATES THE MOST JOBS

Effective cleanup means not just removing contamination from the environment, but also doing so in as short a timeframe as possible. Many plant sites in North and South Carolina are closing their ash ponds using excavation because it reduces contamination quickly. For example, excavation at some South Carolina plant sites has reduced arsenic contamination in the groundwater by 80% to 90% in under five years[17]. A new water treatment plant at the Riverbend Station in Gaston County, North Carolina, is effectively removing heavy metals and other pollutants from coal ash pond water so it can be safely discharged into the drinking water source for Charlotte, North Carolina[18].

Shorter cleanup timelines do not indicate reduced job creation. The sites in North and South Carolina, which are much smaller than the surface area at Colstrip, are projected to take more than five years to complete just the dewatering and excavation steps. Active cleanup strategies employ a significant number of workers. Excavation, in particular, requires a larger workforce and achieves responsible cleanup goals in a shorter timeframe.

REMEDIATION JOBS

Not all cleanup is the same. More robust protocols that include **excavation and water treatment employ more workers than a strategy that relies on cap-in-place and groundwater capture**.



(Credit: Graphic designed by Northern Plains Resource Council, ©2018)

Similarly, this report's case study analysis finds that coal ash excavation projects require a diverse range of skills. *Figure 3* highlights some of the jobs created for those remediation projects.

The local workforce in Colstrip already has many of the skills required for this remediation project, although additional training will probably be needed as workers shift from plant operations to remediation work. While some of these jobs are shorter-term in nature, like the construction jobs associated with building a landfill, others are highly-skilled professions that will be needed for decades, such as a water treatment plant operator.

Figure 3: Heavy metal and industrial contamination cleanup sites in Montana utilize a wide range of skilled workers. This is a selection from an analysis of required jobs for recent mine reclamation and heavy metal remediation projects in Montana. (see "Natural resource and environmental restoration in Montana: Case studies in restoration and associated workforce needs" by Swanson, L. and Janssen, H. (2012)).



Pictured: IBEW Local 1638 President, Brett Bowen

LOCAL WORKERS IN COLSTRIP ALREADY HAVE MANY OF THE SKILLS REQUIRED FOR REMEDIATION.

RESPONSIBLE CLEANUP IS GOOD FOR WORKERS AND PROPERTY VALUES

Effective cleanup of industrial pollution provides positive economic impacts for local communities. A recent analysis of 797 brownfield sites showed that remediation resulted in an average 5% to 11.5% increase in property values, with increases up to 15% observed[20]. This increase in property values also leads to stabilized or increased tax revenue for local governments[21,22]. The sooner cleanup efforts begin and goals are reached, the sooner property values and associated tax benefits will be realized.

Research shows that existence of contamination—or even the *perception* of contamination due to proximity or history—can seriously hamper new commercial investment in an area[23]. Communities that recognize this fact and swiftly address contamination while working with local businesses and government agencies can ameliorate many of the investment disincentives associated with pollution[24,25].

More effective cleanup also increases the supply of useable, clean water for agricultural producers and other industries in the area[26].

Furthermore, an isolated community like Colstrip is especially affected by a plant closure due to the smaller number of local businesses that could hire laid-off workers[27]. Hiring non-local, contract labor to conduct remediation work exacerbates this problem. Remediation projects that hire the local workforce instead of non-local, contracted labor will yield more economic benefits for the community in terms of local employment and wages.

THE COST OF POOR CLEANUP

At 937 acres, the pond at the **Little Blue Run** plant in Beaver County, PA, and Hancock County, WV, is the nation's largest coal ash pond; leakage from the impoundment has devastated nearby communities[28,29]. Neighbors filed a lawsuit against the company after leaks polluted drinking water

wells, cracked home foundations, and left yards constantly soggy[30].

The plant's solution has included buying out dozens of homeowners so it can operate the properties as groundwater capture sites[31]. As a result, property values have plummeted in the area. Some homeowners have abandoned their houses while others remain stuck with properties that won't sell[32].

The plant is slated for cap-in-place closure in 2028. Pennsylvania state officials expect groundwater leakage to continue indefinitely and the company plans to simply continue pumping it back into the same impoundment, essentially allowing the problems to continue even after closure[33].



Little Blue Run—on the border of West Virginia and Pennsylvania—leaks more than 400 gallons per minute into the local groundwater, causing nearby property values to plummet. *(Photo credit: Terry Cullinan/Smithsonian Magazine, 2016)*

LEAKAGES FROM LITTLE BLUE RUN'S ASH POND HAVE POLLUTED NEARBY WELLS, DAMAGED HOME FOUNDATIONS, AND DESTROYED YARDS DUE TO OVERSATURATION.

NO PERFECT SOLUTIONS

For all the benefits of thorough remediation, there is no perfect solution for managing coal ash. Even landfills that comply with the new federal Coal Combustion Residuals rule will have to be monitored and maintained for many decades assure communities that they are safe. Transporting coal ash for disposal poses risks as well, and must be done very carefully to protect community and environmental safety. Furthermore, handling coal ash without proper protections has sickened and even killed workers[34]. It is imperative that worker safety is a top priority for all cleanup efforts and disposal operations, including adequate protective gear, proper training, and rigorous project oversight.

KEY TAKE-AWAYS

1. ***The best cleanup strategies achieve cleanup goals in a short timeframe, permanently stop point-source pollution, and utilize the local workforce.***

2. ***Excavation and water treatment create more jobs and remediate existing contamination in a shorter timeframe than methods that rely on cap-in-place, groundwater capture, and natural attenuation strategies.***

3. ***Effective cleanup leads to economic benefits, such as:***
   - Increased property values
   - Increased local tax revenue
   - Greater potential for future business development
   - Higher rates of local employment

4. ***The current Colstrip power plant workforce has many of the skills required for a thorough cleanup strategy that includes excavation and water treatment.*** While some additional training would be needed, this modest additional effort and cost would lead to many long-term benefits of keeping these jobs in the community.

5. ***Agricultural users will benefit from plans that remediate the existing groundwater plume more quickly since they rely on the area's groundwater for livestock and crop production.***

6. ***Excavation is allowed -- but not specifically required -- by federal coal ash regulation, and therefore Talen could legally avoid excavating its coal ash ponds.***

7. ***Other states and utilities have adopted excavation cleanup strategies because it is a more permanent and thorough method to stopping contamination.*** North Carolina passed a law in 2014 requiring excavation of the state's most polluting wet ash ponds. All three of South Carolina's utility companies voluntarily agreed to close their unlined wet ash ponds via excavation and two of these companies are not seeking ratepayer increases for these closures.

8. ***Decision-makers should take all these impacts into account when analyzing various cleanup options and should advocate for the solutions that best meet the community's needs.***

CASES ANALYZED IN THIS STUDY SUGGEST THAT RESPONSIBLE CLEANUP AT THE COLSTRIP SITE CAN LEAD TO HIGH JOB CREATION AND OTHER WIDESPREAD COMMUNITY BENEFITS.

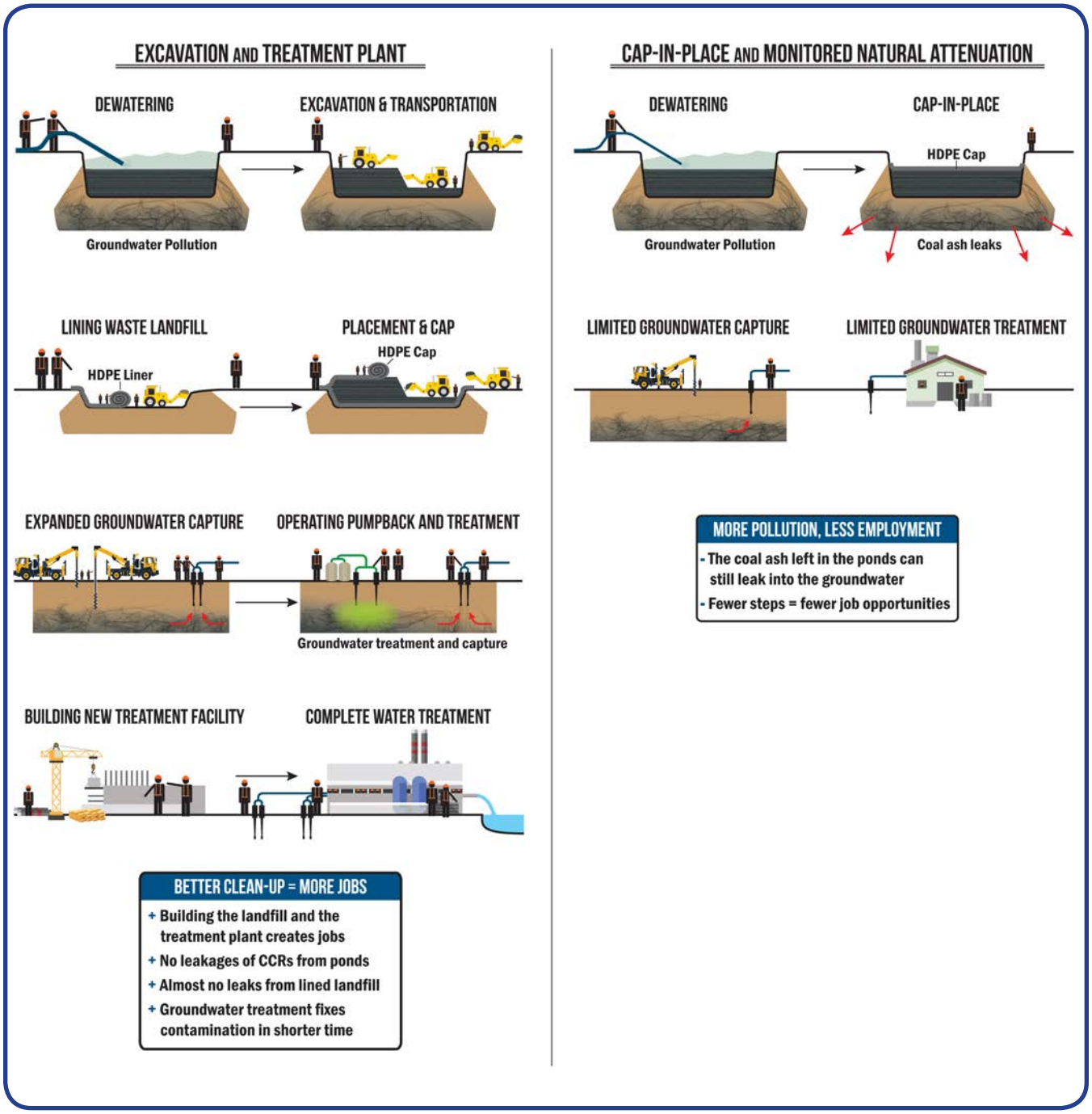


Figure 4: Cleanup strategies that permanently stop future contamination and quickly fix existing pollution of the groundwater are big job creators. Capping ash in the same pond location leaves open the possibility for future groundwater contamination, and creates fewer jobs.