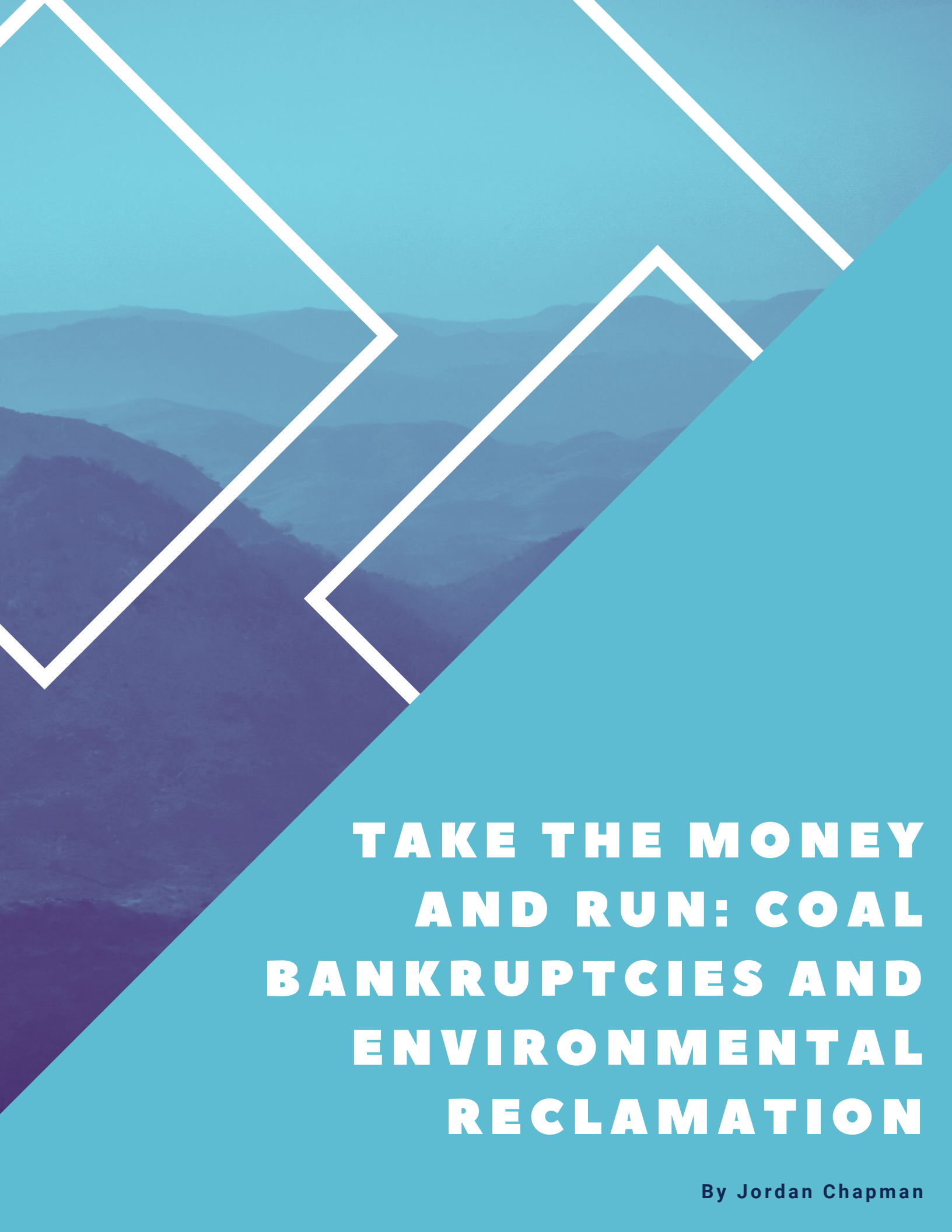

# TAKE THE MONEY AND RUN: COAL BANKRUPTCIES AND ENVIRONMENTAL RECLAMATION

By Jordan Chapman

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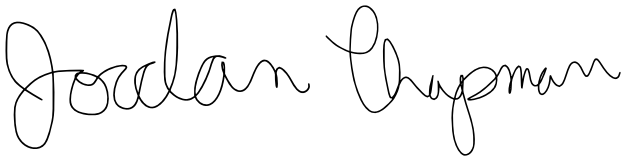
# DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

# HONOR STATEMENT

On my honor as a student, I have neither given nor received aid on this assignment.



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# Acronyms

DMME: Department of Mines, Minerals, and Energy
EPA: Environmental Protection Agency
DOI: Department of the Interior
AML: Abandoned Mine Land(s)
SMCRA: Surface Mining Control and Reclamation Act
NEPA: National Environmental Policy Act
OSM(RE): Office of Surface Mining Reclamation and Enforcement
MTR: Mountaintop Removal (Mining)
NRDC: Natural Resources Defense Council
AMD: Acid Mine Drainage
DMLR: Division of Mined Land Reclamation
NOV: Notice of Violation
FTACO: Failure to Abate Cessation Order
POV: Pattern of Violation
UMWA: United Mine Workers of America
SEC: Securities and Exchange Commission
CBT: Creditors' Bargain Theory
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
NPL: National Priorities List
GAO: Government Accountability Office
CEO: Chief Executive Officer
UFTA: Uniform Fraudulent Transfer Act
UFCA: Uniform Fraudulent Conveyance Act
PCB: Polychlorinated biphenyl
EFH: Energy Future Holdings

# Executive Summary

The bankruptcy system is being used by coal companies to offload billions of dollars in environmental cleanup costs, the burden of which ultimately falls on local communities. This process is rooted in the life cycle of a coal company. First, companies apply for crediting and insurance. Because creditors and insurers face minimal risk in the bankruptcy process, they incentivize the expansion of unstable firms. Once the finances have been arranged, companies apply for permits and post reclamation bonds. A problem at this stage is that certain permitting and bonding regulatory practices like self-bonding end up undermining the mission of regulators: to protect the environment. After obtaining permits and posting bonds, companies are then allowed to mine, expected to engage in reclamation and subject to inspection. Mining is inherently destructive of the environment, yet companies often fail to reclaim the land in a timely fashion, taking advantage of using certain inspection standards to infinitely postpone fulfillment of reclamation obligations. When companies eventually file for bankruptcy protection, they can either liquidate completely, or opt to engage in corporate reorganization. If the company chooses to reorganize, this cycle repeats itself once more. They are allowed to do this because companies inflate their financial solvency and engage in practices like the creation of subsidiaries to prevent creditors from seizing assets and regulators from being able to require the cessation of operations. Additionally, many common standards in the bankruptcy court system are disadvantageous to regulatory enforcement, further complicating this issue. At a broad scale, companies engage in tactics all along the way that reduce the likelihood that the environment will be responsibly managed. This report outlines this process and presents interventions for mitigating some of these concerns. **While the two options proposed, eliminating self-bonding and increased financial monitoring, have great potential due to their low costs and high levels of feasibility, a wide range of considerations and changes are necessary to prevent further environmental degradation.**

# Problem Definition

Once employing 2% of the entire nation's population, the coal industry today employs fewer people than Arby's (Ingraham, 2017). Between January and October 2019, 8 companies filed for bankruptcy protection (Krauss, 2019). The mining process leaves a dangerous footprint on the environment, one that is often still being cleaned up decades after the first mine operations began at that given site.Though there are a number of instruments in place to encourage companies to reclaim land used for mining, coal companies have found ways to take offload liabilities and exploit the federal regulatory regime. This, in combination with the financial collapse of the industry, spell disaster for the environment and communities that rely upon it. **As widespread bankruptcies sweep the industry, coal companies are leaving their obligation to reclaim land to the government and to local communities, while they take the money and run.**

# Background

**Introduction**
As one article described it, “a big company declaring Chapter 11 bankruptcy is like Lindsay Lohan checking into rehab. They’ll be back” (Roberts, 2016). Addiction might be the best framework for considering the relationship between coal companies and environmental reclamation. Here’s how it goes: major coal companies hit rock bottom. They declare bankruptcy, they go to court, and they can either go cold turkey (Chapter 7 bankruptcy, complete liquidation) or they can try to get their act together and start over (Chapter 11 bankruptcy, corporate restructuring). Chapter 11 bankruptcy is essentially top-down company rehab. They stop their operations, install new leadership at the top, and try to make amends with those who they’ve hurt with their irresponsibility (i.e. by paying back their secured creditors). Some people never really get apologies, and some promises remain broken, especially those made to the government like the obligation to engage in environmental reclamation. And unfortunately, like rehab, Chapter 11 bankruptcy doesn’t always work. Companies can say they’ve changed and that they are trying to do better, but in the end, when you’re mining for coal, rock bottom is never really that far away.

**Similarities**
The harms of bankruptcy, like addiction, are often borne by others. Over 6.2 million acres of lands and streams across the country are damaged from abandoned mine land (AML) problems (Dixon & Bilbrey, 2015). The hazards posed by abandoned mine lands are numerous and severe. In fact, almost any environmental danger you could consider, whether it’s water contamination, flooding, landslides, sinkholes, or fires, are potential threats posed by abandoned mines. As recently as February, the Virginia Department of Mines, Minerals and Energy (DMME) declared that two landslides that occurred in Buchanan County were abandoned mine land emergencies. The residents were forced to evacuate as members of DMME worked to redirect water and prevent more material from sliding (Bristol Herald Courier, 2020).

And like addiction, the bankruptcy process has its fair share of players who intend to help, but inadvertently create more long-term harm. The most visible actor on this issue, President Donald Trump, staked his campaign on saving the coal industry. This process involved appointing pro-industry leadership into the Environmental Protection Agency (EPA) and the Department of the Interior (DOI) in the forms of former attorney Scott Pruitt and oil industry ally Ryan Zinke. While Pruitt worked to undo the environmental protections created by the Obama Administration within the EPA, Zinke opened up federal land leasing rights for coal companies, an attempt to end what Trump refers to as, “the war on coal” (Stieb, 2019). Members of Congress who have similarly perpetuated the notion of a “War on Coal” in the past include Mitch McConnell (R-KY), Keith Rothfus (R-PA), Andy Barr (R-KY), Shelley Moore Capito (R-WV), Morgan Griffith (R-VA), Marsha Blackburn (R-TN), Doug Lamborn (R-CO), Jeff Duncan (R-SC), and Tom Rice (R-VA) (War On Coal Debate, n.d.). All the while, creditors, insurers, regulators (when desperate), and company leadership encourage coal companies to expand their mining, even when on the brink of collapse. These actions, though intended to help miners and coal communities, leave environmental harms that will outlast the industry itself.

**Differences**
The addiction analogy stops here, though. Because unlike recovering addicts, coal companies have consistent control over their actions and willfully engage in practices that defer responsibility. Across the industry, companies have used bankruptcy as a bailout, A handful of mechanisms are used to make this happen. Through methods like self-bonding, companies can essentially make a false promise to the government about their ability to pay for reclamation. They do this by inflating the value of their assets, using the formation of subsidiaries to pool liabilities into subsidiaries, and by keeping regulatory obligations off-book altogether. From there, companies can use bargaining to convince regulators to allow

them to continue mining and in exchange, the government is left with a fraction of what they are owed, if any money at all (Macey & Salovaara, 2019).

Also, unlike addiction, this issue is not just amongst a few people who happen to have a problem. Alpha Natural Resources is just one of a group of companies to engage in practices that led to the rejection, abandonment and transference of regulatory obligations, as well as to use inflation of asset values to fake solvency. Patriot Coal, Arch Coal and Peabody Energy are just some others that exemplify the abuse of the bankruptcy system (Macey & Salovaara, 2019). The bad apples are widespread, as are the bankruptcies occurring in this industry. The combined market value of the top four coal companies in the United States dropped from $33 billion to $150 million within a 5-year-period (Roberts, 2018). Annual U.S. coal production is expected to drop from 711 million tons to less than 600 million tons during the next five years as renewables and cheap natural gas overtake coal in domestic energy consumption (Craig, 2019). In terms of the industry impacts, approximately 44% of coal produced in the United States come from companies that have filed for bankruptcy protection since 2012 (Kuykendall & Cotting, 2016). At the same time, the leaders of these failed companies provide themselves with massive bonuses and have been found using their companies to cover their own personal finances (Roberts, 2016; Williams-Derry, 2019). Between 2012 and 2017, four of the largest coal companies in the US shed approximately $5.2 billion of environmental and retiree liabilities, or 22% of the total debt discharged (Macey & Salovaara, 2019).

**Impact**
This matters not just because of the environmental impact, but also the impact felt by coal mining communities. Rates of poverty in coal mining communities have historically been higher than in non-coal mining communities, and that gap as widened substantially in recent years. Coal mining communities also have approximately a 25% higher rate of mortality than non-coal mining communities (Bowen, Christiadi, Deskins, & Lego, 2018). Meanwhile, coal-related revenues may fund as much as a third of the local budgets for some parts of the country (Morris, Kaufman, & Doshi, 2019). Those who most depend on coal companies are also those who are the most at risk when rock bottom comes.

**Takeaways**
America has a dangerous addiction to coal. Luckily, with the support of multiple policies and actions, our nation can begin to not only break the habit, but start cleaning up the messes that have been made and hold those who created those messes in the first place accountable. But first, it will help to understand the process that leads to bankruptcy. What follows is an in-depth outline of the steps companies take prior to and during bankruptcy that allow them to impose these burdens on regulators, taxpayers, and communities. This process begins with crediting and insurance before companies apply for permits and post bonds that allow them to engage in mining, with reclamation being an expectation overseen through the inspection process. But first, a cycle that ends in insolvency naturally must begin with financing.

# Crediting and Insurance

**Introduction**

One of the first steps of the mining process is getting financing and insurance. Financing is required to cover the costs of the equipment, the acquisition of mines, the payment of bonds, and many other parts of the mining process. For reference, this step will be referenced as crediting and financing interchangeably, since while business language tends to use the word financing, crediting as a term is more compatible with bankruptcy vernacular. Major creditors in the industry include investment firms, banks and hedge funds (*U.S. coal company leaving bankruptcy, mines go to creditors*, 2019). As an increasing number of companies face bankruptcy, it has been said that "Wall Street now runs most of the coal business" (Brown, 2019). At the same time, over 100 major creditors and insurers have announced their plans to divest from coal mining and coal-fired power plants (*Financial Institutions Are Restricting Thermal Coal Funding*, 2020). Speaking of insurers, insurance is required for coal mining to occur. Insurance policies cover such areas as general liability, workers compensation, reclamation bonds, and other forms of environmental liability (*CDT Mining Insurance*, 2020). As of July 2019, 17 insurers have adopted policies restricting coverage of the coal sector, and at least 25 insurers with combined assets of over $6 trillion have chosen to divest from coal. These insurers have made this change due to the decline in the industry and a desire to move away from fossil fuels and towards greener sources of energy (*Why Insurers Need To Ditch Coal*, 2019).

**Peabody Energy Bankruptcy**

The case of the Peabody Energy bankruptcy can illustrate an important caveat to the positive actions undertaken by creditors and insurers. When the company was facing impending bankruptcy, it created a subsidiary of company known as Gold Fields Mining. Gold Fields Mining had assets of $6 million against claims of almost $13 billion. Peabody Energy kept its assets to itself, which, by pooling liability in its subsidiary, made it appear more financially secure. It then divested its liabilities into Gold Fields, which would then be liquidated. This method allowed Peabody Energy to pay just $32 million in settling environmental claims, or a 98% discount on the $1.8 billion it was estimated to owe. Some have argued that in cases like Peabody Energy for example, the companies might have been considered insolvent as soon as they emerged from bankruptcy, assuming they had provided accurate accounting. In other words, these actions are being undertaken manipulatively to delay already impending bankruptcy, potentially unbeknownst to those incurring the risk. At the same time, creditors and insurers are incentivizing this behavior because these actions reduce the likelihood that creditors and insurers will be left uncompensated in the bankruptcy process, since in taking these actions, the asset-loaded firms being backed are less likely to declare bankruptcy, and has the potential to reduce potential liability to financiers (Macey & Salovaara, 2019).

**Supporting An Industry On Shaky Ground**

It seems contradictory for creditors to try to separate from coal while at the same time pulling the strings. As the Peabody Energy example illustrates, the way this happens is that coal companies approach insurers and creditors with valuations of their assets in order to receive crediting and insurance. This is a textbook illustration of the moral hazard problem and adverse selection: information asymmetry allows coal companies to misrepresent their financial state and since creditors do not bare the social cost of the bankruptcy (when it comes to covering reclamation costs), they act in their own self-interest. Mining companies frequently engage in overvaluation, liquidation and divestiture to minimize perceptions of debt and liability, making investment more enticing. The provided valuations are then assessed by the creditors and the insurers to determine whether or not assuming the risks of backing this particular mine is worthwhile.  Since divestures can decrease the overall likelihood of bankruptcy for financed companies, this choice is made that much simpler.

**When Creditors Go To Court**

It is also easy for creditors and insurers to make this choice because bankruptcy law is designed to protect them, so there is little risk to begin with. Creditors' Bargaining Theory makes the goal of bankruptcy to "maximize the expected value of the pool of assets that will ultimately be divvied up among creditors." The idea is bankruptcy courts would prefer an organized system of asset assessment and distribution because otherwise, creditors could create a tragedy of the commons-type problem. In this scenario, creditors get word that their debtors are about to declare bankruptcy and race to assets before other creditors, or take secret deals with debtors to guarantee payment (Macey and Salovaara, 2019). There are three mechanisms that make this work. The first is automatic stay. Automatic stay prevents creditors from collecting debts, which provides relief to the debtor and stops the rush of creditors from coming in. It also prevents parties from filing suit against the debtors, but that is a story for another section. The second mechanism is the rule against fraudulent transfers. This rule stops debtors from cutting deals prior to bankruptcy that privilege some creditors over others and make assets unavailable for seizure. The final mechanism is the absolute priority rule (Macey & Salovaara, 2019). This rule creates the waterfall payment system where, "higher-tiered creditors receive interest and principal payments, while the lower-tiered creditors receive principal payments after the higher-tiered creditors are paid back in full" (Frankenfield, 2020). The tiering is based on whether the creditor is considered secured or unsecured. While a secured creditor has a lien on a piece of property and is owed debt, an unsecured creditor does not have a claim. This class of creditors is broken down into those with priority and non-priority claims, with priority claims not being dischargeable (O'Neill, 2020).

Stockholders are usually paid last in bankruptcy proceedings. It's worth noting that companies' ability and willingness to pay stockholders can have incredible variance over time. For example, in March of 2019, Bloomberg News ran the headline, "It's The Best Time to Own Some Stock in a Dying U.S. Coal Miner" (Wade, 2019). That's not a typo, the article morbidly used the word "miner" as opposed to "mine." Maybe by December, the author realized his faux pas. More likely, however, is that conditions in the industry changed, because the headline in Bloomberg News in December read, "The Good Times Are Over for Wall Street's Coal-Stock Bulls" (Wade, *The Good Times Are Over for Wall Street's Coal-Stock Bulls*, 2019). This introduces an interesting point: there is incentive for coal companies to expand and increase output in order to pay creditors and stockholders, even after the company anticipates bankruptcy. This process creates more environmental damage, which in turn creates more debt, which then encourages companies to expand even more (Cohan, 2016).

Regardless of whether or not companies seeking out financing have a clean slate or are emerging post-bankruptcy, these pieces generally look similar. Financing and insurance are necessities to the mining process, and because of that, this serves as the beginning of many of the problems associated with this cycle. At the same time, the financing and insurance step in this process can also introduce an opportunity to break the decision cycle. Before discussing the opportunities in this space, the other steps in this cycle must be considered, with the next one being permitting and bonding.

# Permitting and Bonding

**Permitting**

After getting financing and insurance, companies must apply for permits and post bonds. At the Federal level, an application for a permit must include at least:

- A description of the mining process for this site, including the type and method of mining, the engineering techniques and the equipment being used;
- The starting and ending dates for each mining phase as well as the number of acres used in each phase;
- Maps, plans and cross-sections of the areas impacted, and all of the accompanying locations required for construction of these maps such as abutting surface areas, elevations and locations for sampling, location of subsurface water, locations and thickness of coal seams, location and extent of underground structures, any aquifers, location of the water table, locations of refuse disposal areas, locations of topsoil conservation areas, any sediment control or water treatment facilities, and profiles of the surface configuration post-reclamation;
- The determination of the probable hydrological consequences of mining and reclamation operations for the site and the surrounding areas;
- Statement of test results including chemical analyses of the coal seams;
- A reclamation plan addressing pre-mining activities and productivity, the potential post-mining land use, comments of any nearby impacted parties, relation of the proposed post-mining land use to other policies and plans, and a hydrologic reclamation plan and process (Power & Adkins II, 2010);

Additionally, all permit applications must ensure that activities meet the requirements of the following federal laws, along with any required state laws:

- Mineral Leasing Act of 1920,
- National Historic Preservation Act of 1966,
- National Environmental Policy Act of 1969 (NEPA),
- Clean Air Act of 1970,
- Clean Water Act of 1972,
- Endangered Species Act of 1973,
- Surface Mining Control and Reclamation Act (SMCRA) of 1977 (Trapper Mine Environmental Assessment, 2016).

Transfers (also lumped with sales and assignments) are an important component when considering the permitting process. In this context, a transfer can be considered a change in ownership of a permit. The consideration of permit transfers became significant after Peabody Western Coal Co. v. the Office of Surface Mining Reclamation and Enforcement (OSM(RE)), which went to the Office of Hearing and Appeals in DOI. This case was a response to a previous case, and relates to the transfer rules for permits. Originally, the transfer, assignment, or sale of permit rights was defined as “a change in ownership or other effective control over the right to conduct surface coal mining operations under a permit issued by the regulatory authority.” However, after Peabody Western Coal Co. v. OSM, the definition of a transfer was changed to “a change of a permittee.” This means that a change in power within an organization does not constitute a transfer, which will become relevant as more companies go bankrupt and under Chapter 11 are restructured to have new leadership, management and ownership (Power & Adkins II, 2010). To be even more explicit, any solutions related to expanding liability will need to consider ownership, transfers and permitting as pertinent in establishing liability.

In order to apply for a transfer, the applicant must fill out an application, advertise that the application has been submitted in a newspaper and obtain a performance bond adequate to cover reclamation. From there, any party (including government officials) having an interest affected by the transfer may submit written comments to the state regulatory authority. The

applicant must be eligible to receive a permit, have bond coverage and meet the other requirements specified by the regulatory authority in order for the regulatory authority to permit a permit transfer. It should be noted that the company getting the permit transferred may have liability and reclamation responsibilities from the permit before they even begin mining, with any reclamation not done previously potentially left on their shoulders. That being said, Cat Run Coal v. Babbitt found that the entity holding the permit is the primary party to hold responsible for reclamation (Power & Adkins II, 2010). This can be contrasted with legislation related to the Superfund, which invokes strict, joint and several liability so that any party that could even remotely be held responsible may in fact be held responsible in a court of law.

**Bonding**

In addition to getting permits, mine operators must also guarantee reclamation will occur one way or another. On the corporate side, companies must submit reclamation plans when applying for a permit. On the government side, other mechanisms must be created and overseen to guarantee the security of the environment during and after the mining process. There are three systems to try to ensure reclamation occurs. Two of these systems, AML fund and award programs, will be discussed later. For this section, the third mechanism will be discussed: bonding. There are three types of bonds that coal companies usually obtain: collateral bonds, surety bonds, and self-bonds. Collateral bonds are the most straightforward, and involve posting assets as collateral through letters of credit, certificates of deposit, cash and real property, though letters of credit are used the most. If the company goes bankrupt and the government needs to recoup the costs for reclamation, the government may sell these assets to generate revenue for reclamation. These bonds are considered a last resort for operators since they tie up liquid assets that "the company could use to solve problems and weather downturns in the market" (Yonk, Smith, & Wardle, 2019; Mine Reclamation and Bonding, 1989).

Surety bonds are essentially third-party guarantees (Macey & Salovaara, 2019). These bonds tend to make up the majority of the total value of reclamation bonds posted, since they require little upfront funding from the companies. Over time, however, they have fallen out of favor due to changes in the industry, increased regulation and increased agency hesitancy towards bond release (Yonk, Smith, & Wardle, 2019). Bankruptcies have also played a part, leading surety bond companies to raise rates in response to risk. This behavior likely occurs in part because coal companies have a history of misrepresenting their assets (Morgan, 2019). In theory, surety companies can influence the reclamation process by backing companies that are more likely to reclaim land, increasing the likelihood of bond release. However, the availability of surety bonds has gone down, since the length of time that a surety bond is required for companies has increased. This means that the cost of the bond goes up and the likelihood of bond release goes down for surety companies. Therefore, "surety bonds are poorly suited for guaranteeing long term obligations" (Yonk, Smith, & Wardle, 2019). The timing of bond releases is determined by the regulatory authority, which has incentives not to release bonds in order to guarantee reclamation occurs and in the face of the uncertainty that this will happen. This also drives up rates and drives down availability (Yonk, Smith, & Wardle, 2019).

Which brings us to the third and most controversial kind of bonding: self-bonding. This practice allows companies to operate mines by using their current financial health as a proxy for their future financial health. As is stated in regulation, "the regulatory authority may accept the bond of the applicant itself without separate surety when the applicant demonstrates to the satisfaction of the regulatory authority… a history of financial solvency and continuous operation sufficient for authorization to self-insure or bond such amount" that would be covered by a separate form of bonding (Hein, Snow, Stefanik, & Webb, 2016). In order for a company to engage in self-bonding, it must:

- Have continually operated for at least five years;
- Either
  - Have their most recent bond issuance rated an "A" or higher
  - Have a tangible net worth of at least $10 million, a ratio of liabilities to net worth of 2.5 times or less and a ratio of current assets to current liabilities of 1.2 times or more or
  - Have at least $20 million of fixed assets in the United States;

- Have submitted necessary financial documents including audited and unaudited statements and any other information requested;
- Have a total value of self-bonds guaranteed not to exceed 25% of the tangible net worth in the United States (Hein, Snow, Stefanik, & Webb, 2016);

The most glaring issue with self-bonding is that it makes it easier for companies to avoid obligations that this mechanism was designed to guarantee. Bonds are posted in the coal industry to protect against future uncertainty. It allows for the government to know that regardless of what happens to a particular company, there will be enough assets available to cover the costs of reclamation. The problem is that self-bonding attempts to use current financial health to predict future financial health. These bonds are only meant to be used in cases where the company is not financially healthy enough to pursue reclamation in the first place. Because of this and the current regulatory structure, obligations to recover costs for reclamation are considered like unsecured debt, which under the waterfall financing structure, is collected after that owed to the many other creditors in this system. This often leaves the government and taxpayers picking up the tab, especially when companies misrepresent their assets to qualify for self-bonding.

Beyond self-bonding issues with structural incentives, there are a couple of other problems. One such problem is parent-subsidiary distribution of assets and liabilities. Companies can create spinoff firms as a way of pooling liabilities into/away from parent companies in order to maintain the appearance of financial solvency. This makes it easier for firms to emerge cleanly post-bankruptcy and to obtain financing. Bonds can often be transferred through this parent-subsidiary financial maneuvering, leaving one company responsible for the debts and reclamation obligations if the other declares bankruptcy first.

This itself creates a number of issues. First, regulators have the ability to, but are not required to request updated financial information on the state of companies. From there, if regulators have reason to believe that companies may no longer be able to meet the requirements for self-bonding financially, the companies are required to inform regulators and have 90 days to provide an alternative form of the bond to replace that of the self-bond, or else immediately stop extracting coal. This cycle is entirely dependent on the discretion of regulators, and their ability to adequately track companies' financials as well as those of their subsidiaries, all of which assumes that the companies are accurately reporting in the first place.

The final problem with self-bonding again relates to something illustrated in the previous section. Even when those dependent on company revenue such as insurers, creditors, and regulators, know that the companies are at risk of financial collapse, these parties have incentives to encourage expansion. If regulators find out that a company may no longer qualify financially for their posted reclamation bonds, they may feel pressure to let companies continue operating. The idea is that if companies were to be forced to stop their operations, they would be pushed closer to bankruptcy and there would be little chance for the government to fully recoup the assets required to cover reclamation costs thanks to the absolute priority rule. By letting companies continue to operate, the regulators hope that some revenue could be generated to eventually cover the reclamation costs, which is better than the company immediately liquidating and not being able to cover any of their reclamation costs, which brings us to the next part of this process (Hein, Snow, Stefanik, & Webb, 2016).

# Mining, Reclamation, and Inspection

## Mining

With crediting, insurance, permitting and bonding out of the way, companies can finally get down to business. It is important to understand how and where mining occurs to get a clearer picture of what creates hazards, what makes reclamation so necessary, and what areas are impacted. There are two types of mining, surface and underground, which are distinguished by the depth at which coal seams lie. If it is less than 200 feet beneath the surface, surface mining is used. These two types of mining are divided into three different types of mining for each them.

Starting with surface coal mining, the three types of surface coal mining are strip mining, open-pit mining and mountaintop removal mining (MTR). Companies use strip mining when the coal seams are relatively close to the surface, and it can be done in both flat and hilly areas. It is called contour mining when it is done in a mountainous area. In strip mining, the land is cleared before strips of the overburden, or the overlying sediment, vegetation and rock, are removed in strips. Open-pit mining is used when the coal seams lie too deep for strip mining and is usually done on flat land. A pit is dug out and is then referred to as a quarry. This quarry will expand and continue to be mined until the costs of removing and transporting the overburden outweigh the revenue generated from the mined coal. The final and most controversial type of surface mining is MTR. Entire mountains are stripped of their overburden, which often ends up dumped into nearby valleys, giving this practice the nickname “valley fill mining.” Upon being cleared, explosives are used to expose the coal seam, allowing for coal to be extracted. While all three of these practices are destructive to habitats, can produce hazards like landslides, and allow for toxic pollutants to enter the air and water, MTR has the worst reputation, likely due to the valley fill process, which buries streams.

The three types of underground mining are longwall mining, room-and-pillar mining and retreat mining. Longwall mining is one of the oldest mining techniques. Gigantic panels of coal are striped and moved to the surface using a conveyor belt system. Hydraulic supports known as chocks keep the roofs of the mines from caving in. As the panels are removed, the mining and the chocks are pushed forward, allowing the roofs to collapse in the previous sections. The room-and-pillar method works similarly. A “room” about 30 feet wide is carved out of the subsurface, with pillars created to support the overlying overburden. Then, a machine known as a “continuous miner” extracts the coal from the area of the room. Retreat mining is a variation of the room-and-pillar method of mining. Once a room has been stripped of its coal deposits, the pillars are destroyed and the ceiling caves in through the use of explosives. In this process, additional coal is exposed from the pillars and the overburden, which miners then extract (Turgeon & Morse, 2012). This method is particularly dangerous, as though this mining technique accounts for only 10% of underground production, it also accounts for 25% of the underground fatalities (Chase, Mark, & Heasley, 2012).

## Domestic Coal Production

The use of coal mining technique and the overall productivity of mining varies across the United States. As of 2018, 5 states account for 71% of total U.S. coal production, with Wyoming accounting for 40%, West Virginia producing 13%, Pennsylvania extracting 7%, Illinois yielding 7% and Kentucky mining 5% of the total coal produced domestically. Broken down into regions, the Appalachian region (including Alabama, Eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia) accounts for 26% of the coal produced in the United States. Underground mining makes up 77% of the mining taking place in this region, and this region produced 56% of the coal produced from underground mining. The Interior region (comprised of Arkansas, Illinois, Indiana, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, Texas and Western Kentucky) accounts for 18% of domestic coal production, which can be broken into 63% from underground mining and 37%

from surface mining. Finally, the Western region (made up of Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington and Wyoming) accounts for 55% of U.S. coal production, with 92% of that coal coming from surface mines. Wyoming alone holds 6 of the top 10 most productive mines, all of which are surface mines (Coal Explained: Where Our Coal Comes From, 2019).

**Environmental Impacts of Mining**

The mining process has a major impact on the environment and can create a number of different hazards, which require remediation through reclamation. Here are just a handful:

- Acid mine drainage (AMD) is created when pyrite from coal seams is exposed to water and air, which it reacts with to form sulfuric acid and iron. This solution also dissolves other heavy metals like zinc, manganese, and nickel, which accumulates into the runoff. This combination of the acidity and the metals are poisonous to aquatic creatures and leave the water contaminated. These metals can also bioaccumulate into the food chain and can crush bottom-dwelling organisms as they settle out. According to the Natural Resources Defense Council (NRDC), in the eastern United States, AMD has damaged an estimated 4,000 to 11,000 miles of streams, while in the West, between 5,000 and 10,000 miles of streams are estimated to be polluted.
- Tens of millions of tons of mine waste are generated per year. It is composed of solid waste from the mine, which is referred to as “gob,” refuse from coal washing and preparation and excess sludge from treating acid mine drainage. The land where this waste is dumped is left unusable, the piles are susceptible to spontaneous combustion, and the erosion of these piles creates highly acidic runoff.
- Subsidence events occur when the ground above mines collapses. These events can significantly damage roads, water and gas lines, and buildings. Additionally, they can also alter the natural drainage patterns for rivers and aquifers and lead to the destruction of habitats (Keating, 2001).
- The clearcutting process leads to habitat destruction and fragmentation, both of which are correlated to decreased biodiversity. This process displaces wildlife, can lead to soil erosion, reduces opportunities for recreation and destroys the overall aesthetic beauty of the area.
- Valley fills, a product of MTR, have significant impacts on the environment. According to the NRDC valley fills buried more than 700 miles of streams from 1985 to 2001, and that roughly 1,200 miles of streams were affected by MTR, via valley fills, sedimentation, and chemistry alteration between 1992 and 2002. Valley fills have done such extensive damage to waterways that their total impact in length is nearly as long as the Mississippi River. Increased sedimentation generally has major impacts on both aquatic life and groundwater recharge (Lashof, et al., 2007).

**Reclamation**

Reclamation is the restoration of lands that have been previously mined to productive use. These uses can include for agriculture, for recreation, for lumber, for other human-oriented purposes (schools, malls, etc.), and for natural habitat. The reclamation process is fairly standard and should follow the plan companies are required to provide for obtaining a permit. It starts with the land being recontoured, with any of the original topsoil from the site being backfilled. If the original topsoil is not available, an alternative must be found. From there, the land is reseeded with native vegetation meeting the seed mix ratio approved in the reclamation plan. Finally, if the site has met all of the specifications of the regulatory authority, the company that owns the permit may qualify for bond release. The site will then be monitored for years to come. Some challenges to reclamation include maintaining soil stability, preventing invasive plant species, reducing soil compaction and stopping erosion. Despite these obstacles, there have been successes. Since 1978, over 100,000 acres of abandoned mine lands created prior to passage of SMCRA have been restored, and 2.6 million acres of abandoned mine lands created after the passage have been returned to productive use. The AML program, overseen by OSMRE within DOI has played a major role in this restoration process. OSMRE also annually presents the Excellence in Surface Coal Mining Reclamation Award, which go to companies engaging in exemplary reclamation during their company operations (Reclamation Awards, 2017).

The Surface Mining Control and Reclamation Act (SMCRA) of 1977 was passed to ensure

that mines abandoned prior to its passage would be reclaimed, that active mine operations were complying with reclamation requirements, and that a bureau (OSMRE) would have the ability to regulate these processes. As a part of Title IV within SMCRA, which pertains to reclamation, a fee is levied for active mining operations to fund the reclamation of previously abandoned sites. This fee is based on the volume of coal produced or the value of the coal, whichever is less. All revenue generated by the fee is placed into the Abandoned Mine Land (AML) fund, which a total of 25 states and 3 tribes are eligible to request funding from (Larson, 2020). The funding is then divided into three general categories. Half of the revenue generated is redistributed back to the states where active mining is ongoing. 30% of the revenue then goes toward Historic Coal Grants. This program is designed to ensure that states that have historically experienced mining but are not currently producing significant amounts of coal to have sufficient funds to compensate for remaining any abandoned mine sites. Finally, 20% of the funding goes towards federal expenditures. These cover the Minimum Program Make-Up grants. This grant program guarantees that states receive either $3 million or the amount of funding necessary to reclaim any high priority abandoned mine sites, based on whichever amount is lower. Any leftover funding covers operations and emergency projects within OSMRE (Abandoned Mine Land Reclamation Program, n.d.). As of 2018, the balance unappropriated funding from the AML fund stands at $2.3 billion, while the estimated total underfunded reclamation costs are $10.7 billion. It should be noted that these costs factor in only lands abandoned prior to 1977, and do not account for more recently abandoned mines. The authorization to collect fees under Title IV is set to expire in 2021, though a few bills have been proposed to extend the program or move away from it altogether. Proposals for moving away from this financing model are necessary given that as more mine operators go bankrupt, the total number of sites requiring reclamation will increase while the amount of fees collected will decrease (Larson, 2020).

**Inspection**

When it comes to preserving safety and health, underground mines must be inspected at least every 180 days and surface mines must be inspected yearly by DMME, according to the Coal Mine Safety Laws of Virginia Section 45.1-161.81 A (DMME Division of Mines - Inspections, 2015). This frequency can change based on the results of a risk assessment for each site. A risk assessment is conducted and is based on data concerning serious injuries, violation rate, failure to abate/imminent danger, non-fatal days lost, injury rate, and regular/spot inspection rate (DMME Division of Mines - Risk Assessment Process, 2015). The Division of Mined Land Reclamation (DMLR) within DMME conducts inspections more frequently. Partial inspections occur once a month, and a complete inspection occurs quarterly (Squillace, 2009). On such inspections, mines must be found to follow specific performance standards, such as having the appropriate signage on-site, having a plan to return the site to the original approximate contour, having measures in place to ensure backfilling and grading occur, creating sediment structures, maintaining a buffer zone between natural features, having any openings or holes sealed, ensuring the preservation of topsoil, and keeping mining activity 300 feet away from an occupied dwelling and 100 feet away from a public road, just to name a few (Collins, 2020).

**Enforcing Compliance**

There are two processes through which inspectors can enforce compliance. First, when a mine is found to violate a requirement during an inspection, a notice of violation (NOV) is written. The NOV includes a time period for the violation to be corrected, which cannot exceed 90 days. If the correction is not made, the inspector orders a cessation of operations, sometimes known as a failure to abate cessation order (FTACO). Civil penalties may be assessed as early as 30 days after the initial NOV if a FTACO has been issued. The minimum penalty is $750 per day for every day the violation persists, and these penalties are set at a level based on the operator's past violation history, the severity of the violation, the risks posed to public health and safety, the operator's negligence and the operator's good faith in seeking compliance. The operator can contest violations and proposed penalties in a public hearing held before an administrative law judge.

The other process occurs if an operator has demonstrated a pattern of violations (three violations of the same kind during a year). If this pattern is demonstrated, inspectors can trigger a pattern of violations (POV) order. This also occurs when violations are considered

to be an unwarranted failure to comply with federal guidelines or found to embody deliberate negligence. From there, mine operations must cease under a cessation order (M. Hepler, personal communication, April 10, 2020).

For both of these processes' inspectors are required to issue a show cause order, under which the agencies and the operators must investigate whether there was a good explanation for the unwarranted behavior or avoidance of penalties and compliance following cessation orders. This is another opportunity for the operator to hold a public hearing. If there is no proven justification for non-compliance, the agency is required to suspend or revoke the permit (Squillace, 2009). Both of these processes can trigger bond forfeiture, the process by which agencies seek to recoup funds promised by operators contingent on compliance (bonds) dedicated to reclamation. Unfortunately, it has been found that at least 22% of all bond forfeitures between July 2007 to June 2016 failed to cover reclamation costs (Fennell, 2018). In 2011, it was found that 80% of forfeited permits in the state of Kentucky did not have adequate reclamation bonds at the time of cessation (OSMRE Annual Report, 2012).

It is clear that there are difficulties estimating the appropriate amount that should be posted for reclamation bonds. What should also be clear is that bond forfeitures are not an effective deterrent. Companies are not worried about not getting the bonds they posted back because they never had the money to post them in the first place, thanks to parent-subsidiary dynamics, self-bonding, and other accounting tricks (Anderson, 2018). Temporary cessation also appears to be ineffective as a deterrent. This is because mine operators need only basic justifications for ceasing operations (such as market conditions), and the operators do not need to show regulatory compliance, report remaining reserves, or have their financial ability to cover reclamation reassessed. It should also be noted that "regulations lack a time limit for a mine's inactivity or a mechanism for ending that idle status and thus activating the owner's obligation to clean up the site" (Bowlin, 2019). These two mechanisms mean that mines can be left in limbo between mining and reclamation for decades, and all the operator has to do in the state of Virginia is reapply for temporary cessation every six months (Olalde, 2018).

The work of regulators and inspectors plays a major role in whether or not the industry is held accountable. While coal companies meet their ultimate judgment on their day in court, their future is written in their years of operations, where the balance between mining and reclamation can mean awards or financial ruin. It seems like this process favors the former over the latter, as will be demonstrated in a discussion of the bankruptcy process.

# Bankruptcy

As was briefly described early, this life cycle of a coal company can end in two types of bankruptcy: Chapter 7 and Chapter 11. Chapter 7 bankruptcy involves liquidation. All company operations cease and all assets are organized by a court-appointed trustee who then sells off the assets to repay creditors (How Does Corporate Chap. Chapter 11 bankruptcy involves corporate reorganization. The company can continue to operate during and after the bankruptcy process. This form of bankruptcy requires the company to submit a reorganization plan that gets the approval of major creditors and the court. Part of this reorganization also involves shedding debts that could hinder the financial solvency of the company post-bankruptcy. This debt-shedding philosophy can be attributed to what is known as the Creditors' Bargain Theory, which states that "bankruptcy proceedings should not disturb non-bankruptcy entitlements and maximize the value of the insolvent firm's estate. (Macey and Salovaara, 2019). In order to maximize the value of the estate, the courts are willing to approve of measures that shed debt, while the companies often engage in practices prior to bankruptcy which serve the same purpose.

One such measure includes abandonment power. When encumbered by a piece of burdensome property, coal companies have the opportunity to abandon this piece of property. The trustee just has to "demonstrate to the bankruptcy court that such property is burdensome or of inconsequential value" and provide a "good business reason or articulated business justification" for the abandonment." Naturally, companies argue that environmental obligations pose burdens to their financial solvency. The U.S. Supreme Court maintains that property cannot be abandoned if the abandonment undermines federal laws. However, as the courts put it, abandonment power, "is not to be fettered by laws or regulations not reasonably calculated to protect the public health or safety from imminent and identifiable harm." In other words, companies are able to abandon burdensome sites as long as those sites do not post impending and clear harm to public health or safety, a fairly substantial burden of proof (Macey and Salovaara, 2019)

This problem is also exacerbated by the theory of continuation bias, which is when the legal system "allow[s] failing businesses to linger under the protection of the court, which resists liquidation even when it is optimal" (Morrison, 2007). Courts show a preference towards Chapter 11 bankruptcy over Chapter 7, assuming the company's reorganization plan meets the feasibility requirement. Under this requirement, it must be found that "confirmation of the [reorganization] plan is not likely to be followed by liquidation (unless the plan is a liquidating plan) or the need for further financial reorganization." Companies declaring bankruptcy multiple times is not uncommon. For example, Patriot Coal declared bankruptcy for the second time in May of 2015, less than 18 months after it was reorganized (Jarzemsky and Brickley, 2015). In order to get the reorganization plan confirmed, the courts must find the plan is actually feasible, both the plan and its proponent are complying with policies established in the Bankruptcy Code and that the plan has been made in good faith (Chapter 11 - Bankruptcy Basics, 2020).

This section is noticeably brief, if only because so many components of bankruptcy are interconnected with other pieces of this coal industry life cycle, and have already been covered or will be covered in the appendices. These intricacies should illustrate that solutions to this problem are interdependent and can often have ripple effects. It is clear that a wide slate of solutions to this problem are available. Which solutions should take precedent and how that determination is made will be evaluated momentarily. If there is one takeaway from this discussion of the coal life cycle, it is that no one solution will perfectly solve the abuse of the bankruptcy system.  With that in mind, the next step is to assess how these solutions will be evaluated.

# Policy Evaluation Criteria

**Introduction**
The numerous policymakers and policy influencers in this space, such as state and federal agencies and regulators, lawmakers and the courts, have a suite of policy options before them. Therefore, it may be useful to outline how stakeholders could assess potential options. Rather than treat these options as mutually exclusive, a more useful exercise will be using the criteria to rank the options in the optimum order to make an impact on this issue. It should be noted that because there are a number of parties who have the ability to implement these options, the relative importance of the proposed criteria would vary from party to party. Another point to consider is that the cost, effectiveness, and feasibility of a number of these policies depend on the implementation of other policies. For example, increasing financial monitoring is not going to stop creditors from encouraging mines to expand operations unless another alternative is in place that puts creditors at risk of not getting fully compensated. Overall, the options that will be presented will be driven by the outcome of reducing environmental degradation.

**Cost**
This criterion is most relevant to members of the bureaucracy with influence in this space. Cost in this context is to the financial burden left to the government and the taxpayers for covering reclamation costs. Coal companies are using the bankruptcy system to avoid internalizing the social costs of mining and externalize them onto the public. One way to analyze a given alternative is to consider how much of the costs are being forced onto the public. This can be considered in bonds when it comes to the costs saved by the government if companies were forced to post alternative bonds. Another way to consider this is the money returned to regulators if the government were granted first priority and not pressured into granting discounts for superpriorities. For the sake of simplicity, costs will be considered on a scale of low, moderate and high.

**Effectiveness**
This criterion is relevant to all policy actors and refers to how successfully a particular intervention would be in directly preventing harm to the environment. Because this policy problem is an exploitation of regulations, effectiveness will most likely come in the form of closing loopholes or reducing adverse selection through increased information and liability. An outcome like this can be achieved through measures that adequately cover costs or stop companies who are unable to cover their costs from mining in the first place. For example, while expanding liability would help in covering costs since more parties would be potentially responsible for paying for reclamation, blocking firms from creating subsidiaries for asset/debt separation purposes would stop financially at-risk companies from mining altogether. The predicted effectiveness is going to be variable for a number of outcomes, given the interdependence of some on others for successful implementation. For example, eliminating self-bonding is only going to be so effective at getting alternative bonds posted, since companies can just stay in temporary cessation indefinitely, but if temporary cessation had a time limit, companies would feel more compelled to post an alternative bond. It will be measured on a scale of low, moderate, and high.

**Feasibility**
The criterion of feasibility in this space could take on a number of dimensions. At the state level, feasibility could consider how much resistance localities would provide against increased regulations, since coal companies tend to play a large role in local economies. At the federal level, feasibility could consider the likelihood of industry pushback in both the regulatory and legislative sphere. In the court system, feasibility would be based around the likelihood of the bankruptcy court system to change precedent or reach specific outcomes. Feasibility will be measured on a scale of low, moderate, and high.

# Evaluation of Options and Recommendation

Table 1. Evaluative Matrix For Ranking Options Regarding Coal Bankruptcies and Environmental Reclamation

| OPTION | COST | EFFECTIVENESS | FEASIBILITY | RANK |
|---|---|---|---|---|
| A) ELIMINATE SELF-BONDING | LOW | MODERATE | HIGH | TIED FOR 1ST |
| B) FINANCIAL MONITORING | LOW | MODERATE | HIGH | TIED FOR 1ST |
| C) NOVEL LEGAL STRATEGIES | LOW | HIGH | LOW | 3RD |
| D) EXPAND LIABILITY | HIGH | MODERATE | LOW | TIED FOR 4TH |
| E) TRANSACTION ACCOUNTABILITY | MODERATE | MODERATE | MODERATE | TIED FOR 4TH |

The analysis of these options led to the conclusions used to produce this above table and is covered in the appendices of this paper which correspond to the letter before each alternative. The opportunities within the coal bankruptcy system worth prioritizing are the elimination of self-bonding and increased financial monitoring. Both of these options could be implemented by both state and federal regulators. These options are quite feasible, with some degree of financial monitoring already taking place and a number of states already in the process of shifting away from self-bonding. Because eliminating self-bonding would necessitate an alternative bond be posted, reclamation costs would go down since alternative bonds are less risky, while the infrastructure is already set for increasing financial monitoring, lowering costs. These options may not seem exceptionally effective on their own. However, when combined with other options, the combined outcomes of these options would yield direct reductions in environmental degradation. That touches on the main idea here: any options can help prevent further environmental degradation through the misuse of the bankruptcy system, but only through the consideration of the whole system will any change happen.

# Implementation Considerations

**Potential Responses**
The elimination of self-bonding and increased financial auditing are mostly under the realm of state regulators, with these bodies being overseen by OSMRE. Therefore, they will likely be on the frontline of this implementation process, seeing its successes and failures first-hand. The implementation of increased financial monitoring will likely be met with resistance from operators. Complaints could relate to the inconvenience or the concerns regarding privacy. One way of addressing these complaints could be explaining the benefits of this increased transparency. Since the goal is to make this financial data somewhat accessible to the public, it will give operators advanced notice on the performance of other firms and the conditions of the market generally. Resistance to self-bonding elimination may not just come in the form of verbal complaints. Companies under increased pressure may begin pulling out of the market, or begin the endless temporary cessation cycle. Additional pushback could come from mining employees and political figures, who may believe that these actions are contributing to the continued decline in the industry. These people should be gently reminded that growth of the natural gas industry and decreased demand for exports are responsible for over 70% of the decline in the industry. It would also be helpful to consider this as a way of making the industry stronger, with financing for reclamation becoming more stable, less reliable operators having to make tough choices, and companies having more complete information to guide their decision making.

**Unintended Consequences**
Some concerns when it comes to the implementation of both options relate to the immediate impacts. The potential impact is that theoretically, there is a chance that the combination of increased financial monitoring and the elimination of self-bonding is enough to trigger a massive wave of bankruptcies. Though the end of coal does seem to be looming on the horizon, it is not clear whether or not local communities and this country at large are ready to engage in the kind of adaptations required for a success in a post-coal economy. The next concern is that increased financial monitoring and the elimination of self-bonding could induce more deceptive behavior in the industry, as opposed to increasing transparency and stability. Because companies would no longer be able rely on overly optimistic bookkeeping and self-bonding, it begs the question where companies would turn. While there is the possibility that some companies would turn their backs on the industry, no longer capable of keeping pace with regulatory changes, there would likely be others that turned down more darkly lit paths to maintain operations. The implementation of these two options needs to be considered in the context of these and other scenarios in order to achieve the best outcomes.

**Unlikely Allies**
Support for these measures could come from some surprising sources. While environmentalists should be strong supporters of these measures, there may be common ground on these issues with the mining community. Increased transparency could be invaluable to these miners who are (both figuratively and at times literally) left in the dark by the leadership of their companies. The bankruptcy system is also being used by coal companies to offload regulatory requirements relating to miners too, so closing loopholes in the long run beneficial for both groups.

# Appendix A: Elimination of Self-Bonding

Self-bonding is “a promise made by the mine operator that it will carry out all required reclamation and that it has the financial resources to do so” (Alliance for Appalachia Federal Strategy Team). Outstanding self-bonds stand at $3.86 billion nationwide, with $2.4 billion of those being held by companies that declared bankruptcy since 2016. Just four companies account for $2.8 billion worth of self-bonding obligations. Peabody Energy, for example has 73% of its total reclamation obligations in self-bonds, at $1.15 billion, even though it’s reported net worth was $870 million at the end of 2015. Self-bonds account for over 50% of reclamation obligations in at least five states, Colorado, Indiana, New Mexico, North Dakota and Wyoming (Hein, Snow, Stefanik, & Webb, 2016). However, self-bonding only accounts for 12% of the posted reclamation bonds. As of 2017, only a handful of states had bonds covered through self-bonding. These states have historically encompassed those of interest in the region (Virginia and West Virginia) and states like Wyoming which lead the nation in coal production (Fennell, 2018). Governments allow companies to engage in self-bonding because “self-bonds are a calculation by the government that the risk of a company abandoning its mines without reclamation is low enough that external bonding is unnecessary and that sufficient assets exist internal to the company to complete the reclamation requirements” (Yonk, Smith, & Wardle, 2019). This calculation does not hold as much weight when the industry faces large-scale declines, companies misrepresent their financial solvency to get self-bonding, and when the government struggles to accurately calculate an appropriate bond and monitor finances, which has led to suggestions that self-bonding be eliminated altogether (Hein, Snow, Stefanik, & Webb, 2016; Fennell, 2018).

Because of the problems posed by self-bonding, it should be advised that the program be eliminated, especially since no other parts of the energy sector engage in this risky practice. It is also fairly feasible, given that 17 out of the 25 primacy and nonprimacy states covered under SMCRA do not permit self-bonding (Fennell, 2018). By eliminating self-bonding, coal companies would be required to post alternative forms of bonds, such as collateral or surety bonds, which could push companies that are less fiscally solvent out of the market. This solution would stop companies from taking advantage of the regulatory scheme, which in the long run could prevent clean-up costs from being placed on the taxpayer. In other words, if companies can no longer mine using reclamation bonds they lack the finances to cover, they may not be able to mine at all, which could help prevent the land from being mined and abandoned. Unfortunately, this would not change any of the dynamics pertaining to the misrepresentation of assets or the use of subsidiaries to separate assets and liabilities, which could leave financially insolvent companies still capable of obtaining permits and engaging in mining on lands they cannot afford to repay (Macey & Salovaara, 2019).

When it comes to the criteria, theoretically this measure would reduce costs to state regulators and taxpayers by as much as $3.86 billion (in 2016 dollars), the amount of outstanding self-bonds in 2016, listed above (Hein, Snow, Stefanik, & Webb, 2016). This assumes that if every company that engages in self-bonding were to go bankrupt, that these costs would otherwise be put back on the taxpayers, and that all companies would be able to post alternative bonds if self-bonding were eliminated. These are strong assumptions so this value is likely an overestimate. But considering that just one company had as much as $1.15 billion in self-bonds in 2016, the estimate of $3.86 billion is not that unrealistic. Regardless, this measure would reduce costs. Even if a just handful of firms are able to post alternative bonds, this reduces the overall amount states would have to spend financing reclamation under the status quo, where firms are able to fully offload their reclamation costs through self-bonding and bankruptcy. This measures would induce at least some

internalization of the social cost of mining (borne onto the environmental) which is inherently less costly than the current state of affairs. The drawback is that companies pushed out of the industry would no longer be contributing to the AML fund, which could reduce the amount of funding available for environmental reclamation. This drawback will likely be mitigated though, as companies that are still financially solvent will continue to produce, and revenue will still be contributed to the fund.

Regarding effectiveness, as was mentioned previously, self-bonding, while an impactful practice, is not used everywhere, so the reduction in environmental degradation would likely be concentrated regionally. Because of these scale effects, it could be potentially incredibly effective within the scope of states still permitting it, ensuring only financially solvent companies are able to engage in mining. As will be discussed later, determining whether companies are “financially solvent” can be quite difficult, and there are other opportunities for companies to remain in the market without being in a financial position to validly do so. One additional assumption is that companies will be unable to find other means for undermining this policy. The strength of this assumption is measured by the example below, which suggests that it might be naive to assume that companies will not find other loopholes that undermine successful policy implementation. Overall, this measure is likely to be effective locally and in the short term, pushing out any companies that cannot adjust quickly. In the long term and across the country however, there are other opportunities that are available to companies that will likely continue to exploit long after the impacts of eliminating self-bonding are felt.

The state of Virginia proposed eliminating self-bonding in 2014, though some companies have been taking their time in posting alternative bonds. For example, West Virginia Governor Jim Justice was the owner of some of the 19 self-bonded permits left in the state of Virginia as of April 2017. These permits at the time accounted for $24 million and covered more than 15,000 acres (The Alliance for Appalachia, 2018; Kesterson, 2016). This indicates that the measure is fairly feasible at least locally, though appears to have some barriers to effective implementation. Given the number of other states that no longer engage in self-bonding, it does not seem like an overstatement to claim that this measure also may be feasible in other areas, though similar obstacles to implementation may exist elsewhere.

Cost($): Low, -3.86 billion
Effectiveness: Moderate
Feasibility: High

# Appendix B: Increased Financial Monitoring

Misrepresentation of finances plays a role in every stage of the life of a coal company. In the bankruptcy sphere, it allows firms to form spinoffs where assets and liabilities are pooled into separate firms. These separate firms sell their permits with hefty liabilities to other firms, rely on their newly clean slate and overly generous market assessments to get approval for crediting and insurance. From there, these methods, along with double-counting assets across states, is enough to make a firm appear as if they qualify for self-bonding. When regulators realize that the firms are not financially solvent, the firms can pressure regulators into accepting heavily discounted superpriorities, and repeat the cycle once more (Macey and Salovaara, 2019).

While there are a number of cases that can prove this measures necessity, it's worth focusing on one that shows its success. The Railroad Commission of Texas, the state's authority on regulating coal, became aware of an inconsistency between Luminant Mining and its parent company, Energy Future Holdings (EFH) Company when it came to reported self-bonding obligations. Luminant Mining was under the false assumption that its assets were not linked to its parent company, which became apparent in the filings of bonding obligations. When the Commission pieced together that Luminant Mining would likely lose the ability to qualify for self-bonding if EFH went under, they began to require that Luminant Mining submit quarterly financial statements demonstrating continued regulatory compliance. This was about 8 months after the initial discovery was made regarding EFH's finances, in July of 2013. By April of 2014, Luminant informed the Commission of EFH's impending bankruptcy, which gave the Commission the opportunity to obtain alternative bonds from the bankruptcy using a carve-out related to a previous superpriority lien to which granted the Commission a $1.1 billion collateral commitment that happened to be worth over 10 times as much on the market, giving wiggle room for asset depreciation (Hein, Snow, Stefanik and Webb, 2016).

There are a couple of reasons why it does not always go as smoothly. Companies are required to inform the regulators if reclamation fulfillment is at risk and post an alternative form of bond within 90 days, but are not penalized for failing to notify the agencies immediately and feel no need to warn regulators of anticipated ineligibility. Often, by the time the 90 day period elapses, the company has already declared bankruptcy, leaving the ability for regulators to recoup costs for reclamation completely in the hands of the court. In order to combat this evasion of regulatory obligations, increased financial auditing could be implemented.

The paper *Self Bonding in an Era of Coal Bankruptcy* (Hein, Snow, Stefanik and Webb, 2016) suggested that regulators should require companies to report on their financial health at least annually, and should remember that they have the ability to revoke self-bonding the moment it becomes uncertain as to whether a company still qualifies. This paper recommended that states collect the relevant information for both parent and subsidiary companies, make an affirmative determination from the documentation as to whether a company still qualifies for self-bonding and pass this along to OSMRE. They also urged for the following documents be collected, as is common practice in Wyoming:

- A comparative balance sheet for the next five years,
- A comparative income sheet showing all revenue and expenses for the next five years,
- An annual report containing a third-party accountant's audit opinion of the relevant documents, and
- The companies' most recent credit rating, if any;

It was suggested in the same paper that this documentation be filed through the Securities and Exchange Commission as companies already have to annually file a 10-K report to them anyways. This implies that this effort would not be too costly above what companies already have to do. For regulators, this may require more time and labor in terms of keeping track of this information and ensuring it is up-to-date, but beyond that, this does not appear to be a costly option. If anything, the example above showed that it got the state of Texas $1.1 billion in collateral it would not have gotten otherwise. As is considered in the discussion of eliminating self-bonding, it is likely overly optimistic to assume that this will create complete transparency or that companies will not find other means of undermining this intervention. However, so long as this financial auditing prevents some financial manipulation (which the Luminant Mining case suggests it will) and that the value gained from this prevented manipulation is higher than the cost of implementing financial monitoring, this alternative will reduce costs. This assumption may seem strong, but relative to the uncertainties and potential costs of other options, it seems fair to call this measure low cost. In other words, while other measures have the potential to actively generate costs imposed on the government (in the form of legal fees as an example), the only positive costs are those of implementation, which are low given the infrastructure is already in place.

When it comes to effectiveness, this option would likely need to be implemented alongside a number of other alternatives in order to reach fuller value. For example, financial monitoring cannot do much to aid the courts in their decision as to whether or not to approve a reorganization plan if the court prescribes to the Creditors' Bargain Theory (where the goal of bankruptcy is to maximize assets and minimize debts) or the Continuation Bias (Chapter 11 is preferable to  Chapter 7). The courts would have to take measures like preventing spinoffs from being formed to get an accurate read of a firm's condition during bankruptcy, which is where increased monitoring can assist. This would help the court make more informed designs and rely less on uncertainty, theory or bias, to determine whether a company is capable of solvency.

It appears that for most companies, some form of reporting is happening anyways, albeit less frequently than desired. This is notable for Wyoming, which makes up the greatest share of coal production in the country. I guess the idea is that "if I can make it there, I can make it anywhere" when it comes to Wyoming and coal bankruptcy reform. This may be opposed by members of the industry, however, given that the intention is that a fair amount of this information would be publicly accessible (or at least that's what was recommended in the paper mentioned before), it could be beneficial. Coal companies would have an idea as to how their competition is performing, and where permits might soon be up for sale. That may sound counterintuitive, in that coal companies likely do not want their finances available to regulators, much less the public, there are so many tools at their disposal to avoid covering for reclamation that this would not exactly scare anyone.

Cost($): Low, -2.4 billion self-bonds held by bankrupt companies
Effectiveness: Moderate
Feasibility: High

# Appendix C: Novel Legal Strategies

**Resolving Abandonment Power**

Midlantic National Bank v. New Jersey Department of Environmental Protection was a pivotal case when it came to abandonment power and environmental obligations. It involved the bankruptcy of a chemical company that claimed it was unable to clean up after i's production. Its New York facility, for example, had "70,000 gallons of polychlorinated biphenyl (PCB) contaminated oil held in leaky deteriorating containers" (Bolea, 2001). When the case went to the Supreme Court, the majority against Midlantic National Bank, stating "a trustee may not abandon property in contravention of a state statute or regulation that is reasonably designed to protect public health or safety from identified hazards." However, the court also noted that the exception to the usual interpretation of abandonment power is "a narrow one." This exception is not meant to factor in the potential for abandonment to lead to future violation of laws and the abandonment power should not be limited by regulations which are "not reasonably calculated to protect the public health or safety from imminent and identifiable harm."

The dissenters (Chief Justice Burger, Justice White, Justice Rehnquist and Justice O'Connor) argued that since other parts of the bankruptcy code had clear exceptions for environmental concerns, if the intent of Congress was to grant the power to prevent abandonment to regulators, they would have done so. Following that logic, they made the point that Congress did not intend for the abandonment issue to be leveraged as an opportunity for parties to gain priority in bankruptcy. They also pushed back against what could be considered a judicial advocacy framework, saying "[the] Bankruptcy Court may not, in the exercise of its equitable powers, enforce its view of sound public policy at the expense of the interests the Code is designed to protect" (Bolea, 2001).

Other cases have fallen towards the arguments of the dissent. In In re Smith-Douglas, the court argued that abandonment power was allowed for a fertilizer plant. This was decided because the states' failure to enforce compliance after citing multiple environmental violations suggested to the courts that the plant did not pose potential harm to public safety. They also noted that the estate did not possess unencumbered assets which could be used to finance cleanup. Similar points were brought forth to justify the court's decision in In re L.F. Jennings Oil Co.. The general idea is that when companies are sufficiently insolvent, they are unable to finance cleanup themselves, nor does the court believe imposing those costs on them is necessary when regulators are not able to definitively prove the abandonment would pose an "imminent and identifiable threat' to public safety.

However, there have been cases where the courts were willing to grant administrative expense priority to regulators, an equivalent measure to superpriority, in that regulators get compensated before other creditors. There are two arguments that the courts have used to motivate this decision. First, one motivation is that "a company should not be able to avoid compliance with environmental laws and gain a competitive advantage simply by filing for bankruptcy." While this approach makes sense for companies that do possess liquid assets, there is less clarity on this issue within the courts for liquidating estates. The second follows the notion that if the individual company is unable to cover their own regulatory obligations, then granting the power to regulators to oversee these actions is a form of "preserving the estate." This is well-aligned with the discussion of Creditors' Bargain Theory, where bankruptcy courts seek to maximize the value of the assets and minimize liabilities. Granting the regulators the ability to maximize the value of the estate through administrative expense priority fulfills the notion of CBT while ensuring that reclamation costs are not

ultimately a burden imposed on taxpayers (Gelber and Kim, 2011). The opportunity to grant regulators administrative expense priority has it's clear benefits, but " priority status should only be granted for actual costs incurred post-petition that were deemed necessary to preserve the estate; potential costs, which may be incurred post-bankruptcy, have been held to be too speculative in nature to constitute an administrative expense" (Ames, 2005).

**Finding Solutions Related to Automatic Stay**

There are three different layers related to the automatic stay rule. At its face, the automatic stay rule is designed to prevent parties from taking independent actions against a firm during the bankruptcy process. This allows for all the assets to remain intact until the bankruptcy proceedings are finalized, and works along with other measures to prevent preference actions from occurring. The government and regulators are in theory exempt from automatic stay. Specifically, the legislative history "indicates Congress intended to except governmental actions to protect the public health and safety from the automatic stay provision, but not to except government actions directed solely at protecting the government's pecuniary interests" (Angelo, 1986).

Courts have been shown to allow government agencies exception to automatic stay, even when it was an issue of pecuniary interests. But the concerns regarding this remain (Gelber and Kim, 2011). Put another way, "the exception extends to permit an injunction and enforcement of an injunction, and to permit the entry of a money judgment, but does not extend to permit enforcement of a money judgment. Since the assets of the debtor are in the possession and control of the bankruptcy court, and since they constitute a fund out of which all creditors are entitled to share, enforcement by a governmental unit of a money judgment would give it a preferential treatment to the detriment of all other creditors" (Termini, n.d.). In other words, in what ways is a regulator distinct from any other secured creditor if it is attempted to reclaim monetary assets through a money judgment? This puts courts in a bind. Luckily, this same author suggests that to resolve issues between bankruptcy and environmental law, all environmental enforcement actions should be exceptions to the automatic stay rule on the grounds that "environmental regulations are by their nature health and safety oriented and the debtor has available equitable remedies" (Termini, n.d.).

**Opportunities to Counter the Absolute Priority Rule**

While there are many groups or circumstances that lead to exemptions from the absolute priority rule, the system through which creditors are compensated during bankruptcy, no such opportunities are explicitly legislated in regards to environmental issues or cleanup costs.There are two different points of view on this issue, which have somewhat overlapping solutions.

One perspective is that while regulators are not explicitly granted exemptions from the automatic priority rule, there is an opportunity to lean on administrative priority. This solution is ideal for a multitude of reasons. Administrative priority is effective in both Chapter 7 and Chapter 11 bankruptcies and it requires upfront payment, as opposed having to wait until the end of the bankruptcy process for distribution of assets. It also puts the costs and opportunities directly into the hands of the regulator. Rather than having to wait around for an operator to engage in reclamation or having to hope the operator will have the financial capacity post-bankruptcy to engage in reclamation, the agency can get directly into reclamation as soon as it's priority has been fulfilled. Most uniquely, this option has major implications for cases that involve secured creditors. While ordinarily secured creditors like banks would possess a lot of influence in this process, the regulators in this case hold enormous power when it comes to the amount of assets left to the rest of the creditors, so much so that it could potentially pressure parties into a settlement for greater reclamation financing (Abbott, n.d.). This perspective is reminiscent of the court's concerns with automatic stay exceptions, but presumably could go a long way in advancing reclamation goals.

Another solution could be that states or members of the federal government enact provisions that grant environmental law claimants priority in bankruptcies known as a superpriority. This measure, similar to administrative priority, would secure maximum reimbursement to the state and guarantee reclamation. However, some potential qualms should be mentioned. First, “the state must raise money to finance the restoration before it may bring an action 'for compensation in bankruptcy court’” (Angelo, 1986). Without making the initial investments in reclamation, regulator s will be unable to seek reimbursement, and reclamation may not be conducted. There are also concerns about innocent creditors and otherwise unsecured creditors facing increased risk, with the industry likely to experience higher rates or difficulties in finding financing to reflect this. All of this might push other claimants into seeking alternative security for their interests. With all of these concerns in mind, courts are unlikely to allow regulators to use administrative expenses or superpriority to ensure reclamation is covered (Angelo, 1986).

**Cost, Effectiveness, and Feasibility**
For this discussion, the proposed solution is to pursuemandated superpriority/administrative expense priority. In theory, the costs for achieving reclamation and preventing degradation through legislated priority in courts should be low, in that by having the first opportunity to get compensation, an appropriate amount of revenue can be extracted and put towards reclamation. It should be noted that calculations for reclamation costs have appeared to underestimate the required amount of funding needed historically, which could increase costs faced by other parties in the bankruptcy sphere, but ultimately, any money will likely be put towards reclamation. This money will come directly from the debtor, which will keep costs low. These measures would be quite effective at reducing environmental degradation because the responsibility to reclaim has been placed into the hands of the regulators with the financing coming from the firm. This is the opposite dynamic that currently persists in the industry. Again, this does somewhat assume accurate calculation of reclamation needs by the regulators, but overall, should be effective. It could also have the effect of deterring creditors from financing risky companies, since the automatic priority rule would no longer be a guarantee of compensation, especially if the firms involved have high reclamation costs. In terms of feasibility, while there are conditions that make achieving greater priority more likely, the court seems to prefer not to utilize such measures, especially in light of the “pecuniary interest” concerns (Macey and Salovaara, 2019). The courts view reclamation claims as equivalent to claims owed to secured creditors, dischargeable like any other held in court. While there is agreement on the court that the motivation behind legislation supports the regulatory capacity to engage in environmental cleanup, the lack of clear provisions limits the court's ability to advantage regulatory aspirations.

Cost: Low
Effectiveness: High
Feasibility: Low

# Appendix D: Expanded Liability

To consider how the expansion of liability could influence environmental reclamation and bankruptcies, it is helpful to look at this problem in a different context. The Superfund was created in 1980 through the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in order to protect the environment and human health from the impacts of hazardous substances (Superfund: Trends in Federal Funding and Cleanup of EPA's Nonfederal National Priorities List Sites, 2015). Superfund works by assigning responsibility after the damage is done. In this case, the damage is caused by chemical waste storage and recovery, resource extraction, landfills and other environmentally harmful processes. Under this system, the federal government, through the Environmental Protection Agency (EPA), is charged with reclaiming the land. When the EPA can hold the responsible parties accountable through legal enforcement mechanisms, the EPA gets the funding directly from the companies involved in the degradation. When they cannot, they turn to a trust system. The trust is funded as a combination of excise taxes and corporate taxes. All in all, this means that about 80% of Superfund funding is covered by taxpayers (How Is Superfund funded today?, 2016). Any gaps in funding are filled using state funding or other federal revenue (Brazell & Gerardi, 1994).

Both the current Superfund system and the Abandoned Mine Land (AML) fund are generated in part through taxes on production. Both systems, which are overseen by federal organizations (the Office of Surface Mining Reclamation and Enforcement, or OSMRE, for coal), often face trouble generating revenue for these programs, with both using taxes as a preferred method. More than half of the sites added to the National Priority List when the program started in 1983 still have not been taken off the list today. Meanwhile, President Trump has proposed a cut of 30% to the Superfund (Anderson, 2017). The Superfund system and the AML fund eventually find themselves relying on congressional funding in order to make significant change, and generally find themselves underfunded. To put it bluntly, both programs eventually place the burden on the taxpayer and the government, even though they were both designed to put the burden on the companies.

Generally, the Superfund-based legislation is a lot stricter than the Surface Mining Control and Reclamation Act (the coal mining equivalent legislation, also known as SMCRA). It relies upon a variety of different kinds of liability (specifically strict, joint and several, and retroactive) to make sure at the end of the day, someone can be held accountable for reclaiming the land. This means that the Superfund system does not consider whether or not the actions took place before or after the Superfund legislation existed. If there is a party to be held accountable, that party will be held accountable (Brazell & Gerardi, 1994). This enforcement process can succeed in recovering the funds necessary to reclaim land under the Superfund, unlike the coal industry. The Superfund also is not facing the same funding death spiral as the AML fund, because the industries covered under the Superfund are not facing the same freefall as the coal industry. Another fact about the Superfund is that, unlike funding for environmental reclamation in coal, there is no self-bonding. This loophole which is frequently exploited by coal companies is not afforded to other industries. Whereas the SMCRA has the self-bonding piece where companies pay directly, the Superfund used to use taxes when it could not hold companies accountable, though has shifted towards federal appropriations since 1995.

The Superfund takes direct action against companies that degrade the environment. The tradeoff is that the consequences are borne by the third parties almost immediately, just as directly as the action taken against the responsible parties. Both the Superfund and the AML

fund have too many projects and not enough funding. The Superfund is, on paper, fairly clear cut, all of which makes the harsh realities of its failures transparent. The AML fund is more complicated, and is seeking a slower decline over time. These key dynamics play a major role in determining whether adopting a similar system for regulating the coal industry would be worthwhile.

And so, an option worth evaluating is amending SMCRA to create a system similar to the Superfund as an alternative to the AML fund and to offset the losses generated in unmet bonding obligations. The creation of a Superfund-like system would solve problems posed by the waterfall payment system which leaves the government with few assets left to liquidate post-bankruptcy. This is the system that allows creditors both secured and unsecured to be compensated prior to the government during liquidation. Something like the Superfund could also counteract the automatic stay rule, which prevents the government from filing suit against companies during bankruptcy. This system could potentially provide some opportunities for accountability in the transfer process, where companies offload their reclamation obligations to other firms that are unable to cover the costs. It could potentially have a similar effect with the issues of parent-subsidiary interactions, where firms create spinoffs to separate assets from liabilities and further misrepresent their financial health. In order to assess this alternative, the knowledge available about the Superfund will be applied and modified to fit the context of environmental reclamation for the coal industry.

**Cost**
The Government Accountability Office (GAO) has found that the costs for cleaning up Superfund sites frequently exceeds the funding provided for cleanup, with the EPA struggling to accurately estimate these costs consistently (Information on the Nature and Costs of Cleanup Activities at Three Landfills in the Gulf Coast Region, 2011). It has been found that while between 2000 and 2010, the EPA allocated $243 million per year for cleanup, the true cost has been projected to be between $335 and $681 million per year (Adams, 2014). Costs incurred to the government include clean up costs, covering legal fees and administrative costs required for program implementation (Schmidt, 2003).

That being said, the Superfund has had mixed success when it comes to passing a benefit-cost analysis. For example, one study found that the Superfund program would pay for itself in 38 years through a reduction in special education costs for children exposed to environmental toxics (Evidence Shows Costly Superfund Cleanup Worth the Investment, 2019). However, another study found that within a sample of 150 Superfund sites, the expected number of cancer cases averted by remediation is less than 0.1 cases per site and the cost per cancer case averted is over $100 million (Hamilton & Viscusi, 1999).

This brings us to a discussion on this issue within the context of coal. The costs and benefits in this context are different because whereas the Superfund operates in a linear system, coal bankruptcies can occur repeatedly thanks to Chapter 11 bankruptcy. Similarly, the oversight of reclamation issues fall under different authorities, and the impacts of reclamation are borne differently. A benefit-cost analysis could be conducted to determine whether or not switching over to a Superfund-like system would be cost effective. The costs would be framed in terms of the financial burden left to the government and taxpayers for environmental reclamation.. A potential factor to include could be the prevention of future land degradation assuming the lawsuit process sufficiently prevents irresponsible companies from re-entering the market or continuing to damage the environment.

Effectiveness
Effectiveness of this solution is framed as how directly it prevents further environmental harm. Within the Superfund system, since the system was put into place, a total of 424 sites been cleaned up, as compared to the 1,335 still on the list as of February 2020 (Superfund: National Priorities List (NPL), 2020). If we are to assume that such an initiative would be

hampered by the same struggles as the EPA experiences in achieving the goals of the Superfund including underestimation and underfunding, then in terms of environmental reclamation, this solution may not be the most efficient.

A measure of effectiveness could be the extent to which this solution prevents the cycle of offloading from continuing. On this dimension, this solution should be highly effective, because in the short-term, a lawsuit recoup the assets needed to engage in reclamation. A lawsuit could also justify to the courts that the company is not in the financial position to re-enter the system post-bankruptcy, whether that's by draining assets or simply exposing circumvention of regulatory obligations. No creditor or insurer is going to cover the costs of a company without sufficient means for operating, regardless of what accounting magic the companies pull. In the long-term, this also works as a deterrent for engaging in risky practices. The potential for multiple forms of liability ensures that everyone in the system must work more responsibly, since any one of them, be it parent companies, subsidiaries, creditors, and insurers, could be responsible for cleanup costs. Even if a company comes out of bankruptcy and a lawsuit safely, creditors and insurers are less likely to cover costs since they also put themselves at risk for suit. While there are certain conditions under which secured creditors are exempted from Superfund liability, the exact phrasing is somewhat open to interpretation in CERCLA, and could be revised under a new piece of legislation to firm up liability (Wolford, 2014). This complication is due to defining the role of an owner/operator in CERCLA, but since this still covers transfers, it creates even more incentive for mining companies to behave responsibly.

To summarize, this intervention's ability to increase environmental reclamation is ambiguous. The low clean up rate for Superfund sites suggests there may be issues in implementation, while its ability to act as a deterrent indicates that it could be quite effective at preventing further environmental harm. Companies who can no longer use bankruptcy as a shield from liability (through the automatic stay rule) have reason to behave more responsibly, or risk a lawsuit from the government. Even if the original company does not change their behavior in response to increased risk of legal action, other entities in the system, such as companies purchasing permits or companies investing in/insuring coal companies may change their own behavior to reduce their exposure to liability.

**Feasibility**
OSMRE is an incredibly small bureau and would need to substantially increase their reach in order for this to work. While the Department of the Interior has historically leaned conservative, it is hard to imagine a scenario where the Trump Administration would want to increase risk for the coal industry, even after Bob Murray, one of Trump's biggest allies in the industry, has been faced with bankruptcy and has lost power in the industry. On the plus side, in terms of congressional action, the current AML fund is set to expire in 2021 and two representatives from Pennsylvania have already begun pushing for reauthorization (Thompson, Cartwright Introduce Legislation Addressing Abandoned Coal Mines, 2019). Congress also passed a bill to cover the pensions of a select group of miners after the pension fund was close to depletion (Rainey, 2019). While Congress may be amenable to having a discussion on the issue, it is hard to imagine a scenario where they are in favor of increasing liability for coal companies given that the strongest advocates for coal are those who believe it is fundamental for their local economies. Moreover, it's even harder to imagine a situation where Congress would be alright with an increase in EPA authority if the EPA were to absorb the duties for implementation or an expansion of federal powers on this issue in the first place. That being said, it's an election year, so a lot of these "hard to imagine" scenarios may get closer to reality and with each new bankruptcy, a new call to action is sounded. One of these days, someone will have to listen.

Cost($): High, $508 million per year (average of upper and lower bound estimates)
Effectiveness: Moderate
Feasibility: Low

# Appendix E: Transaction Accountability

Peabody Energy was the world's largest coal producer, accounting for 20% of U.S. coal production, when it declared bankruptcy in 2016 (Macey and Salovaara, 2019). In order to separate itself from its environmental obligations, Peabody chose to misrepresent its financial status by manipulating its bookkeeping and to convince regulators to accept a fraction of what they were owed through something similar to a superpriority. The strategy up for discussion now is the creation of subsidiaries to pool liabilities and other burdensome holdings. Peabody used its ability to inflate assets in order to get approval for creating a subsidiary for holding liabilities. One example was the creation of Gold Fields. When Gold Fields liquidated, Peabody's reorganization agreement forced Peabody to pay for the $43 million Gold Fields possessed in environmental liabilities. While that sounds reasonable, it should be noted that when Gold Fields declared bankruptcy, it had assets of $6 million and claims of almost $13 billion, with $745 million of those claims covering environmental liabilities (Macey and Salovaara, 2019).

And then there's Jeff Hoops. Chief Executive Officer (CEO) of Blackjewel, Revelation, and Lexington Coal, Hoops has quite a reputation in the industry. Specifically, he was found to have used his company Blackjewel as a sort of  personal bank account, transferring funds in and out as he pleased (Williams-Derry, 2019). As one article described his pattern, Hoop's various coal firms have spent the past few years picking up coal assets on a dime, in many cases getting paid in return for an assumption of environmental obligations and reclamation costs" (Richards, 2018). For example, Hoops purchased the Eagle Butte and Belle Ayr from Contura Energy, who had only held on to the mines for about a year for $21 million dollars. By making this sale, Contura anticipated being able to write off $200 million in reclamation obligations (Roberts, 2018). Contura's parent company, Alpha Natural Resources, paid Hoops $204 million upfront with $112 million paid in installments to take over 280 permits in Appalachia. Keep in mind that the minimum reclamation bond requirement is $10,000 per permit. That means that in the short run, Hoops was operating at a minimum with a $760,000 loss (Hein, Snow, Stefanik and Webb, 2016). Hoops has recently been under investigation for what has been described as, "a years-long effort by Mr. Hoops to transfer tens of millions of dollars of the Debtors' assets for his benefit and the benefit of his family and other Hoops-Related Entities." Beyond the phrase "hoops-related entities" being my favorite thing I've read all day, the court filing continued, "it appears that Hoops acted with one guiding principle: to use the Debtors and their assets to improve his personal, and the Hoops Parties', bottom line-despite the harm it caused the Debtors and their creditors" (McKim, 2020).

Some of the behaviors listed are unique to the circumstance (or the person in Mr. Hoops' case), but a fair amount of this is a common practice. Luckily, for common practices, there are common solutions. The courts have the ultimate say on whether or not companies can create subsidiaries and have the final judgment on whether the practices described above have legal bearing. However, a handful of legal doctrines can be used to create accountability in the courts by a variety of parties to counter these issues. The four that will be discussed here include fraudulent conveyance, successor liability, the corporate veil piercing doctrine and substantive consolidation (Heenan, 2004; Gilbert, 1990).

Under the Uniform Fraudulent Conveyance Act (UFCA) and the Uniform Fraudulent Transfer Act (UFTA), a transfer is considered to be fraudulent if it was "made or an obligation incurred with actual intent to hinder, delay or defraud creditors." There are two types of fraudulent transfers, the first of which "is a transfer that is actually fraudulent. Under this

definition, a transfer committed with the demonstrated intent to defraud creditors is considered a fraudulent conveyance. This type of fraudulent conveyance is difficult to prove directly. The second type of transfer is constructively fraudulent, and determining whether or not a transfer fits into this category is dependent on two factors. First, it was to be questioned whether or not the debtor received “less than a reasonably equivalent value” from the exchange. From there, the debtors insolvency is interrogated based on whether the debtor: i) "was engaged or was about to engage in a business transaction for which the remaining assets of the debtor were unreasonably small in relation to the business or transaction"; (ii) "intended to incur, or believed or reasonably should have believed that [it] would incur, debts beyond [its] ability to pay as they became due"; or (iii) "was insolvent at the [time of the transaction] or the debtor became insolvent as a result of the transfer or obligation.” (Heenan, 2004).

It could be argued that Contura and Alpha Natural Resource’s sale of those mines to Hoops could qualify as a constructively fraudulent transfer. Hoops should have believed these transfers would incur debts beyond his ability to pay, especially since he has a habit of accumulating such debts. But this isn’t about Jeff Hoops. This action could be considered fraudulent conveyance because, when these companies were in dire financial straights (notice Contura only had the mines for a year), rather than pay what they owed the government by posting alternative bonds, these companies offloaded their regulatory obligations in a way that delayed the fulfillment of these obligations.

When it comes to successor liability, Professor Vulkovich explains it as “A frequent stratagem employed by corporate insiders is to create a "new" corporation to which the insolvent debtor corporation transfers, frequently through a maze of transactions, substantially all of its assets. The insiders own the stock of the new corporation and operate it as they did the old corporation. Meanwhile, the debtor corporation files bankruptcy and its creditors are left to battle over the funds that the debtor received in exchange for its assets” (Heenan, 2004). While ordinarily successors are not liable for corporations whose assets it obtains, the case where the successor only receives said assets to prevent them from being seized by creditors violates this principle. This dynamic was clearly at play when Peabody Energy created Gold Fields, albeit in the reverse order. The formation of Contura from Alpha Natural Resources takes on a clearer version of this dynamic.

Corporate veil piercing is when the court does not view the corporation as separate from the individual controlling it, and uses this mechanism to pursue liability from the individuals “behind the veil.” In other words, when a corporation has, so to speak, no separate mind, will or existence of its own and is but a mere conduit for its principal,” then it’s within the rights of the creditors in the court system to pursue compensation from said principal. The three considerations for piercing the veil include the degree of control by the shareholder, undercapitalization, and observance of corporate formalities (Heenan, 2004). While it’s a nice twist on the outcome of the Citizens United case, it also provides an opportunity for the courts to hold individual coal magnates accountable when ordinary instruments are not at play. So while Jeff Hoops may have gotten a less-than-ideal deal from Alpha Natural Resources and Contura Energy, his use of his company’s resources for his own benefit could qualify him to be personally held liable.

Finally, the courts can impose substantive consolidation on firms based on their interpretation of the “equity powers” laid out in the bankruptcy code. Courts consider seven elements in their choice to motion for consolidation. These elements include:(1) The presence or absence of consolidated financial statements;(2) The unity of interests and ownership between various corporate entities; (3) The existence of parent and intercorporate guarantees on loans;(4) The degree of difficulty in segregating and ascertaining individual assetsand liabilities;(5) The existence of transfers of assets without formal observance of corporateformalities;(6) The commingling of assets and business

functions; and (7) The profitability of consolidation at a single physical location.The U.S. government has successfully argued for consolidation in the past, and based on the elements above, it appears that a similar argument could be made for the consolidation of subsidiaries with their parent companies, especially when combining this perspective with the earlier discussion of fraudulent conveyance regarding coal bankruptcies (Gilbert, 1990). Within this context, substantive consolidation, or the treatment of parent and subsidiary as one company with summed assets and liabilities, would be an appropriate measure for countering the actions of Peabody Energy and Gold Fields along with Alpha Natural Resources and Contura Energy.

**Cost, Effectiveness, and Feasibility**
It appears that each time the "fraudulent conveyance" argument has been brought into the courtroom during a bankruptcy, it has been by the shareholders of the company (Bringardner, 2013; Maher, 2013). This suggests that the government and nonprofits should not necessarily pursue this line of justice, given that they can reap the same benefits from the most well-financed creditors' choosing to take action. In other words, it could be less costly for non-private stakeholders to act as "free riders" when it comes to holding companies accountable through fraudulent conveyance. While this measure certainly is a useful legal tool, it is one that nonprofits and the government may not necessarily have the comparative advantage to pursue. It's effectiveness depends on whether the outcomes achieved when creditors pursue fraudulent conveyance are aligned with those who desire environmental reclamation.

Cost: Low, 0 if no action is taken
Effectiveness: Moderate
Feasibility: High

When it comes to making an argument related to successor liability, the only case related to coal mining, UMWA 1992 Benefit Fund v. Leckie Smokeless Coal Co., ended up with the court ruling in favor of the defendant, since "making the sale free and clear [was] the only economically feasible way to sell the debtor's assets" (Laurent, Glass, Fogel, O'Connor, 1998). Though such a small sample size should not be used to make conclusions, given the government's current difficulties with tracking parent-subsidiary interactions, the relative benefit of pursuing this line of legal advocacy might outweigh the costs. In terms of effectiveness and feasibility, it seems slightly less feasible and effective as these other measures, with similar barriers to entry in terms of information and capital, though worse proven outcomes (again, sample size of one) suggesting it may not be the most value-generating legal strategy.

Cost: Moderate
Effectiveness: Moderate
Feasibility: Low

In United States v. WRW Corp., three individuals were personally sued for violations for violations of the Federal Mine Safety and Health Act. The court upheld the suit, citing undercapitalization and lack of formalities (Sparkman, 2016). Again, relatively small sample size, but the factors considered in pursuing "piercing the veil" appear to have a lower burden of proof. While it may be difficult to tell what interactions are going on between a parent company and a subsidiary, the practices of a single leaders or group of shareholders, especially when it comes to practices like a lack of corporate formality, are more transparent. In other words, it has to be easier to catch Jeff Hoops using his companies as a piggy bank that to know exactly what the liability to asset ratio are between Contura Energy and Alpha Natural Resources. Because individuals or shareholders are often well-endowed financially, getting even a small some from them through a "piercing the veil"-like method would be more than the nothing regulators are likely to get if a company undergoes Chapter 7 bankruptcy. That being said, pursuing legal action does cost money, and the

uncertainty of the cases can affect the estimation of their costs.

Cost: Moderate
Effectiveness: High
Feasibility: High

Continuing on this conversation related to circumventing limited liability, there was little information available about substantive consolidation as it relates to coal bankruptcy. However there are some speculations to be made about how this measure would be received by the industry. An interpretation of substantive consolidation is that it can be beneficial to creditors who were misled or coerced into a lending scenario from which they are too entangled to escape from successfully on their own. There is a more “liberal” interpretation of this doctrine, that leans on efficiency through bankruptcy. Arguments can be made that this violates a “bedrock principle of American jurisprudence - corporate separateness.” Critics would say that creditors should not give up their “economic and legal rights” for the sake of efficiency (Graulich, 2004). All this goes to say, pursuing substantive consolidation will generate allies and opponents, with allies likely being proponents of fiscal responsibility, transparency, possibly labor and likely the environment, and opponents being representatives of business interests. If such a measure were to be implemented, it would immediately assist in the recouping of reclamation costs, but it is unclear whether or not such a pursuit would outweigh the costs, and given the negligible evidence for success for such a pursuit, it does not appear to be feasible.

Cost: Moderate
Effectiveness: High
Feasibility: Low

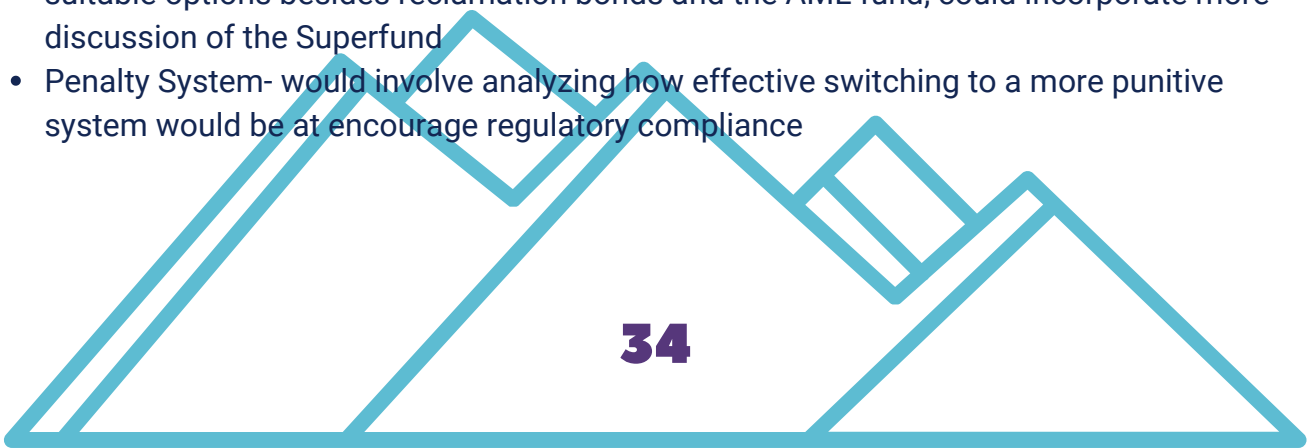
# Appendix F: Annotated Decision Matrix

All of these are scored based on preference, with higher scores being preferred.. Note any option that is considered low cost gets a score of 3, since a low cost is ideal.

| OPTION | COST | EFFECTIVENESS | FEASIBILITY | RANK |
|---|---|---|---|---|
| A) ELIMINATE SELF-BONDING | LOW=3 | MODERATE=2 | HIGH=3 | SCORE=8 RANK=TIED FOR 1ST |
| B) FINANCIAL MONITORING | LOW=3 | MODERATE=2 | HIGH=3 | SCORE=8 RANK= TIED FOR 1ST |
| C) NOVEL LEGAL STRATEGIES | LOW=3 | HIGH=3 | LOW=1 | SCORE=7 RANK=3RD |
| D) EXPAND LIABILITY | HIGH=1 | MODERATE=2 | LOW=3 | SCORE=6 RANK=TIED FOR 4TH |
| E) TRANSACTION ACCOUNTABILITY | MODERATE=2 | MODERATE=2 | MODERATE=2 | SCORE=6 RANK=TIED FOR 4TH |

There are a handful of other alternatives worth discussing in terms of analysis, which include:

- Standard Raising- would involve assessing the feasibility requirement and the requirements for reclamation plans to determine if the bar needed to be raised when it comes to standards for compliance
- Alternative Financing- would involve comparing reclamation and cleanup financing mechanisms across the environmental policy arena to determine if there were more suitable options besides reclamation bonds and the AML fund, could incorporate more discussion of the Superfund
- Penalty System- would involve analyzing how effective switching to a more punitive system would be at encourage regulatory compliance



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