Attachment—Additional Questions for the Record

Subcommittee on Environment and Climate Change
Hearing on
"The CLEAN Future Act: Superfund Proposals to Advance Cleanups, Equity, and Climate Resilience"
May 13, 2021

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The Honorable Diana DeGette (D-CO)

1. Were hard-rock mining facilities a top priority when it came time for EPA's Superfund program to develop financial assurance requirements?

RESPONSE: Yes. Congress created Superfund in 1980 and specifically directed EPA to decide which industries needed CERCLA108(b) financial assurance requirements by 1983. Congress further directed EPA to finalize the financial assurance requirements for covered industries by 1985. EPA failed to meet this mandated deadline. Despite more than 40 years since the explicit directive from Congress and EPA's own findings, the agency has yet to develop CERCLA 108(b) rules for any industry.

After a citizen suit by many conservation groups and an order from a federal district court, in 2009, EPA published notices in the Federal Register finding that financial assurance rules under CERCLA were warranted for at least four industries: the hardrock mining industry, the chemical manufacturing industry, the petroleum and coal products manufacturing industry, and the electric power generation, transmission, and distribution industry.[1]

In its 2009 prioritization notice, EPA found it was "readily apparent that hardrock mining facilities present the type of risk that, in light of EPA's current assessment, justifies designating such facilities as those for which EPA will first develop financial responsibility requirements."[2] EPA described the volume of hazardous substances released by hardrock mining facilities as "enormous": 1.15 billion pounds annually.[3] This waste frequently includes hazardous substances of "particular concern" such as heavy metals, ammonia, and nitrites, and releases from hardrock mines can cause significant environmental harm including contamination of

[1] *See* U.S. Envt'l Prot. Agency, *Identification of Priority Classes of Facilities for Development of CERCLA Section 108(b) Financial Responsibility Requirements*, 74 Fed. Reg. 37,213 (July 28, 2009) ("*EPA Prioritization Notice*")
[2] 74 Fed. Reg. at 37,214.
[3] *Id*. at 37,215.

ground and surface water.[4] The hardrock mining industry is responsible for polluting approximately 440,000 acres of land and contaminating as much as 10,000 miles of rivers and streams.[5]

Toxic Release Inventory reports show that the hardrock mining industry releases an average of 1.7 billion pounds per year of hazardous substances, accounting for 47 percent of all releases from all industries.[6] Similarly, data from the federal Emergency Response Notification System showed more than 950 reported releases from mines since 1990 and approximately 435 since 2000.[7]

Hazardous pollutants released from hardrock mines can cause severe public health hazards. Pollutants released by mines include some of the most dangerous contaminants, including lead, arsenic, cadmium, zinc, and mercury.[8] These pollutants can cause serious health and environmental harm, ranging from brain damage to children, to cardiovascular effects and damage to nervous and reproductive systems in healthy adults.[9] EPA found that currently operating sites release these pollutants in large volumes.[10]

To make matters worse, people are exposed to these pollutants simply while living their lives and engaging with their natural surroundings. EPA found that past exposures included eating contaminated homegrown vegetables, playing in a creek that had contaminated sediments, and drinking contaminated well water.[11] EPA found that currently operating sites had already caused and had the potential to cause similar exposures.[12] For all of these reasons, EPA designated the hardrock mining industry as its highest priority for development of financial assurance rules under CERCLA.

2. If we totaled up the spending of the federal and state governments and responsible parties for remediation, would that be enough to ensure timely cleanup of hard-rock mining sites?

RESPONSE: No. EPA and other government oversight agencies have consistently arrived at the same conclusion, in study after study: the high cost of cleanup and the dwindling resources of the Superfund program render it impossible to address all sites in a timely and adequate manner. The EPA estimates that about 8,000-31,000 abandoned mine sites pose a significant risk to the environment and human health, and the estimated cost for cleanup of hardrock mining sites alone

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[4] *Id*. at 37,216.
[5] *Id*. at 37,215.
[6] U.S. Envt'l Prot. Agency, *Financial Responsibility Requirements Under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry*, 82 Fed. Reg. 3388, 3477 (Jan. 11, 2017).
[7] *Id*.
[8] EPA, *supra* n. 6, 82 Fed. Reg. at 3473-77
[9] U.S. Envt'l Prot. Agency, *Evidence of CERCLA Hazardous Substances and Potential Exposures at CERCLA §108(b) Mining and Mineral Processing Sites*, 19-25 (Sep. 23, 2016), https://www.regulations.gov/document/EPA-HQ-SFUND-2015-0781-0487 ("*EPA Hardrock Mining Evidence Report*")
[10] *Id*. at ES-3, ES-4.
[11] *Id*. at ES-3, 37.
[12] *Id*. at 38.

is $20-54 billion.[13] In its 2009 notice, EPA noted that "[t]he severity of consequences posed by hardrock mining facilities is evident in the enormous costs associated with past and projected future actions necessary to protect public health and the environment, after releases from hardrock mining facilities occur."[14]

Mine sites, particularly mega-sites, are responsible for significant CERCLA costs. A 2015 GAO report estimates that EPA spends anywhere from 7 to 52 times more at mining sites than any other type of Superfund sites.[15] EPA spent almost $1.1 billion in Superfund removal and remedial response costs at 137 mining sites during fiscal years 2010-2014. Of the $1.1 billion, EPA spent nearly $585 million in congressionally appropriated funds.

Huge funding shortfalls for remediation are not unusual. For example, in March 2008, W.R. Grace entered into the then-largest Superfund settlement in history, agreeing to pay $250 million to clean up asbestos contamination from its vermiculite mine in Libby, Montana. Asbestos contamination caused hundreds of deaths and thousands of illnesses in Libby.[16] W.R. Grace declared bankruptcy in 2001, shortly after the deadly situation came to light. But even the record-setting settlement does not come close to covering the cost of cleanup. The EPA has reported expenditures of $540 million – a $290 million shortfall.[17]

Similarly, despite recent record-setting settlements with Asarco, the primary responsible party for the Bunker Hill Mine site, substantial public funds will be needed to cover the full cost of cleanup.[18] According to the EPA, "While the Asarco bankruptcy settlement is very significant [$494 million], the funds received represent only about 20% of the overall site cleanup needs.

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[13] U.S. Envt'l Prot. Agency, Ofc. of Inspector General, *Evaluation Report: Nationwide Identification of Hardrock Mining Sites*, Report No. Report No. 2004-P-00005 (Mar. 31, 2004), https://www.epa.gov/sites/default/files/2015-12/documents/20040331-2004-p-00005.pdf ("*2004 Inspector General Report*")

[14] *EPA Prioritization Notice*, 74 Fed. Reg. at 37,217.

[15] U.S. Envt'l Prot. Agency, *One Year After the Gold King Mine Incident: A Retrospective of EPA's Efforts To Restore and Protect Impacted Communities*, (Aug. 1, 2016) https://www.epa.gov/sites/production/files/2016-08/documents/mstanislausgkm1yrreportwhole8-1-16.pdf.

[16] AP Story, "U.S. cleanup would leave some asbestos in contaminated Libby, Montana," May 5, 2015. http://www.stltoday.com/business/local/u-s-cleanup-would-leave-some-asbestos-in-contaminated-libby/article_886cad8a-9e3f-57cc-b3a2-0e1503c748b8.html

[17] A. Schneider, "W.R. Grace indicted in Libby asbestos deaths," Seattle PI, Mar. 17, 2011, http://www.seattlepi.com/national/article/W-R-Grace-indicted-in-Libby-asbestos-deaths-1165915.php

[18] EPA Region 3, Bunker Hill FAQ, located at: https://www3.epa.gov/region10/pdf/sites/bunker_hill/asarco-trust-faqs-031610.pdf

EPA estimates that the cost of a final Bunker Hill remedy, including the Coeur d'Alene Basin and Bunker Hill Box, would be more than $2 billion."[19]

In short, federal, state, and responsible party funds do not even come close to covering existing or potential cleanup costs at hardrock mining sites.

3. One of the biggest problems with oil and gas wells is that when extraction companies go bankrupt and the wells are abandoned, there's no one left to clean up the mess but the taxpayer. Do we essentially have the same problem with hard-rock mining?

RESPONSE: Yes. The problems created by abandoned oil and gas wells and abandoned hardrock mines are essentially the same—the lack of financial assurance requirements means that companies abandon the pollution they created after exhausting the natural resource. Hardrock mining sites pose a serious threat because mining activities emit hazardous pollution that can cause debilitating disease and health impacts if people are exposed. Further, the cost to remediate abandoned hardrock mines can be astronomical because they cause hazardous contamination of ground water and surface water that must be remediated in perpetuity. EPA recently found that 82% of the currently operating mines in the contiguous United States are upsteam of drinking water source protection areas.[20] As EPA's Office of Inspector General noted, while many mining sites currently have a financially viable party, "our data also show that the majority (59 percent) of all the projected sites will need 40 years to 'in perpetuity' for cleanup, and we question the ability of businesses to sustain efforts for such lengths of time."[21]

In its 2009 prioritization notice, EPA determined that remediation of hard rock mines is woefully underfunded. Taking into account existing federal and state funding, as well as funds recovered from potentially responsible parties, only "20 percent of all cleanup would be completed within 30 years."[22] EPA found that remediating existing hardrock mines would cost anywhere from $7 to $24 billion—costs that dwarf the Superfund budget by 12 times.[23] Yet, mining companies foist these costs on the public, declaring bankruptcy and avoiding responsibility for hazardous waste cleanups. EPA concluded that "the hardrock mining industry has experienced a pattern of failed operations, which often require significant environmental responses that cannot be financed by industry."[24] Parent-subsidiary corporate structures that are common in the mining industry can allow subsidiaries with environmental liabilities to declare bankruptcy after transferring their most valuable assets to a parent corporation that cannot be reached for cleanup.[25]

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[19] *Id*.

[20] *EPA Hardrock Mining Evidence Report*, at 38.
[21] *2004 Inspector General Report*, *supra* n. 13, at ii, 20.
[22] *EPA Prioritization Notice*, 74 Fed. Reg. at 37,217.
[23] *Id.*
[24] *Id*. at 37,218.
[25] *Id.* at 37217-18.

4. Would you agree that we need the hard-rock mining industry to take more responsibility for cleaning up after itself?

RESPONSE: Yes. Strong financial assurance regulations are needed to protect the American taxpayer from the burden of clean-up costs associated with the mining industry – the nation's leading source of toxic pollution. With an estimated backlog of $7-24 billion for clean-up of hardrock mines,[26] American taxpayers already face an enormous financial burden. The mining of increasingly lower grade deposits has increased the scale of surface disturbance and the volume of waste generated. Climate change further exacerbates the risks to mine infrastructure from increased storm events, wildfires, flooding, melting permafrost, and other climate change impacts.

Numerous reports have highlighted the need for EPA to develop regulations under its CERCLA 108(b) authority to address the clean-up liabilities associated with the release of hazardous materials from hardrock mining. A 2005 GAO Report[27] explained:

> The need for EPA to fully use its existing authorities to execute the 'polluter pays' principle underlying the Superfund laws is even more compelling today than it was during the 1980s and 1990s when corporate taxes ... provided about $1 billion a year for Superfund cleanups. Now, without revenue from Superfund taxes, the cleanup burden has increasingly shifted to the general public—and at a time when large federal deficits are likely to constrain EPA's ability to obtain such funding for these cleanups. In addition, over time, businesses have become more sophisticated in using the limited liability principle to protect their assets by separating them from their liabilities. The result is that businesses of all sizes can easily limit the amounts they may be required to pay for environmental cleanups under Superfund.... These challenges can seriously hamper EPA's ability to achieve its primary mission of protecting human health and the environment because they present formidable obstacles to obtaining the funding needed for cleanups. ... Thus, we believe it is imperative for EPA to increase its focus on financial management and to fully use its existing authorities to better ensure that those businesses that cause pollution also pay to have their contaminated sites cleaned up.

Unfortunately, EPA never finalized the regulations necessary to implement this authority for hardrock mining. In early 2017, EPA proposed financial assurance requirements for hardrock mines, but the Trump Administration later reversed course—issuing a final action that withdrew the proposed rule.[28]

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[26] *2004 Inspector General Report*, *supra* n. 13, at ii.

[27] Government Accountability Office, Environmental Liabilities, EPA Should Do More to Ensure that Liable Parties Met Their Cleanup obligations. August 2005.

[28] *See* U.S. Envt'l Prot. Agency, *Financial Responsibility Requirements Under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry*, 82 Fed. Reg. 3388, 3477 (Jan. 11, 2017).

Funding shortfalls reduce the effectiveness of Superfund cleanups, leaving the public exposed to higher levels of hazardous substances. EPA's Office of Inspector General found that in fiscal year 2003, a $174.9 million funding shortfall "prevented EPA from beginning construction at all sites or providing additional funds needed to address sites in a manner believed necessary by regional officials."[29] The report identified 29 specific sites where cleanup work was delayed or scaled back in ways harmful to human health and the environment because of funding shortfalls. For example, "[t]he impact of reduced funds for the Bunker Hill site [in Northern Idaho and Eastern Washington] is associated with risk to human health, particularly for young children and pregnant women, from lead contamination in a residential area."[30]

The delayed cleanup and prolonged health risks at the Bunker Hill site are not unique: indeed, it is now more common than not for cleanup to be delayed due to lack of funding, even at the sites that pose the highest risks to human health.[31] At over 60 percent of the 75 nonfederal [National Priority List] sites with unacceptable human exposure, all or more than half of the work remains to complete the remedial construction.[32]

Since fiscal year 2000, most [EPA] regions have experienced delays because of insufficient funding. These delays "increase the length of time it takes to clean up a site; the total cost of cleanup; and, in some cases, the length of time populations are exposed to contaminants."[33]

In short, we do need the mining industry to take responsibility for cleaning up its own toxic messes, and the way to ensure they do so is to require robust and comprehensive financial assurances from all new and existing mines.

5. The CLEAN Future Act would require hard-rock mining facilities to establish financial assurance consistent with the risks associated with climate change and extreme weather. Why would that financial assurance be necessary for hard-rock mining facilities?

RESPONSE: Mining and mineral processing generate more toxic and hazardous releases than any other industrial sector.[34] Modern technology has made it possible to mine increasingly lower

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[29] US EPA, Ofc. of Inspector General, *Special Report: Congressional Request on Funding Needs for Non-Federal Superfund Sites,* Report No. 2004-P-00001, at 1 (Jan. 7, 2004), https://www.epa.gov/sites/default/files/2015-12/documents/20040107-2004-p-00001.pdf.

[30] *Id*. at 8.

[31] U.S. Gov't Account. Ofc., *Superfund EPA's Estimated Costs to Remediate Existing Sites Exceed Current Funding Levels and More Sites Are Expected to Be Added to the National Priorities list*, Report No. GAO-10-380 (May 2010), http://www.gao.gov/assets/310/304124.pdf.

[32] *Id*.

[33] *Id*.

grade deposits, which has increased the scale of surface disturbance and the volume of waste generated. The increase in severe storm events, flooding, changes in precipitation and melting permafrost associated with climate change exacerbate the risks to mining infrastructure, and the potential for spills of hazardous materials. According to the Fourth National Climate Assessment report[35]:

> "Permafrost degradation impacts society in both tangible and intangible ways, including decreased bearing capacities of building and pipeline foundations, damage to road surfaces, deterioration of reservoirs and impoundments that rely on permafrost for wastewater containment, reduced operation of ice and snow roads in winter, and damage to linear infrastructure (such as roads and power lines) from landslides. As permafrost thaws, the ground sinks (known as subsidence), causing damage to buildings, roads, and other infrastructure; these impacts to structures and facilities are likely to increase in the future."

> "In Alaska, thawing of permafrost is responsible for severe damage to roads, buildings, and pipelines that will be costly to replace, especially in remote parts of Alaska. Alaska oil and gas operations are vulnerable to thawing permafrost, sea level rise, and increased coastal exposure due to declining sea ice; however, a longer ice-free season may enhance offshore energy operations and transport. These impacts are expected to grow with continued warming."

The increased risk to infrastructure, including mining infrastructure, increases the potential for spills and other releases of harmful materials, with an increased potential for harm to water quality, soils, subsistence resources, wildlife and other uses and resources.

The track record of metal mines in Alaska and throughout the west demonstrate that water quality impacts are already commonly occurring at modern operating mines, where adaptive management practices and existing laws and regulations are applied.[36] Climate change increases the risk for these types of ongoing impacts.

Industry leaders and regulators acknowledge that mining best practices have not kept pace with these rapid changes. A recent report from a leading mining engineering firm concludes:

> "There are few best practices and no common standards of practice that provide a prescribed or consistent process for incorporating climate

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[34] U.S. EPA, 2019 Toxic Release Inventory National Analysis, Available at: https://www.epa.gov/trinationalanalysis/releases-chemical-and-industry

[35] https://nca2018.globalchange.gov/

[36] Earthworks et. al., "Alaska Metal Mines, "The track record of impacts to land and water from the failure to capture and treat mine pollution." March 2020.

> change into engineering design" and it concludes that "this is a barrier in the ability to address the impacts of climate change to mining infrastructure."[37]

A presentation by a BLM geologist highlights the risks to mine infrastructure from the increased frequency and severity of storm events, and warns that "the reality is the industry is making closure, reclamation and drainage treatment predictions based on a historic climate that no longer exists."[38]

A 2019 GAO report found that available federal data—from the Environmental Protection Agency (EPA), Federal Emergency Management Agency, National Oceanic and Atmospheric Administration, and U.S. Forest Service—on flooding, storm surge, wildfires, and sea level rise suggest that about 60 percent of all nonfederal National Priorities List (NPL) sites are located in areas that may be impacted by potential climate change effects.[39]

The GAO report highlights the Iron Mountain Mine in California as an example of these risks and increased costs. According to the EPA's analysis of the potential impacts of climate change, it determined that the site is located in an area with high or very high wildfire hazard potential. In July 2018, the Carr Fire burned through the site and almost destroyed the water treatment system. EPA and state officials determined that increasing frequency and intensity of wildfires and landslides and erosion because of storm runoffs are ongoing concern at the site. Following the fire, the site operator replaced portions of the pipes conveying acid mine drainage with nonflammable stainless steel. For those sites with Potentially Responsible Parties, amending clean-up plans to address the risks of climate change, and covering those increased liabilities with financial assurance should be a priority.

6. Would that financial assurance be any different than what's already required under Superfund for facilities managing the risks associated with the production, transportation, treatment, or disposal of hazardous substances?

RESPONSE:

Yes. Although the goal of CERCLA is to promote speedy cleanup of hazardous pollution, and to make the polluter pay for the cleanup, the absence of financial assurance requirements undermines this central remedial goal of the statute.

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[37] Maritz Rykaart, et. al., Climate Change for the Engineer: Standardized Procedure for Climate Change Integration into Engineering Design.," October 2016. Available: https://www.srk.com/en/publications/climate-change-for-the-engineer

[38] R. David Williams, "Climate Change – Extreme Conditions: Do Plans of Operations Need to Include an Ark?" presented at 20th Annual Mine Design, Operations & Closure Conference, 2012. https://www.mtech.edu/mwtp/2012_presentations/Dave%20Williams.pdf

[39] https://www.gao.gov/products/gao-20-73

CERCLA mandates cleanup of sites contaminated with hazardous pollution, but also requires EPA to impose measures on industry that would reduce the risk of future disasters. It makes polluters liable for the cost of cleanup,[40] authorizes EPA to conduct cleanups,[41] and provides public funding through the Superfund for cleanups at abandoned sites.[42]

To reduce the risk of future contamination, CERCLA directs EPA to adopt "financial responsibility" rules to ensure that companies are incentivized to avoid hazardous releases and that they remain financially viable to address them promptly if they occur.[43] The statute directs EPA to develop such rules consistent with the "degree and duration of risk" associated with classes of facilities' use and disposal of hazardous substances.[44] EPA must prioritize rules for the classes of facilities that pose the highest "risk of injury."[45]

However, in its recent decision, the D.C. Circuit found that the statute provides EPA with discretion to decide whether to impose financial assurances in the first instance.[46] In recent rulemakings, EPA refused to require financial assurances for any industry, despite the documented tremendous public health and financial cost to taxpayers. Requiring EPA to develop financial assurance requirements for hardrock mining facilities and other high risk industries would better achieve the central purpose of CERCLA—making polluters pay for cleaning up releases of hazardous waste that they caused.

Further, requiring financial assurances for hardrock mining facilities would actually make mining **safer** and would result in **speedier cleanups**. EPA found that financial assurances would likely reduce hazards at mines because mining companies would use more care, and insurers would require stricter safety requirements to reduce liabilities, which in turn could result in less pollution. This "may reduce acid mine drainage and other discharges into waterways caused by mining activities."[47] Further, cleanups would commence faster because funding is secured in advanced, rather than being dependent upon EPA budgetary constraints.[48]

As Congress explained when it enacted revisions to the CERCLA bill during the Reagan Administration, requiring polluters to demonstrate their ability to pay for cleanup, financial assurances help prevent harmful releases of hazardous substances by providing incentives for maximum care:

> [A] major goal of the financial responsibility requirements is to enlist insurers to provide additional policing and incentives to monitor the behavior of their insureds. . . It is often

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[40] 42 U.S.C. § 9607.
[41] *Id*. § 9604.
[42] *Id*. § 9611
[43] 42 U.S.C. § 9608(b)(1)
[44] *Id*.
[45] *Id*.
[46] *Idaho Conservation League v. Wheeler*, 930 F.3d 494, 502-504 (D.C. Cir. 2019).
[47] EPA, *supra* n. 6, 82 Fed. Reg., at 3395-96
[48] *Id*.

> policy terms and conditions, as well as inspection and rate-making, that form the basis of the insurer's ability to influence the insured to act carefully and responsibly.[49]

When assurances are absent or inadequate, funding shortfalls lead to delayed and incomplete cleanups and prolonged injury to human health and the environment. "Site cleanup delays from a lack of sufficient financial assurance create a risk of longer exposures to unsafe chemicals or longer periods where natural resources are restricted and unavailable for use."[50]

In short, hardrock mining facilities are not currently required to maintain any financial assurances under CERCLA, and requiring such assurances would provide substantial incentives to prevent releases and ensure rapid and thorough cleanup if releases do occur.

7. Is it correct that "modern" hard-rock facilities do not need financial assurances?

RESPONSE: No, that is incorrect. Most states and federal land management agencies (BLM and the US Forest Service) require some form of financial assurance for hardrock mine facilities. However, there are important gaps and inadequacies in these programs that have resulted in severe environmental impacts, public health risks and shifted the burden of clean-up to the public, rather than the responsible party - the mining company. These are exacerbated by the increased risks from climate change. These gaps and inadequacies include, but are not limited to, the following:

a. Spills, accidental releases and tailings dam failures

Pipeline spills, tailings spills, tailings impoundment failures and other releases of hazardous materials are generally not covered in most state or federal financial assurance programs even though they commonly occur at hardrock mines, and can result in substantial liabilities.

In a recent report, Earthworks reviewed state and federal documents and a federal database for fourteen copper porphyry mines representing 87% (14 out of 16) of operating copper porphyry mines, and 89% of U.S. copper production in 2010.[51] The fourteen mines were chosen based on an operating record of more than five years, and they provide a representative view of the types of environmental impacts resulting from the development of copper porphyry deposits, focusing on pipeline spills, tailings failures and water collection and treatment failures.

The report found that all of the mines (100%) experienced pipeline spills or other accidental releases. The most frequent spills were reported at the Ray Mine in Arizona, where over fifty

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[49] S. Rep. No. 99-11, at 47 (1985).
[50] U.S. EPA, Ofc. of Inspector General, *Management Alert: Significant Data Quality Deficiencies Impede Ability to Ensure Companies Can Pay for Cleanups*, Report No. 16-P-0126 (Mar. 31, 2016), https://www.epa.gov/sites/default/files/2016-03/documents/20160331-16-p-0126.pdf.
[51] Earthworks, "U.S. Copper Porphyry Mines: The Track Record of Water Quality Impacts Resulting from Pipeline Spills, Tailings Failures and Water Collection and Treatment Failures, July 2012. Available at: https://www.earthworksaction.org/files/publications/Porphyry_Copper_Mines_Track_Record_-_8-2012.pdf

pipeline spills occurred from 1988 to 2012. Examples of recent pipeline spills with adverse on and off-site effects include a 2012 spill at the Ray Mine which washed tailings into the Gila River, a 2008 pipeline spill at the Morenci Mine of 186,000 gallons of sulfuric acid along two miles of Chase Creek - a tributary of the San Francisco River, and a 2009 spill of 2 million gallons of process water at the Bagdad Mine.

At 4 out of 14 mines (28%), partial tailings impoundment failures have occurred, and at 9 out of 14 mines (64%), tailings spills have occurred. These included a 1997 partial failure of the tailings impoundment at the Pinto Valley Mine, where 8.1 acres of creek bed and surrounding upland were buried under material as deep as 42 feet. In 1993, heavy precipitation caused the Gila River to flood and breach the tailings impoundment at the Ray Mine, carrying pollutants 11 miles downriver. And in 1980, 2.6 million cubic yards of tailings were released at the Tyrone mine, and flowed 8 kilometers downstream.

Recent research also indicates that the rate of severe tailings dam failures is increasing globally.[52] The report finds that the problem is driven by mining continuously lower grades in identified resources and continuously falling real prices of most metals. The research found that many of the same features of modern mining that create economic feasibility in lower grades of ore also pose greater challenges for the management of mine waste and waste water. One of the manifestations of these challenges overall is a greater frequency of Very Serious tailings dam failures with significant levels of social and economic consequence, sometimes non remediable.

The study also found that 49% of all recorded Serious and Very Serious failures from 1940-2010 have occurred since 1990. Of all 525 recorded incidents cited, 1990- 2010, 17 (33%) were Serious failures, i.e. large enough to cause significant impacts or involved loss of life. Another 31% were Very Serious failures, i.e. catastrophic dam failures that released more than 1 million cubic meters of tailings and in some instances resulted in multiple loss of life. 63% of all incidents and failures since 1990 were Serious or Very Serious.

The total costs for just 7 of these 16 large failures was $3.8 billion, at an average cost of $543 million per failure (See Appendix 3). These losses, according to dam committee reports and government accounts are almost all the result of failure to follow accepted practice. According to the report, these failures are a direct result of the increasing prevalence of tailings storage facilities with greater than a 5 million cubic meter total capacity necessitated by lower grades of ore and the higher volumes of ore production required to attain or expand a given tonnage of finished product.

The risks and liabilities associated with tailings dam failures are not addressed in state financial assurance programs or those of federal land management agencies, and state and federal regulations do not require the best available technology recommended by the panel.

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[52] Bowker, Lindsay Newland and Chambers, David M., "The Risk, Public Liability and Economics of Tailings Storage Facility Failures," July 21, 2015. Available at: https://www.earthworksaction.org/files/pubs-others/BowkerChambers-RiskPublicLiability_EconomicsOfTailingsStorageFacility%20Failures-23Jul15.pdf

The Gold King and Sunnyside Mines in Colorado provide another example. These inactive mines have owners, but no financial assurance was obtained for these mines and failure to complete reclamation at the sites allowed for conditions to deteriorate over time. As a result, acid mine drainage built up to problematic levels. In an attempt to remediate the Gold King mine, an EPA contractor inadvertently triggered a release of an estimated 3 million gallons of acid mine drainage into the Animas River – resulting in impacts that extended into three states. The EPA has dedicated $29 million to address the release to date.[53]

b. Natural Resource Damages

Natural resource damages, particularly those that occur off-site, are generally not addressed under existing state or federal land management financial assurance programs. For example, the phosphate mines in southeast Idaho have resulted in off-site impacts of selenium pollution to surface water, soils, domestic stock, and fish and wildlife.

According to a 2012 GAO report that evaluated the regulatory oversight at phosphate mines in Idaho, federal agencies are currently overseeing mining operations or selenium cleanup at 18 phosphate mines, of which 5 are active and 13 inactive.[54] Of the 18 mines, 16 are contaminated with selenium and most are being assessed CERCLA, also known as Superfund, for future cleanup.[55]

[53] EPA, News Releases from Headquarters, "EPA Continues Reimbursing Gold King Mine Costs, June 23, 2017.

[54] US Government Accountability Office, Phosphate Mining: Oversight Has Strengthened, but Financial Assurances and Coordination Still Need Improvement, May 2012. Available at: http://www.gao.gov/assets/600/590642.pdf

[55] Id.

Table 1. Phosphate Mine Status and Associated Selenium Contamination in Southeast Idaho (adapted from GAO 2012) .

MINE NAME	ACTIVE	INACTIVE	ACRES DISTURBED	SELENIUM CONTAMINATION DETECTED	LIVESTOCK DEATHS HAVE OCCURRED
Ballard		•	635	•	
Blackfoot Bridge[1]	•		NA		
Champ		•	392	•	
Conda/Woodall		•	1,506	•	•
Diamond Gulch		•	32	•	
Dry Valley		•	888	•	
Enoch Valley		•	581	•	
Gay[2]		•	4,736	•	
Georgetown Canyon		•	251	•	•
Henry		•	1.074	•	•
Lanes Creek	•		29	•	•
Mountain Fuel		•	716	•	
North Maybe		•	1,228[3]	•	
Rasmussen Ridge	•		756	•	
Smoky Canyon	•		2,506	•	
South Maybe Canyon		•	See North Maybe Mine	•	•
South Rasmussen	•		389	•	
Wooley Valley		•	808	•	•
Total	4	14	16,527	17	6

[1] The Blackfoot Bridge Mine is a newly permitted mine (Record of Decision signed in 2011), and as such will not be included in the NRDA.
[2] Gay Mine occurs on Shoshone-Bannock Tribal lands. For purposes of this PAS, Trustees, at this time, are not considering Gay Mine. Such consideration may be made at a later date.
[3] Acres of disturbance provided include disturbance for North Maybe Mine and South Maybe Canyon Mine combined.

The report also found that "no final cleanup actions have been chosen at any of the sites, and according to officials, most sites will require years of additional investigative work before final cleanup actions are selected," and furthermore, "no financial assurances have been established to cover future cleanup costs because remaining cleanup actions have not yet been identified, according to agency officials."[56] The report further found that:

> "Over the last 16 years, federal agencies and mine operators have primarily focused on assessing the extent of selenium contamination in Idaho and have conducted only limited remediation actions. The agencies have conducted or overseen high-level assessments of contamination at 16 of the 18 mines where federal agencies are overseeing mining operations or cleanup activities, and at several of these mines the agencies and mine operators are now conducting more detailed assessments, known as remedial investigations and feasibility studies. However, no final cleanup actions have been chosen at any of the sites, and according to officials, most sites will require years of additional investigative work before final cleanup actions are selected. Federal agencies reported that they have

[56] *Id*.

> spent about $19 million since 2001 to oversee these assessments and undertake a limited number of remediation actions, roughly half of which has been reimbursed by the mine operators under cleanup settlement agreements. Mine operators told GAO that they too have spent millions of dollars in additional assessment and remediation work but did not provide documentary evidence to support these claims. Agency officials told GAO that they have not developed estimates for the remaining cleanup costs because final cleanup remedies have not yet been identified. However, their informal estimates suggest that remaining cleanup costs may total hundreds of millions of dollars for the contamination from mining in Idaho.[57]

The agencies are still in the process of determining the extent of natural resource damage from selenium releases at many of these mines as well. In 2015, a preassessment screen was conducted under 43 CFR Part 11 for seventeen of the southeast Idaho phosphate mines (collectively called the Mine Site) to provide a review of readily available information on hazardous substance releases and potential impacts of these releases on natural resources under the trusteeship of Federal, State or Tribal authorities.[58] It found that:

> "Numerous natural resources, including surface water, ground water, sediments, vegetation, and animal tissues, have accumulated elevated selenium concentrations as a result of releases from identified upstream mines and ore processing facilities, and these releases have occurred through various pathways. Upstream sources have discharged in the past, and in most cases, continue to discharge selenium into the Blackfoot, Salt, Bear, and Portneuf River Subbasins. Infiltration of water through waste rock dumps and pits has resulted in mobilization of selenium into the surface and groundwater, as well as accumulation in sediments and vegetation both on-site and in downstream locations that are influenced by the surface and groundwater flowing through the individual mine sites. Erosion from waste rock dumps to surface soils also contributes to the transport of selenium."

The preassessment screen is part of a natural resource damage assessment underway by various state and federal agencies. It is only the initial step in a long process. They anticipate that a plan for studying the natural resource damage injuries will be in place by the end of 2018. There is no date set for when the damage claim will be filed, and the mining companies will be required to provide funding to the agencies. In the meantime, the liability for these damages rests on the

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[57] http://www.gao.gov/assets/600/590642.pdf

[58] Smoky Canyon Mine Remedial investigation/Feasibility Study, prepared for J.R. Simplot Company by Formation Environmental, September 2014.

public because there is no financial assurance in place to cover these costs in the event of a bankruptcy.

c. Groundwater plumes

Groundwater impacts from hardrock mining are widespread. Recent studies document that a large percent of mines predict that there will be no impacts to groundwater during the permitting process, but groundwater impacts often occur once mining commences.[59] State and federal land management agency financial assurance programs generally do not address the risk or liability of groundwater pollution until after it has occurred, and even then, it's generally only the cost of installing pumpback wells to contain the plume – rather than requiring financial assurance sufficient for clean-up.

Furthermore, existing financial assurance programs by state or federal land management agencies do not cover the natural resource damage costs associated with damaging this important resource, often in perpetuity. In many cases, the public is left with a site that includes groundwater pollution in perpetuity, precluding the use of that resource for other beneficial uses. The National Groundwater Association puts the estimated annual economic value of pumped groundwater at $20.9 billion, and 43.8% of America's population regularly depends upon groundwater for its drinking water.[60]

d. Pit lakes

Financial assurance requirements also generally do not address the environmental liability and natural resource damages associated with the formation of pit lakes – the water that fills the open pit after the completion of mine operations at some surface mines. These pit lakes can cause long term harm and be costly to remediate. At the Thompson Creek Mine in Idaho, the BLM says that they will manage the pit lake as a wastewater storage facility and that it does not need to meet water quality standards.[61] This policy position by the BLM makes it clear that risks to wildlife, water quality and public health from the release of hazardous material in pit lakes may occur at mines under its regulatory authority.

The long-term impact to groundwater resources associated with the development of pit lakes is extensive. According to a 2002 article in Southwest Hydrology, gold-mining pit lakes in Nevada, when filled, will contain more water than all of the reservoirs within the borders of this arid state. The preponderance of pit lakes will be in the Humboldt River basin where these lakes are estimated to eventually hold approximately 1,052,0003 acre-feet of water (more than the all existing reservoirs in Nevada, 600,000 AF, excluding Lake Mead). An estimated 35 pit lakes from all types of hard rock mining are expected to form, containing from less than 100 acre-feet up to about 540,000 acre-feet of water. Pit lakes represent an in- perpetuity commitment of

[59] https://www.asrs.us/Portals/0/Documents/Conference-Proceedings/2006/1122-Maest.pdf

[60] http://www.ngwa.org/Events-Education/awareness/Documents/usfactsheet.pdf

[61] DOI, Thompson Creek Mine, Final Environmental Impact Statement, Appendix E, Response to Comments, p. E-182.

groundwater resources, particularly in arid climates where water is the limiting resource for agricultural and municipal development.[62]

e. Water treatment in perpetuity

Water is a scarce and precious asset, particularly in the western United States where the demand for freshwater is far out-pacing the supply. Perpetual management of mines is a rapidly escalating national dilemma.[63] Existing financial assurance programs fail to proactively provide for financial assurance for sites with a high risk for water treatment in perpetuity, nor do they address the natural resource damages associated with the loss of this important resource. In 2001, the Bureau of Land Management imposed an additional yet distinct requirement for a trust fund to guarantee water treatment separate from the financial guarantee for reclamation. However, this trust fund is imposed after-the-fact "when BLM identifies a need for it," and does not ensure the kind of prospective, forward-looking requirements that is intended in the implementation of Section 108(b) financial assurance. Similarly, the Forest Service does not ensure that these risks are adequately addressed, leaving lengthy periods of environmental liability.

f. Gaps in state regulatory programs

There are gaps in state regulatory programs that fail to ensure adequate financial assurance for reclamation and closure liabilities. In Montana, for example, various areas at the Continental Pit mine, owned by Montana Resources, fall under a grandfather clause that places an arbitrary ceiling on reclamation costs.[64]

8. Is it correct that the only Superfund sites that have been created since 1980 are sites with legacy contamination?

RESPONSE: No. It's certainly accurate to say that many mine sites have been mined historically, and often involve some level of legacy contamination. However, there are also many mines that have been added to the Superfund program since 1980 that involve contamination from modern mining. For example, modern mining was permitted at the Formosa Mine by the State of Oregon in 1990. When mining operations ended in 1993, the mine was filled with mill tailings, crushed ore, concentrates, and other mine materials. Acidic water, called acid rock drainage, was directed into the adit water diversion system and discharged into a

[62] Miller, Glenn, Ph.D., "Precious Metals Pit Lakes: Controls on Eventual Water Quality", Southwest Hydrology, September 2002.

[63] Earthworks, "Polluting the Future," May 2013. Available at: https://www.earthworksaction.org/files/publications/PollutingTheFuture-FINAL.pdf

[64] Montana Standard, "Too soon to clean up Butte Mine," December 1, 2001. http://mtstandard.com/news/local/too-soon-to-clean-up-butte-mine/article_d1783ac8-b67a-5e2f-8401-aa6a836fee0a.html

drainfield area. Tailings and low grade ore from the mine were placed in a lined cell and capped. After some additional reclamation work, the mining company left the area in 1996. The financial assurance collected by the State of Oregon, $980,000, has long been spent.[65] The original adit water diversion system began to fail in 1995. Despite reclamation efforts, the mine continued to release acid mine drainage, affecting downstream waters. According to the EPA remedial investigation: These studies have documented 18 miles of fish habitat in Middle Creek and South Fork Middle Creek that have been severely degraded. The fishery that had thrived before this time was destroyed.[66]

The mine was designated a National Priorities List site under CERCLA in 2007. An ecological risk assessment was completed, along with a human health risk assessment. The costs associated with these two assessments were not included in the state or federal financial assurance programs, nor are the costs associated with the extensive natural resource damages. An EPA report states, "Besides leaving massive piles of polluted waste rock, the company caused a perpetual flow of highly acidic waters to stream down the mountainside and into the headwaters of a creek that feeds the Umpqua River. The toxic metals have decimated most life in and around the creek, including a fishery that included fall and spring chinook and coho salmon. A 2018 news report documents the BLM's ongoing efforts to try to control metals contaminated water from leaving the adit.

Another example is the Beal Mountain Mine, an open-pit, cyanide heap-leach gold mine permitted by the Forest Service and the State of Montana in the late 1980s. The 450-acre site is located on National Forest System lands in the headwaters of German Gulch. The mine operated until 1998, when Pegasus Gold Corporation filed for bankruptcy. The site was pulled into the CERCLA program following the bankruptcy. The $6.2 million dollar reclamation bond was inadequate. In addition to the bond monies, over $14 million dollars in Forest Service appropriated funds have been spent on water treatment and reclamation activities so far.

The Forest Service has identified a number of ongoing critical issues, including geotechnical instability and water treatment. According to the Forest Service, "Movement of the geologic fault systems in the Main Beal Pit highwall has the potential to propagate into the foundation of the leach pad containment dike. Failure of the containment dike could result in a release of contaminated water and spent ore from the leach pad facility. Such a release could have far-reaching impacts on the Westslope Cutthroat Trout population in German Gulch and the remediated reaches of Silver Bow Creek and the Upper Clark Fork River. Water treatment, which currently costs approximately $350,000/year, is projected to become increasingly costly and technologically difficult."[67] An Engineering Evaluation/Cost Analysis (EE/CA) report completed in 2010 estimated the cost of final closure at $40 million dollars. Recent site work has demonstrated the approach envisioned by the 2010 EE/CA, particularly for the leach pad facility,

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[65] EPA, Final OU1 Remedial Investigation Report: Formosa Mine Superfund Site, January 30, 2012

[66] https://www3.epa.gov/region10/pdf/sites/formosamine/Formosa_Mine_FS_2_12.pdf

[67] USDA, Forest Service, Beal Mountain Mine Reclamation Project, Beaverhead Deerlodge National Forest, July 13, 2021 Technical Working Group Site Visit Summary of issues.

is unlikely to eliminate the need for water treatment.[68] The Forest Service is currently considering other reclamation options.

These are two examples among many. Unfortunately, there are many instances of substantial mining contamination that have occurred after 1980 even at sites with no legacy contamination, and some of these sites have already been added to the Superfund list. More may be added in the future, since it can take many years for the full extent of contamination at a mining site to become evident.

9. Could financial assurances help address risks at hard-rock mining sites that have been operating for many years?

RESPONSE: Yes. For the same reasons discussed earlier, requiring financial assurances would likely result in a greater standard of care to prevent releases of hazardous materials in the first instance. Further, imposing these requirements on existing facilities is critical to ensure that hardrock mining companies and their executives do not abscond with profits, while leaving toxic contamination in soil and water. Climate change has significantly increased the risks associated with modern mining. This is particularly true for mine facilities that have been operating for many years, and were not designed to withstand the severity of large storm events, melting permafrost or changes in precipitation patterns associated with today's climate. Financial assurance could help address these risks, and ensure that there are sufficient funds available to remediate the environmental impacts from hazardous releases and protect taxpayers from these liabilities.

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[68] https://mtstandard.com/news/local/cleanup-costs-climb-at-beal-mountain-as-deq-drops-bad-actor-case-against-former-pegasus/article_2f78acdc-d083-5ab4-bdfd-be0dd60e5b3e.html