July 11, 2017

Submitted via www.regulations.gov

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue N.W.
Mail Code 1101A
Washington, DC 20460

Attention Docket ID No.: EPA–HQ–SFUND–2015–0781

RE: Financial Responsibility Requirements Under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry; 82 Fed. Reg. 3388 (Jan. 11, 2017)

Dear Administrator Pruitt:

The National Mining Association ("NMA") submits these comments in response to the U.S. Environmental Protection Agency's ("EPA") proposed rule to establish "Financial Responsibility Requirements under Section 108(b) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") for Classes of Facilities in the Hardrock Mining Industry." 82 Fed. Reg. 3388 (Jan. 11, 2017). NMA is a national trade association representing the producers of most of America's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and the engineering and consulting firms, financial institutions and other firms serving the mining industry.

NMA's membership includes the classes of facilities targeted in the proposed rule and thus NMA has a direct and substantial interest in the rulemaking. Domestic mining is an important economic driver. The value added by major industries that consume the $78 billion of minerals produced in the U.S. is an estimated $2.78 trillion in 2016, up from 2.69 trillion in 2015, and represent nearly 15 percent of our GDP. Mining's direct and indirect economic contribution includes nearly 2 million jobs with wage and benefits well above the state average for the industrial sector. In addition, domestic mining generates $46 billion in tax payments to federal, state and local governments. And, if we can unlock our mineral resources, mining could contribute even more to our economic security. This is especially true as the demand for minerals continues to grow.

The proposed rule is flawed in many respects, all of which raise significant questions about its legality. The most serious defect, however, is EPA's abject failure to meet the statutory obligations imposed by CERCLA § 108(b) to first assess the risks posed by the hardrock mining and mineral processing industry (hereafter the "HRM" industry) to determine if the imposition of new financial responsibility requirements is merited. This flaw and the overwhelming evidence that NMA, its members, various states with significant HRM activity, federal land management agencies, the Small Business Administration ("SBA"), governors and others have presented regarding the risk-reducing nature of existing federal and state programs compel one outcome – EPA should publish a notice of final action withdrawing the proposed rule because the HRM industry does not present the "highest level of risk of injury" or the "degree and duration of risk" contemplated under the statute, and thus a CERCLA § 108(b) program is unwarranted for the HRM industry.

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Executive Summary

Nearly 40 years ago, Congress enacted CERCLA to address threats to human health and the environment posed by the nation's past waste disposal practices. CERCLA is both a backward and forward-looking statute – backward to find responsible parties, or in their absence, otherwise address remediation of existing sites – and forward to prevent creation of new sites. As the EPA acknowledges in the proposed rule, CERCLA § 108(b) is one of the forward-looking provisions of the statute.[1] CERCLA § 108(b) requires EPA to determine the classes of facilities that present the "highest level of risk of injury" and promulgate financial responsibility for such facilities "consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances." 42 U.S.C. § 9608(b)(1). Clearly, Congress intended that risk be the primary criterion when determining the classes of facilities that should be subject to new financial responsibility requirements under CERCLA §108(b).

EPA did not take affirmative steps to promulgate any CERCLA § 108(b) regulations until 2009 when, prompted by litigation, it published its "Identification of Priority Classes of Facilities for Development of CERCLA Section 108(b) Financial Responsibility Requirements." 74 Fed. Reg. 37,213 (July 28, 2009) ("Priority Notice"). In the Priority Notice, EPA identified several classes of facilities within the "hardrock mining industry" as the agency's first priority for development of financial responsibility requirements. Notably, during EPA's decades of inactivity, state and federal regulatory programs were maturing and evolving to address the same types of risks contemplated by CERCLA § 108(b). These federal and state programs were established, implemented, and amended to ensure that HRM facilities are comprehensively regulated, including prevention of releases of hazardous substances, from exploration through operation, reclamation, closure, and post-closure. EPA failed to take these programs into consideration when it published its Priority Notice and relegated any discussion of them to a single footnote despite the clear relevance of such programs to identifying facilities that pose the "highest level of risk of injury."

For the next five years, EPA struggled with the complexities of developing this first-of-its-kind rule, and indicated it was determining how CERCLA § 108(b) interacts with existing state and federal programs that regulate the HRM industry and impose significant financial assurance obligations. Given these complexities, EPA set a course to make a final decision as to whether a rule was warranted by 2019, but litigation again accelerated the schedule. In 2014, several nongovernmental organizations sought a writ of mandamus in the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) to force EPA to finalize an HRM rule by Dec. 1, 2016.

Feeling the intense pressure from a court that signaled obvious displeasure at oral argument with the agency's over 30-year delay, EPA voluntarily entered into an imprudent consent decree to fast-track the HRM rulemaking. Notably, NMA attempted

[1] The rule would apply to "current owners or operators of facilities that are authorized to operate, or should be authorized to operate, on or after the effective date of the rule." 82 Fed. Reg. at 3486.

to intervene in the litigation but ultimately was denied standing to do so. The court's rationale in denying standing, however, clarifies whether EPA is obligated to finalize a HRM rule. In denying standing and blessing the consent decree, the D.C. Circuit made it clear that while EPA had to act by Dec. 1, 2017, the final action could be no rule at all: "[T]he proposed joint order 'does not *require* EPA to promulgate a new, stricter rule. At most, it 'merely requires that EPA conduct a rulemaking and then decide whether to promulgate a new rule – the content of which is not in any way dictated by the [proposed order on consent] – using a specific timeline." *In re Idaho Conservation League*, 811 F.3d 502, 524 (D.C. Cir. 2016) (emphasis in original).

Certainly, the court's order did not give EPA permission to short-circuit the risk analyses mandated by CERCLA § 108(b) simply because the agency was entering into the fourth decade of delay. Yet EPA, still stinging from the court's rebukes on delay, did just that and the result is a fatally flawed rulemaking process. As laid out in the comments below, the flaws in the rulemaking are numerous and wide-ranging from flaws in the process (*e.g.*, shortchanging the federalism consultation, failing to conduct peer reviews of "highly influential scientific documents" upon which the proposed rule places heavy reliance, failing to perform an accurate regulatory impact analysis) to flaws that unequivocally undercut EPA's ultimate erroneous conclusion: that today's HRM industry continues to present such "degree and duration of risk" as to merit the imposition of financial responsibility requirements under CERCLA § 108(b). These flaws provide numerous grounds for legal challenges to the rule but none more so than EPA's arbitrary and capricious "continuing risk" conclusion. As such, a considerable portion of NMA's comments and the following discussion is devoted to providing concrete evidence to rebut this conclusion.

EPA failed to conduct any quantitative, or even qualitative, risk analysis either in 2009, when it improperly identified classes of the HRM industry as presenting the "highest level of risk of injury," or in 2017 when it wrongly determines that today's HRM industry continues to present the "degree and duration of risk" that warrants regulation under CERCLA § 108(b). Most importantly, the agency fully ignores the risk-reducing effects of existing state and federal programs, which include financial assurance components. EPA cannot meet its duty to assess the "degree and duration of risk" posed by HRM facilities by largely ignoring the existing requirements that address those same risks. Instead, the agency engaged in a determined effort to overwhelm the docket with anecdotal, circumstantial, and irrelevant evidence in an attempt to attribute risk to today's HRM industry. These comments methodically evaluate the data, documents, and reports upon which EPA's continuing risk determination rests and provide ample evidence to rebut that conclusion.

As detailed below, much of the agency's so-called evidence is historical in nature – describing operations that inflicted their environmental damage decades and even generations ago – and not representative of today's HRM industry. Many of the studies cited or relied upon were completed decades ago, and many of the facilities EPA "scrutinized" began operations a century ago or longer. EPA additionally misuses a host of data sources, including the Toxics Release Inventory ("TRI"), the Emergency

Response Notification System ("ERNS"), and Resource Conservation and Recovery Act ("RCRA") Hazardous Waste Biennial Reports to exaggerate the risk-profile of the HRM industry. None of these sources addresses potential exposure to CERCLA hazardous substances or the probability that a CERCLA response action may occur in the future. The significant limitations of these data sources – and EPA's deliberate misuse of them – devalue their utility in determining the "degree and duration of risk" or "highest level of risk of injury" in any industry sector.

In an effort to claim more recent evidence, EPA prepared a trio of reports in 2016 allegedly evaluating releases, practices, and exposures at currently operating facilities. EPA relies heavily on these reports to conclude "there is abundant evidence that hardrock mining facilities continue to pose risks associated with the management of hazardous substances at their sites." 82 Fed. Reg. at 3470. As the NMA comments herein make clear, proper evaluation of these releases, practices, and exposures, however, logically compel the opposite conclusion. While there may be superficial similarities in the releases, practices, and exposures that historically occurred and those at today's HRM facilities, the risks and outcomes are not comparable. Modern state and federal regulatory programs prohibit many management practices that were industry standards 50 years ago. These programs prevent the vast majority of impacts that are common at some (not all) legacy sites. In the event of releases of hazardous substances at current HRM facilities, today's regulatory programs ensure those releases are identified by monitoring, reported to regulatory authorities, and corrected by the operator under the supervision of federal and/or state regulators without risk of lasting environmental injury or response costs. As such, these actions are the hallmarks of effective regulatory programs rather than any evidence of risk.

NMA contends that in the face of EPA's failure to properly assess risk as required by CERCLA § 108(b), as well as the evidence provided by the HRM industry and others of the risk-reducing nature of existing federal and state regulatory programs, the agency must conclude that this rulemaking is unnecessary. NMA's comments, however, raise a number of other significant flaws that independently provide grounds for the agency to change course, such as EPA's fatally flawed financial responsibility formula, its wholly inadequate Regulatory Impact Analysis ("RIA"), and its failure to evaluate the market availability and affordability of requisite financial responsibility instruments.

Overall, EPA's approach to establishing a formula to calculate the level of financial responsibility is full of circular reasoning, inconsistencies, internal contradictions, and unsupported assumptions. EPA's basic premise that CERCLA § 108(b) is functionally different from closure and reclamation requirements covered under existing state and federal programs is contradicted by its own methodology, which relies on closure and reclamation costs to calculate hypothetical CERCLA response costs and the amount of additional financial responsibility required under the rule. Moreover, despite acknowledging the precision accorded by site-specific financial responsibility, the agency instead adopts overly simplistic formulas based on statistical manipulation of misunderstood and misinterpreted data. EPA's failure to consider the

probability of occurrence compounds the problems associated with the formula, resulting in egregiously high financial responsibility calculations. By designing the formula to replicate costs incurred in remediating the most expensive legacy Superfund sites, EPA's approach is in no way "consistent with the degree and duration of risk" presented by today's HRM industry and thus the financial responsibility formula is arbitrary and capricious.

EPA's approach to providing financial responsibility reductions does not solve the fundamental problems with the formula since the reductions will be difficult or impossible to attain due to the prescriptive nature of the reduction criteria. The financial responsibility proposed in this rule will impose an unreasonable burden on an already highly regulated industry without reducing any significant risks not already addressed by existing state and federal programs. All in all, the proposed CERCLA § 108(b) financial responsibility formula and the proposed reduction criteria go far beyond what Congress authorized under the statute, make the proposed rule indefensible legally and as a matter of policy, and thus support the withdrawal of the rule.

EPA's RIA so significantly underestimates the economic impact on the HRM industry as to constitute another incurable shortcoming of the proposed rule. EPA's RIA estimates that the proposal would impose $7.1 billion in financial assurance obligations on the HRM industry. As detailed in NMA's comments, however, an analysis by an independent firm, OnPoint Analytics, demonstrates that EPA substantially underestimated the cost of the rule to the HRM industry by orders of magnitude. OnPoint concludes that the cost of the proposal could be as high as $39.4 billion on a net present value basis, or over five times the total amount estimated by EPA's RIA. A comparison of these costs to the EPA's "best case" benefit scenario shows how the costs of the rule eclipse the projected savings to the government of $527 million over 34 years (or $15.5 million per year). Moreover, it strongly appears that the agency completed the RIA before finalizing the reduction criteria in the proposed rule. Consequently, the RIA is an arbitrary assessment of the exorbitant costs that this proposal would impose on the HRM industry.

NMA's comments also demonstrate how EPA's market capacity study lacks credibility and fails to satisfy the Congressional mandate pursuant to which it was written. Congress, echoing the statutory language in CERCLA, directed EPA to consult with the commercial insurance industry in assessing market capacity. EPA failed to engage in any rigorous consultation, which resulted in a study divorced from true market capacity conditions. EPA's extremely limited consultation occurred prior to the rule's proposal and therefore was not based on full disclosure of the scope of EPA's program. Instead, EPA relied primarily on its own perfunctory and inadequate research to assess market capacity. The agency simply researched published industry data on insurance and surety premiums as if these were a reliable measure with which to assess market capacity. Based on this cursory analysis, EPA concluded coverage is available or will become available as the program is implemented. To suggest coverage is available without careful analysis of the details of the rule and reasoned justification is indefensible given the immense economic repercussions of this rule.

I. EPA's Proposed Rule Violates CERCLA § 108(b)

EPA's authority to issue financial responsibility requirements under Section 108(b) is constrained by three key phrases in the statutory language. First, the statute directs the agency to prioritize the development of any financial responsibility requirements for "those classes of facilities, owners, and operators which the President (and EPA) determines ***presents the highest level of risk of injury***." 42 U.S.C. § 9608(b)(1) (emphasis added). This first step is the identification phase of the rulemaking. Second, if certain classes of facilities meet this threshold risk determination, the President (and EPA) is then directed to promulgate regulations to ensure that those "classes of facilities establish and maintain evidence of financial responsibility ***consistent with the degree and duration of risk*** associated with the production, transportation, treatment, storage, or disposal of hazardous substances." *Id*. (emphasis added). Third, these regulations should establish and, when necessary adjust, the level of financial responsibility "to protect against the ***level of risk which the President in his discretion believes is appropriate*** based on the payment experience of the Fund, commercial insurers, courts settlements and judgments, and voluntary claims satisfaction." 42 U.S.C. § 9608(b)(2) (emphasis added). These sections apply to the second phase of any rulemaking: setting an appropriate level of financial responsibility to cover the identified risk. EPA failed to appropriately evaluate the hardrock mining and mineral processing industry (hereafter referred to as the "HRM industry") in every step of this statutory analysis and rulemaking.

A. EPA's 2009 Finding that the HRM Industry Presented the "Highest Level of Risk of Injury" is Fundamentally and Irreversibly Flawed

In 2009, EPA issued a seven-page *Federal Register* notice identifying priority classes of facilities for development of CERCLA § 108(b) financial responsibility requirements. 74 Fed. Reg. 37,213, *et. seq*. In this Priority Notice, EPA identified several classes of facilities within the "hardrock mining industry"[2] as the agency's first priority for development of financial responsibility requirements. In developing the Priority Notice, "EPA chose to look for ***indicators of risk and its related effects*** to inform its selection of classes for which it would first develop requirements under CERCLA Section 108(b)." *Id.* at 37,214 (emphasis added). More specifically, EPA developed a methodology comprised of eight factors[3] that the agency claimed had

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[2] For purposes of the notice, EPA defined the hardrock mining industry as "facilities which extract, beneficiate or process metals (e.g., copper, gold, iron, lead, magnesium, molybdenum, silver, uranium, and zinc) and non-metallic, non-mineral fuel minerals (e.g., asbestos, gypsum, phosphate rock, and sulfur)." 74 Fed. Reg. at 37,214.

[3] These factors included: (1) annual amounts of hazardous substances released to the environment; (2) the number of facilities in active operation and production; (3) the physical size of the operation; (4) the extent of environmental contamination; (5) the number of sites on the CERCLA site inventory (including both National Priority List (NPL) sites and non-NPL sites); (6) government expenditures; (7) projected clean-up expenditures; and (8) corporate structure and bankruptcy potential. 74 Fed. Reg. at 37,214.

demonstrated: (1) releases and exposures to hazardous substances from the HRM industry; and (2) the severity of consequences resulting from these releases and exposures. Through this woefully limited and misdirected analysis, EPA determined that "hardrock mining facilities present ***the type of risk*** that . . . justifies designating such facilities as those for which EPA will first develop financial responsibility requirements pursuant to CERCLA Section 108(b)." *Id.* (emphasis added). *Compared to* 40 U.S.C. § 9608(b)(1) ("those classes of facilities, owners, and operators which the President determines ***presents the highest level of risk of injury***.") (emphasis added). Inexplicably, EPA did not formally solicit public comment on the Priority Notice or the underlying methodology the agency used to identify the HRM industry as the first (or highest risk of) classes of facilities warranting financial responsibility requirements under Section 108(b) of CERCLA.[4]

As NMA explained in detailed comments to the record for the Priority Notice, EPA's methodology for identifying the HRM industry as the first classes of facilities for regulation was fundamentally flawed and arbitrary and capricious. Simply stated, the agency's decision to promulgate financial responsibility requirements for any particular class of facilities under Section 108(b) must be based on two concepts of risk: (1) risk to human health and the environment (i.e., a future release of hazardous substances from currently permitted and operating facilities); and (2) financial risk (i.e., risk to the Fund). *See* 42 U.S.C. § 9608(b)(1)-(b)(2). However, EPA's attempt to evaluate both types of risk in the Priority Notice veered drastically off-course from a proper risk-based determination and resulted in a risk characterization of the HRM industry that is not remotely tied to today's reality.

Overall, EPA's methodology did not evaluate actual or potential human health or environmental risks (or risks of injury) posed by today's operating HRM facilities and whether those risks were the "***highest level of risk of injury***" warranting regulation going forward. Instead, EPA's methodology blindly looked to legacy mines that solely or predominantly operated prior to current regulations to characterize future risks from today's HRM sites. Compounding that fundamental flaw, EPA chose not to evaluate the robust state and federal environmental and reclamation regulations that prevent, control, minimize, and, in some cases, eliminate the risk of release of hazardous substances from today's HRM facilities. These comprehensive regulations, as well as

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[4] EPA claimed that its notice was "not itself a rule, and [did] not create any binding duties or obligations on any party." 74 Fed. Reg. at 37,214 n.5. Instead, EPA deferred to future informal "outreach to stakeholders" that never happened. *Id.* In a subsequent advance notice of proposed rulemaking (ANPRM) on "Identification of Additional Classes of Facilities for Development of Financial Responsibility Requirements Under CERCLA Section 108(b)," EPA extended that important regulatory procedural step to stakeholders outside of the HRM industry. *See* 75 Fed. Reg. 816 (Jan. 6, 2010) (setting a comment period of Feb. 5, 2010, which was later extended to Apr. 6, 2010). *See also* 75 Fed. Reg. 5715 (Feb. 4, 2010). As EPA is aware, NMA filed detailed comments on the Priority Notice and submitted those comments to the docket for the ANPRM. NMA requested that these comments be considered by the agency as it developed the proposed rule at issue in today's comments. EPA never placed NMA's comments in the Priority Notice docket (only three comments appear), despite NMA's request for the agency to do so. They only appear in the ANPRM docket. *See* NMA Comments docketed at EPA-HQ-SFUND-2009-0834-0097. NMA's 2010 comments are incorporated in these comments as well.

their associated financial assurance requirements, are inextricably related to the first decision that must be made: ***whether this rule is even warranted in the first place***.[5] EPA cannot simply ignore the almost 40 years since Section 108(b) was signed into law during which state and other federal regulatory authorities acted in this regulatory space. As described in detail in Section II.B below, these federal and state programs were established, implemented, and amended to ensure that HRM facilities are comprehensively regulated, including prevention of releases of hazardous substances, from exploration through operation, reclamation, closure, and post-closure. Today, these programs adequately address CERCLA releases and the risk to the Superfund. Finally, EPA's manipulation of data and government reports to make general assumptions and allegations regarding the risks presented by today's HRM industry further worsened the underlying methodology used to identify the HRM sector for this rulemaking. All things considered, a new EPA program is not warranted because the human health and environmental risk from the HRM industry is well-managed under current state and federal regulatory programs, and financial risk to the Superfund is adequately covered.

The statute is clear that EPA must first decide what (if any) classes of facilities present the "***highest level of risk of injury***" warranting financial responsibility requirements under Section 108(b) of CERCLA. EPA's Priority Notice and the fundamentally flawed methodology underpinning that notice did not reasonably or defensibly address this critical first step of this rulemaking process. In fact, EPA candidly admits in the proposed rule that it skipped this important step. The proposed rule specifically acknowledges that the Priority Notice did not "purport to identify which 'classes of facilities, owners and operators . . . ***present the highest level of risk of injury' as required by CERCLA § 108(b)(1)***." 82 Fed. Reg. at 3398 (emphasis added). In other words, EPA did not fulfill its statutory obligation in the initial Priority Notice, but has now allegedly done so in this proposed rule. Regardless, as shown in NMA's comments below in Section II, seven years after issuing its Priority Notice, EPA continues to use a methodology that is not credible, resulting in a gross distortion of the alleged risks presented by today's HRM industry to prop up its findings and move forward with an insupportable and unwarranted rule.

B. CERCLA § 108(b) Financial Responsibility Requirements Must Be "Consistent with the Degree and Duration of Risk"

Regardless of the procedural infirmities of the Priority Notice and EPA's inexcusable choice to conduct a cursory risk analysis – disconnected entirely from today's operating HRM facilities and inconsistent with EPA's own risk assessment guidelines – to identify the sector as the first classes of facilities warranting financial responsibility requirements, EPA cannot continue to eschew its statutory responsibilities in establishing the level of financial responsibility in this proposed rule. Any financial

[5] EPA relegated this important issue to a footnote in the Priority Notice: "In addition, EPA is aware and will consider in its development of proposed and final rules, that mining on federal land triggers either the Bureau of Land Management's (BLM) Part 3809 regulations (43 Part 3809) and the Forest Service's Part 228 regulations (36 CFR Part 228), both have financial responsibility requirements that cover reclamation costs. Many states also have reclamation laws." 74 Fed. Reg. at 37,219 n.50.

responsibility requirements established by the agency must be "***consistent with the degree and duration of risk*** associated with the production, transportation, treatment, storage, or disposal of hazardous substances." 42 U.S.C. § 9608(b)(1). EPA's approach in the proposed rule, as described more thoroughly in Section III below, impermissibly goes beyond the statutory bounds of CERCLA Section 108(b).

EPA claims that because "the statute provides only general direction" on determining the financial responsibility amount, the statute "confers upon EPA significant discretion in both methodology and in the ultimate selection of the appropriate amount." 82 Fed. Reg. at 3460. NMA agrees that the statute does not include a specific methodology for evaluating risk or the injuries for which financial responsibility requirements should be implemented to cover. However, EPA's authority for establishing the level of financial responsibility is ultimately limited by the "degree and duration of risk" presented by the identified classes of facilities. 42 U.S.C. § 9608(b)(1). EPA disregarded the critical statutory phrase "degree and duration of risk" in establishing the proposed financial responsibility requirements. Instead, EPA unjustifiably chose "to provide assurance against ***all potential risks*** associated with hazardous substance management at [a] facility." 82 Fed. Reg. at 3405. Stated another way, by covering all potential risks the agency is creating a program that addresses the risk of a risk and therefore exceeds a reasonable interpretation of "degree and duration of risk" consistent with CERCLA's risk-based approach. Consequently, EPA is not setting a level of financial responsibility to cover the environmental or financial risks that Congress contemplated, but instead creates an expansive and duplicative federal program in an attempt to reach a "zero risk" threshold.

EPA is not authorized to cover "all potential risks" and should not require facilities to secure financial responsibility instruments to cover "all potential risks." CERCLA does not require or allow such an expansive reading of "risk." The statute demands consideration of the *actual* "degree and duration of risk." EPA instead punts on this analysis in favor of concepts of potential risk or non-minimal risk and therefore imposes requirements that are intentionally overly-inclusive in a manner that exceeds the agency's statutory authority. EPA, however, has the authority and responsibility to draw the line between acceptable and unacceptable risks and then only require financial responsibility for those unacceptable risks according to their "degree and duration." In fact, EPA may lawfully determine that the risks from certain classes of facilities, after careful analysis and on reasonable bases, do not warrant financial responsibility requirements at all. While EPA did not choose that more reasonable and defensible approach in this proposed rule, it certainly has the discretion to make the right choice for the HRM industry by withdrawing this proposal and determining that no new financial responsibility requirements are warranted under CERCLA § 108(b). NMA explains those reasons in detail below in Section II.

Importantly, EPA's decision to cover "all potential risks" from the outset is not the only problematic approach in this rule. By not establishing a threshold risk standard at the identification phase or in setting the level of financial responsibility, EPA punts any real decision-making to the final step of this program. In the proposed rule, EPA

includes a superficial procedure whereby a facility can petition the EPA Administrator to be released from its financial responsibility obligation. Specifically, under proposed Section 320.27, a facility must "demonstrat[e] that the degree and duration of risk associated with the production, transportation, treatment, storage and disposal of hazardous substances is ***minimal***." 82 Fed. Reg. at 3489 (emphasis added). EPA's proposed method for releasing facilities from this obligation is so vague as to be arbitrary and capricious and does not cure the underlying flawed approach to this entire rule.

EPA's duty under the law is to make the following fundamental decision: What is the appropriate level of financial responsibility, based on the "***degree and duration of risk***" presented by the identified classes of facilities? Here, EPA established a regulatory program based on a worst-case scenario, assuming that every site feature at a company's operation will have a release(s) of a hazardous substance(s) requiring full source controls that would require a full blown CERCLA response and that such a response would otherwise be unfunded by the company but for this new regulatory program. The only way out of the program is to prove to the agency that a facility's risk profile is "minimal." Yet, to add injury to insult, EPA does not even define what "minimal" means in the context of this regulatory program. CERCLA 108(b) does not authorize this type of regulatory program. A more defensible reading of the statute places the duty squarely on EPA to make a reasonable determination on the "duration and degree of risk" posed by classes of facilities prior to imposing financial responsibility requirements on them, and then set the level of financial responsibility requirements, if any, according to the same standard. EPA's arbitrary and capricious approach to the HRM industry fails to comply with either of these statutory directives.

C. CERCLA § 108(b) Financial Responsibility Requirements Cannot Duplicate Existing Federal Reclamation Programs

CERCLA 108(b)(1) directly addresses the relationship of EPA's program to other federal requirements. Specifically, Congress directed EPA to promulgate requirements for classes of facilities "***in addition to*** those under subtitle C of the Solid Waste Disposal Act [42 U.S.C.A. § 6921 et seq.] ***and other Federal law***[.]" 42 U.S.C. § 9608(b)(1) (emphasis added). EPA claims to "read this provision in a most straightforward way: Requirements in this proposed rule are quite literally 'in addition to' whatever financial responsibility requirements may be imposed under other ***Federal laws for other purposes***." 82 Fed. Reg. at 3402 (emphasis added). EPA further argues that the phrase "in addition to" provides no "limitation on the applicability of this section." *Id.* Consequently, under EPA's reading of the statute, "CERCLA § 108(b) requirements apply even where a hardrock mine or mineral processor may be subject to, for example, federal reclamation bonding requirements." *Id.* at 3402-3403.

Contrary to EPA's position, a plain language interpretation of the "in addition to" language in the statute expressly limits EPA's authority and prohibits the agency from duplicating financial responsibility requirements that are ***in place pursuant to the RCRA*** (previously referred to as the Solid Waste Disposal Act) or other federal laws that

share the same purpose, ***including federal reclamation bonding requirements***. The legislative history behind Section 108(b) supports this commonsense reading of the statute. Specifically, the Senate Report to CERCLA explained that "[i]t was not the intention of the Committee that operators of facilities covered by [RCRA financial responsibility requirements] be subject to two financial responsibility requirements ***for the same dangers***." S. Rep. No. 96-848, at 92 (1980) (emphasis added). Instead, CERCLA § 108(b) was intended to cover those facilities "who are ***not now covered by any*** [financial responsibility] requirements under [RCRA] section 3004(c)."[6] *Id.* (emphasis added).

While the statute and the legislative history call out RCRA financial responsibility requirements specifically, the phrase "other Federal law" clearly shows that Congress envisioned that duplication may also occur with other federal financial responsibility requirements and thus EPA should avoid duplicating these programs in a similar manner. Because EPA did not promulgate CERCLA § 108(b) financial responsibility requirements in the 1980s as Congress directed, this phrase in the statute becomes even more central in interpreting EPA's appropriate regulatory role today as the federal regulatory landscape has substantially grown – particularly for the HRM industry – to include other comprehensive programs that protect against the same risks that triggered Congressional action in the first place.[7] In fact, Congress recently reaffirmed this clear intent to avoid duplication in the Conference Committee Report attached to the Consolidated Appropriations Act of 2016 (Public Law 114-113): "Prior to proposing any rule pursuant to section 108(b) . . . the [EPA] Administrator is directed to . . . [include in an analysis] . . . the Agency's plan to avoid requiring financial assurances that are duplicative of those already required by other Federal agencies."

EPA's choice to summarily dismiss these programs in critical elements of this rulemaking (*e.g.*, determining "degree and duration of risk") is baffling. Prior to issuing the proposed rule, EPA stated in a declaration defending the agency's delay in proposing financial responsibility rules that one of the challenges the agency faced was

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[6] *See also* United States Treasury, The Adequacy of Private Insurance Protection under Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980: A Report in Compliance with Section 301(b) of P.L. 96-510 (June 1983), at 72 ("[F]acilities already covered by the financial responsibility requirements of RCRA and other federal law are not yet again by Section 108.")

[7] EPA argues that "if Congress intended to insert limitations based on other Federal law into CERCLA, it clearly stated them as such." 82 Fed. Reg. 3402. This argument is also not convincing in this context. In 1980, there were few similar programs on the statutory books, with RCRA being the lead example. Congress could not have possibly predicted what other federal departments within the government would do in the future on this same subject matter. The phrase "other Federal programs" recognizes this basic reality. EPA's examples in other sections of CERCLA containing different limiting language are irrelevant to interpreting Section 108(b), which is clearly structured in a specific way to accomplish a purpose that would necessarily evolve over time. *See* Comment from The Honorable Darryl L. DePriest, Chief Counsel, Office of Advocacy, U.S. Small Business Administration at 4 (Jan. 19, 2017) (EPA-HQ-SFUND-2015-0781-1406) ("SBA Letter") ("When Congress enacted CERCLA in 1980, there were few financial assurance requirements in either state or Federal regulations, and what requirements existed were largely untested.").

"how to ***integrate*** CERCLA section 108(b) requirements with not only other EPA programs such as the RCRA, but also those of other federal agencies, such as the United States Department of the Interior, Bureau of Land Management [(BLM)] and the U.S. Department of Agriculture, United States Forest Service [(U.S. Forest Service)]." Opposition of Respondent United States Environmental Protection Agency to Petitioners' Petition for Writ of Mandamus, *Idaho Conservation League v. EPA* (No. 14-1149) (filed Nov. 19, 2014); Barnes Johnson Declaration at ¶ 10 (emphasis added). EPA did not specifically address how it would incorporate these programs into its underlying risk determination. EPA instead focused on the "structure" of the rule, stating that "[the] general instruction in section 108(b) has not lent itself to obvious answers." Barnes Johnson Declaration at ¶ 55. At that time, EPA stated that coordination with federal agencies, including the BLM, U.S. Forest Service, and Nuclear Regulatory Commission, would "inform EPA's decision making on how the rules should be structured."[8] Barnes Johnson Declaration at ¶ 56. EPA acknowledged that these agencies "require financial responsibility to address specific environmental risks." *Id.* However, EPA's focus on "structure" of the rule and "integration" with other programs, to the exclusion of the agency's duty to first assess the "degree and duration of risk" presented by the HRM industry taking into consideration the risk-reducing effects of these federal programs, ultimately biased the rulemaking.

Two years later, in response to Congress's request for a plan on avoiding duplication with federal programs, EPA in three short paragraphs and without any supporting analysis concluded that "Section 108(b) requirements established to address CERCLA liabilities are ***distinct*** from federal closure and reclamation bonding requirements imposed under other statutes." U.S. EPA, "CERCLA 108(b) Hardrock Mining and Mineral Processing Evaluation of Markets for Financial Responsibility Instruments, and The Relationship of CERCLA 108(b) to Financial Responsibility Programs of Other Federal Agencies" ("Market Capacity Study") at 6 (Aug. 25, 2016). EPA also revealed the approach it would pursue in this rulemaking, claiming that CERCLA § 108(b) is ***entirely distinguishable*** from the BLM and U.S. Forest Service programs, ***while at the same time*** recognizing that "some federal mine closure program requirements ***help to address releases to the environment and thereby may have the effect of reducing the risk a facility presents***." *Id*. (emphasis added). However, not once did EPA recognize that its underlying risk determination should also include consideration of the risk-reducing impacts of other federal programs.

EPA persisted with that approach in the proposed rule. EPA continues to argue that CERCLA 108(b) financial responsibility requirements are "structured . . . to address the CERCLA liabilities at a regulated facility" and "not designed to ensure compliance with technical engineering requirements imposed through a permit, or to ensure proper

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[8] NMA shares the same concerns voiced in the U.S. Small Business Administration (SBA) Office of Advocacy comments this year that EPA did not correctly analyze the relevant documentation provided in this consultation or the small business advocacy review panel process. *See* SBA Letter at 4. ("Advocacy is concerned that EPA may not have correctly analyzed the relevant documentation."). NMA's comments discuss this issue in more depth in Section II.B

closure or reclamation of an operating mine." 82 Fed. Reg. 3403. While EPA admits in the proposed rule that "past operating procedures, before the advent of environmental laws, were likely in many cases to give rise to environmental problems that current regulations and modern operating practices can prevent or minimize," *Id.* at 3461, this conclusion plays essentially no role in the agency's finding of "continuing risk" from today's HRM industry. *See id.* at 3470-3480. Instead, EPA designates the HRM industry as a "high risk" sector warranting a CERCLA § 108(b) rule and imposes an inferior, one-size-fits-all financial responsibility formula that assumes a worst-case risk scenario in which existing federal regulations play no role. EPA further distinguishes its program from the BLM and U.S. Forest Service programs by stating that it will "create incentive for practices that will prevent the need for future CERCLA responses." *Id*. at 3403. Attempting to create "incentives for practices" is inarguably a duplication of existing federal and state regulation that are expressly designed to require practices that reduce the "degree and duration of risk" at HRM facilities.

EPA's failure to appropriately consider these programs in the underlying risk determination is patently wrong. Essentially, EPA never gave any credit to these federal programs and how they reduce the risk of releases from the HRM industry in the first place. By focusing on form over function, EPA ignored the core objectives of these programs and how they function to control, minimize, and prevent hazardous substance releases. Consequently, EPA distorts and exaggerates the risk profile of today's HRM industry, resulting in a rule that on its face is arbitrary and capricious. The BLM and U.S. Forest Service programs serve a functionally equivalent purpose as CERCLA financial responsibility requirements. As described in Section II.B, these programs address the same risks EPA seeks to cover under its own rule and therefore demonstrate why this additional regulatory program is unnecessary in the first place. EPA cannot refuse to consider the programs simply because their authorizing statutes and implementing regulations use different words to describe the same objective and address the same risks.

Likewise, EPA cannot cure the inherent duplication in this rule through unsound reduction criteria. The contradictory nature of EPA's approach is clear in its use of existing financial responsibility requirements to determine response category costs and the proposed reductions to the total financial responsibility amount that theoretically allow facilities to "account for reductions in risk at a facility that may result from compliance with applicable Federal . . . requirements." *Id*. at 3467. *See also* U.S. EPA, "Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule," at ES-2 (Dec. 1, 2016) ("RIA") ("The formula is also structured to allow facilities, upon meeting certain criteria, to reduce their [financial responsibility] liability to account for enforceable reclamation plans that meet environmental performance standards."). Essentially, EPA attempts at the very backend to give credit to federal (and state) programs in the calculation for the response category through potential reductions in the financial responsibility amount. This regulatory approach is flawed and is an affront to the limitations Congress placed on EPA in promulgating rules under CERCLA § 108(b).

To make matters worse, EPA cherry-picked reduction criteria that it believed could "confidently be tied to reductions in risk in a nationally applicable rule." 82 Fed. Reg. at 3467. Yet, as discussed in Section III, these reduction criteria are also significantly flawed and thus do not reduce the duplication with federal programs or give them proper credit. EPA's disregard for the decades of experience held by the BLM and the U.S. Forest Service in regulating the HRM industry with site-specific criteria and substitution of its own one-size-fits-all blueprint for the site-specific engineering and operating controls that should be in place is indefensible.[9]

D. CERCLA § 108(b) Financial Responsibility Regulations May Not Duplicate RCRA Financial Responsibility Requirements

EPA's overall approach of simply ignoring federal programs is apparent in the notice of intent to proceed with rulemakings for the three other industries. *See* 82 Fed. Reg. 3512, 3514 (Jan. 11, 2017). In that notice, EPA states: "[CERCLA § 108(b)] requirements, which are designed to help ensure that CERCLA liabilities are paid if CERCLA claims are made, ***are distinct from financial responsibility requirements for closure imposed under other statutes, such as RCRA***, which are more narrowly designed to assure compliance with those closure requirements." *Id.* (emphasis added). EPA's insistence that its CERCLA § 108(b) program is fundamentally different from RCRA demonstrates its ultimate failure in listening to Congress's express direction to avoid duplication. This contradictory policy choice by the agency also spills over into the HRM industry proposed rule.

Specifically, EPA entirely omits any discussion of the corrective action program established under RCRA and imposed pursuant to a RCRA Part B permit or other legally binding instrument, such as a RCRA corrective action order.[10] *See* 42 U.S.C. § 6924(u) & (v). Yet, this RCRA program provides a powerful example of functionally equivalent financial responsibility requirements imposed today on some of NMA's members. These members would be required to secure additional and duplicative CERCLA financial responsibility, which Congress directed EPA to avoid in any future CERCLA § 108(b) rule. The RCRA corrective action program shares the same goals of protecting human health and the environment from releases of chemicals, addresses substantially the same waste management units, and imposes financial responsibility.[11]

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[9] EPA's approach creates a significant inconsistency with the mandate in Executive Order 12,866. *See* Executive Order 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993) ("Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies.").

[10] RCRA is only mentioned when the agency is describing the bases for certain requirements related to the terms and conditions of the financial responsibility instruments. *See e.g.*, 82 Fed. Reg. at 3416, 3419, 3420, & 3422.

[11] EPA failed to avoid duplication with RCRA's corrective action program as directed in the statute. The RCRA corrective action requirements are expansive. RCRA-regulated facilities must investigate current and former releases of hazardous waste and hazardous waste constituents from any hazardous waste management unit or solid waste management unit (SWMU). If releases above risk-based action levels are detected, the owner or operator of the facility must perform a Corrective Measures Study

Moreover, the RCRA corrective action program's approach to identifying and conducting remediation and in setting financial responsibility levels is far superior to the regulatory approach EPA proposes under CERCLA. EPA's choice to ignore these programs in the underlying "risk" determination for the HRM industry and in setting the level of financial responsibility is unjustifiable, arbitrary, and capricious.

E. CERCLA 108(b) Financial Responsibility Regulations Must Account for Existing State Programs

Congress directed the President (and EPA) to first develop financial responsibility requirements for classes of facilities that pose "the highest level of risk of injury." 42 U.S.C. § 9608(b)(1). Congress further directed the President (and EPA) that any regulations promulgated must be "***consistent with the degree and duration of risk*** associated with the production, transportation, treatment, storage, or disposal of hazardous substances." *Id*. (emphasis added). Accordingly, and as explained above in Section I.B., EPA must limit its program to reflect the environmental protection and related financial assurance requirements rooted in state regulations, which are directly related to the "degree and duration of risk" posed by the HRM industry. EPA failed to appropriately account for state programs in its underlying risk evaluation and in setting the level of financial responsibility under this rule, and thus violated the statutory directives found in CERCLA § 108(b).

EPA's inattention to and superficial analysis of the state regulatory programs has plagued this entire rulemaking process. In developing the Priority Notice that identified the HRM industry as the first classes of facilities for regulation, EPA omitted any evaluation of existing state programs. Instead, the agency committed to a future "examination and review of existing federal and state authorities, policies, and practices that currently focus on hardrock mining activities" in determining "what proposed financial responsibility requirements may be appropriate." *See* 74 Fed. Reg. at 37,219. EPA did not commit to re-evaluating its 2009 "high risk" determination based on this new evaluation. Instead, EPA moved straight to developing the agency's financial responsibility regulations for the HRM industry without accounting for the risk-reducing effects of state regulatory programs.[12]

(CMS) with alternative remedial measures. Upon completion of the CMS, EPA or a state agency with delegated authority selects the remedy which is to be performed. Importantly, the facility must achieve stringent cleanup levels within the facility or anywhere beyond its boundaries where off-site releases are detected, as necessary to protect human health and the environment. Following the agency selection of the remedy, the facility must implement and complete within a reasonable time the necessary remedy. A schedule for compliance is put into place and the facility must establish financial assurance for completing the corrective action. This entire process is closely reviewed by EPA or the state delegated agency. Notably, the RCRA definition of SWMUs includes all the types of units listed in proposed 40 C.F.R. § 320.63(a)(1)-(7) and many additional types of units, such as ditches and spills. This program is directly related to whether certain facilities present the "degree and duration of risk" that warrant a new CERCLA financial responsibility requirement. EPA cannot simply disregard this program in its regulatory approach.

[12] EPA, without explanation, established a different methodology and rulemaking process for other industry sectors. In the ANPRM for additional industry sectors, EPA announced that financial responsibility requirements may be warranted for classes of facilities outside of the HRM industry, but that

EPA's willful disregard for state programs in its underling risk determination is also evident in the administrative steps preceding this proposed rule. In defending against the D.C. Circuit lawsuit seeking to compel agency action, EPA set forth a host of "major challenges" to explain why EPA had not completed a financial responsibility rule for the HRM industry. The only "challenge" EPA identified related to state regulations involved the need to "[address] the ***potential for preemption*** of state regulatory programs, including state mine bonding programs." Barnes Johnson Declaration at ¶ 33 (emphasis added). According to EPA, "the preemption issue is especially pressing for the hard rock mining sector, because many states already have mine financial responsibility requirements." Barnes Johnson Declaration at ¶ 69. At that time, "EPA's initial review of state mining programs indicated that financial responsibility requirements vary, and that states use mine permitting authorities to enforce compliance with state mining regulations. Additionally, some states may address different risks from, or may address risks in a different manner than, what EPA is considering for the section 108(b) rule." *Id.* In addressing the role of state programs, EPA did not once mention that they had any relevance to EPA's underlying risk determination.

EPA wrongly maintains this position in the proposed rule. The two pages of *Federal Register* text addressing state programs is solely focused on preemption concerns without any mention of how these programs reduce the environmental risks or risks to the Fund posed by the HRM industry and thus fundamentally influence the underlying risk determination. Yes, preemption is a fundamental concern of this proposed financial responsibility program. In fact, there are significant preemption concerns because of the proposed rule's inherent and pervasive duplication of state regulatory programs. Yet, instead of properly examining how state programs address the "degree and duration of risk" presented by the HRM industry,[13] EPA bends over backwards to distinguish its program in a futile and unpersuasive attempt to allay concerns about preemption.

According to EPA, its main consideration was "what effect, if any, ***compliance with the Federal requirements*** would have under [CERCLA's express preemption provision] relating to specific state financial responsibility requirements." 82 Fed. Reg. at 3403. EPA's answer: "EPA does not intend its CERCLA § 108(b) regulations to result in widespread displacement of those programs, nor does EPA believe that such

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it would first "carefully examine . . . Federal and state authorities, policies, and practices ***to determine the risks posed by these classes of facilities*** and whether requirements under Section 108(b) will effectively reduce these risks." 75 Fed. Reg. at 818 (emphasis added). EPA requested comment on two sets of information for these other industry sectors: (1) financial responsibility provisions under state requirements; and (2) how state requirements "***might affect the environmental risks posed***." *Id.* at 831 (emphasis). EPA never afforded the HRM industry the same opportunity to engage on the initial risk determination.

[13] *See* Appendix A for a thorough description of state regulatory programs.

preemption is intended by CERCLA, necessary, or appropriate."[14] *Id.* EPA backs this unhelpful and circular reasoning by characterizing state programs as having "a limited relationship to liability for the release of hazardous substances" and "not similarly limited to CERCLA hazardous substances or their release." *Id.* at 3403-3404. As shown in greater detail in Section II.B and Appendix A, EPA's superficial assessment of and conclusions about state programs could not be farther from the truth. State programs address the exact CERCLA response cost liabilities that EPA proposes in the financial responsibility formula for this rule. EPA insistence that there is no overlap and no preemption is a semantic maneuver that does not excuse or justify EPA's failure to properly address these issues in the rulemaking. EPA cannot entirely disregard this overlap simply because the regulations are also designed to ensure reclamation and closure.[15]

Most notably, EPA's position that only programs that are "***expressly focused*** on hazardous substances, the risks they present, and financial responsibility associated with liability stemming from their release or threatened release" would be in danger of preemption is fundamentally flawed. 82 Fed. Reg. at 3403 (emphasis added). State programs are not "expressly focused" on reclamation and closure—they address hazardous substances—and much more. In fact, EPA ignored state programs governing groundwater or state delegated programs for surface water and the efficacy of such programs in controlling the "degree and duration of risk" presented by the HRM industry. As the summary of state and federal programs included with these comments and many of the comments from mining states show, current regulations and permits require monitoring of facilities, immediate reporting of releases of hazardous substances (and sometimes other releases) and immediate corrective action under supervision of state regulators. State programs include requirements that reduce the risk of release of hazardous substances and the risk that taxpayer funded response will be required. Moreover, these programs seek to prevent releases and avoid the need for these response categories altogether. Finally, these programs have financial assurance requirements and mechanisms that EPA entirely ignored throughout this rule, such that even where state programs would be viewed as meeting some aspects of the rule's proposed reductions, the financial assurance mechanisms would be disallowed by EPA and therefore ineffective. These state financial assurance mechanisms indisputably

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[14] EPA caveats its discussion on preemption as representing "general views" and that the courts "would make any final determinations about the preemptive effect of CERCLA 108(b) regulations at any particular facility." *Id.* at 3403 n.46. EPA should not establish a program that has obvious and significant overlap with functionally equivalent state programs, summarily claim that such overlap essentially does not exist, saddle the HRM industry with an additional and exorbitant regulatory burden, and then basically challenge industry and the states to litigate issues of preemption (also a costly endeavor). This approach flies in the face of responsible regulation. *See e.g.,* Executive Order 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993) (the agency "shall design its regulations in the most cost-effective manner to achieve the regulatory objective" and "shall seek to harmonize Federal regulatory actions with related State, local, and tribal regulatory and other governmental functions").

[15] In fact, reclamation and closure is also fundamentally about returning land to a designated use and preventing releases of hazardous substances. In other words, preventing uncontrolled release of hazardous substances is integral to reclamation and closure – there is no dichotomy.

mitigate risk and cannot be ignored. To summarily dismiss these programs using a semantic argument is indefensible.

CERCLA § 114(d) further reinforces this reading of the statute. Here, Congress made it clear that no owner or operator of a facility "who establishes and maintains evidence of financial responsibility" in accordance with CERCLA "shall be required under any State or local law, rule or regulation to establish or maintain any other evidence of financial responsibility in connection with liability for the release of a hazardous substance from such . . . facility." 42 U.S.C. § 9614(d). Instead, "[e]vidence of compliance with the financial responsibility requirements" of CERCLA "shall be accepted by a State in lieu of any other requirement of financial responsibility imposed by such State in connection with liability for the release of a hazardous substance from such . . .facility." *Id.* While Congress preserved the right of states "to [impose] any additional liability or requirements with respect to the release of hazardous substances within such State," 42 U.S.C. § 9614(a), it also made clear that if EPA were to act in the same regulatory space and require financial responsibility, then the federal program would preempt any similar state requirement. 42 U.S.C. § 9614(b).

According to EPA, CERCLA § 114 "quite naturally preserve[s] state mine bonding requirements as 'additional requirements' to the extent that they may also address the releases of hazardous substances." 82 Fed. Reg. at 3403. EPA's interpretation of the statute, however, produces absurd results. EPA made no effort to develop financial responsibility requirements for almost 40 years. In that time, the states did act and have been developing, implementing, and enforcing comprehensive programs, including financial assurance. Congress could not have predicted that EPA would not act. Moreover, there is no reason to believe that Congress intended the disruptive result that EPA is proposing in this rule. It is not enough for EPA to minimize preemption of state law requirements, as it claims in this proposed rule, or to simply distinguish them without basis. A more rational and defensible approach would avoid duplication and preemption altogether, particularly given that well-functioning state programs exist and achieve the same objective.

II. EPA's Finding of Continuing Risk in the HRM Sector is Fatally Flawed

Section VI.D.7. of the proposed rule is devoted to EPA's determination of continued risk at hardrock mining facilities. In this section, EPA identifies the data it relied upon to reach its conclusion that there is "abundant evidence that hardrock mining facilities continue to pose risks associated with management of hazardous substances at their sites." 82 Fed. Reg. at 3470. To reach this conclusion, EPA relies on the following: (1) data it has gathered since issuing the 2009 Priority Notice, including the three 2016 reports it prepared in conjunction with this rulemaking to document alleged examples of hazardous substance releases from currently permitted and operating HRM facilities (discussed in further detail in Section II.II.D below); (2) CERCLA site data; (3) TRI, RCRA Hazardous Waste Biennial Report (BR), and ERNS data; and (4) several EPA reports developed outside this rulemaking context that the agency claims also show continuing risk from the HRM industry.

A. EPA Failed to Assess Risk from Today's HRM Facilities

In its analysis of continuing risk, EPA utterly fails to quantitatively or even qualitatively assess risks posed by today's regulated HRM facilities. As a result, not only has EPA ignored its statutory obligation under CERCLA as discussed in Section I above, but the rulemaking record is bereft of any direct evidence that HRM facilities pose the "degree and duration of risk" necessitating imposition of a CERCLA § 108(b) program. Instead, EPA relies on dated information and incorrect, tangential, and circumstantial evidence to make its risk determination and attempts to obfuscate this fatal flaw by overwhelming the docket with over 230,000 pages of documents.

When discussing its authority regarding the calculation of a financial responsibility amount, EPA blithely asserts that its CERCLA obligation related to risk is unfettered:

> CERCLA § 108(b) establishes a general end-point for the Agency's financial responsibility requirements, which must be ''consistent with'' the ''degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances'' at the facility. *EPA does not interpret this to require any precise association with a risk calculation.*

82 Fed. Reg. at 3460 (emphasis added). CERCLA § 108(b) does vest a certain amount of discretion in EPA, but the plain language of the statute does not allow EPA to make its decisions about classes of facilities in a vacuum. The phrase "consistent with the degree and duration of risk" has meaning and obligates EPA to consider the relevant facts in making decisions about which classes of facilities will fall under CERCLA § 108(b). Regardless of whether EPA can ascertain the precise level of risk associated with a particular site in the absence of any response action, EPA cannot abdicate its statutory responsibility to assess the "degree and duration of risk" of an industry sector *prior to* developing financial responsibility requirements. Otherwise, EPA is reading the word "risk" out of CERCLA § 108(b) contrary to Supreme Court precedent and canons of statutory construction that all words of a statute should be given effect.

The starting point in construing a statute is the language of the statute itself. The Supreme Court often recites the "plain meaning rule," that, if the language of the statute is plain and unambiguous, it must be applied according to its terms. Words that are not terms of art and that are not statutorily defined are customarily given their ordinary meanings, frequently derived from the dictionary.[16] CERCLA does not define "risk" in the context of Section 108(b) or otherwise, but EPA's historical use of the term in the CERCLA context accords with the ordinary meaning of the word. For example, EPA's

[16] *FDIC v. Meyer*, 510 U.S. 471, 476 (1994) (In the absence of a statutory definition, "we construe a statutory term in accordance with its ordinary or natural meaning.") *See also, U.S. v. Lehman*, 225 F. 3d 426, 428 (4th Cir. 2000). ("A fundamental canon of statutory construction requires that 'unless otherwise defined, words will be interpreted as taking their ordinary, contemporary, common meaning.'").

Risk Assessment Guidance for Superfund defines risk as "a measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard."[17] EPA's Exposures Factors Handbook similarly defines risk as "the probability of an adverse effect in an organism, system, or population caused under specified circumstances by exposure to an agent."[18] A more basic definition is found on EPA's Risk Assessment webpage: "EPA considers risk to be the chance of harmful effects to human health or to ecological systems."[19]

Common to each of these risk definitions is that the word risk is inextricably intertwined with the concept that harm or damage could result. If there is no potential for harm or damage, there is no risk. Also common to each is the concept of probability or the likelihood of harm occurring.[20] Yet, throughout the proposed rule and supporting documents, EPA again and again divorces the term risk from these concepts and equates "risk" with the occurrence of a "release" and other inappropriate risk surrogates. For example, in the 2016 reports that EPA uses to support its risk determination, the agency conflates risks with releases without acknowledging that the mere existence of releases is inadequate to demonstrate that any meaningful risk exists. In fact, EPA does not address whether the risk has been abated.

B. EPA Fails to Consider Risk-Reducing Effects of Current Federal, State, and Voluntary Programs

Most notably absent from EPA's overall analysis of continuing risks is any evaluation of the role that existing federal and state environmental regulations play, including those that impose financial assurance requirements, in addressing and reducing risks in the first instance. This omission mirrors perhaps the biggest flaw in EPA's Priority Notice in which the entire topic of these programs was relegated to a single footnote. As described in more detail below, all states with significant HRM activity and the key federal land management agencies (*e.g.* BLM and U.S. Forest Service) have robust regulatory programs that address all aspects of HRM operations. EPA cannot meet its duty to assess the "degree and duration of risk" posed by HRM facilities by largely ignoring the existing requirements that address those same risks.

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17 U.S. EPA, *Risk Assessment Guidance for Superfund: Volume 1 Human Health Evaluation Manual Supplement to Part A: Community Involvement in Superfund Risk Assessments*, EPA 540-R-98-042 (March 1999).

18 U.S. EPA, *Exposure Factors Handbook: 2011 Edition*, National Center for Environmental Assessment, Washington, DC, EPA/600/R-09/052F (2011).

19 *Available at* https://www.epa.gov/risk/about-risk-assessment.

20 In EPA's Priority Notice, the agency did at least minimally acknowledge the importance of these two concepts in assessing risk. While NMA did not agree with the eight factors EPA selected, the agency did attempt to characterize them according to the categories: (1) the probability of release of and exposure to hazardous substances; and (2) the severity of the consequences as a result of releases and exposure to hazardous substances. *See* 74 Fed. Reg. at 37,214.

As discussed in Section I above, while EPA ignores these programs in the context of its risk determinations, paradoxically EPA relies on these same programs in two contexts: (1) to determine the possible amount of response costs; and (2) to determine backend reductions to the total amount of the financial responsibility obligation. EPA cannot have it both ways and claim that EPA's program is completely distinct from existing federal and state programs while simultaneously relying on the cost estimates from these programs' reclamation and closure plans as the foundation of the formula for determining the level of financial responsibility that would be required under CERCLA § 108(b) program. Moreover, EPA cannot ameliorate this glaring inconsistency through an ill-crafted process at the backend that supposedly reduces HRM facilities' financial responsibility amounts, but which will fail to do so in practice. Most notably, EPA's proposed rule fails to appropriately account for the comprehensive ways these programs reduce risk at HRM facilities and therefore is not consistent with the statute's focus on "degree and duration of risk" or "highest risk of injury."[21]

1. The HRM Industry's Arc of Environmental Improvement

Mining and mineral processing has a lengthy history in the United States. Commercial mining transactions are documented from the early colonial period. Records indicate that iron ore was shipped from the Jamestown Colony to England as early as 1608, only one year after the colony was founded.[22] As the country expanded westward, so did mining. Mining in the west began nearly 170 years ago in the 1840s and was actively encouraged by the laws and policies of the federal government. The history of mining dwarfs the relatively brief history of environmental laws and regulations that govern modern industrial activities including HRM operations.

Over the last four decades there has been a sea-change in environmental awareness, ushering in numerous federal and state laws and regulations, environmental management systems, design standards, engineering controls, environmental monitoring requirements, best management practices, improved technology, training and, most significantly in this context, financial assurance. These developments were aimed at all industrial activities that could adversely impact human health and the environment. It was during this era that Congress passed CERCLA and directed EPA to develop appropriate financial responsibility requirements for classes of facilities that present the "highest level of risk of injury." 42 U.S.C. § 9608(b)(1).

Regardless of whether it would have been appropriate to target the HRM industry if EPA had begun this rulemaking in 1980 when CERCLA was passed, it is inappropriate today. In the intervening nearly 40 years, the HRM industry has become one of the most comprehensively regulated industries in the country, as states and federal land management agencies developed mining-specific regulatory programs.

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[21] The fundamental flaws of EPA's proposed financial responsibility formula, including the proposed reduction criteria, are more fully laid out in Section III and Appendix B.

[22] Bolles, Albert S., *Industrial History of the United States, From the Earliest Settlements to the Present Time: A Complete Survey of American Industries.* Book IV, at 668 (1879).

Most of these programs came into being in the 1970s and 1980s, with a few into the 1990s. Importantly, these regulatory programs have not been static but have evolved over time, as operators and regulators alike learned from past experiences and as new advances in science and technology have occurred. As a result, many past practices are no longer allowed today (i.e., unrestricted dumping of wastes into surface waters; construction of tunnels that intercepted groundwater). Prevention is the watchword of today's HRM industry and the authorities that regulate them. New facilities are specifically designed, constructed, operated, and closed in a manner to prevent environmental degradation and avoid the types of problems that were caused by past practices. Examples of preventive practices and technologies include enhanced liner systems and leachate collection systems.

Monitoring requirements compliment prevention techniques and have evolved as an important tool to ensure environmental compliance. In the 1800s and early 1900s, monitoring for environmental impacts was rarely (if ever) considered at HRM facilities and consequently releases that occurred at these legacy HRM sites went undetected for decades or longer. Environmental monitoring, which became an important tool for enforcing the new environmental laws and regulations, arose not only to provide early warning signs of potential releases but also to promote corrective action when releases occur. As federal and state mining programs and groundwater protections have matured, monitoring, reporting, and corrective action have become core components of HRM programs and permits. For example, when BLM updated its regulations in 2000, the agency began requiring the submission of a comprehensive monitoring plan to meet the following objectives:

> To demonstrate compliance with the approved plan of operations and other Federal or State environmental laws and regulations, to provide early detection of potential problems, and to supply information that will assist in directing corrective actions should they become necessary. Where applicable, you must include in monitoring plans details on type and location of monitoring devices, sampling parameters and frequency, analytical methods, reporting procedures, and procedures to respond to adverse monitoring results. Monitoring plans may incorporate existing State or other Federal monitoring requirements to avoid duplication. Examples of monitoring programs which may be necessary include surface- and ground-water quality and quantity, air quality, revegetation, stability, noise levels, and wildlife mortality.

43 C.F.R. § 3809.401(b)(4).

As a result of the progress of the last few decades, mining related activities have become increasingly protective of the environment and the public. By 1999, these programs had evolved to a point that the National Academy of Sciences ("NAS") concluded that "the overall structure of the federal and state laws and regulations that provide mining-related environmental protection is complicated but generally effective."

"Hardrock Mining on Federal Lands," National Academy of Sciences, National Academy Press, at 89 (1999) ("NAS Report").

Progress has continued since the NAS Report was published both in response to various recommendations in that report and independently, particularly related to financial assurance.[23] Financial assurance requirements applicable to HRM facilities have become increasingly robust over time, especially as states and the federal land management agencies abandoned one-size-fits-all formulas and began basing financial assurance amounts on site-specific data. As described by the U.S. Forest Service in their comments on the proposal:

> A similar [to EPA's proposed] formula approach was used early on by federal and state agencies to put cost per acre figures to reclamation. To our knowledge, all of the surface management agencies have moved away from this approach to implement a site-specific method of calculating projected reclamation and closure costs. Modeling, using site-specific data, is used to predict likely and possible post-closure scenarios.[24]

Current state and federal financial assurance requirements too will continue to evolve, especially since by law they are reviewed and adjusted on a regular basis, often annually, to ensure they keep pace with inflation and on-the-ground conditions. Further, regulatory authorities can now require the establishment of a funding mechanism to ensure the construction and continuation of treatment to achieve water quality standards and for other long-term, post-mining reclamation and maintenance requirements. As a result of these advancements, today's financial assurance requirements significantly reduce the risk that the public will have to fund the cleanup of HRM facilities in the event an operator is unable to meet that responsibility.

Furthermore, these regulatory improvements have been supplemented by the development and adoption of industry best management practices (BMPs) and other voluntary programs.[25] Citing the voluntary nature of these programs, EPA gives these risk-reducing activities even less credit than federal and state regulatory programs as the agency did not propose to allow reductions in the financial assurance amount for

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[23] For example, the agencies have updated their regulations to: require financial assurance for operations of five acres or less; strengthen the criteria for modifications of plans of operations; address temporary closures; and allow for funding mechanisms needed for any long-term, post-closure management.

[24] Comment submitted by Leslie A. C. Weldon, Deputy Chief, National Forest System, U.S. Forest Service, Department of Agriculture at 5 (Apr. 18, 2017) (EPA-HQ-SFUND-2015-0781-2400) ("U.S. Forest Service Comments").

[25] EPA neglects to consider how often HRM facilities work collaboratively with state and/or federal regulators to incorporate BMPs into facility permits. As such, EPA wholly ignores the industry's leadership and its willingness to be proactive in environmental performance and prevention to beyond minimum regulatory requirements.

such activities.[26] As EPA is well aware, these types of voluntary measures can prove extremely successful in improving environmental performance. As described in EPA's "1995 Profile of the Metal Mining Industry," BMPs are:

> used to reduce the amount of pollution entering surface or groundwater, air, or land, and may take the form of a process, activity, or physical structure. BMPs include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, waste disposal, drainage from raw material storage or other disturbed areas.

U.S. EPA, *Profile of the Metal Mining Industry* (EPA 310-R-95-008), at 65-66 (Sept. 1995).

BMPs continue to evolve over time as EPA acknowledged in its "Mining Hardrock Framework:"

> In recent years, environmental practices employed by the mining industry have improved considerably. Installation of [BMPs] for control of storm water runoff, improvements in treatment of wastewater, better management of tailings and waste rock, and more efficient metal recovery technologies have all contributed to reduced environmental impacts from mining projects.

U.S. EPA, *National Hardrock Mining Framework* (EPA 833-B-97-003), at 2 (Sept. 1997).

The advent of Environmental Management Systems ("EMS") in the 1990s was another key development for improved environmental performance. An EMS is a framework that helps an organization meet its regulatory compliance requirements and otherwise achieve its environmental goals through consistent review, evaluation, and improvement of its environmental performance.[27] This consistent review and evaluation are intended to identify opportunities for continuous improvement in the environmental performance of the organization. Many HRM facilities have implemented EMS programs. In fact, at EPA's behest, NMA, in association with the Society for Mining, Metallurgy, and Exploration ("SME"), developed a model EMS guide to address the agency's concerns about the ability of smaller and medium size mining companies to

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[26] EPA only "solicits comment on allowing reductions to the financial responsibility amount for other risk reducing practices and/or controls (e.g., voluntary practices) that are implemented at hardrock mining facilities that should be accounted for in the reductions, and on how, if reductions were allowed for such practices and/or controls, EPA could assure that those controls would remain in place and be effective over time where there is no regulatory program overseeing their maintenance and operation." 82 Fed. Reg. at 3468.

[27] *See* U.S. EPA, *Learn About Environmental Management System*, *available at* https://www.epa.gov/ems/learn-about-environmental-management-systems#what-is-an-EMS.

develop and implement EMS programs.[28] The objective of the EMS guide is to assist companies in achieving reliable regulatory compliance, reducing adverse impacts to the environment, improving environmental stewardship, and continually improving environmental performance.

The most commonly used framework for an EMS is the one developed by the International Organization for Standardization ("ISO") for the ISO 14001 standard. Established in 1996, this framework is the official international standard for an EMS and includes an optional third-party certification component, meaning an independent certification body audits an organization's practices against the requirements of the standard. Many HRM facilities have taken this extra certification step. And, even EMS standards have evolved over time as lessons are learned and new information comes to light. For example, IS0 14001, first published in 1996, underwent significant revisions in both 2004 and 2015.[29]

EPA cannot adequately evaluate the risk of today's HRM facilities by blindly looking to the distant past and ignoring the arc of environmental improvement of the HRM industry. EPA must give appropriate weight to the progress achieved in reducing the "degree and duration of risk" posed by today's HRM industry. As shown in more detail below, these advancements obviate the need for EPA to impose any CERCLA § 108(b) financial responsibility obligations on the HRM industry.

2. Efficacy of Today's Mining Regime in Addressing CERCLA Risk

Mining is comprehensively regulated by a vast range of federal, state, and local environmental laws and regulations. Importantly, these laws and regulations provide "cradle to grave" coverage of virtually every aspect of mining from exploration to operations through mine reclamation and closure/post-closure. As explained in Sections I.B. and I.C. above, despite EPA's claims to the contrary, these regulations do address the kinds of risks contemplated by CERCLA § 108(b). SBA shares the industries' concerns about the duplicative nature of EPA's proposed program as highlighted in recent comments on the proposed rule:

> Although EPA states that these mining regulations are "distinct" from CERCLA §108(b) requirements, this does not mean that the Federal and state mining requirements do not address the same response categories using other legal authorities and different language. An entirely duplicative CERCLA §108(b) financial responsibility program would be inconsistent with the degree and duration of risk associated with potential releases from

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[28] NMA, *Hardrock Mining & Beneficiation Environmental Management System Guide* (2012), *available at* http://nma.org/wp-content/uploads/2016/09/Toolkit-Hardrock-Mining-and-Beneficiation-Environmental-Management-System-Guide.pdf.

[29] *See* ISO, *ISO 14000 Family – Environmental Management*, *available at* https://www.iso.org/iso-14001-environmental-management.html.

> current highly regulated and fully bonded hardrock mines. EPA is proposing an additive regulatory scheme in the absence of a clearly articulated need as to why these existing programs are deficient or require additional financial assurance.

SBA Letter at 5.

a) Federal and State Environmental Regulations Adequately Address CERCLA Risk

To start, the HRM industry is subject to all major applicable federal environmental laws including the: Clean Air Act ("CAA"); Clean Water Act ("CWA"); Safe Drinking Water Act; Toxic Substances Control Act; RCRA; Emergency Planning and Community Right-to-Know Act; Endangered Species Act; and numerous others.[30] States with HRM facilities also have an additional layer of laws dealing with protection of groundwater, management and disposal of solid waste, closure, and reclamation.

Furthermore, mature regulatory programs for HRM facilities are in place at both the federal and state levels that include rigorous requirements designed to ensure that HRM operations are protective of public health and the environment. For example, BLM's mining regulations, promulgated in 1980 and extensively revised in 2001, are designed to prevent unnecessary or undue degradation of public lands by HRM facilities.[31] Not only do these regulations require reclamation after mining, they additionally contain operational, design, and environmental standards to prevent harmful releases and impacts to the environment both during and after operations.

Similarly, the Forest Services' hardrock mining regulations, which went into effect in 1974, are designed to minimize adverse environmental impacts both during and after operations.[32] In addition, states have their own comprehensive regulatory programs for hardrock mining.[33] Notably, regulatory authorities will not issue permits to a HRM facility if the applicant cannot demonstrate that it will comply with numerous design and operational requirements tailored specifically to HRM facilities. These requirements are in place to minimize the risk of significant spills or other releases that could adversely impact the environment. If any such accidents occur, the relevant regulations require the mining company to take appropriate corrective action. Additionally, these regulations require post-mining reclamation activities.

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30 NMA provided a comprehensive list of these statutes and regulations in comments on the priority notice of action. *See* Appendix A of NMA's Comments (EPA-HQ-SFUND-2009-0834-0097).

31 43 C.F.R. Subpart 3809.

32 36 C.F.R. 228 Subpart A.

33 For example, see Nevada Administrative Code (NAC), chapters NAC 535, NAC 445A and NAC 519A, and the Arizona Mined Land Reclamation Act, Ariz. Rev. State. Ann. §§ 27-901 through 1026, and the Aquifer Protection Permit, Ariz. Rv. State. Ann. §§ 49-241 through 252. *See also* Appendix A.

The number of approvals and permits the typical mining operation must obtain is evidence of the thoroughness of the regulatory framework. For example, a typical operation must obtain:

- Approval of a plan of operations from the BLM or U.S. Forest Service (or state regulatory authority), including a reclamation plan, closure plan, and environmental monitoring. A federal plan of operations is also scrutinized under the National Environmental Policy Act ("NEPA"), usually requiring the preparation of an environmental impact statement, which evaluates potential environmental impacts of the mining operation, assesses alternatives, and requires the identification of mitigation measures to reduce potentially significant environmental impacts. Fifteen states also have their own NEPA-like statutes.[34]

- Air quality permits from EPA or state agencies with delegated programs under the CAA. The complexity of the air quality permits increases if there are substantial onsite processing facilities. All sites must have an approved fugitive dust control program.

- CWA permits from EPA, the Army Corps of Engineers, or state agencies with delegated CWA programs. Mining operations may require CWA permits for the discharge of mine and process water,[35] management and discharge of stormwater, and discharge of dredged or fill material.

- State water quality permits to address potential impacts to ground water.

- Rights to use or consume water from appropriate state authorities.

- EPA identification number and other applicable hazardous waste requirements under RCRA that govern storage, transportation and disposal of hazardous wastes generated at HRM facilities.

- Authorization under the National Historic Preservation Act if cultural or historic resources are present.

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34 *See* Mandelker, NEPA Law and Litigation, (2016) Section 12.2. Important HRM states with state NEPA-like statutes include California, Minnesota, Montana, South Dakota, and Washington.

35 Such permits, issued pursuant to the National Pollutant Discharge Elimination System, typically include technology-based effluent limits established through application of EPA's Ore Mining and Dressing Point Source Category Effluent Limitations Guidelines and New Source Performance Standards. *See* 40 C.F.R. Part 440; 47 Fed. Reg. 54,598 (Dec. 3, 1982). Those regulations, which establish a minimum level of treatment of pollutants from ore mining and dressing facilities, include restrictions on the discharge of process water from mining operations, including a "zero discharge" limit on process water for numerous facilities. Permits for zero discharge facilities typically include strict monitoring requirements to ensure that no process water is being discharged.

- Permits to construct tailings impoundments or other impounding structures for structural integrity and to prevent releases of hazardous substances.

- Detailed site environmental monitoring and reporting requirements to verify compliance with project permits.

- Financial assurance equal to the cost that would be borne by the government if it had to contract with a third-party to maintain environmental controls, address releases of hazardous substances and complete reclamation of the site, including any necessary long-term water treatment.

Clearly, existing federal and state laws and regulations already give regulators the tools to protect the environment from hazardous substance releases from HRM facilities and deal effectively with unexpected releases should they occur in the future. In light of these programs, there is no need for an EPA CERCLA § 108(b) program to "provide an incentive for implementation of sound practices at hardrock mining facilities and thereby decrease the need for future CERCLA actions." 82 Fed. Reg. at 3388. These "incentives" are built into the existing federal and state environmental regulatory programs as implemented by HRM facilities and noncompliance with these programs can result in corrective action, fines, other enforcement actions, and even permit revocation.[36]

Throughout the rulemaking process, there has been a chorus of comments from federal and state regulators in defense of the comprehensive nature of their regulatory programs. A sample of these statements is provided below.

> **U.S. Forest Service**: "the laws and regulations governing mining operations on NFS land ***prohibit releases of hazardous substances,*** and the Forest Service requires surety that is reasonably calculated to insure that operations and reclamation are conducted to avoid releases and respond to releases that may occur."[37]
>
> **Interstate Mining Compact Commission** (IMCC): "EPA has repeatedly stated that what CERCLA 108(b) would regulate is different from what the states are doing, emphasizing that states' programs are 'preventive' in nature and only address mine reclamation and closure requirements, as opposed to addressing releases of hazardous substances. The fact is,

[36] The regulatory programs administered by the federal land management agencies similarly have such "incentives" built in. For example, BLM considers bonding to be a function of BLM's enforcement program in that it ensures all requirements will be met. *See* BLM Presentation, *Hardrock Reclamation Bonding*, (June 2016 Small Business Advocacy Review Panel meeting).

[37] U.S. Forest Service Comments at 2 (emphasis added).

state reclamation programs are designed to prevent such releases from ever occurring and thereby to eliminate the risk."[38]

Western Governors Association (WGA): "EPA has not indicated to states what, if any, problems or gaps the agency perceives in state financial assurance requirements. EPA has likewise failed to indicate that modern, state-driven standards necessitate any alternative program. Western states have the staff and expertise necessary to ensure environmental compliance, reclamation and site closure. Reclamation and closure bonding calculations are based on the unique circumstances of each mining operation, the local ecology and post reclamation land use. Local expertise allows for informed decisions on financial assurances required – based on real values over the life of the mine and after its closure. Many of the hard rock mines in the Western U.S. are on private or public lands, and at times on both. Only state regulatory agencies can oversee bonding and closure on sites with dual ownership and split mineral estate."[39]

Environmental Council of States (ECOS): "The states have acquired extensive expertise and understanding of the various mining methods and technologies used by their hard rock industries, and have gained significant experience in evaluating mining operations, calculating bond amounts based on the unique circumstances of each mining operation, assuring that the completion of reclamation and proper mine closure take place, addressing public health and environmental risks, regulating hazardous substances used in mining and preventing and remediating hazardous releases. The states have also developed the staff and expertise necessary to make informed predictions of how the real value of financial assurance may change over the life of the mine, including post-closure. They have authority to make adjustments to financial assurance requirements when necessary."[40]

Nevada Division of Environmental Protection (NDEP): "As we have explained during recent work group calls with EPA, NDEP has specifically designed our mining program and regulations to minimize the potential for hazardous substance releases. In the event these releases occur at

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[38] Comment submitted by Beth A. Botsis, Deputy Executive Director, Interstate Mining Compact Commission at 2 (Aug. 16, 2016) ("IMCC Comments").

[39] Comment submitted by Wyoming Governor Matthew H. Mead and Montana Governor Steve Bullock, Chairman and Vice Chair of Western Governors Association at 2 (March 29, 2016).

[40] Comment submitted by Alexandra Dapolito, Executive Director and General Counsel of the Environmental Council of the States, at 1 (Aug. 17, 2016).

permitted mine facilities, both mitigation and financial assurance are then required to ensure these releases are addressed."[41]

Utah Department of Natural Resources: "The rules promulgated under the Utah Mined Land Reclamation Act have been effective in requiring operators to control deleterious materials and to reduce or eliminate adverse environmental effects from these materials. Additional regulation by EPA is not necessary and would be a duplication of Utah's efforts."[42]

To provide further evidence of the duplicative nature of EPA's proposal, NMA commissioned a "Review of State Financial Responsibility Requirements for Hardrock Mining Facilities" ("State Report") on the duplication between EPA's proposed rule and the comprehensive and effective environmental protection regulations and corresponding financial responsibility requirements in state laws, regulations, and permits. The report is included as Appendix A to these comments. Specifically, the narrative and comparison tables in this analysis demonstrate that the environmental controls required in state regulations, which were almost entirely disregarded by EPA, are directly related to the statute's threshold standard on risk and level of appropriate financial responsibility. The report includes a detailed narrative and comparison of each state's regulations to the response cost categories in EPA's proposed financial responsibility formula for the following states: Alaska, Arizona, California, Colorado, Florida, Idaho, Michigan, Minnesota, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The analysis also includes tables comparing the programs administered by the BLM and the U.S. Forest Service to the response cost categories in EPA's financial responsibility rule.

The report details how EPA analyzes the sufficiency of state financial assurance programs in a vacuum without consideration of the interaction between each state's environmental protection and financial assurance laws and regulations. As a result of this failure, EPA overlooks key facts that ultimately impact the degree and duration of risk posed by any HRM facility:

- The states' environmental protection laws and regulations, together with implementation of federal laws and regulations, including delegated programs, are designed to prevent environmental degradation due to a release of a hazardous substance and thereby substantially minimize the risk of releases of hazardous substances;

- The environmental monitoring and reporting requirements in state operating permits act as real-time, early-warning systems that provide state regulators and operators with indicators of a possible release of a hazardous substance. If project monitoring data indicate there may be a release, state regulations compel

[41] Comment submitted by David Emme, Administrator, Nevada NDEP at 1-2 (Aug. 17, 2016).

[42] Comment submitted by John R. Baza, Director of Division of Oil, Gas and Mining, Utah Department of Natural Resources at 1. (Aug. 17,2016).

the operator to report and investigate the potential release and take remedial action. These requirements minimize both the "degree and the duration of risk" associated with that release; and

- The costs associated with operating and maintaining the environmental controls specified in mine operating permits are included in the financial assurance. Thus, the financial assurance requirements extend far beyond physical reclamation; they include costs to operate and maintain a project's environmental controls necessary for compliance with the environmental protection and performance standards in the mine's operating permits.

See State Report at 8.

By providing the full picture of how the state programs work, the State Report thoroughly rebuts EPA's contentions that states are addressing different risks, or addressing "risks in a different manner from those for which EPA's proposed Financial Responsibility Formula is designed to account." 82 Fed. Reg. at 3403. The tables in the report show how each state program addresses all of EPA's 13 identified response categories and, therefore, are compelling evidence that state programs reduce both the risk of release and the risk that taxpayers will incur response costs and that EPA's proposal duplicates the existing state programs.

A review of the HRM facilities on the CERCLA NPL provides additional confirmation about the efficacy of these programs in addressing CERCLA risks. As BLM and the U.S. Forest Service attested in 2011 in responding to a request by Senator Lisa Murkowski (R-Alaska), no HRM facility approved by these agencies since 1990 has been added to the NPL.[43] [44] This data refutes EPA's fundamental assumptions that all currently operating and future mine sites will require CERCLA response actions for all site features. If this premise were true, one would expect to see currently permitted and operating HRM facilities, including those with no legacy contamination, added to the NPL at a rapid pace. In fact, as Figure 1 demonstrates, only one HRM site that began operations after CERCLA's passage is included on EPA's list of "mining sites proposed for and listed on the NPL as well as mining sites being cleaned up using the Superfund Alternative Approach."[45] The greatest percentage of sites on this list began operations in the mid- to late-1800s, well before the state and federal regulatory programs came into existence. Furthermore, EPA's assumption that all sites will require remedies for every response category is not consistent with historical HRM CERCLA sites at which not all mine features are universally present and not all remedies are required.

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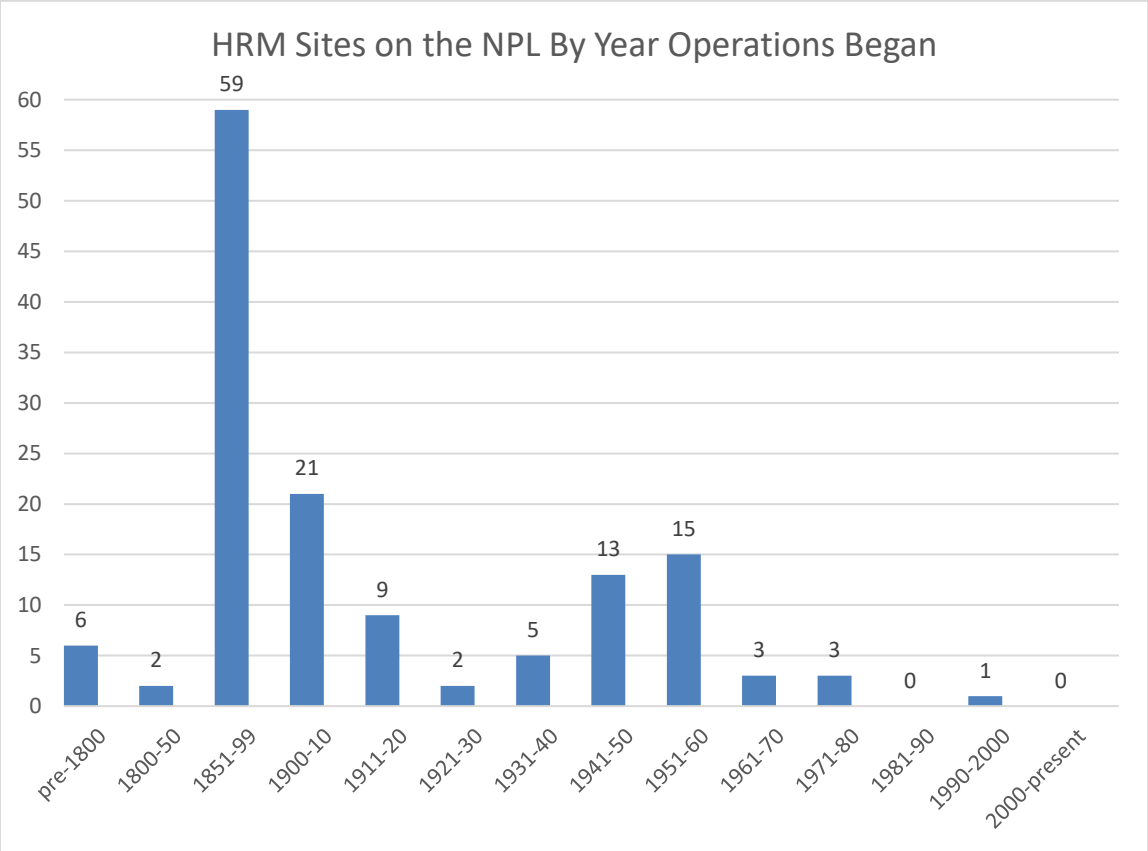
[43] Letter from Robert V. Abbey, BLM Director at 5 (June 21, 2011) (None of the 659 plans of operation for mine production authorized by the BLM have been placed on the NPL).

[44] Letter from Thomas J. Vilsak, Secretary U.S. Department of Agriculture at 4 (July 20, 2011) (None of the 2,685 mines permitted by the U.S. Forest Service have been placed on the NPL).

[45] This list is maintained at https://www.epa.gov/superfund/abandoned-mine-lands-site-information.



b) Federal and State Financial Assurance Programs Reduce Risk of Public Funds Being Needed to Address Releases from HRM Facilities

Requirements related to financial assurance are an essential component of the federal and state regulatory scheme to effectively reduce the "degree and duration of risk" posed by the HRM industry.[46] HRM facilities are subject to financial assurance requirements imposed by BLM and the U.S. Forest Service as well as the states.[47] In fact, in today's regulatory world, HRM facilities cannot begin operations without first providing financial assurance.

These financial assurance requirements have evolved over time as regulators gained expertise in calculating the amounts necessary to cover the obligation. As mentioned above, one of the biggest changes is the shift from use of a generic formula

[46] EPA's summaries of the states' financial assurance requirements do not adequately describe how the states' regulatory programs and environmental protection requirements are coordinated with the financial assurance programs and the relationship of the environmental regulations to determining the amount of financial assurance ultimately required.

[47] *See* BLM – 43 CFR 3809.500; U.S. Forest Service – 36 CFR 228.13; State example – Nevada Administrative Code 519A.

to determine financial assurance amounts to use of site-specific information to do so. As even EPA admits, a site-specific determination is much more precise and better reflects potential risks.[48] The comprehensive nature of these programs is highlighted in a recent comment letter submitted by the Interstate Mining Compact Commission (IMCC) during the agency's federalism consultation conducted last year:

> [T]he states have acquired extensive expertise on and understanding of the various mining methods and technologies used by their hardrock industries, and have years of experience in evaluating mining operations, calculating bond amounts based on the unique circumstances of each mining operation, assuring that completion of reclamation and proper mine closure takes place, addressing public health risks and environmental risks, regulating hazardous substances utilized in mining, and preventing and remediating hazardous releases. The states have also developed the staff and expertise necessary to make informed predictions of how the real value of financial assurance may change over the life of the mine, including post-closure, and they have the authority to make adjustments to financial assurance requirements over time when necessary.

IMCC Comments at 2.

For example, EPA points to the shortfall in the bonded amount at the Zortman-Landusky mines in Montana as evidence of flawed bonding programs. But the specific problem with the bond calculations at Zortman have been solved for twenty years. According to the Final Environmental Impact Statement on the Reclamation Plan for those mines:

> Shortfalls in certain reclamation scenarios exist largely due to an assumption made during bond calculation that the mine configuration would be different at closure than actually existed when the operator filed for bankruptcy. As a result, more material has to be moved than was planned for in the bond calculations. This problem has been corrected in the new 3809 regulations, and in the State's bonding procedures, which specify that the bond amount should be adequate to cover the point of maximum reclamation liability, and not necessarily the conditions that would exist as the 'anticipated' end of mine life.

BLM, "Final Supplemental Environmental Impact Statement for Reclamation of the Zortman and Landusky Mines," at 6-14 (Dec. 2001).

Site-specific determinations are also in-line with the recommendations of the 1999 NAS Report. The report cautioned against applying inflexible, technically

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[48] *See* 82 Fed. Reg. at 3460 ("This approach is the most precise of the three approaches considered by EPA. However, it is also the most resource intensive to implement. It requires gathering detailed information about the site, including an assessment of the site conditions.")

prescriptive standards stating that “simple ‘one-size-fits-all’ solutions are impractical because mining confronts too great an assortment of site-specific technical, environmental, and social conditions” and urged that “each proposed mining operation be evaluated on its own merits.” NAS Report at 5.

The NAS Report also contained specific recommendations to the federal land management agencies on how their financial assurance requirements could be strengthened. Since the NAS Report was published, the federal land management agencies have acted to make their effective regulatory programs even stronger. For example, BLM’s regulations now require financial guarantees for all mining and exploration disturbances, no matter how small, *before* activities can proceed. Both agencies require the financial guarantee to cover the full cost to reclaim the operation, as if the agencies were to contract with a third-party to conduct reclamation. In addition, the agencies can now require the establishment of a funding mechanism to ensure the continuation of long-term treatment to achieve water quality standards and for other long-term, post-closure care and maintenance requirements.

Due to these developments, federal land managers now hold a record amount in financial assurance. BLM holds nearly $3 billion, a 71 percent increase over the past five years. The Forest Service, which oversees far fewer HRM facilities holds an additional $325 million. States have strengthened their financial assurance programs as well. For example, South Dakota has made significant refinements to its reclamation bond calculation program to ensure better precision in the amount of financial assurance required. As another example, the State of Idaho amended its Surface Mining Act in 2015 to increase the level of financial assurance. Major mining states also hold significant amounts in financial assurance.[49] Furthermore, the vast majority of states now have the authority to require assurance for longer-term post-closure activities. Additional details about various key mining states’ financial assurance programs are included in the State Report in Appendix A to these comments.

The improvements in financial assurance requirements, combined with sustained environmental compliance, will ensure that the public will not ultimately become responsible for releases of hazardous substances or reclamation of HRM facilities. As such, a separate and duplicative EPA program is simply unnecessary to protect the taxpayers from these liabilities.

[49] For example, Nevada holds $2.66 billion and New Mexico $692 million. *See* letter from David Emme, Administrator, Nevada NDEP at 1 (Aug. 17, 2016). *See also,* presentation by Bill Brancard, General Counsel of the New Mexico Energy, Minerals and Natural Resources Department to the CERCLA § 108(b) Small Business Advocacy Review Panel.

C. EPA Has Not Supported Its Claims that Bankruptcy Is an Actual Indicator of Risk to the Fund or a Reason to Disallow Corporate Guarantees

Much of the impetus for the rule is to protect the taxpayer from shouldering CERCLA liabilities.[50] In its RIA, EPA estimates that absent the rule, defaults on CERCLA § 108(b) liabilities at mining facilities, including response costs, natural resource damages, and health assessment costs, would cost the government or taxpayer approximately $527 million. EPA's assumptions about the risk of bankruptcy in the HRM sector are fundamentally incorrect. First, EPA overstates the risk that HRM facilities will file for bankruptcy.

EPA fails to make any showing that this risk is greater for HRM companies than other industries. In fact, a key report that EPA relies upon in making its conclusions about bankruptcy rates clearly indicates that bankruptcy rates are much higher for a variety of other industries, noting that the manufacturing sector experienced seven times the number of bankruptcies during the analyzed timeframe. Industrial Economics, Inc., "Background Document for Financial Test Analyses," at 6. And this same report overstates the rate of bankruptcy for HRM facilities that would be subject to the proposed rule.[51] The report identifies 43 mining company bankruptcies between 1981 and 2010 but 20 of these companies were associated with sectors that are not included in the HRM sector (as defined in the proposed rule), such as coal mining, oilfield drilling, and petroleum ore processing. As explained in an analysis of EPA's RIA,[52] prepared by OnPoint Analytics for Freeport-McMoRan ("OnPoint Analysis"), the differences in market structure and industry characteristics make it inappropriate to compare risk of bankruptcy across these sectors.

The OnPoint Analysis identifies other significant flaws with EPA's examination of bankruptcy risk including:

- EPA fails to consider how portfolio diversification across, and within, the operating activities of HRM facilities reduces bankruptcy risk.

- EPA fails to look at key financial ratios related to leverage, profitability, and stability for the HRM industry that demonstrate when compared to

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50 *See e.g.,* 82 Fed. Reg. at 3394 (The primary effect of this proposed rule is to transfer the risk associated with CERCLA liabilities from the taxpayer to the private sector) and at 3394 (if a company files for bankruptcy and defaults on its financial responsibility obligations EPA assumed the taxpayers would assume those obligations).

51 Many states' experience with rate of default or bankruptcy confirm EPA's overstatements of risk. *See e.g.,* comment letter submitted by Governor C. L. "Butch" Otter to EPA Administrator Gina McCarthy at 2-3. (Aug. 17, 2016) ("No hardrock mine approved since 1986 for which financial assurances were posted has defaulted on the financial assurance such that the mine was not closed and reclaimed in accordance with (1) the reclamation/closure plan approved by the relevant federal and/or State agencies; and (2) the financial assurances retained by the agencies").

52 This report is covered in more detail in Section IV.

> other industries, the HRM exhibits better financial ratios that are indicative of financial stability.

Furthermore, EPA significantly exaggerates the risk to the Fund by ignoring three key facts: (1) even in documented cases of bankruptcy, EPA has frequently obtained substantial recoveries and hence, the "gross cost" is not the "net cost' to the government; (2) many bankruptcies end as reorganizations with the entity continuing to operate during the proceeding and emerge from bankruptcy after recapitalization or sale to another entity as a financially viable company with its pre-filing financial assurance obligations unchanged;[53] and (3) the bankruptcy of one potentially responsible party (PRP) does not necessarily mean that the government will be responsible for all remediation at the site since most, if not virtually all, CERCLA mining cases have multiple PRPs subject to government claims of joint and several liability. As evidenced by EPA's "Recovering Costs from Parties in Bankruptcy" webpage, the agency uses its "enforcement authority to ensure that responsible parties, and not taxpayers, pay for the cleanup of hazardous waste."[54] Through this effort, EPA has "pursued some sizable claims and achieved excellent recoveries through settlement of bankruptcy." *Id.* Thus, EPA's assumption in the economic analyses that the agency would recover none of what is required to fund cleanup and restoration is patently incorrect.

Nor is EPA able to demonstrate a link between bankruptcy and frequency or severity of releases. As acknowledged by EPA, the findings that operator bankruptcy and abandonment are associated with releases "reflect anecdotal evidence of the contributing factors to releases***. In a literature review, no systematic reviews studied operator financial health in the hardrock mining sector and the creation of CERCLA liabilities***." U.S. EPA, "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances," at 8, fn. 17 (Nov. 30, 2016).

EPA nevertheless uses its bankruptcy narrative to bolster its position on use of a financial test or corporate guarantee. The proposal states that

> [t]he Agency remains extremely concerned regarding the boom and bust nature inherent to the hardrock mining industry and recent volatility in commodity prices and global markets. History suggests that the increased risk of default for these companies makes this sector particularly problematic from the perspective of allowing them to self-insure through a financial test. Finally, many hardrock mining facilities require long-term care, such as long-term water treatment of acid mine drainage. ***Allowing owners or operators to self-insure where such long-term liabilities are***

[53] Even operators that are in bankruptcy may resolve their financial obligations to debtors while maintaining environmental compliance. For example, one of the major mines involved in the Pegasus Bankruptcy, the Florida Canyon Mine in Nevada, was purchased from the bankruptcy estate and has continued to operate without any taxpayer dollars to address environmental issues. Hycroft Mining Corp. in Nevada emerged from Chapter 11 bankruptcy in October 2015. Environmental responsibilities and performance were unaffected by the bankruptcy.

[54] Web page available at https://www.epa.gov/enforcement/recovering-costs-parties-bankruptcy.

anticipated may be ill-advised given that some sites require treatment into perpetuity.

82 Fed. Reg. at 3432 (emphasis added).

As discussed above, EPA's concerns about widespread defaults by the HRM industry are unfounded.[55] Regardless, EPA is not free to ignore the CERCLA § 108(b) mandate that "financial responsibility may be established by any one, or any combination, of the following: insurance, guarantee, surety bond, letter of credit, or qualification as a self-insurer." 42 U.S.C. § 9608(b)(2). The plain language of the statute therefore requires EPA to allow a corporate guarantee and financial test option. However, the announced preferred option in the rule, Option 1, would completely prohibit any means of self-bonding by anyone. EPA's secondary option, Option 2, similarly fails to meet the statutory obligation. While Option 2 does include a financial test, its stringency will make it unavailable even to financially strong companies and that stringency is not justified by the administrative record.

Given the numerous fatal deficiencies with this rulemaking, NMA believes the only defensible outcome is for the agency to conclude that the imposition of additional financial responsibility requirements is not necessary given the "degree and duration of risk" presented by the HRM industry. As such, NMA is not providing specific recommendations on how an appropriate financial test could be structured.[56] However, to preserve any legal arguments in the event the rule is finalized, NMA raises some significant concerns with the proposed approach.

First, the approach to the financial test contradicts EPA's use of a financial test under RCRA and for companies with existing CERCLA response obligations. Under these other programs, EPA has established reasonable financial tests to satisfy cleanup obligations. For example, EPA allows the use of a financial test to satisfy RCRA financial responsibility requirements for closure and post-closure costs[57] and to satisfy CERCLA cleanup obligations embodied in settlement agreements and CERCLA § 106 administrative orders. It is mystifying that EPA refuses to do so in the context of CERCLA § 108(b) obligations, especially since the agency explicitly acknowledges that

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[55] In fact, the duplicative nature of the regulation could potentially lead to unintended counterproductive environmental and economic consequences as hardrock mining companies are potentially induced into bankruptcy by the costs of the regulation. *See*, OnPoint Analysis at 41.

[56] NMA notes, however, that the agency should allow the ability to self-insure up to 100 percent of the obligation for companies that can meet any of the following: (1) have an investment grade (BBB- or better) credit rating; (2) satisfy the Nevada financial assurance test; or (3) have sufficient net worth and total assets.

[57] *See* 40 C.F.R. § 264.143(f) ("Financial test and corporate guarantee for closure"); 40 C.F.R. § 65.143(e) (same); *See also* 70 Fed. Reg. 53419, 53439 (Sept. 8, 2005) (explaining the Agency's reasoning for retaining the RCRA financial test in response to comments suggesting that it be abandoned).

there have not been "widespread" problems with self-bonding under those other programs.[58]

Second, the proposed rule indicates only audited financial statements prepared in accordance with the U.S. Generally Accepted Accounting Principles ("U.S. GAAP") will be recognized for purposes of the financial test.[59] NMA believes the use of International Financial Reporting Standards (IFRS) prepared financial statements should also be allowed. EPA's rationale for disallowing use of IFRS-audited statements for the purpose of supporting financial test or parent guarantee financial assurance is based on incorrect assumptions.[60] Any disparities between U.S. GAAP and IFRS statements are already addressed by the adjustment employed in the Standard & Poor's (S&P) financial rating evaluation process. S&P adjusts an entity's financial data prepared under U.S. GAAP or IFRS to S&P's view of the entity's underlying financial stability. The credit ratings set by S&P (*e.g.*, A- or BBB) would have considered any accounting differences between U.S. GAAP and IFRS. S&P credit ratings, therefore, do not make any distinction between U.S. GAAP and IFRS financial statements.

D. EPA's Alleged Evidence of Releases from Current Mining Operations is Unsubstantiated and Does Not Justify EPA's Risk Determination

It is through the lens of steadfastly ignoring the risk-reducing nature of the federal and state programs that EPA mistakenly concludes that today's HRM industry is "high risk" and merits creation of a CERCLA § 108(b) program. To justify its conclusion, EPA prepared a series of reports (collectively referred to as the "2016 Reports") that the agency contends provide the evidence showing there is continuing risk posed by currently permitted and operating HRM facilities:

- U.S. EPA, "Office of Resource Conservation and Recovery, Memorandum to the Record: Releases from Hardrock Mining Facilities" (Nov. 22, 2016) ("Releases Report").

- U.S. EPA, "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances" (Nov. 30, 2016) ("Practices Report").

- U.S. EPA, "Evidence of CERCLA Hazardous Substances and Potential Exposures at CERCLA § 108(b) Mining and Mineral Processing Sites" (Sept. 2016) ("Evidence Report").

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58 *See* 82 Fed. Reg. at 3432.

59 *See id.* at 3,437-38, 3,492-93.

60 *See* 82 Fed. Reg. at 3,438 ("[T]o accept both IFRS and GAAP financial statements in support of the financial test would yield a potentially disproportionate playing field wherein some companies using IFRS may pass the test where they might otherwise fail under GAAP, and vice versa.").

Only by bundling these reports, each of which is significantly flawed, can EPA create the illusion that today's HRM activities are not only as risky, but perhaps even riskier than historical and largely unregulated HRM activities. But this house of cards cannot withstand scrutiny. When these reports are carefully examined, they reveal how profoundly EPA has misinterpreted or misunderstood its own data. EPA concludes that the "risk" of releases triggering response costs remains high and therefore CERCLA 108(b) financial assurance requirements are necessary. These reports, however, support the opposite conclusion: if "releases" of hazardous substances at mine sites do occur, current regulatory programs ensure those releases are identified by monitoring, reported to regulatory authorities and corrected by the operator under the supervision of federal and/or state regulators without risk of environmental injury or response costs. As such, these actions are the hallmarks of effective regulatory programs rather than any evidence of risk. While the 2016 Reports purport to demonstrate hundreds of "releases" occurred over the past decade, there is no evidence that the current federal and state regulatory programs are not adequate to identify and respond to these releases. Nor do the reports provide evidence that response costs funded by taxpayer dollars would have been or will be required to address any of these "releases."

Each of the reports is addressed below. NMA notes there are general criticisms that apply to each report. Additionally, Appendix C is NMA's "Analysis of Facilities EPA Alleges Demonstrate HRM Facilities Present Continuing Risk," which provides an extensive critique of EPA's characterization of the 72 specific HRM facilities mentioned in the three reports and the preamble to the proposed rule. This appendix corrects EPA's mischaracterizations and/or omissions of key facts for the HRM industry that EPA stubbornly and mistakenly relies upon to reach its conclusions about the continuing risks posed by HRM facilities.

1. Focus on Wrong Timeframe

While not stated explicitly in the preamble to the proposed rule, EPA appears to have adopted a firm year,1980, as the year marking the changeover from historical/legacy mining to modern mining. While 1980, the year CERCLA was enacted, may seem like a practical choice, it is arbitrary and ignores the evolution of other environmental laws and mining regulations and practices over time (see discussion above in Section II.B), especially as many federal and state environmental regulatory schemes applicable to mining were in their infancy in 1980.[61] Due to this faulty assumption, EPA nonsensically equates the risks from HRM facilities that were in operation in 1980 (regardless of when they were built or how long they operated pre-1980) to the risks from currently permitted and operating HRM facilities.

EPA's inappropriate conflation of 1980 sites with currently permitted and operating facilities is evidenced by the 2016 Reports that the agency published to

[61] For example, BLM's surface management regulations, 43 C.F.R. Subpart 3809, which have been the primary regulatory framework for HRM on federal lands, were proposed in 1980 and became effective in January 1981.

support the proposed rule. For example, the Releases Report addresses sites that were "recently or currently operating" as illustrated by a chart of HRM facilities with operations from 1980-present. The Practices Report also segregates pre-and post-1980 releases.[62,63] The Evidence Report most explicitly indicates EPA's decision to conflate the risks from all post-1980 HRM operations, noting that "***sites that operated after 1980*** represent current mining and processing operations and practices." Evidence Report at ES-1 (emphasis added). EPA admits that "the focus on post-1980 is to ***strengthen the relevance of the data*** to . . . current sites because sites operating after 1980 would be more likely to use techniques similar to those in use today, compared with pre-1980 sites."[64] [65] *Id.* (emphasis added).

Even more troubling than equating 1980 sites with currently permitted and operating HRM facilities, EPA relies heavily on historical (pre-1980) and largely unregulated mines throughout the development of the rule. For example, in developing its formula, EPA conducted analysis of *historical response* costs at HRM sites on the NPL and non-NPL CERCLA sites and then used this information to help further identify the magnitude of continuing risks from HRM facilities potentially subject to the rule. As an example, EPA relies on NPL data to inform the formula's water treatment response costs for operating facilities instead of properly acknowledging that many permitted and operating facilities will not require water treatment.[66] By not focusing on the much lower

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[62] "Many facilities within the non-operating and currently operating sample have been active for a century or longer. When a post 1980 release occurred at these facilities it was difficult to determine if the equipment or practice responsible for the release was newly constructed or part of the site's past operations." Practices Report at 5.

[63] "Federal and state authorities, including EPA, [BLM] and states, promulgated environmental regulations applicable to hardrock mining and primary processing operations throughout the 1970s, 1980s and 1990s. During this period, incremental requirements and applicability of standards continued to bring hardrock mining and mineral processing operations into the period of contemporary mining." Practices Report at 6.

[64] "Post-1980 sites more likely to represent sites where practices resulting in contamination are confirmed, are expected to be similar to current-day practices where risks have been characterized." Evidence Report at 3.

[65] NMA does not support the establishment of any firm date to demarcate historical and modern mining as doing so cannot substitute for assessing the actual risks posed by currently permitted and operating HRM facilities. NMA notes, however, that EPA has in the past determined 1990 is the more appropriate date. *See* Phase 1 Preliminary Analysis Report, available in the docket EPA established for the HRM Priority Notice (EPA-HQ-SFUND-2009-0265-0019), at ES-2 (EPA eliminated sites from consideration that were "proposed to the NPL strictly as a result of 'legacy' contamination, i.e., sometimes the results of decades, even centuries of practices that were not subject to modern waste management regulations . . . Most of the sites listed prior to 1990 would tend to be on the NPL due to poor waste management practices that occurred before the full implementation of modern state and federal environmental waste management laws.").

[66] "One of the highest-dollar response categories, water treatment, also presented one of the smallest cost sample sizes with only 15 facilities represented. As a result, EPA supplemented the closure plan cost data on water treatment costs with data from the three CERCLA sites contained in EPA's

potential risks from currently permitted and operating HRM facilities, EPA grossly distorts the risk profile of today's HRM industry and proposes a financial responsibility obligation that is completely out of touch with the reality of current conditions.

2. Lack of Peer Review

Individually and as a group, each of the 2016 Reports meet the criteria that require peer review outlined in the Office of Management and Budget's ("OMB") 2004 Bulletin M05-3 "Final Information Quality Bulletin for Peer Review." U.S. OMB, Final Information Quality Bulletin for Peer Review, M05-3 (Dec. 16, 2004) ("Peer Review Bulletin"). However, they have not been subject to adequate peer review and consequently are insufficiently reliable to support EPA's continuing risk determination. Specifically, the Bulletin requires all agencies to conduct peer review of influential scientific information before it is disseminated by the federal government. The Bulletin defines the term "scientific information" as:

> …. factual inputs, data, models, analyses, technical information, or scientific assessments related to such disciplines as the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences.

Id. at 10-11. To determine which scientific information is "influential," the Bulletin refers to OMB's guidance implementing the Information Quality Act. Based on this law, OMB defined "influential information" as:

> "Influential", when used in the phrase ''influential scientific, financial, or statistical information", means that the agency can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on important public policies or important private sector decisions.

U.S. OMB, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, 67 Fed. Reg. 8452, 8460 (Feb. 22, 2002). One of the examples of "influential" in the OMB Bulletin is an agency's assessment of risk that influences state, local, and international action.

The 2004 Bulletin also created the term "highly influential" if the agency or the OMB Office of Information and Regulatory Affairs ("OIRA") Administrator determines that the dissemination could have a potential impact of more than $500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest. Peer Review Bulletin at 23. The Bulletin requires all agencies to have certain minimum peer review standards for "highly influential scientific information." These minimum standards

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CERCLA site data set, for which water treatment cost data were readily available, and could be disaggregated from the sites' full costs." 82 Fed. Reg. at 3463.

include that agencies provide the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' reports and findings, and the agency's response to the peer reviewers' findings. Agencies must also form a peer review process with the necessary expertise and with best practices to avoid potential conflicts of interest.

The Bulletin contains some exemptions, deferrals, and waivers but does not automatically permit an agency to waive the peer review requirements due to a judicial deadline for a rulemaking. Specifically, the Bulletin states: "Deadlines found in consent decrees agreed to by agencies after the Bulletin is issued will not ordinarily warrant waiver of the Bulletin's requirements because those deadlines should be negotiated to permit time for all required procedures, including peer review." *Id.* at. 32.

EPA's description of how it complies with the Bulletin is contained in its peer review handbook. U.S. EPA, Peer Review Handbook 4th Edition (EPA/100/B-15/001) (October 2015). The 2015 edition includes OMB's definitions for "highly influential scientific information" and incorporates the OMB Bulletin requirements into EPA's overall peer review process. As such, EPA is obligated to fulfill the OMB peer review bulletin requirements for "highly influential scientific information."

EPA failed to follow these requirements for the 2016 Reports despite the fact these reports are "highly influential" under the OMB criteria. First, the reports meet the criteria that "the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest." Namely, the SBA's Jan. 2017 letter demonstrates substantial interagency interest. The primary point of the SBA letter is that EPA should withdraw its proposal as "there is no statutory need for this regulation, nor are there any significant environmental benefits demonstrated by EPA." SBA Letter at 3. In its letter, SBA references the preamble discussion and 2016 Reports that EPA is relying upon to support the need for the CERCLA § 108(b) rule. Specifically, SBA questions the findings of the Releases Report, pointing out that EPA:

> simply describes evidence of recent releases, while not addressing the fact that the responses to these releases are potentially being handled effectively under the existing regulations. If other federal and state programs adequately handle these releases, this would undermine, rather than support the foundation for this proposal.

SBA Comment Letter at 7. The U.S. Forest Service and BLM are other federal agencies that have expressed significant interest and concern regarding the proposal. During the federalism consultation, several states also expressed this same concern. The agencies have worked diligently since the 2009 Priority Notice to educate EPA about the comprehensiveness and strength of their respective programs to reduce the "degree and duration of risk" posed by HRM facilities. Both agencies provided extensive

overviews of their environmental regulatory programs and how they calculate financial assurance for the HRM industry.[67]

Additionally, the 2016 Reports are “highly influential under the criteria that the dissemination could have a potential impact of more than $500 million in any one year on either the public or private sector.” While EPA estimates that the annual cost to industry for the rule is $174 million, EPA’s estimate is extremely conservative and wrong. According to Freeport-McMoRan Inc.’s preliminary analysis, its company alone could add more net financial responsibility than EPA projected for the entire mining industry ($4-7 billion) if the rule is finalized as proposed.[68] In addition, the aforementioned OnPoint Analysis of the EPA RIA reveals significant flaws in the RIA that demonstrate the agency significantly underestimated the costs of the rule.[69]

3. Lack of Data on Funding of Any Needed Response Costs

Each of the 2016 Reports refers to alleged releases from currently operating HRM facilities to support the agency’s overarching conclusion on continuing risk. Missing from each, however, is complete information about whether taxpayer dollars were required to conduct any necessary response or remediation. As such, these reports fail to accurately assess whether such releases pose a risk to the Superfund itself. At many of the facilities described in these 2016 Reports, the HRM facility operator paid for and/or conducted any needed remediation for the discussed releases. Importantly, most of these activities were achieved without any need for enforcement action by any regulatory agency as the operators frequently self-identified the problems from project monitoring data, notified any necessary authorities as required under federal and state laws and voluntarily engaged in cleanup activities. Ironically, it is the ever-evolving state and federal regulatory programs that EPA has disregarded throughout this rulemaking that creates the setting, including the project monitoring requirements, that allows operators to identify any environmental concerns early and obligates them to address such problems quickly and effectively.

4. EPA’s Releases Report

The stated intent of the Releases Report is "to substantiate the ongoing existence of environmental risk from releases to the environment from hardrock mining *in spite of improved regulation of and practices instituted by the hardrock mining and mineral processing industry.*" Releases Report at 2 (emphasis added). In the attempt to make this connection, the report included sites that allegedly were “recently or currently operating” and that allegedly “had no previous significant legacy mining issues.*”* 82 Fed.

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[67] Most recently, both agencies gave lengthy presentation about their programs at the June 2016 Small Business Advocacy Review Panel meeting. EPA representatives were present at this meeting.

[68] Comment Submitted by William E. Cobb, Vice President, Environmental Services, Freeport-McMoRan Inc. to EPA Administrator Scott Pruitt at 3 (May 5, 2017).

[69] *See* section IV of these comments for discussion of OnPoint Analysis’ conclusion that the true cost of the proposed rule could be as high as $39.4 billion on a net present value basis.

Reg. at 3471. EPA places huge weight on a flimsy report with a page length (26) that is shorter than the number of HRM facilities it examines (27).

The Releases Report summary indicates that the agency evaluated three types of incidents and response actions from HRM facilities: CERCLA actions, CERCLA-like actions, and potential CERCLA actions.[70] EPA's terminology regarding the types of actions evaluated is very misleading, especially the use of the term "CERCLA-like." Specifically, the report identifies "a number of other mine sites have resulted in releases to the environment that were subsequently mitigated using CERCLA-like actions under state and/or federal statutory authority." Releases Report at 9. NMA objects to the characterization of responses to the alleged releases at these sites as "CERCLA-like." For the vast majority of the facilities EPA characterizes as CERCLA-like, the releases were identified by the operator and reported to the appropriate regulatory authority under state environmental regulatory programs. Ultimately, most of these releases were addressed by the operator under the supervision of applicable state and federal mine regulators without the invocation of CERCLA authority or the expenditure of any public funds. The designation this entire group of releases as "CERCLA-like" has no basis in law, regulation, or guidance. In fact, rather than supporting EPA's continuing risk conclusion, the CERCLA-like narrative of the Releases Report demonstrates that existing regulatory programs are effective, that risk of injury or response action is low, and that no duplicative financial assurance is necessary.

While EPA contends that for each included HRM facility, it attempted to identify: (1) the source of the release; (2) the proposed or implemented clean up actions; and (3) to the extent available, the approximate cost of cleanup, financial assurance amounts and underlying cause of the release, in fact, the site narratives are almost uniformly incomplete, and they therefore mislead the reader about risks from currently permitted and operating HRM facilities. Far from documenting or clarifying the risk of hazardous substance releases from HRM facilities, the Releases Report does the opposite: it obscures the kinds of releases that occur, how and why operators respond, and who pays for the response. For example, very little information about financial assurance is provided and there is wide variation in the site descriptions especially between those related to CERCLA actions and those associated with CERCLA-like actions. The former are in a more detailed narrative format while the latter often are simply excerpts of site permits taken out of context.

Other major flaws that damn EPA's reliance on the Releases Report as a basis for its continuing risk determination include limited sample size and selection bias, lack of peer review, and inclusion of sites with legacy mining issues. First, the data set of facilities reviewed is extremely limited. The report only includes 27 HRM facilities, which from a statistical standpoint is hardly a sufficient sample to substantiate the proposition

[70] While the report references a third category – potential CERCLA actions – there is no such section of the report. A draft version originally included in the docket included at least the preliminary outline of this section, which the final did not contain. Apparently, EPA decided not to include it, perhaps because the agency could not identify any sites that fit within such a nebulous category.

that current mining regulations and practices do not reduce environmental risks of releases. Second, EPA does not explain how or why these facilities were selected for inclusion in this analysis or how they are representative of current operations. This selection bias is not limited to the Releases Report but is a troubling trend in many of EPA's "supporting" documents, including the selection of the 63 sites relied upon to develop response costs for the financial responsibility formula. Because "an analysis is only as good as the data on which it rests," EPA's cherry picking of sites and failure to consider that not all historic facilities warranted CERCLA response or dollars instills a bias in this rulemaking.[71] EPA's selection bias further exaggerates the risk of releases and threatened releases requiring CERCLA response.[72]

Third, as EPA acknowledges, the peer review of the document was minimal and included those who generated the report such as internal EPA staff and EPA Contractor James Kuipers. As such, the peer review fails to meet the aforementioned peer review obligations imposed by the OMB bulletin for "influential" or "highly influential" "scientific information," including the requirements to provide the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' reports and findings, and the agency's response to the peer reviewers' findings.

Further, while EPA contends the Releases Report only includes recently or currently operating mines and mineral processing facilities that had no previous significant legacy mining issues, such claims are patently untrue. At least 12 of the sites in the Releases Report data set are associated with significant historical and largely unregulated HRM activities and therefore, cannot be used to support conclusions about the risks associated with currently permitted and operating HRM facilities. As previously demonstrated in Figure 1 of these comments, the vast majority of HRM sites on the NPL began operations before the advent of any environmental regulations and there is only a single HRM facility included on the list that commenced operations post-1990.

The Releases Report's overarching flaw is the excessive focus on demonstrating that releases occurred without evaluating whether such releases actually posed risk of harm to the environment and whether the release was fully addressed by the operator, posing no risk whatsoever to the Fund. As such, EPA's simplistic methodology is divorced from the concept of "risk" under CERCLA § 108(b) and inconsistent with the Agency's risk assessment process under CERCLA and RCRA programs. Simply put,

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[71] Michael J. Saks, et al., Ann Reference Manual on Sci Evid. 83 (2d ed.) at 7 - 17 (discussing study design and the dangers of selection bias). *See also*, *In re Countrywide Financial Corp. Mortgage-Backed Securities Litigation*, 984 F.Supp.2d 1021, 1039-1041, (C.D. Cal. 2013) (finding a report inadmissible because selection bias rendered the data unreliable).

[72] In 2012 EPA presented a strategy for evaluating 464 lead smelter sites as part of a national site assessment program under CERCLA. *See EPA Strategy for Addressing 464 Lead Smelter Sites* (Aug. 30, 2012), *available at* http://semspub.epa.gov/src/document/HQ/176082. At the time of this white paper, EPA had concluded that of the 350 sites screened, only 132 were considered for preliminary assessments and of those, only 6 were eligible for the NPL. This document demonstrates the fallacy in EPA's assumption that 100 percent of currently operating and permitted mines are likely to result in NPL listing and eligibility for the Superfund.

the Releases Report overstates the risk of release, the potential severity of any release, and the risk that the release exceeds the ability to remediate without the use of taxpayer funds. Moreover, its stated objective is an admission that EPA's rulemaking efforts are results-driven and, therefore, by definition, biased, arbitrary and capricious.

5. EPA's Practices Report

The stated intent of the Practices Report is to evaluate the validity of public comments received in response to the Priority Notice that EPA's rule is not necessary "in light of existing environmental regulatory programs at both the state and federal levels, and considering the risk of future releases of hazardous substances from current mining operations." Practices Report at 1. Further, EPA relies heavily on the Practices Report to conclude that "the results of this relatively recent effort to further document the state of current mining practices substantiates the findings from the other documents described herein and further reinforces the Agency's belief that currently operating hardrock mining and mineral processing facilities subject to this proposal continue to present risks of release of hazardous substances." 82 Fed. Reg. at 3475.

It is mystifying how this document can be used to support EPA's risk conclusions when the document contains the following disclaimers, "[t]his document does *not* endeavor to develop a formal risk assessment of the non-operating and currently operating sites and facilities," Practices Report at 4 (emphasis in the original), and "[t]his review did not attempt to characterize the environmental or human health risks associated with specific releases. No comparison of magnitude and severity was drawn between releases at non-operating sites and currently operating facilities." *Id.* at 5. Despite these disclaimers, once again, EPA conflates and equates releases with risk and wrongly asserts that the mere occurrence of a release means harm will result and taxpayers will foot the bill. And once again, EPA completely ignores the risk-reducing nature of today's regulatory programs or how they apply to each of the practices summarized in the report.

In a surprising turn, this document is one of the rare instances when the agency tepidly admits there are difficulties in looking to the past to determine risks from today's HRM industry. EPA acknowledges that:

> [M]any sites and facilities within the non-operating and currently operating samples have been active for a century or longer. When a post-1980 release occurred at these facilities, it was difficult to determine if the equipment or practice responsible for the release was newly constructed or part of the site's past operations.

Id. This single statement is sufficient to materially undercut the Practices Report and its conclusion that today's mining practices continue to pose a risk as "all of the practices either resulted in releases or contributed to increasing the volume or environmental harm of a release, or both." *Id.* at 9. Combine this statement with the following admission from EPA and it becomes evident that the Practices Report cannot be relied upon to make any conclusions about ongoing risks from HRM facilities:

> [S]ystematic and comprehensive information about facility characteristics, waste management, releases, and regulatory oversight was not available for either non-operating sites or currently operating facilities. Thus, this profile is based on information that may be incomplete or anecdotal.

Id. at 4-5.

Another major flaw in the Practices Report is the overly simplistic description of HRM practices and the unsupportable premise that because legacy sites have HRM components like waste rock and tailings storage facilities or used flotation or cyanide processing reagents that the problems at these pre-regulation sites will be replicated at current mines that have similar components. There is no factual basis for EPA's assertions about the likelihood that those practices will result in releases at currently regulated HRM facilities. The description of mining practices reads as if drafted by a layperson without the requisite expertise, resulting in overly simplistic descriptions and not very precise or meaningful descriptions of mining practices.[73] The document shows no understanding by EPA of the impacts of technological advances in HRM practices on risks posed by the HRM industry.

NMA solicited the expert assistance of SME to critique the Practices Report's description of practices and to provide an accurate assessment of how technology can reduce risks.[74] The SME Analysis, "Review of Environmental Protection Agency Reports," is included as Appendix D to these comments. The analysis' primary focus is the technical validity of statements by the EPA about practices and technologies employed in mining, and the degree and duration of risk associated with the use of those practices and technologies. Specifically, SME methodically reviews the agency's description of the following: non-entry solution mining and ion exchange processing; physical processing and gravity and magnetic separation; flotation processing; cyanidation; acid leach, solvent extraction and electrowinning; pyrometallurgical processes; Bayer process; mine influenced water; waste rock piles; tailings management; and mining process leaks and spills. Overall, the SME Analysis concludes that EPA's findings are overly simplistic and ignore the weight of scientific evidence demonstrating the evolution and improvement of mining practices and mineral and ore processing technologies since the enactment of CERCLA more than thirty

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[73] While in a different context, NMA agrees with views expressed by Reviewer 4 that EPA's analyses would "benefit from closely interacting with industry professionals. While I have not been privy to the generation of the Formula or report, the little bit of close data inspection that I have done gives me the impression that there is a stark lack of understanding of the workings of the industry that the EPA is tasked with regulating." "Response to Peer Review Comments: CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities Background Document" at 6-16. (Dec. 2016).

[74] SME is a professional society whose more than 15,000 members represent all professionals serving the mining industry in more than 100 countries. SME members include engineers, geologists, metallurgists, educators, students and researchers. SME advances the worldwide mining and underground construction community through information exchange, education and professional development. A panel of experts within SME prepared its analysis.

years ago. SME's Analysis corrects EPA's omissions and mischaracterizations in the descriptions of these practices and technologies, and thereby provides evidence that the improvements in today's HRM practices and technologies greatly reduce both the degree and duration of risk of release of hazardous substances. In addition, SME responds to EPA's unreasonable use of a 25-year old paper, "Mining Sites on Superfund's National Priorities List – Past and Current Mining Practices," which the proposed rule indicates is one of the underpinnings of the Practices Report. 82 Fed. Reg. 3472, fn. 194.

Notably, the conclusions EPA draws from the Practices Report that today's HRM practices do not significantly differ from historic practices contradicts previous EPA analyses. For example, EPA's "Report to Congress: Wastes from the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale," contains several statements about the differences in practices over time. (EPA/530-SW-85-033) (Dec. 1985). The Report to Congress analyzes various HRM damage cases and CERCLA sites and concludes that "many of the waste disposal practices that have resulted in major incidents of environmental contamination at abandoned mine sites are no longer used (i.e., the dumping of tailings into streams or onto uncontained piles)." *Id* at 4-64.[75]

6. EPA's Evidence Report

The stated intent of the Evidence Report is to compare case study historical sites with 2009 current sites in order "to describe the extent to which those same practices, contamination patterns, releases and exposures might occur at current and future sites." Evidence Report at ES-1. Of the three 2016 reports, the Evidence Report is the most reliant on circumstantial evidence to conclude that currently permitted and operating HRM facilities are similar enough to sites where CERCLA response actions were required in the past to conclude they continue to pose a risk of CERCLA release. For example, EPA merely looked at four data points, none of which provide any direct evidence for the agency's continuing risk conclusion:

- Whether mining and mineral processing practices at the historical sites continue to be used at the 2009 current sites;

- Whether there are similarities between priority constituents of concern ("COCs") reported at historical sites and the CERCLA hazardous substances reported in TRI and National Pollutant Discharge Elimination System ("NPDES") permit reporting from 2009 current sites;

- Whether human and ecological receptors at historical sites have parallel potential receptors at 2009 current sites; and

[75] Further, the report states "It is not clear, from the analysis of damage cases and Superfund sites, whether or not current waste management practices can prevent damage from seepage or sudden releases but it is clear that some of the problems at abandoned or Superfund sites are attributable to waste disposal practices not currently used by the mining industry." *Id.* at ES- 18

- Whether environmental settings and exposure pathways at historical sites have corresponding environmental settings and potential exposure pathways at 2009 current sites.

This is a list of the wrong questions; they have nothing to do with CERCLA's statutory charge. The correct question is whether the "degree and duration of risk" presented by currently operating and permitted HRM facilities merits development of a CERCLA § 108(b) program. EPA's analysis is irrelevant to the correct question. Furthermore, the data uncertainties and the flaws in the methodology and assumptions that underlie the Evidence Report are so numerous and significant that the report's conclusions should be rejected.

The discussion above regarding the Practices Report, as well as the associated SME Analysis, addresses the flaws with EPA's reliance on perceived parallels in practices to draw conclusions about continuing risk and is equally applicable here. Contrary to EPA's conclusions and persistent reliance on dated material,[76] advances in practices and techniques have occurred over time, and these advances reduce the "degree and duration of risk" from HRM facilities.

Regarding COCs, the fact that similarities exist between historic COCs and TRI/NPDES hazardous substances does not answer the question of whether such constituents pose a risk at currently permitted and operating HRM facilities. Since most hazardous substances associated with mining occur naturally in ore, it is obvious that the COCs at legacy and currently operating properties will be similar. That fact alone illustrates the flaw in EPA's reliance on this question as probative.

As explained in greater detail in Section II.D.I.E.7, TRI data are an inappropriate surrogate for risk as TRI data are strictly a volume-based reporting requirement, not an assessment of risk to human health or the environment. Thus, that fact that 24 percent of the 2009 current sites reported TRI on-site releases says nothing about whether such releases pose the type of risks EPA is supposed to be focused on. As EPA acknowledges elsewhere, there is no direct correlation between such releases and risk. Equally unavailing is EPA's use of CWA NPDES Discharge Monitoring Reports (DMRs) related to point source discharges to surface water bodies. Similar to TRI data, DMRs are merely reports of releases to surface water, without any accompanying assessment of risk.

The overly simplistic question about whether there are parallels between receptors at historic and currently permitted and operating sites seems particularly absurd as there are a limited number of human and ecological receptors to evaluate in the first instance. A similar evaluation would take place regardless of the type of industrial activity involved. For example, all sites being scored pursuant to the CERCLA

[76] Similar to the Practices Report, EPA again uses dated information about historic practices to draw inferences about current practices: *See* U.S. EPA, Identification and Description of Mineral Processing Sectors and Waste Streams (Dec. 1995).

Hazard Ranking System ("HRS"), are evaluated for four pathways: ground water migration (drinking water); surface water migration (drinking water, human food chain, sensitive environments); soil exposure (resident population, nearby population, sensitive environments); and air migration (population, sensitive environments). U.S. EPA, "Introduction to the Hazardous Ranking System," *available at* https://www.epa.gov/superfund/introduction-hazard-ranking-system-hrs. As such, similarities in receptors cannot be an accurate indicator of likelihood of risk of release or severity of release.

To the extent EPA was attempting to draw more substantive comparisons between historic and currently permitted and operating sites regarding environmental settings and exposure pathways, the agency lacked the data to be able to do so. EPA acknowledges that "human health and ecological risk assessments are site-specific and highly variable," Practices Report at ES-5, and notes significant uncertainties in the data and geographic information systems used to estimate the proximity of human and ecological receptors to current sites including: the exact location of current mines; use of census data to estimate residence locations; and dated nature of the census data from 2000. Significantly, EPA noted:

> Although substantial amounts of data are available on many of the factors influencing human and ecological exposures, direct evidence of exposures of either human or ecological receptors to CERCLA hazardous substances, with corresponding evidence of adverse effects, is available for only a few 2009 current sites. *This data gap constitutes the largest source of uncertainty* in the overall comparisons to the Case Study Historical sites.

Evidence Report at 52 (emphasis added). To put it more bluntly, EPA cannot demonstrate that receptors are at risk at any currently operating sites.

Importantly, the Evidence Report's discussion of the essential role of site characteristics in assessing risk of future CERCLA releases, acknowledges both the probability and harm component of risk that are notably absent from EPA's continuing risk conclusion. In the context of historical sites, the report acknowledges:

> [T]he probability of a CERCLA hazardous substance release occurring is also influenced [in addition to practices used] by site characteristics, as well as physical phenomena such as rate of release and its magnitude. Site characteristics such as climate, soil types, geological settings, topography, and hydrology can play a major role in influencing CERCLA hazardous substance releases.

Id. at 5. Despite this acknowledgement, EPA failed to analyze site specific conditions at currently permitted and operating sites, even though "such characteristics can affect rates or magnitudes of hazardous substance releases." *Id.*

Another key admission in the Evidence Report – but not represented in any of the overall risk findings – is the acknowledgement that other programs besides CERCLA can mitigate risk of releases of hazardous substances. In its discussion of aluminum smelters, the report notes use of the historical practices at current sites but clarifies that "an important difference between the three historical sites and the aluminum smelters operational in 2009 is that the hazardous waste regulations under the [RCRA] have been in effect for a number of years; those regulations modify the waste management practices substantially compared with the practices that resulted in contamination at the three historical sites." *Id.*at 13. As discussed in detail throughout these comments, EPA should have adopted a similar approach to state and federal regulatory programs applicable to HRM facilities, and its failure to so do is arbitrary and capricious and inconsistent with the agency's statutory mandate to assess the degree and duration of risk posed by the HRM industry.

7. EPA Misuses Data from the Toxics Release Inventory, RCRA Hazardous Waste Biennial Report and Emergency Response Notification System to Support its Risk Determination

To bolster its claims of "continuing risk" in the HRM industry, EPA identified other sources of data that the agency claims are relevant to a CERCA 108(b) risk determination. Despite resounding criticism from multiple industry sectors on the use of these sources in the Priority Notice on the HRM industry and the Advance Notice identifying other industry sectors, EPA chose to adopt the TRI and RCRA BR data as valid sources for attributing risk. In this proposed rule, EPA adds the ERNS as a third source. As described in greater detail below, the agency misuses these data sources to exaggerate the risk-profile of the HRM industry. None of these sources address potential exposure to CERCLA hazardous substances or the probability that a CERCLA response action would occur in the future. The significant limitations of these data sources devalue their utility in determining the "degree and duration of risk" or "highest level of risk of injury" in any industry sector. EPA cannot simply ignore these limitations and tack on claims of non-compliance, studies completed by environmental organizations, or incomplete case studies to overcome these limitations. In the end, EPA's reliance on these sources undermines EPA's credibility and further shows the agency's abdication of its statutory obligations in developing a rule consistent with the "degree and duration of risk" as CERCLA expressly requires.

a) EPA's Reliance on Toxics Release Inventory Data as Support for its Risk Determination for HRM Facilities is Inappropriate and Contrary to EPA's Repeated Position on TRI Data

In the Priority Notice, EPA used TRI data submitted by the metal mining sector for the 2007 reporting year to summarily conclude that the data demonstrates "the industry's potential for posing health and environmental risk." 74 Fed. Reg. at 37,215, n.11. NMA objected to this use of TRI data to reach a broader conclusion on risk

posed by the HRM industry. *See* NMA 2010 Comments at 16-19. NMA repeats those objections here. Overall, any assessment of facilities presenting the "highest level of risk of injury," as required by CERCLA § 108(b)(1), or the establishment of financial responsibility, should rely on established risk assessment tools rather than TRI reports. As EPA has repeatedly recognized, TRI data are strictly a volume-based reporting requirement, not an assessment of risk to public health or the environment.

Since 2009, EPA "has continued to gather data and information on hardrock mines, practices, and risks associated with classes of facilities within the industry." 82 Fed. Reg. at 3470. As part of this exercise and in the proposed rule, EPA continues to defend its use of TRI data, specifically in its determination that HRM facilities "continue to pose risks associated with hazardous substances at their sites." *Id.* Specifically, the agency "examined [2010 through 2013] TRI data in order to identify the types, amounts, and methods of hazardous substance management at facilities potentially subject to the rule." *Id.* at 3477. EPA concludes that "the ***presence*** of such significant amount of hazardous substances, even if subject to regulatory controls, provides some indication of the potential for risks to result if improperly managed." *Id.* (emphasis added). EPA's continued use of TRI data as evidence of risks associated with the HRM industry is unjustifiable.

First, NMA is deeply troubled by EPA's continued blatant disregard of its own position on the limitations of using TRI data to determine risk. EPA provides the following disclaimer on the use of the 2015 TRI data (the most recent available under the TRI program): "Pounds of releases, however, is not an indicator of any health risks posed by the chemicals."[77] U.S. EPA, "TRI National Analysis 2015," at 36 (Updated Jan. 2017) (providing a short overview of factors that influence risk including: emissions, fate, exposure, toxicity, and risk of adverse effect). EPA further explains that "[t]he human health risks resulting from exposure to toxic chemicals are determined by many factors. . . TRI contains some of this information, including what chemicals are released from industrial facilities; the amount of each chemical released; and the amounts released to air, water, and land." *Id.*

EPA expounds on this disclaimer in a separate question and answer document:

> Users of TRI information should be aware that ***TRI release estimates alone are not sufficient to determine human exposure to toxic chemicals or to calculate potential risks to human health and the***

[77] The 2015 National Analysis may be accessed at https://www.epa.gov/trinationalanalysis/report-sections-2015-tri-national-analysis. In the 2013 TRI National Analysis, EPA characterized this limitation differently. EPA states that "trends in pounds of chemical releases ***do not account for potential risk*** of chemical releases." U.S. EPA, "TRI National Analysis 2013," at 34 (Updated Jan. 2015), *available at* https://www.epa.gov/sites/production/files/2017-01/documents/2013-tri-national-analysis-complete_1_0.pdf. This characterization is more in sync with the numerous limitations EPA recognizes in underlying guidance documents as discussed in more detail below. EPA also provided a more in depth summary of the concepts of hazard and risk and the additional steps needed to evaluate potential risks to human health and the environment.

> ***environment***. Different chemicals can pose different health hazards . . . In addition, chemicals can have these different effects at different concentrations of exposure.

U.S. EPA, "2015 TRI National Analysis Questions and Answers," at 6 (2016) (emphasis added).[78] EPA even cautions the public that:

> When using TRI data one should be aware that ***a release of toxic chemicals does not automatically mean that local communities are at risk***. Large release numbers do not necessarily mean there is a large risk, nor do small releases necessarily mean there is a low risk. "Disposal or other releases" represent a wide variety of management methods. These range from highly controlled disposal, such as in hazardous waste landfills, to uncontrolled releases due to accidental leaks or spills. Many releases reported to TRI are subject to permits and/or environmental standards that establish emissions limits under Federal or State laws such as, for example, air permits issued under the Clean Air Act. Other factors, such as exposure to the release, route of exposure (e.g., breathing, via skin), bioavailability from the exposure route, and sensitivity of exposed individuals to effects caused by a toxic chemical must be considered ***before any judgments regarding risk can be made***.

Id. at 6-7 (emphasis added).

EPA's proposed rule does not acknowledge these limitations, nor does the agency analyze the other information the agency itself claims to be necessary to evaluate potential risk of or exposure to hazardous substances reported under the TRI program. *See id.* at 7 ("TRI data can provide lists of top facilities with the largest disposal or other releases, which can be used as screening tools to identify facilities that may warrant a closer examination. ***This closer examination should include considering factors mentioned above like toxicity of chemicals and potential exposure***. In these cases[,] TRI data should be supplemented with data from other sources."). Specifically, EPA never even considers: (1) toxicity of any hazardous substance identified in its description of the HRM industry's TRI data; (2) exposure; (3) type of disposal or release; (4) fate and transport of the chemical in the environment; or (5) on-site waste management of the chemical. *Id.* at 6. In fact, EPA never conducted a thorough investigation of potential exposures and risks of the HRM industry, taking into consideration the operational controls implemented on-site to minimize releases.

The 2015 TRI National Analysis is not the only source for guidance on the limitations of using TRI data. EPA has cautioned from the inception of the TRI program that reports are not intended to assess risk to the public or the environment and should not be used for that purpose. In fact, EPA published a 38-page document to educate the public on how to use TRI data. In this document, EPA presents seven

[78] EPA's Q&A document may be accessed at https://www.epa.gov/sites/production/files/2017-01/documents/tri_na_2015_qs_and_as.pdf.

"key factors" the public should consider when using TRI data. Notably, EPA instructed the public that:

- The level of toxicity varies among the covered chemicals; ***data on amounts of the chemicals alone are inadequate to reach conclusions on health-related risks***.

- The presence of a chemical in the environment must be evaluated along with the potential and actual exposures and the route of exposure, the chemical's fate in the environment and other factors ***before any statements can be made about potential risks associated with the chemical or a release***.

- ***Regulatory controls apply to many of the releases reported***; reporting facilities must comply with environmental standards under statutes such as the CAA and the CWA, in addition to reporting releases to TRI.

- ***Many options for managing wastes are subject to stringent technical standards and exacting state and federal regulatory oversight***.

See U.S. EPA, "Factors to Consider When Using Toxics Release Inventory Data," at 4 (2015) (emphasis added).[79]

Yet again, EPA fails to heed its own advice on the use of TRI data. Not once in the proposed rule does EPA acknowledge these "key factors" or attempt to evaluate them in the context of the HRM industry's TRI data. Instead, EPA summarily concludes that "TRI data provide relevant information on the risks associated with hardrock mining facilities." 82 Fed. Reg. at 3477. The agency failed in 2009 to complete a more robust analysis of potential exposure scenarios before concluding that the HRM industry was "high risk" and thus a candidate for CERCLA § 108(b) financial responsibility requirements. Seven years later, EPA again fails to address the legitimate concerns raised by NMA on the agency's blatant misuse of the TRI data to presume "continuing risk" from the industry that warrants imposing CERCLA § 108(b) financial responsibility.

Second, EPA's misuse of TRI data is particularly alarming in that the agency cites to release numbers without putting any of them into context. For example, in the proposed rule, EPA singles out "catastrophic or one-time events" such as a 194 million pound "release" reported in 2013 to support its finding of "continuing risk" from the industry. EPA, however, takes this data point completely out of context. In the 2015 TRI National Analysis, EPA reported that in 2013 "a mining facility reported a one-time only release of 193 million pounds due to decommissioning a heap leach pad." U.S. EPA, "TRI National Analysis 2015," at 66. As EPA knows, the materials on that heap leach pad were added incrementally during years of operations, and managed subject

[79] This guidance document may be accessed at https://www.epa.gov/sites/production/files/2015-06/documents/factors_to_consider_6.15.15_final.pdf.

to state and federal regulations. The "release"[80] number from the decommissioning of the heap leach pad is large because it was reported in compliance with EPA's own TRI reporting rules, which require that the entire amount of material be reported as released only when the pad is closed. This figure, seemingly employed by EPA in the proposed rule to sensationalize the subject of risk, has absolutely nothing to do with the types of risks Congress intended to be covered under a CERCLA § 108(b) program. Yet, EPA improperly relies on it anyway and refuses to be accountable for using such data responsibly.

Besides this one data point, the larger problem with EPA's reliance on the HRM industry's TRI data is that the agency never puts any of the metal mining industry's TRI data into context. Admittedly, the metals mining industry has and continues to figure prominently in the agency's TRI reports. However, the metals mining industry must report as "releases" on their TRI reports the trace amounts of naturally occurring metal and metal compounds that are present in the rock and dirt that is moved and deposited at a mine site. In fact, the vast majority of what the hardrock mining industry reports – from 85 to 99 percent – consists of these naturally occurring substances.

Importantly, while the metal mining industry's reports reflect the high volume of materials managed on-site, these materials are managed in engineered facilities that are permitted and regulated under state and federal law. Other "releases" reported by the metal mining industry include materials shipped off-site to approved RCRA Subtitle C hazardous waste management facilities. A small subsection of "releases" by the metal mining industry includes TRI chemicals that are "otherwise used" – such as cyanide, sulfuric acid, and other human-made TRI chemicals. All non-accidental releases reported under TRI are specifically approved under environmental laws, such as air emissions under the CAA or water discharges under the CWA. Moreover, operational controls are in place to prevent or minimize any accidental releases that could impact water and air quality.

EPA attempts to diminish the importance of these regulations, permits, and controls in the proposed rule by citing "non-compliance with regulatory standards." 82 Fed. Reg. at 3477. However, EPA's use of the Office of Enforcement and Compliance Assurance's national enforcement initiative (NEI) on the HRM industry is purely a smoke screen and does not address the core problems regarding EPA's reliance on TRI data. Moreover, EPA fails to acknowledge that the agency ended the NEI almost two years ago and returned the HRM industry to the base enforcement program in Fiscal Year (FY) 2017.[81] In doing so, EPA recognized that "the NEI has

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[80] The decommissioning of a heap leach facility triggers the TRI requirement to report this material as a release. However, decommissioning does not create a release to the environment because the material in question remains fully contained on an impermeable liner. It is the merely the change in status from an active heap to a decommissioned heap that triggers the TRI requirement to report this change as a "release."

[81] U.S. EPA, "National Enforcement Initiatives," https://www.epa.gov/enforcement/national-enforcement-initiatives (noting that the enforcement initiative on "reducing pollution from mineral processing operations" was returned to the base program in Fiscal Year 2017).

resulted in a number of large, high impact cases to ensure proper handling of these hazardous wastes," and "by the end of FY16 many of the highest risk mineral processing facilities are expected to be under enforceable agreements or orders that will require them to properly address waste." 80 Fed. Reg. at 55,352, 55,353 (Sept. 15, 2015). EPA, however, is relying on claims of non-compliance when in fact there is no significant issue with non-compliance for those facilities that the agency previously deemed were high risk under the NEI.[82] To claim differently in this proposed rule is a baseless and contradictory reversal of agency position.

Overall, EPA's failure to put the HRM industry's TRI reports into context results in a distorted and misleading view of the environmental risks posed by the industry. The data reported by the industry are simply volumetric data—predominantly resulting from moving naturally occurring ore and waste rock on-site. The data do not address the toxicity or concentration of the chemicals reported, nor do they reflect potential environmental risk or human exposure. EPA is statutorily directed to evaluate "risk" in deciding which classes of facilities should be subject to financial responsibility requirements under CERCLA, as well as in establishing the level of financial responsibility. This evaluation must go beyond a mere recitation of volumetric data. EPA's misuse of TRI data in the proposed rule – in direct contradiction to its own stated limitations of the data – is arbitrary and capricious.

b) EPA's Reliance on RCRA Hazardous Waste Biennial Report Data Does Not Support the Agency's Risk Determination for HRM Facilities

In 2009, EPA did not rely on RCRA hazardous waste biennial report (BR) data to evaluate risk in the HRM industry. However, the agency did use this data to identify the chemical and petroleum industries "as those for which the Agency plans to develop, as necessary, a proposed regulation identifying appropriate financial responsibility requirements under CERCLA Section 108(b)." 75 Fed. Reg. at 816. There, EPA stated that the chemical manufacturing and petroleum industries comprised "approximately 74 percent of the total amount of hazardous waste generated." *Id.* at 820. When EPA included the hardrock mining industry, that percentage increased to "80 percent of all RCRA hazardous waste generated by large quantity generators." *Id.* EPA clearly did not think that the HRM industry's small contribution to this dataset was significant, since it was absent from EPA's original analysis of the industry.

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[82] NMA's comments on the national enforcement initiative on mining and mineral processing are attached. These comments explain in great detail the history behind this initiative and the concerns and objections raised by the HRM industry over the last several years. *See* NMA letter to Michele McKeever, Branch Chief, National Planning, Measures, and Analysis Staff, Office of Enforcement and Compliance Assurance (Feb. 27, 2013) (submitted to Docket ID No. EPA-HQ-OECA-2012-0956); NMA letter to Daniel Palmer, Deputy Director, Planning Measures and Oversight Division, Office of Enforcement and Compliance Assurance (Oct. 14, 2015) (submitted to Docket ID No. EPA-HQ-OECA-2015-0628).

Regardless, EPA now adds the RCRA hazardous waste BR data into its risk evaluation of the HRM industry. NMA is bewildered by the agency's continuing use of this data despite the sound arguments provided by other industry stakeholders against its relevance to the underlying risk evaluations intended under CERCLA § 108(b).[83] Most perplexing, EPA even admits that "the BR data concerning volume of hazardous waste generated and managed onsite, when considered alone, does not provide a direct indicator of risk of release or of mismanagement of wastes." 82 Fed. Reg. at 3478. For the HRM industry, the reported numbers are so inconsequential they have no bearing on the type of risk that should be covered under a CERCLA § 108(b) financial responsibility program. Yet, EPA unconvincingly continues to defend its use of the BR data as offering "insights on the types, amounts, and management of RCRA hazardous wastes (by definition CERCLA hazardous substances) at [HRM] facilities potentially subject to this rule." While the BR data certainly offers insights into types and volumes of hazardous wastes managed, it clearly offers no insights into the "degree and duration of risk" from actual or potential releases of CERCLA hazardous substances.

NMA repeats the criticisms previously lodged by other stakeholders against EPA's use of the BR data as their relevance is not diminished by the agency's unsatisfactory attempt to dismiss them in this proposal. The RCRA BR report simply contains the nature, quantities, and disposition of hazardous waste generated (e.g., recycling, treatment, storage, or disposal) at certain facilities (e.g., large quantity hazardous waste generators and treatment, storage, and disposal facilities). Like TRI data, BR data are not indicators of risk (or mismanagement) and thus provide no support for an evaluation of the "degree and duration of risk" as required under CERCLA § 108(b). Generation of hazardous waste does not correlate to the risk of an actual or threatened release of a hazardous substance that requires a CERCLA remedy. For EPA to suggest otherwise is a huge misrepresentation of the scope and purpose of this data collection. Further, EPA's attempts to direct attention away from these truths with incomplete discussions of the RCRA Bevill Amendment and a settlement reached through the RCRA NEI does not fix this problem.

First, as EPA is well aware, the Solid Waste Disposal Act Amendments of 1980 contained several provisions related to the regulation of mining and mineral processing waste. Section 3001(b)(3)(A)(ii) suspended any hazardous waste regulation of "solid wastes from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore." 42 U.S.C. § 6921(b)(3)(A)(ii). During this suspension, Congress directed EPA to conduct two comprehensive studies on (1) "adverse effects of solid waste from active and abandoned surface and underground mines on the environment;"[84] and (2) "the adverse

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[83] EPA discusses these criticisms in the proposed rule but does not provide a rational response to these comments. *See* 82 Fed. Reg. at 3478.

[84] Study factors included: (1) the sources and volume of discarded material generated per year from mining; (2) present disposal practices; (3) potential dangers to human health and the environment from surface runoff of leachate and air pollution first; (4) alternatives to current disposal practices; (5) the cost of those alternatives in terms of the impact on mine product costs; and (6) potential use of discarded material as a secondary source of the mine product. 42 U.S.C. § 6982(f) (covering mining waste).

effects on human health and the environment, if any, of the disposal and utilization of solid waste from extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from uranium mining."[85] 42 U.S.C. § 6982(f) & (p). These reports to Congress were the first step in determining whether hazardous waste regulations were warranted for the HRM industry.

In 1986, EPA issued a regulatory determination stating it would not impose Subtitle C rules on extraction and beneficiation wastes because "current hazardous waste management standards are likely to be environmentally unnecessary, technically infeasible, or economically impractical when applied to mining waste." 51 Fed. Reg. 24,496 (July 3, 1986). In 1991, EPA also issued a regulatory determination on mineral processing wastes, finding that 20 "high volume, low hazard" mineral processing wastes (listed in 40 C.F.R. § 261.4(b)(7)(ii)) do not warrant Subtitle C hazardous waste regulation. 56 Fed. Reg. 27,300 (June 13, 1991). As EPA states, "it is important for the reader to note that many wastes generated by mining and mineral processing operations are excluded from RCRA Subtitle C hazardous waste regulation under the Bevill Amendment." However, it is more important that the public understand why such exemption exists: EPA found that such regulations are unwarranted for the HRM industry for those studied wastes. This is not a statutory or regulatory loophole that indicates unaddressed or heightened risk as EPA seems to suggest.

Second, EPA's one sentence claim regarding concern with "potential co-mingling of hazardous wastes with Bevill excluded wastes or non-hazardous wastes" is also unfounded. Specifically, EPA's reference to its settlement with Mosaic Fertilizer, LLC is completely taken out of context. EPA omits critical facts on the phosphogypsum stack system closure, post-closure care, and corrective action requirements that are currently being implemented to address the releases EPA discusses in this section of the proposed rule. As EPA is aware, this company entered into a consent decree with state and federal governments that requires core injunctive relief, which addresses waste management practices and establishes significant and sufficient financial assurance. Yet, these critical facts – that are directly related to the "degree and duration of risk" posed by classes of facilities within the HRM industry – are completely omitted from EPA's discussion. Any additional federal financial responsibility requirements under CERCLA would be unnecessary and duplicative in this scenario. EPA's mere citation to

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[85] Study factors included: (1) the sources and volume of discarded material generated per year; (2) present disposal and utilization practices; (3) potential danger, if any, to human health and the environment from the disposal and reuse of such materials; (4) documented cases in which danger to human health or the environment has been proved; (5) alternatives to current disposal methods; (6) the cost of such alternatives; (7) the impact of those alternatives on the use of phosphate rock and uranium ore, and other natural resources; and (8) the current and potential utilization of such materials. 42 U.S.C. § 6982(p) (covering extraction, beneficiation and processing wastes); *See* U.S. EPA, "Report to Congress: Wastes From the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale," (EPA/530-SW-85-033) (Dec. 1985); U.S. EPA, "Report to Congress on Special Wastes from Mineral Processing: Summary and Findings," (EPA/530-SW-90-070B) (July 1990).

the settlement without considering how it fundamentally and significantly reduces future Superfund risk is arbitrary and capricious. Moreover, EPA must base its proposal on facts that can be substantiated not mere possibilities or allegations of illegal co-mingling.

c) EPA's Reliance on Releases Reported Under the Emergency Response Notification System Does Not Support the Agency's Risk Determination for HRM Facilities

A new dataset not in the Priority Notice identifying the HRM industry for this rulemaking is EPA's use of CERCLA hazardous substances reported under the ERNS. According to EPA, the ERNS data provides "a means by which to show the ***extent of and reasons for reported releases*** of CERCLA hazardous substances by [HRM] facilities." 82 Fed. Reg. at 3476. Specifically, EPA examined National Response Center data from 1990 to 2014 involving releases of CERCLA hazardous substances, finding that more than 950 releases of CERCLA hazardous substances associated with currently operating facilities in the HRM industry were reported. *Id.* at 3477. Approximately 435 of the releases were reported since 2000, with an average of only 30 reported releases per year since that date. EPA claims that these data "provide another ***indicator of ongoing releases*** of CERCLA hazardous substances from HRM facilities." *Id.* (emphasis added).

EPA's evaluation of ERNS data is egregiously incomplete. As the agency has noted in fact sheets on this program, "[b]ecause ERNS is a database of initial notifications and not incidents, there are several limitations to the data." U.S. EPA, "An Overview of ERNS: Fact Sheet," at 1 (EPA 540-F-94-027) (March 1995). For example, the ERNS "contains initial accounts of releases, made during or immediately after a release occurs when exact details are often unknown." *Id. See also* U.S. EPA, "The Emergency Response Notification System," at 2 (EPA 9360 0-21) (Aug. 1989). ("ERNS provides a mechanism for documenting and verifying incident notification information as initially reported."). In fact, "[t]he data are usually not updated unless an EPA Region is involved in the response action." Overview of ERNS: Fact Sheet at 1. While EPA acknowledges these limitations in the proposed rule, it simultaneously disregards them and relies on the data as a risk indicator anyway. EPA's perfunctory analysis is entirely divorced from any type of risk assessment and should be omitted as a source of information in the agency's underlying risk determination.

First, EPA does not even attempt to document how these releases were dealt with by the facility that initally reported them. Merely adding up total release numbers for a period of years provides an entirely incomplete picture. EPA ignores the important questions: How many of these releases were large in volume or otherwise significant? How did operators and regulators respond to these reported releases? How many of these releases were cleaned up immediately or in the short-term by the company requiring no action by a state or federal regulatory authority? Did any of these reported releases require a full blown CERCLA response action, much less any state or federal

involvement to remedy the situation? Did any of these reported releases require expenditures from the Superfund itself? None of these questions can be answered because EPA fails to catalogue any of this information in its analysis of the ERNS data, even though EPA claims that the ERNS includes information on response actions taken. Instead, EPA chose to focus on the causes of the release, not the critical response to the release. This approach totally contradicts CERCLA's statutory directive to evaluate the "degree and duration" of risk from classes of facilities. Yet, ERNS reports show evidence of prompt response and proactive management of releases, which reduces risk and the need for future CERCLA response actions. The fact that facilities were monitored and releases were immediately reported means that the risk of injury and response costs from those releases are significantly reduced.

Second, by law facilities must report releases of CERCLA hazardous substances if they meet or exceed certain reportable quantities (RQ), many of which are quite low. *See* 40 U.S.C. § 9603(a); 40 C.F.R. § 302.4 (if no RQ is established by regulation the threshold is set at one pound). Yet, EPA's analysis again simply aggregates the number of reported releases without attempting to better understand whether these releases resulted in harm to the environment or public health. This type of evaluation most certainly relates to the "degree and duration of risk" standard that limits EPA's authority under CERCLA §108(b). However, EPA never discusses whether any of the reported releases contained constituents of concern that exceeded, for example, soil screening levels or maximum contaminant levels for drinking water requiring significant remedial actions. Accordingly, EPA's superficial analysis of this dataset provides no hard evidence as to the need for a CERCLA § 108(b) financial responsibility program, and if EPA would look more closely at the data it cites, it would confirm that risks have been reduced. Finally, in order to comply with the reporting requirements under ERNS, it is not unusual for companies to report a *potential* release, prior to verifying that a release has actually occurred. Thus, some reported releases are "false alarms" because further site investigations reveal that a release did not occur.

EPA also cites to an Earthworks report that it claims relied substantially on ERNS data on copper porphyry mines to document substantial water quality impacts from that commodity sector. *See* 82 Fed. Reg. at 3477. However, this report lacks any foundation based on the following reasons: (1) prior administrative and judicial settlements resolved or otherwise addressed significant releases (*e.g.*, releases that came into contact with surface water); (2) many releases were confined to on-site areas (e.g., properly-reported on-site releases of leach solutions that happened to exceed the CERCLA reportable quantity for sulfuric acid); and (3) completed and on-going remediation projects have resolved, or are resolving, releases from noted facilities through CERCLA or state-equivalent programs.

8. EPA's Reliance on Studies Completed in the 1990s Does Not Justify EPA's Risk Determination

EPA identified certain documents that it claims "show[s] recent releases of CERCLA hazardous substances at [HRM] facilities and thus continuing risks of release or threatened release of CERCLA hazardous substances associated with those activities." 82 Fed. Reg. at 3475. Specifically, EPA relies on:

- U.S. EPA, "Mining Sites on Superfund's NPL – Past and Current Mining Practices," (1992) (hereinafter "1992 Practices Study"): "Although this document was published over 25 years ago, EPA has concluded that it still presents a relatively accurate description of current mining and mineral processing practices and the potential releases associated with these practices." *Id.*

- U.S. EPA, "Technical Background Document Supporting the Supplemental Proposed Rule Applying Phase IV Land Disposal Restrictions to Newly Identified Mineral Processing Wastes" (1995) (hereinafter "1995 Technical Background Document"). EPA uses this document to illustrate human health and environmental damages from mining and mineral processing (*e.g.*, land-based management practices). EPA claims these damage cases are "still indicative of current mining and mineral processing practices and potential releases associated with these practices." *Id.* at 3476.

- U.S. EPA, "Damage Cases and Environmental Releases from Mines and Mineral Processing Sites," (1997) (hereinafter "1997 Damage Cases Study"): "EPA believes this document presents a relatively accurate description of current mining and mineral processing practices and the potential releases associated with these practices." *Id.* at 3475.

First, NMA objects to the use of the 1992 Practices Study. This article, authored by EPA staff outside the context of any rulemaking process and thus, not previously subject to notice and public comment or appropriate peer review, is an out of date and biased depiction of HRM facilities that is not representative of current practices. NMA shares SME's concerns that EPA's reliance "upon a report published more than 25 years ago (Housman/Hoffman) is itself troubling, given the agency's stated intent to assess contemporaneous mining practices." SME Analysis at 2. The SME Analysis specifically addresses the conclusion of that report (which EPA adopts in the proposed rule):

> While some mining waste management practices have changed over time, the basic technologies for extracting and processing of mineral ores have remained fairly constant over approximately the last 50 years. Mining technology has become more efficient over time in recovering mineral values – allowing lower grade ores to be mined which produce more waste.

> At the same time, combinations of economic and technological factors have increased the scale of surface disturbance and waste generation.

82 Fed. Reg. at 3475. As discussed above in section II.D.5., the SME Analysis critiques the 1992 Practices Report as overly simplistic and ignoring the weight of scientific evidence demonstrating the evolution and improvement of mining practices, and mineral and ore processing technologies that reduce the degree and duration of risks from HRM facilities.

Second, NMA has thoroughly refuted the conclusions made in the 1995 Technical Background document, and continues to dispute them. Despite EPA's claims, the case histories in this report did not provide support for the land disposal restrictions (LDR) the agency proposed at that time, nor does it provide support for a CERCLA § 108(b) financial responsibility rule now. For example, the majority of the case histories EPA relied on to support its LDR proposed rule attempted to document damages associated with ***historical*** mining or smelting operations. Historical mining and mineral processing sites are irrelevant to assessing the "degree and duration of risk" posed by today's HRM industry and are excluded from the universe of mining projects that EPA is proposing to regulate under this rulemaking. EPA's rote recycling of this study for this rulemaking is completely inappropriate and not a justifiable approach to assessing risk in the context of a CERCLA § 108(b) rulemaking.

Third, EPA's use of the 1997 Damage Cases Study is also objectionable. As NMA explained in detailed comments during EPA's LDR IV rulemaking under RCRA,[86] that study presented no credible evidence supporting the agency's proposed regulation: (1) of the storage and handling of mineral processing secondary materials prior to reuse; or (2) on the use of secondary materials as an alternate feedstock to mineral beneficiation and mineral processing units. Specifically, 81 percent of all the cases summarized in EPA's 1997 Damage Cases Study solely involved releases that were either violations of existing NPDES permits, represented discharges without such permits, or were violations of state surface water discharge prohibitions. Fifty-nine percent (50 out of 85) of the releases alleged in the 1997 Damage Cases Study resulted in state and/or federal Notices of Violation (NOVs) and/or citations, many of which carried extensive penalties relative to the alleged releases. Additionally, of the 35 incidents in which citations or NOVs were not issued, 5 related to ongoing permit proceedings which directly addressed the alleged release. Thirty of the reported incidents represented proceedings in which state and/or federal regulatory agencies reviewed the release and deliberately decided either to continue the investigation or to not issue a citation or NOV.

Even 20 years ago, the incidents described in this document demonstrated the ability of existing state and federal authorities to adequately address the releases at

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[86] Comments prepared by Welch Associates for the NMA on the "Land Disposal Restrictions Phase IV; Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues; and the Use of Hazardous Waste as Fill," (Aug. 1997).

issue in the 1997 Damage Cases Study. The enforcement actions that were taken to address the incidents described in the 1997 Damage Case Study were not "after the fact," but were designed to avoid and/or prevent future similar incidents. The 1997 Damage Case Study did not support additional RCRA requirements back in the late 1990s and it certainly does not support EPA's finding of "continuing risk" in today's HRM industry. Again, EPA is required to assess the "degree and duration of risk" posed by today's HRM industry. This study simply is not germane to that task. Moreover, EPA's generic claims that this document presents an accurate description of current HRM practices and potential releases are completely unsupported in the record. EPA provides no evidence that this report, or the incidents it discusses, have any relevance to the classes of facilities that would be subject to this proposed rule.

9. **EPA's Faulty Reasoning on Continuing Risk**

EPA's conclusions about the continuing risk presented by currently permitted and operating HRM facilities may seem sensible to the layperson not conversant with the HRM industry. However, applying EPA's reasoning to a more familiar "vehicle," the automobile, better exposes the fallacies of EPA's house of cards argument. Applying EPA's methodology, one could easily conclude that no advancements have been made over the last four decades to reduce the risk of driving a car because today's cars and cars from the 1980s:

- are made the same basic materials (*e.g.*, steel is the primary component of each);
- have similar exterior and interior designs;
- have the same essential features (*e.g.*, brakes; steering wheel, tires, engine etc.);
- are manufactured in an analogous way using an assembly line process; and
- are involved in a similar number of car crashes (even with the significantly greater number of cars on the roads in 2015).[87]

But, as is evident, this analysis completely misses the point and fails to provide a complete or accurate assessment of technological advancements in the last 40 years. While modern cars look quite similar to older cars, the changes in this timeframe have been extensive and significantly reduced the risks associated with driving. Many of the advancements are the result of laws and regulations governing not only how cars are made, (*e.g.*, many safety standards are established by the Automotive Industry Action

[87] National Highway Traffic Safety Administration, Traffic Safety Facts 2015 at 17 (Table 1 - Crashes by Crash Severity, 1988-2015).

Group)[88] but how they are driven (*e.g.*, driving under the influence laws) and others are the result of improved technologies (*e.g.*, anti-lock brakes, air bags, side and rear cameras, automatic collision-avoidance breaking, lane change warnings, etc.). Voluntary programs have played a role as well, and states have initiated driver education and awareness programs to better inform the public about driving hazards. As a result, while the overall number of car crashes may be similar over this time period, the occupant fatality rate has dropped over 40 percent.[89] But, the logic EPA applies under this rule, if applied to automobiles, would have missed this very important fact. If EPA's view were applied, risks of injury would remain because cars can go at higher speeds, and seat belts, airbags, child safety seats, and anti-lock braking systems would all be ignored in the calculation of risk.

It is true that today's HRM facilities have many of the same types of components as legacy sites. They mine the same types of minerals (*i.e.*, gold, silver, copper, etc.), use many of the same mining techniques including open pit and underground mining, and build similar milling and tailings storage facilities. But the comparison stops there because today's HRMs are designed, operated, and closed with environmental control measures and environmental monitoring systems that effectively minimize the degree and duration of risk of releases of hazardous substances (analogous to the documented reduction in fatal car crash statistics in modern cars compared to old cars).

III. EPA's Financial Responsibility Formula is Fatally Flawed

EPA's proposed approach to establishing the level of financial responsibility for the HRM industry CERCLA § 108(b) rule results in a gross misrepresentation of the risk presented by the industry in violation of the statutory directives. This is not surprising given EPA's unlawfully expansive reading of its statutory authority as discussed in Section I, as well as its complete mishandling of the underlying risk assessment as described in Section II. However, the arbitrary approach EPA chose to take in this rulemaking process is amplified in how the agency calculates the CERCLA financial responsibility obligation for the HRM industry. A detailed critique of the financial responsibility formulas and proposed reduction criteria, commissioned by NMA and produced by SRK Consulting ("SRK"), is provided in Appendix B. Overall, the formulas are so fatally flawed and unworkable that they do not reflect a realistic or plausible risk scenario for the HRM industry. As a result, there is nothing EPA can do to fix the formulas to reflect the "degree and duration of risk" presented by the HRM industry as required by CERCLA. Thus, the formulas serve as another compelling reason for withdrawal of the rule.

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[88] AIAG develops and publishes standards for manufacturing within the automotive industry that are involved in the production of virtually every car in the United States and cover nearly every step in the supply chain.

[89] *Id.* at 15.

A. EPA's Generic, Formulaic Approach is Fundamentally Flawed

The following is a summary of the main problems contained in EPA's approach to the financial responsibility formula. Appendix B contains SRK's full critique. The arguments regarding peer review in Section 2 apply with equal weight to EPA's financial responsibility formulas. The formulas are a highly influential scientific document that should have been peer reviewed pursuant to OMB guidelines and consistent with the agency's own guidance.

- EPA's rejection of a site-specific approach is arbitrary and indefensible. As described in Section B above, existing regulatory programs managed by the BLM and U.S. Forest Service, as well as the state agencies, already perform site-specific assessment of risks, control those risks, and require financial assurance that reduces the "degree and duration of risk" associated with the HRM industry. Not only does EPA ignore this fact, it unjustifiably abandons a tested and proven site-specific approach for a simplistic formulaic approach because a site-specific approach was simply too "resource intensive to implement." 82 Fed. Reg. at 3460. "Too resource-intensive to implement" is not a sound or rational basis for rulemaking, especially when sister federal agencies are currently conducting the precise reviews EPA claims it cannot muster the resources to conduct. Moreover, EPA's claims that a site-specific approach to setting the level of financial responsibility is not appropriate or practical because there have been no CERCLA remedy decisions is totally unconvincing given the agency's overwhelming confidence in its ability to use site-specific approaches to increase a HRM facility's obligation, as well as when considering a HRM facility's petition to be released from the obligation. See 82 Fed. Reg. at 3461; 82 Fed. Reg. at 3415. In fact, EPA even acknowledges that the agency "has substantial experience making individualized determinations of site risk, as this practice is consistent with EPA's practice under the Superfund program." 82 Fed. Reg. at 3415. Overall EPA's choice to abandon a site-specific approach at the very beginning and rely on a generic formulaic approach is arbitrary and capricious.

- Flaws in the data collection include: obsolete data (*e.g.*, only 16 percent of the sites EPA used had data that is less than 5 years old) and mischaracterized data. Moreover, the data are not a fair representative sample to correlate costs. EPA's decision to select a small number of sites, then to further whittle those down, makes this dataset unrepresentative. Ultimately, EPA has a fundamental lack of understanding of the number of variables that influence risk in the HRM industry.

- EPA improperly ignored zero cost source control data points and thus, does not account for the probability of occurrence for any specific type of response cost. Instead, the agency assumed that if a specific site feature is present, it will always require EPA's full suite of response cost actions, such as water treatment and source controls, regardless of whether they would actually be

needed at a particular facility. However, there are numerous sites where many of the response actions for which EPA estimates costs are simply not required due to site-specific factors. Therefore, the cost for those response costs for those sites is in fact zero. By not including zero cost data points as appropriate, the formula results in heavily biased (biased high) data sets (*e.g.*, NRD data sets).

- As discussed above, EPA fails to address the probability of occurrence and assumes that in the future all HRM facilities will require CERCLA responses for every site feature identified in the proposed rule. Yet, EPA has not provided a single example of a CERCLA HRM site that required response actions for every site feature identified. In fact, this assumption contradicts the agency's own data collection. At each site referenced by EPA in support of the proposed rule, the agency identified a specific release or media issue that occurred at one primary HRM component.

- Correlation is not causation. EPA has incorrectly focused on just three variables (area, precipitation, and flow) with only one (area) being used to determine the cost for most of the response categories. EPA's justification for this decision is that there is a correlation between cost and acreage. However, the correlation factors for all the response categories, except water treatment, are very poor to moderate. EPA inexplicably concludes that simply because a correlation exists, causation is probable. This is simply unsupported by any evidence in the record. Risk of release cannot be accurately assessed based on a single factor and even in the water treatment category, which has the highest correlation factor, EPA's regression analysis and other statistical test results are deceptive. For the analysis to have any meaning, the regression must test the correlation between water treatment cost and the three variables driving this cost (*e.g.*, total disturbed area, underground flow, and in-situ leach flow), and not simply focus on flow rate. EPA's belief that accurate financial responsibility costs can be based on a single factor is a serious oversimplification of what is required to properly estimate financial responsibility costs, particularly in the HRM industry.

- The overly simplistic financial responsibility formulas that EPA has developed for CERCLA § 108(b) do a very poor job of predicting reliable cost estimates because they are not based on realistic or plausible scenarios for today's permitted and operating HRM facilities (e.g., the formulas have very poor precision) and duplicate the financial assurance already held by these facilities under existing state and federal reclamation and closure programs. EPA's treatment of outlier data points, use of smear factors, and handling of source control contributions result in significantly overinflated estimates that are not at all reflective of the "degree and duration of risk" of today's HRM industry.

- For almost every site feature that EPA includes in its formula development, there are obvious outlier results that reside at the extreme upper range of the data sets utilized. An extreme outlier is defined as greater than the third quartile plus 3.0 times the interquartile (IQ) range. Nine of the eleven data points are well outside this extreme threshold. In most instances, they range from the third quartile plus 5 – 10 times the IQ range. Two data points that EPA relied upon are approximately 20 times the IQ range. The inclusion of these data points significantly skews the regression analysis for EPA's formulas to the extreme high side. As an example, the open pit data set includes six extreme outliers. Excluding these extreme outlier data points would reduce the average cost by 82 percent. Stated another way, the inclusion of these extreme outlier data points means the average of the source data is 450 percent higher than if they were excluded. Overall, EPA's selected method produces an absurd overestimation to reach an extreme level of a few outliers. This approach is unjustifiable and has no relationship to the "degree and duration of risk" associated with today's HRM industry.

- EPA has incorporated smear factors into its analysis that are meant to account for potentially excluded data points at the extreme range of the data set. However, EPA has failed to identify what sites these data points might represent and has provided no justification for this assumption. The inclusion of smear factors appears to be another statistical manipulation of the data set to skew the formula output to be as high as possible. Effectively, the smear factors increase the costs based on a simple regression of the data by a minimum of 20 percent (in the instance of water treatment) to a maximum of 960 percent (in the instance of drainage). A specific example is found in open pit costs, where the addition of the smear factor increases the average estimate an additional 507 percent (smear factor of 5.07) and results in the formula overestimating costs by 640 percent (when compared to the source data), on average, for the 31 data points that do not classify as extreme outliers.

- EPA's analysis of open pits, waste rock, heap leach pads, and tailings impoundments included costs for source controls, whether the source data included source controls or not, and thus, sites with zero costs associated with source controls were omitted from the underlying regression. This is a critical omission as EPA's application of source controls has a significant impact on the formula outputs and overall financial responsibility estimates. EPA's arbitrary decision that source controls would be required at every site for these four features fails to account for the probability of occurrence, which is low (7 percent to 16 percent) even when not accounting for the zero cost data points. Simply stated, EPA has created a completely arbitrary multiplier effect. For example, for the open pit category, EPA's improper inclusion of source controls for all sites has shifted estimated costs upward by 1,900 percent (19 times) for those sites that do not require source controls. Although source controls are typically not necessary, EPA's regression

unjustifiably drives a significant portion of the actual cost calculation, further weakening EPA's statistical basis for this formula.

- By including extreme outliers and inappropriate smear factor calculations, and mishandling of source control data, EPA has created a financial responsibility formula that produces estimates that are significantly higher than the original financial assurance estimates taken from reclamation and closure plans. This result is baffling. EPA chose to use the engineering cost data from cost estimates developed for state and federal mining reclamation and closure plans. Despite this approach's obvious duplication with existing state and federal programs, EPA used this data because it was readily available and represented similar site features and remedy types that have been implemented at HRM CERCLA sites. In fact, the underlying cost data accurately reflects the level of risk presented by each facility. But then, EPA manipulates this data to produce predicted financial responsibility costs that are often multiple orders of magnitude higher than the original source data. The overall result is predicted costs that have absolutely no resemblance to the risk posed by a specific facility. The highly inflated and unrealistic results are clearly evident in the open pit costs, which are on average 32,300 percent higher (or 323 times higher) than the original source costs they are derived from. The most significantly overpredicted cost is more than 3,000 times its original source data estimate (a 300,000 percent overprediction). This problem with the formula is not just present for the open pit response cost category. EPA's formula output substantially overestimates the cost of every response cost category to such a degree that there is no resemblance to the "degree and duration of risk" posed by the HRM industry.

- EPA's approach to the NRD multiplier is fundamentally flawed. First, EPA's claim that NRD costs are a function of response costs is not valid and the application of NRD costs as a multiplier on top of CERCLA response costs is not appropriate. In fact, SRK's review of the data EPA used in developing its multiplier for the proposed rule shows there is no statistical correlation. Second, EPA's exclusion of certain data points it considered outliers only served to greatly increase the multiplier. Specifically, EPA removed four of the 24 sites because they had response costs that were an extreme deviation from the IQ range. The exclusion of these sites is critical as they have NRD costs that are a relatively small percentage of response costs. Inclusion of these data points reduces the mean of the data set from 13.4 percent to 2.6 percent and the median from 3.8 percent to 2.5 percent. Third, EPA inappropriately used cost data from legacy HRM sites with CERCLA responses. This dataset is biased and not representative of potential future NRD costs as it reflects response costs related to practices that are no longer utilized in the industry. Finally, overall, EPA's multiplier has the effect of arbitrarily and capriciously increasing the amount of financial responsibility on an industry-wide basis.

B. EPA's Reduction Criteria and Methodology are Fundamentally Flawed

Compounding the overestimated costs in the formula, EPA then proposes reduction criteria that supposedly account for existing federal and state reclamation bonding requirements but are likely illusory in practice and result in a completely unworkable and unviable financial responsibility regime. Specifically, the proposed rule includes provisions to reduce the financial responsibility amount based on "risk-reducing practices, including controls established in compliance with Federal and state reclamation and closure programs." 82 Fed. Reg. at 3391; *See also* 82 Fed. Reg. at 3467 (describing the agency's approach to the reduction criteria).

As explained in Section I & II above, financial responsibility reductions do not cure the significant overlap between the proposed CERCLA § 108(b) rule and existing state and federal reclamation and closure programs. Below are NMA's main criticisms regarding this approach. A more detailed analysis is available in Appendix B. Overall, these backend reductions do not provide a meaningful solution to EPA's inherent duplication of existing state and federal programs. EPA's "all-or-nothing" reduction approach, which contains engineering controls and design standards cherry-picked from various existing state and federal programs for nationwide application, is unjustifiable and only serves to guarantee an overly inflated financial responsibility estimate that is not tied to the actual "degree and duration of risk" presented by an individual facility. Many of these arbitrarily selected reduction standards conflict with existing laws thereby rendering them useless in obtaining any meaningful reductions under the CERCLA § 108(b) formula. Furthermore, EPA's reduction criteria and process are so vague that actual reductions may take years and millions of dollars to attain approval, without any bearing on actual "degree and duration of risk."

- EPA's proposed reduction criteria are inferior to the existing state and federal programs from which the agency plucks out certain engineering controls and design standards for its CERCLA § 108(b) rule. Current closure and reclamation plans typically require multiple years of site-specific investigation and engineering work to be developed with the intent of mitigating risk to human health and the environment at a particular site, taking into account the numerous site conditions that influence the potential risk. These plans are then reviewed by experienced regulatory authorities and subject to public comment and/or public hearing prior to final approval. Any identified deficiencies are addressed through the review process. In contrast, EPA's generic, simplistic formula and equally general simplistic reductions to that formula have no scientific basis and are grossly inferior to the requirements of existing site-specific federal and state mining regulatory programs. A good example here is EPA's reduction criteria for open pits, which have no technical relevance to pits that are hydrologic sinks and therefore, make it a moot exercise to try to obtain credits. Further, the credits do not take into account the actions that might be needed for either protection of the public health or environment or compliance with applicable or relevant and appropriate requirements under CERCLA.

- If CERCLA § 108(b) is implemented as proposed, HRM companies will not be incentivized to implement sound practices that would decrease the need for future CERCLA response actions. To the contrary, HRM companies will be incentivized to modify their reclamation and closure plans to ensure they meet EPA's arbitrary reduction criteria to minimize the significant CERCLA § 108(b) financial burden on the operation, assuming its even available as an option, which EPA has not even evaluated. In some cases, HRM companies cannot sufficiently implement EPA's preferred approaches, such as concurrent reclamation, for which EPA's proposal is overly simple and does not consider the complex economics of mining. Even where available, this would focus reclamation and closure plan development on a limited number of specific types of activities arbitrarily mandated by EPA rather than focusing on risk-based, site-specific measures developed from sound science and engineering. The EPA-directed activities may conflict with existing, applicable federal and state laws and/or mining and reclamation plans, creating a Hobson's choice for HRM companies. Moreover, EPA's proposed approach could result in HRM companies spending large sums of money on controls that are not justified by their site-specific risk-profile, thereby reducing future investment dollars in controls that could have a positive impact at that site. In short, this approach is less likely to ensure future reduction in risk.

- The method that EPA has used to develop the reduction criteria is illogical, poorly substantiated, and completely arbitrary. At the most basic level, EPA has provided no scientific basis for the reduction criteria. In fact, EPA never comprehensively compiled recommendations for public review and comment beyond its "Technical Support Document," where it lists selected reduction criteria and compares the criteria to a number of what the agency deems are "best management practices." EPA provides no reason for its selections or reasons for why other practices were ignored. Furthermore, EPA never consulted with the HRM industry or with state and federal expert mining regulators on what criteria may be appropriate under this approach. Instead, the agency arbitrarily selected criteria without any peer review or consultation with knowledgeable persons or agencies, and without providing any justification.

- EPA's inconsistent use of regulations for the reduction criteria is an exercise in selective omission in which the agency has inappropriately excluded relevant portions of other equally valid regulations, thus misrepresenting the full scope of the relevant regulations. In some instances, EPA's reduction criteria directly contradict the state regulations that the agency uses as a basis for the reduction criteria. Consequently, EPA creates conflicts with existing law and adopts criteria that fundamentally should not apply nationwide.

- EPA's reductions overlap with existing regulatory programs. Existing state and federal mining programs can include hundreds of pages of detailed requirements and recommendations, which are implemented through approved site-specific

plans. Yet, EPA has taken this comprehensive risk review and whittled it down to just 10 pages of arbitrarily selected and subjective reduction criteria. Many of these criteria are also repeated multiple times for each site feature. Current closure and reclamation plans require multiple years of investigation and engineering work with the intent of mitigating risk to human health and the environment. EPA's generic one-size-fits-all approach is grossly inferior to the requirements of existing state and federal mining regulatory programs.

- Many of the reductions in the proposed rule are poorly defined and therefore highly subjective and unclear. The use of these reduction criteria will create significant uncertainty as to whether a facility has met the proposed standards and will leave both operators and EPA exposed to significant potential litigation. This concern is especially warranted given that the agency has not adequately defined the standard or process for the agency's approval of a company's estimated CERCLA § 108(b) financial responsibility obligation or the release of that obligation.

- EPA has also selected highly prescriptive and inflexible criteria for other conditions. The agency provides no justification for these criteria, nor does it acknowledge that such criteria simply do not apply nationwide given the varying characteristics of the HRM industry. In fact, to obtain a reduction, many facilities will have to specify those prescriptive (and inferior) criteria in their reclamation and closure plan for no reason other than that EPA's new regulations require them. It is unjustifiable for EPA to refuse to allow the HRM industry site-specific flexibility in selecting criteria that are the most appropriate for their operations.

- Validation of the model and the reductions shows how far EPA's formula-based calculation is removed from reality. EPA provides one example where an existing closure plan meets all reduction requirements and, therefore, the CERCLA § 108(b) bonding requirement is zero dollars. This operation's formula-based calculation for CERCLA financial responsibility is $331 million. The site's estimated reclamation and closure cost is $35 million. Therefore, EPA believes that $35 million in actual closure activity fully reduces the "degree and duration of risk" while its formula would have required almost 10 times that amount. This result is similar for all sites evaluated in the RIA. Where EPA determined a site met the proposed reduction criteria, and thus lowered the final financial responsibility amount, a comparison of the calculated financial responsibility amount to the actual cost estimate used (from existing financial assurance requirements), consistently shows EPA's formulaic costs approaching orders of magnitude higher than actual estimates. Finally, even where EPA claims that the reduction criteria are met, it has not considered its rigid limitations on "acceptable" financial responsibility mechanisms, which would likely disallow the state reductions that EPA purports would be available.

C. EPA's Approach to Determining Health Assessment Costs is Arbitrary and Capricious

EPA claims that health assessment costs are "fairly consistent in cost from facility to facility." 82 Fed. Reg. at 3461. Accordingly, EPA adopted a fixed amount approach through which the agency identified a standard health assessment cost for the HRM classes of facilities subject to this rule. *See id.* at 3460. Under this method, EPA "does not rely on site-specific factors but rather on historical costs associated with similar facilities to calculate an expected future amount." *Id.* More specifically, EPA relied on cost information provided by the Agency for Toxics Substances and Disease Registry (ATSDR) on recently completed health assessments. *See id.* at 3465. Notably, "ATSDR did not provide [HRM]-specific data, and thus non-mining health assessment costs are included in this dataset." *Id.* The ATSDR data related to health assessments completed with the 18 months preceding EPA's request.

EPA's approach to calculating relevant health assessment costs is arbitrary and capricious. First, there is no basis for assessing a flat amount for health risks at every HRM site. Most HRM sites will not have health risks and many have a small or zero resident population in the area. Health assessment costs are therefore not a foregone conclusion. Second, EPA's admitted disregard towards collecting HRM-specific data further erodes the reliability of this approach. There is no record support for the agency's assumption that facilities are the same in this context. This is certainly not true when comparing different industry sectors. It also is not true when comparing individual HRM facilities or in comparing legacy HRM sites to today's HRM sites. Simply stated, EPA's one-size-fits-all $550,000 flat amount has no relation to the "degree and duration of risk" presented by permitted and operating HRM classes of facilities. Finally, NMA is concerned that the proposed formula's separate accounts for response costs and health assessments could result in potential double counting.

D. CERCLA § 108(b) Should Not Include NRD Costs and EPA's Approach to Determining the Multiplier is Arbitrary and Capricious

EPA proposes to make the financial responsibility instruments for all types of CERCLA liability enumerated in CERCLA § 107, including NRD. *See* 82 Fed. Reg. at 3461. Specifically, EPA is proposing a multiplier of 1.134 in the financial responsibility formula for the NRD component. *See* 82 Fed. Reg. at 3465. NMA objects to the inclusion of NRD in the underlying financial responsibility formula as this proposal exceeds EPA's statutory authority. Congress specifically fashioned through CERCLA § 107(f) specific liability recourse and mechanisms for recovery of NRD damages that are not the same as those for CERCLA response costs. *See* 42 U.S.C. 9607(f) ("Sums recovered by a State as trustee under this subsection shall be available for use only to restore, replace, or acquire the equivalent of natural resources."). The liability provisions are specific to the U.S. Government and states or Indian tribes for natural resources within their boundary, management, or possession. Accordingly, a governmental trustee has a direct action for NRD that is outside the traditional realm of CERCLA response costs. The CERCLA § 108(b) financial responsibility program was not intended to cover

these damages, as a separate process already exists to recover them as appropriate. CERCLA already provides an exclusive remedy for NRD through CERCLA § 107(f). It is arbitrary and capricious to use CERCLA § 108(b) as a backdoor to creating another mechanism for securing these funds for every HRM site despite not having utilized the statutory provisions that grant that liability protection in the first place.

Moreover, NRD damages are not the kind of response costs that are paid out of Superfund, which is a statutory consideration under CERCLA § 108(b)(2), nor are they a foregone result of the release of hazardous substances. In developing the NRD multiplier, EPA studied 319 facilities with CERCLA response costs and only 24 of those sites had NRD. That is only 8 percent of the facilities studied by EPA. This does not even account for those facilities that have no CERCLA releases and therefore no CERCLA NRD liability. If the agency had considered those facilities with CERCLA releases but no NRD in its calculations, then the median NRD as percentage of response costs is zero and the mean is 1.1 percent, both magnitudes of order lower than EPA's proposed 13.4 percent multiplier. However, even with that correction, NMA opposes the inclusion of the NRD. To assume that NRD will occur at all HRM classes of facilities is unsupported in the record and certainly does not reflect the "degree and duration of risk" presented by classes of facilities in the HRM industry. As described above in Section A, EPA also made various faulty assumptions in calculating the proposed multiplier that are arbitrary and capricious. Taken together, EPA has exceeded its statutory authority in including the proposed NRD multiplier for the HRM industry.

E. Conclusions on EPA's Flawed Approach to the Formula

Overall, EPA's approach to establishing the level of financial responsibility is full of circular reasoning, inconsistencies, internal contradictions, and unsupported assumptions. EPA's basic premise that CERCLA § 108(b) is functionally different from closure and reclamation requirements covered under existing state and federal programs is contradicted by its own methodology. Moreover, EPA ignores the industry best practice of calculating site-specific financial responsibility in favor of overly simplistic formulas based on statistical manipulation of poorly misunderstood and misinterpreted data. EPA's failure to consider the probability of occurrence compounds the problems associated with the formula, resulting in egregiously high financial responsibility calculations. By designing the formula to replicate costs incurred in remediating the most expensive legacy Superfund sites, EPA in no way reflects the "degree and duration of risk" presented by today's HRM industry and thus the financial responsibility formula is arbitrary and capricious.

EPA's reductions do not solve the fundamental problems with the formula and only serve to further shine a spotlight on EPA's flawed approach. In EPA's zest to distinguish this rulemaking from existing state and federal reclamation programs, it unlawfully substitutes the expertise of state regulators and federal land managers with its own flawed design and operating criteria. While EPA claims throughout the proposal that it is not regulating the design and operation of HRM facilities, this very approach

results in the backdoor regulation of the HRM industry beyond the scope of CERCLA § 108(b)'s statutory directive. *See* 82 Fed. Reg. at 3403 (claiming that the proposed CERCLA 108(b) requirements are not designed to "ensure proper closure or reclamation of an operating mine."). EPA's approach could also incentivize the adoption of practices that simply do not apply to all HRM classes of facilities, and are inappropriate or even harmful when imposed at specific sites. These investments would result in wasted dollars with no meaningful environmental benefit. The financial responsibility proposed in this rule will impose an unreasonable burden on an already highly regulated industry without the benefit of reducing any significant risks not already addressed by existing state and federal programs. All in all, the proposed CERCLA § 108(b) financial responsibility formula and the proposed reduction criteria go far beyond what Congress authorized under the statute and thus support the withdrawal of the rule, not its promulgation.

IV. EPA's Economic Analysis Significantly Underestimates the Economic Impact on the HRM Industry

EPA's RIA is an assessment of compliance costs based on a subset of HRM facilities (49 facilities identified) and related owner companies for which the agency claimed it could obtain detailed technical data. *See* 82 Fed. Reg. at 3391; *See* at ES-3. According to EPA's RIA, the proposed rule "may require [HRM] facilities to secure approximately ***$7.1 billion*** in financial responsibility obligations."[90] RIA at ES-7; 82 Fed. Reg. at 3393 (emphasis added).

Under the preferred option, which does not allow the use of the financial test, the entire $7.1 billion would be covered by third-party instruments. *Id.* EPA estimates that if it allowed the financial test, $4.9 billion would be covered by third-party instruments (or 70 percent of the total). *Id.* EPA quantifies the annualized compliance cost to industry to procure third-party instruments at ***$171 million*** (without a financial test) and $111 million (with the financial test), not including additional annualized administrative costs. *Id.* (emphasis added). In comparison, EPA's preferred option results in a savings to the government of approximately $527 million over 34 years, or ***only $15.5 million per year*** (and even less at the estimated $511 million savings with the financial test). *See* RIA at ES-7 & ES-8; *See also* 82 Fed. Reg. at 3395 (emphasis added).

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[90] To support its RIA and Market Capacity Study, EPA assumes that modeled HRM facilities meet the reduction criteria for many site features, when in practice it is unlikely that most facilities could meet the reduction requirements because of their all-or-nothing nature. Thus, if many site features fail to meet the reduction criteria, which is a likely outcome as described in more detail in Section III.B, EPA's proposed rule will cost significantly more than the estimated $7.1 billion. There is a second fundamental flaw with the RIA; apparently EPA did ot finalized the language for the credits or reductions until after the RIA was completed. The examples calculated for the RIA did not use the same credits that are included in the final text of the proposed rule. NMA members and other companies who are used as examples in Appendix B to the RIA have tried to replicate the calculations, but find either that their facilities do not qualify for the credits under the language of the proposed rule or there are substantial uncertainties about the application of the credits. If the authors of the RIA were not working with the final text of the proposed rule, the entire analysis is useless.

NMA supports and incorporates by reference the independent economic analysis completed by OnPoint Analytics, Inc. and submitted by Freeport-McMoRan Inc. to the docket for this rulemaking. OnPoint's Analysis demonstrates that EPA substantially underestimated the cost of this rule to the HRM industry by several orders of magnitude. Specifically, OnPoint concludes that the cost of the proposed rule could be as high as ***$39.4 billion*** on a net present value basis. That is ***over five times*** the total amount estimated by EPA in the RIA. In addition, OnPoint concludes that the proposed rule could directly reduce employment by up to 10,110 jobs in the HRM industry, even before considering the indirect and induced impacts of the rule. In comparison, EPA's RIA does not even attempt to quantify employment losses. *See* 82 Fed. Reg. at 3395 ("EPA did not have sufficient data to model and quantify the potential changes in mines' employment levels as a result of the proposed regulation.")

Importantly, OnPoint's analysis accounts for collateral and annual costs that are typical in the HRM industry to estimate the cost of obtaining a financial responsibility instrument. EPA's analysis wrongly assumes that there will be no collateral costs. ***For the 19 mines modeled by OnPoint, financial responsibility requirements are estimated to total $15.04 billion***. This number far exceeds the agency's estimated $7.1 billion total for the universe of facilities impacted by this rule. In addition, these modeled mines would be required to set aside between $3.67 billion and $9.02 billion as collateral and pay annual costs of between $75 million and $376 million according to standard industry percentages. Using a metals mining industry weighted average cost of capital of 8.40 percent, the total annual costs for the modeled universe of setting aside this capital, along with the annual fees, is between $391 million and $1.13 billion. Again, this far surpasses the estimates in EPA's RIA. The annual revenue impact of the proposed rule on these modeled mines alone is between $434 million and $1.26 billion.

Notably, OnPoint's modeled universe is estimated to represent approximately 34 percent of the HRM industry. ***OnPoint estimates that the proposed rule will cost the HRM industry between $1.1 billion and $3.3 billion per year***. OnPoint's lower bound estimate is ***6.4 times*** EPA's estimate for the annual cost of the preferred option. OnPoint's higher bound is over ***19.3 times*** EPA's estimate for the annual cost of the preferred option. **With annual net profits estimated at $5 billion for the HRM industry, *these regulatory costs are estimated to be between 23 percent and 66 percent of industry profits under current commodity prices. The proposed rule's regulatory costs are estimated to reduce the capital investment in the HRM industry by between $5.6 billion and $16.1 billion***.

OnPoint also analyzed the indirect and induced impacts in Alaska, Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Utah. OnPoint concluded that the proposed rule would reduce annual economic output by between $1.3 billion and $3.8 billion within these modeled states alone, considering direct, indirect, and induced effects. Furthermore, the proposed rule will result in 3,808 jobs to 11,047 jobs lost in these modeled states alone, again considering direct, indirect, and induced effects. Finally, the proposed rule would lead to a decrease in annual tax revenue between $58 million and $168.4 million at the state and local level, while associated federal tax

revenue will decrease by between $92.5 million and $268.3 million, for these modeled states alone.

Altogether, these economic impacts will have a profound and extraordinarily adverse impact on the HRM industry, as well as substantially impact the local communities it supports through the significant loss of high-paying jobs and tax revenue. The proposed rule will significantly reduce mining employment, investment, and revenues. While EPA grossly underestimates the economic impacts of the proposed rule on the HRM industry, the agency also overestimates the benefits to the government. In particular, EPA improperly uses an economy-wide exit rate, instead of the firm exit rate for overall mining companies. This choice alone significantly biases the benefits of this rule. ***For example, using the more reasonable exit rate of 2.27 percent, the government's cost in the absence of the proposed rule – otherwise known as the benefits of this rule – is reduced from $527 million to $160 million***. Importantly, EPA provides no evidence to support its assumption that exiting firms will fail to meet any of their CERCLA obligations. Thus, EPA's calculations represent the maximum possible benefit, as even exiting firms are unlikely to fail to meet all of their environmental obligations.

V. EPA Failed to Adequately Assess Market Availability and Affordability and Proposed Instrument Terms and Conditions that Will Limit Market Participation

Pursuant to a Congressional request,[91] EPA conducted a Market Capacity Study prior to the publication of the proposed rule. 82 Fed. Reg. at 3399. *See also* Market Capacity Study at 1 ("The subject request asks for the EPA to collect and evaluate information from the insurance and financial industries regarding the use and availability of financial responsibility instruments."). According to EPA, this study "assessed the likely availability of financial responsibility instruments and the capacity of third-party markets to underwrite financial responsibility requirements for responsible parties subject to CERCLA § 108(b)." 82 Fed. Reg. at 3399. Based on this study, EPA claims that "sufficient capacity ***likely will be available*** to cover the financial responsibility obligations called for under CERCLA § 108(b)." *Id.* (emphasis added). *See also* Market Capacity Study at 21 ("additional market capacity likely exists to support entities seeking financial responsibility coverage in response to CERCLA 108(b)").

Notably, EPA at the same time admits that "the ultimate availability of CERCLA § 108(b) financial responsibility instruments ***cannot be predicted with certainty*** until the final rule has been promulgated." 82 Fed. Reg. at 3399 (emphasis added). In the RIA, EPA is even more direct, stating that the agency "determined that the market for the

[91] The Conference Committee Report attached to the Consolidated Appropriations Act of 2016 (Public Law 114-113) directed EPA to: "collect and analyze information from the commercial insurance and financial industries regarding the use and availability of necessary instruments (including surety bonds, letters of credit and insurance) for meeting any new financial responsibility requirements and to make that analysis available to the House and Senate Committees on Appropriations and to the general public on the Agency website 90 days prior to a proposed rulemaking."

types of [financial responsibility] instruments described above ***does not yet exist*** to cover financial responsibility under CERCLA 108(b)." RIA at 4-10 (emphasis added). However, the agency convinces itself that "the market will have an opportunity to respond" and therefore, no real market capacity problems exist that could derail the ability of HRM facilities to obtain affordable third-party instruments to cover this costly new obligation. 82 Fed. Reg. at 3399. *See also* Market Capacity Study at 2 ("[W]ith all else equal, standard economic principles suggest that as demand for a new product increases, insurers and sureties will seek to satisfy such demand with new products."). These conclusions read more like wishful thinking than an actual market analysis. Additionally, EPA's attempts to reassure itself and the regulated community are in the end futile. EPA's remarkably limited analysis of market capacity does not reflect, nor do the proposed financial instruments fix, the real-world concerns from experts in the insurance, finance, and banking sectors that will drastically impact the ability of the HRM industry to even obtain, nonetheless afford, third-party instruments to cover this costly new obligation.

A. EPA's Market Capacity Study Provides No Value in Assessing Affordability or Availability of CERCLA § 108(b) Financial Responsibility Instruments

EPA's Market Capacity Study has no real value in assessing the availability or affordability of third-party instruments that could prospectively cover EPA's proposed CERCLA § 108(b) financial responsibility obligation. The scope and depth of EPA's Market Capacity Study is limited to examining high level financial measures of the insurance and surety industries. This generic analysis produces a simplistic quantitative assessment which fails to support the conclusion that adequate capacity will be available for the type of financial responsibility obligations proposed for the HRM industry under CERCLA § 108(b). Contrary to EPA's assertion in the proposal, the study contains no "qualitative data" that supports the conclusion that "sufficient capacity likely [would] be available to cover the financial responsibility obligations." 82 Fed. Reg. at 3399.

1. EPA's Inadequate Research and Consultation Results in Unjustifiable Conclusions

EPA simply researched published industry data on insurance and surety premiums as if these were "a reliable measure with which to assess market capacity." Market Capacity Study at 2. EPA's theory rests on the unsupportable assumption that "[a] 'soft' market suggests that there exists the potential for greater instrument supply than demand" and that since current market conditions are healthy it signals "potential capacity for expansion." *Id.* at 8. Specifically, EPA opines that "the current capacity of (re)insurance and surety markets for the product lines necessary to serve the financial responsibility needs of the [HRM] industry pursuant to CERCLA 108(b) requirements may be as much as $5.6 billion." *Id.* at 2. The agency completely punted on any relevant analysis of the proposed rule itself, instead summarily concluding: "The timing, pricing

and nature of such products will ultimately depend on the requirements established by the rule."[92] *Id.* at 5.

At best, the data in the study supports the single proposition that at the moment the overall insurance and surety markets are currently in sound financial condition. Yet, that "macro" analysis does not inform whether sufficient capacity will exist for the environmental site liability segment of the market or, more specifically, for the HRM industry. Amounts of coverage may be available for standard coverages, but they do not offer any insights into whether coverage may be available for non-standard coverages associated with the unique environmental and financial exposures rooted in the HRM industry CERCLA § 108(b) rule. Nor does this global capacity reflect what is truly available for products specific to the HRM industry. Indeed, as described in more detail below, EPA's report contains ample evidence that the market for more volatile lines of business—environmental liability generally and mining more specifically—are constrained if not shrinking.

For example, the number of sureties actively participating in the HRM sector is a small percentage of the overall industry and offer more restrictive capacity terms for the HRM industry due to the nature of the underlying risks, the long-term duration of guarantees, and the non-cancellable nature of the bond. In combination, these characteristics result in a smaller aggregate pool of capacity and the amount available to any particular HRM owner or operator is limited. Moreover, a dramatic increase in demand will assuredly drive both higher pricing and higher collateral requirements for many HRM companies. Capacity terms and conditions, including rate and collateral, will depend on specific underwriting criteria such as individual site characteristics, the compliance record of the owner or operator, and various credit metrics. EPA gives short shrift to these important considerations, merely mentioning them without any further analysis. *See* Market Capacity Study at 2.

Notably, EPA conducted its capacity study and consulted (on a very limited basis) with the insurance and surety industries *prior* to articulating sufficient details on the requirements for the different financial instruments that EPA will allow under the proposed rule. Consequently, the providers of the various acceptable forms of financial responsibility could not provide the type of feedback useful for assessing their appetite—and likely capacity—for underwriting the proposed obligations. In combination, the gaps in relevant information, lack of meaningful analysis, and inadequate consultation with providers, precludes accepting the EPA conclusion "that there will likely exist sufficient providers and capacity to meet the requirements of future CERCLA 108(b) regulations." Market Capacity Study at 22. The hedge that immediately follows—it cannot be predicted with certainty until after those rules are finalized and the market responds—reveals the only honest answer EPA can provide: "We don't know."

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[92] Even in EPA's very brief discussion of trusts, letters of credit, and financial test, where EPA wrongly assumes that "there is essentially unlimited market capacity for these specific [financial responsibility] options," EPA acknowledges that these forms also have qualifying limitations such as an owner or operators showing of adequate credit and assets, demonstrated performance, financial health, and credit worthiness. Market Capacity Study at 7.

As explained more fully below, the market response to the financial responsibility obligations proposed will be largely negative and any capacity that may emerge will be selective and limited.

To suggest coverage is available without reasoned justification is indefensible given the immense economic repercussions of this rule as described in Section IV. This is particularly concerning since EPA assumed that no market capacity constraints exist when estimating the cost of the instruments. *See* 82 Fed. Reg. at 3392. According to OnPoint's analysis, financial responsibility requirements for just the 19 mines it modeled are estimated to total $15.04 billion. This number is three times over the market that the agency claims will be available to absorb this new obligation. Even taking as truth EPA's $7.1 billion in total financial responsibility obligations, the agency's own estimates completely dwarf the agency's identified market capacity. *See* 82 Fed. Reg. at 3392; RIA at ES-7. Yet, in complete contradiction, EPA argues that "preliminary results from draft regulatory impact analyses reveal estimates of total demand for instruments to be below that of the Agency's estimate of overall capacity." 82 Fed. Reg. at 3399. To claim market capacity exists without considering the critical elements of the rule that will have an impact on the willingness of market participants to offer these instruments, such as the estimated aggregate liability from the financial responsibility formula, the wording and form of the third-party instruments, and other relevant conditions on each of the instruments, is arbitrary and capricious and fundamentally wrong.

Interestingly, the Market Capacity Study is rife with cautionary language relevant to market capacity and instruments associated with environmental liability, as well as more generally for financial assurance available to the HRM industry under existing programs. For example, EPA acknowledges that the "insurance and surety capacity for environmental liabilities may be contracting." Market Capacity Study at 2. EPA offers a specific example, noting that AIG, the largest underwriter of environmental insurance, announced last year that it would no longer offer environmental impairment liability coverages. *Id.* at 15. Other examples include statements such as: (1) "[r]educed underwriting in business lines that are inherently volatile [as] necessary to ensure long-term financial stability and profitability in a low interest rate environment;" and (2) "it is important to keep in mind that insurers and sureties will continue to be wary of business lines that are recognized as volatile (as the HRM industry could be characterized)." *Id.* at 16. EPA completely downplays these realities.

In the agency's summary of key information, several important cautionary statements are also present from brokers with mining experience. For example, Wells Fargo acknowledged in its "2016 Insurance Market Outlook:" "Energy risks, power and utility risks, and mining risks: these industries have significantly less capacity available to them, with carriers generally not willing to write more than a one- or two-year term." *Id.* at 18. Specific to mining, Marsh stated in its "United States Market Report 2016:" "The sustained downward movement in commodity prices continued in 2015, and mining companies faced constant pressure to contain risk and insurance costs." *Id.* at 19. EPA also notes that "Willis identifies mining as a risk of concern, warranting careful evaluation." *Id.* at 20. Willis reported that "increased regulatory scrutiny on

transportation/railroad, mining, energy, and pipeline exposures, [are] resulting in the reevaluation of these sectors by underwriters and inspiring a new push to shift liability to users of facilities." *Id.* EPA simply glosses over these significant cautions on availability of insurance/surety to the HRM industry.

EPA even concludes that the agency's assessment "suggests a growing trend on the part of underwriters to shy away from volatile lines of coverage" and that "[t]his consideration will weigh on the degree of additional market capacity that third-party insurers and sureties are likely to leverage to provide the instruments necessary for [HRM] entities required by any CERCLA 108(b) final rule." *Id.* at 21. *See also* RIA at 4-10 ("observers acknowledge that overall capacity for risk specific to the mining industry will decrease due to the sector's volatility"). However, EPA dismisses these critical facts with essentially no reasoned explanation or further analysis, and instead rests its ultimate conclusion of available market capacity on: (1) general commentary on the growth of capacity in the insurance and surety markets; and (2) the potential and untested role of captives and risk retention groups (RRGs) in filling a market void where traditional forms of third-party instruments are unavailable for a majority of the HRM sector. *See* Market Capacity Study at 21-22. EPA's RIA is explicit in its reliance on these flawed theories, concluding that the agency "anticipates that the insurance market will endeavor to meet the increased demand . . . through alternative risk transactions, such as layered risk management instruments, and the concurrent formation of risk retention groups." *Id.* at 4-10. Yet, at no point in the Market Capacity Study or the RIA does EPA even attempt to evaluate the suitability of RRGs for the HRM industry. NMA is greatly concerned with the agency's blanket reliance on these arrangements given that they are difficult to achieve, are completely untested for the kind of expansive financial liability proposed in this rule, and are not widely used in the HRM industry today. To suggest that these arrangements will result in any meaningful increase in capacity is a baseless overstatement.

In the end, EPA's unsubstantiated optimism that the market will simply just respond and cover this new obligation is not based on a true evaluation of market capacity, the barriers associated with specific regulatory provisions in this proposed rule, or the aggregate demand that will be placed on and constrain the market. *See* 82 Fed. Reg. at 3399. Nothing in the Market Capacity Study evaluates the important issues at hand, such as whether there will be a third-party market for the financial responsibility instruments EPA actually proposes in the rule (instead of hypothetical scenarios), or how any such market will price or establish terms and conditions for those prospective products. Consequently, the agency's Market Capacity Study is critically flawed and provides no value in assessing this crucial issue.

2. EPA Failed to Examine the Correct Market Segment

EPA's assessment that $600 million in environmental insurance capacity and $5 billion in surety capacity may currently exist for the type of product lines to address HRM financial responsibility needs under the proposed rule lacks credibility. The estimates are based upon written premiums as a measure of the current size of the

overall insurance and surety markets for environmental coverage. However, premiums written captures both rate actions and new business. Accordingly, this metric alone does not provide a reliable indicator of the potential capacity for the proposed financial responsibility obligations. Moreover, capacity and availability varies by both lines of business and industry segments. In short, nothing in the analysis attempts to evaluate how much capacity may exist for the obligation EPA proposes to impose on the HRM industry. Both experience and market analysis confirm that for certain classes, such as mining, significantly less capacity will be available than what EPA surmises may exist *for all classes* of environmental risk. *See* Wells Fargo, 2017 Insurance Market Outlook, at 14 ("Therefore, we are confident that there will be continued growth with a soft market in 2017 for most classes or risks, *except higher risks such as* petrochemical, oil and gas, power and utility, and *mining*.") (emphasis added). In sum, environmental site liability coverage for the mining sector does not reflect the broader market examined by EPA.

Apart from the failure to examine the likely availability of insurance or surety coverage for the proposed financial responsibility obligations for the HRM industry, the analysis does not examine the related availability issue of the limits third-party providers will impose on individual companies. Both insurance and sureties will limit the amount of aggregated exposure for any one company. Both availability and the limits are often accompanied by collateral demands that further impair the company's financial position or credit worthiness. This in turn will compromise their retention of existing coverages under other closure, response, and reclamation programs.

Experience over the past several years reveals that environmental site liability insurance for the HRM industry is *potentially* available on only a *very select* basis by a *few* carriers. The terms are becoming more restricted with short policy terms, high deductibles, and often limited to new conditions. *See, e.g*., Wells Fargo, 2017 Insurance Market Outlook at 14 (noting that one year policy terms are becoming the norm for difficult risks such as mining). Some of the major carriers have reinsurer treaty exclusions for HRM companies.

The face amounts, nature of the risks, and the unconventional terms and conditions proposed for the financial responsibility instruments will require access to the Excess and Surplus ("E&S") line of insurance—a small subset of the environmental insurance market. E&S lines are resorted to for high capacity, unique and new, or emerging risks that standard line insurers decline to cover when they do not meet insurers' underwriting guidelines. The total E&S lines of business on a direct premiums written ("DPW") basis represents only 7.0 percent of the total Property and Casualty sector. A.M. Best, *U.S. Surplus Lines*, at 3 (Exhibit 1) (Sept. 2016). The top ten U.S. based E&S providers had approximately $11.5 billion in DPW in 2015. *Id.* at 9 (Exhibit 8). Two E&S Groups, Lloyd's and AIG, account for more than 32 percent of the total E&S line share. *Id.* at 8 (Exhibit 7). However, as discussed below these markets are consolidating and contracting.

The market is consolidating through increased merger and acquisition activity. Future growth will continue to be inorganic through more mergers and acquisitions. These trends suggest reduced competition with a combination of attendant impacts of reduced underwriting, higher pricing, or eschewing more volatile business lines to preserve profitability. The recent exit of AIG from the environmental site liability product line is especially instructive. AIG had one of the largest books of environmental site liability policies for mining and over 30 years of experience in this market. While a few carriers may have picked up some of AIG's vacated positions, the fact that AIG could not remain profitable in this space despite three decades of actuarial data suggests the remaining few market participants may exit or further reduce their exposures.

Apart from a passing mention of the E&S line of insurance, the market capacity study is devoid of any analysis of the capacity for that insurance line, how it interacts with the standard line providers, and how the E&S insurers' view the nature of the risks, high capacity requirements, and the terms and conditions of the proposed financial responsibility instruments. This omission is especially egregious since even EPA's report acknowledges that the E&S line will be the primary source of insurance for the proposed obligations. *See* Market Capacity Study at 14 ("In general, insurance for purposes of financial responsibility is provided by 'surplus' and 'excess' lines insurers.").

B. EPA's Consultation with the Insurance, Surety, and Banking Community Was Woefully Inadequate

As briefly discussed above, EPA's evaluation and conclusions on market capacity are based on insufficient consultation with the third-party instrument providers who are the true experts in this field. In December 2015 and January 2016, EPA held just four meetings, all lasting only two hours, with the insurance, surety, and banking communities.[93] At the time of these meetings, EPA had not yet developed critical elements of the rule that are crucial to evaluating and understanding market availability and affordability, including the financial responsibility formula and the CERCLA § 108(b) financial responsibility instruments. Instead, the agency walked these stakeholders through the agency's then current thinking on the proposed rule structure, covering various topics such as: (1) scope of coverage; (2) payment triggers; (3) duration and cancellation; (4) amount; (5) direct action; and (6) instrument form. Such discussions, while relevant, should have been the starting point of the consultation, not a one-time

[93] *See* Meeting Notes from CERCLA 108(b) Meeting Between EPA and Insurance Community Representatives (Dec. 8, 2015) (EPA-HQ-SFUND-2015-0781-0447) (Insurance Meeting Notes); Draft Meeting Notes from CERCLA 108(b) Meeting Between EPA and Banking Community Regarding Letters of Credit (Jan. 12, 2016) (EPA-HQ-SFUND-2015-0781-0446) (LOC Meeting Notes); Draft Meeting Notes from CERCLA 108(b) Meeting Between EPA and Surety Community (Jan. 14, 2016) (EPA-HQ-SFUND-2015-0781-0445) (Surety Meeting Notes); Draft Meeting Notes from CERCLA 108(b) Meeting Between EPA and Banking Community Regarding Trust Funds (Jan. 28, 2016) (EPA-HQ-SFUND-2015-0781-0444) (Trust Meeting Notes). Based on our review of the participants in attendance, NMA is concerned that these meetings were not fully representative of the markets that participate in the HRM reclamation bonding sector, who could have provided necessary expert advice on this proposed rule.

opportunity to provide minimal advice on this complex issue before any details were available.

CERCLA clearly directs EPA "[t]o the maximum extent practicable . . . cooperate with and seek the advice of the commercial insurance industry ***in developing financial responsibility requirements***." 42 U.S.C. § 9608(b)(2) (emphasis added). However, EPA never shared the type of information necessary for these stakeholders to provide any meaningful advice in the development of this rule as directed by Congress. In fact, EPA even declined to discuss essential issues with stakeholders. *See* Surety Meeting Notes at 4 ("EPA responded that EPA is not able to share details on the [financial responsibility] model right now[.]") When the agency consulted with the insurance, surety, and banking sectors, EPA was many months away from finalizing key documents that supported the agency's decisions on the draft terms and conditions of each of the third-party instruments, including the specific wording of each agreement and the eligibility requirements for these instruments.[94]

In addition, these stakeholders were never given other important information related to the aggregate amount of financial responsibility estimated under this proposed rule,[95] the process for regulatory review and approval of financial responsibility amounts, or other triggers in the rule that will require action from an instrument provider. All are key elements related to the exposure that these providers will be insuring against and will directly influence their willingness to participate in the market. Yet, EPA squandered the opportunity to obtain critical advice while developing the proposed rule.

Overall, EPA's lack of transparency resulted in a missed opportunity to learn from the experts, including those familiar with the complexities of existing bonding regimes for the HRM industry. The agency did not avail itself of the expertise offered by those in the financial and banking sectors and instead simply "checked the box" and developed its proposal in a vacuum. Because of this choice, EPA was left to guess at what the

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[94] *See* CERCLA § 108(b) Financial Responsibility Instrument Support: Potential Issuer Eligibility Requirements for Insurance, Surety Bonds, Letters of Credit, and Trust Agreements and Standby Trust Agreements under CERCLA § 108(b) (Nov. 2016) (EPA-HQ-SFUND-2015-0781-0504); *See also* CERCLA § 108(b) Financial Responsibility Instrument Specification: Potential Requirements for Insurance, Surety Bonds, Letters of Credit and Trust Agreements and Standby Trust Agreements under CERCLA § 108(b) (Nov. 2016) (EPA-HQ-SFUND-2015-0781-0503).

[95] EPA even cautions that sufficient capacity "will be highly dependent upon the overall amount of financial responsibility that the market will need to accommodate." 82 Fed. Reg. at 3399. This information was not available during the stakeholder meetings. *See* Insurance Meeting Notes at 1 ("EPA responded that the model/formula is still under development and that the Agency hasn't established a minimum or a maximum."). The Surety & Fidelity Association of America asked for this information *six months* after EPA's meetings with stakeholders. Letter from Surety & Fidelity Association of America to Mathy Stanislaus, Assistant Administrator of the Office of Land and Emergency Management at 3 (July 14, 2016) (EPA-HQ-SFUND-2015-0781-0443) (SFAA Letter) ("Does EPA have an estimate of the aggregate required amount of financial assurance for the entire hardrock mining industry?"). EPA did not provide this information before issuing the proposed rule.

financial industry would potentially find palatable. This woefully limited consultation does not comply with the more rigorous outreach intended by Congress.

C. The Terms and Conditions for the Proposed Third-Party Instruments Will Discourage Providers from Participating in this Market

As demonstrated throughout this rulemaking, limited consultation with the experts has resulted in a fundamentally flawed rule. EPA's failure to continue the conversation and seek the advice of the insurance, surety, and banking experts while developing the key elements of the rule is apparent in the defects found in the proposed financial responsibility instruments. The amounts calculated from the proposed rule are enormous and the form and function of the instruments are unconventional compared to current commercial products used to financially support or transfer risk for environmental obligations. The combination of these features all but guarantee that third-party underwriting will be unavailable except for a select few and expensive for anyone who can access such coverage.

One third of the 49 sites EPA modeled yield final financial responsibility amounts in excess of the prevailing $50 million policy limit for environmental site liability. RIA, Appendix B, Exhibit B-9. For companies with multiple facilities, the underwriters' aggregate company exposure limits pose additional constraints on accessing third-party financial responsibility instruments for each of its facilities.

EPA's failure to examine the relevant market segment in its "macro" analysis of market capacity is compounded further by erroneously projecting a market response for an entirely different obligation than the current market for the commercial financial products EPA examined in the market capacity study. At its core, the obligation EPA has designed in the proposed rule is disconnected from the actual event or risk of a release of a hazardous substance. This fundamental change arises primarily from the proposed use of cancellation, termination, non-renewal or filing for bankruptcy protection—events distinct from an actual or threatened release of a hazardous substance—as triggers for automatic recovery of the full amount of the financial instrument. So rather than insuring the risk of a release or owners' performance, the obligation EPA is requiring the insurance and surety industry to guarantee is the insured company's financial condition.

CERCLA requires EPA "[t]o the maximum extent practicable . . . cooperate with and seek the advice of the commercial insurance industry in developing financial responsibility requirements." 42 U.S.C. § 9608(b)(2). The direct inference from this requirement is that Congress intended EPA to fashion financial responsibility requirements in a manner that would align closely with the common available forms available in the commercial market place. Here, EPA has proposed financial responsibility requirements that are directly at odds with the fundamental and customary underwriting practices, the risks they typically underwrite, and the business models of insurance, surety, and LOC providers. There is nothing in the statutory design that compels EPA to fashion a financial responsibility obligation in such a manner.

EPA's apparent answer is simply that "economic principles suggest that as demand for a new product increases, insurers and sureties will seek to satisfy such demand with new products." Market Capacity Study at 2. This "Field of Dreams" bromide (*If you build it, they will come*) misses the mark. The third-party providers will behave like any other business and find a more attractive use of their capital. Longer-tail and vague exposures such as those proposed delay their ability to report a return and make it more difficult to extract their risk capital. Premature payouts as envisioned under the range of trigger events will prevent the third-party providers from attaining the earnings on premiums to more than offset any payouts. On the other side for HRM companies, financial responsibility instruments that are not available because of lack of qualification, collateral requirements, and higher premiums provide no demand at all. EPA's proposed rule represents a minefield for all participants.

NMA highlights some of these concerns in more detail below, which were identified based on discussions with various financial assurance providers in the insurance, surety, and banking communities, as well as internal discussions with member company finance experts.

- **EPA's Approach Restricts the Diversity of Available Options**: EPA acknowledges that market capacity will be influenced by the agency's own decisions on: (1) the diversity of instruments allowed; (2) whether risk retention groups (RRGs) are allowed; and (3) whether a financial test is permitted. 82 Fed. Reg. at 3399. According to the agency, "[a]ll such features, if included in the rule, could help to relieve pressure on third-party surety markets and ensure greater market capacity." Yet, EPA's proposal does not even implement the methods the agency has identified as necessary to promote capacity. EPA's preferred option is no financial test, even though the agency recognizes that under this approach "limited market capacity may be burdened." 82 Fed. Reg. at 3440 fn.131. In addition, EPA does not propose to allow captive insurance or RRGs as eligible issuers; rather, it merely seeks comment on various concerns regarding these mechanisms and additional ratings requirements the agency may impose if the agency approved their use. *See* 82 Fed. Reg. at 3426-27. This baffling bait and switch further erodes the reliability of EPA's overall market capacity analysis.

- **Direct Access by Third Parties**: NMA understands that third-party direct action is a major concern raised by numerous instrument providers. For example, we are aware through comments submitted by the Surety & Fidelity Association of America (SFAA) last summer that direct-action claims will pose a major impediment to participation by a significant portion of the surety market. SFAA Letter at 2. In EPA's limited consultation, this theme was also prevalent. *See* Surety Meeting Notes ("3rd party liabilities that can be claimed by a wide range of claimants may cause concern to surety providers because it can be very expensive and messy"); *See also* Insurance Meeting Notes at 4 ("direct action is possible, but it's not a preference for the insurer"); LOC

Meeting Notes at 3 (“direct action wouldn’t work because it would make the LOC like an insurance policy and a LOC is not, and cannot be, an insurance policy”). While EPA “sought to address the major issues raised by the financial community” in the proposed rule, 82 Fed. Reg. at 3414, NMA remains very concerned that the language in the instruments is not adequate to describe the requirements for direct action claims. Additionally, EPA’s failure to impose limitations on a provider’s ability to recover costs for defense of these claims from the instrument will limit the number of providers willing to undertake this new liability. The result is likely unreasonably high costs imposed on owners and operators seeking coverage, such as high premiums and fees to cover claims management and defense of claims outside the limits of the policy.

- **Extremely High Limits of Liability**: The surety industry is on record that the aggregate demand imposed on the market by this rule will have an impact on market capacity in that sector. SFAA cautioned that “the aggregation of financial assurance requirements could present availability challenges, particularly considering the other risks” identified by the association. SFAA Letter at 3. Notably, SFAA pointed out the inherent duplication of EPA’s proposed rule with existing state and federal bond requirements that its members currently provide, emphasizing the need to avoid duplicative liability. *Id.* at 2-4 (“there is significant overlap of coverage between the 108(b) financial assurance and the surety bonds currently being furnished to meet state and federal requirements”). EPA, however, did not listen to this advice. As discussed above, the estimated amount of financial responsibility for the expected universe of modeled facilities exceeds the current global capacity of the surety and insurance markets identified by the agency.

- **Cancellation, Termination, or Non-Renewal as a Payment Trigger**: EPA proposes to use cancellation, termination, or non-renewal of a product as a trigger for recovery of the full-face amount of the instrument. Consequently, EPA can call the face amount of the policy, put it into a standby trust account and hold that money indefinitely. This requirement effectively changes the nature of the risk being covered. Instead of providers assessing the risk of a CERCLA response event, providers will be forced to underwrite the ability of the operator to meet financial and administrative compliance requirements not directly related to CERCLA’s statutory purpose. NMA understands that this kind of trigger is at odds with how commercial third-party insurance operates and could result in much higher premiums and collateral requirements.

- **Bankruptcy as a Payment Trigger**: As proposed, bankruptcy triggers a claim on the financial responsibility instrument. However, EPA has been warned that bankruptcy alone should not be a trigger for payment and including this payment trigger would constrain the market. *See* Surety Meeting Notes at 3 (“Zurich commented that the surety provider would prefer that bankruptcy alone not be a trigger for payment” and that this “will impact

surety providers' interest in participating in the program."). *See also* SFAA Letter at 2 ("Merely filing for bankruptcy should not be the triggering event for rights under the bond."). As discussed in Section C, bankruptcy will not necessarily result in the government being responsible for remediation at the site, since operators are often still able to meet their environmental obligations during bankruptcy proceedings. As one surety stakeholder pointed out to EPA, "to interpret bankruptcy as equivalent to a threatened release . . . could trigger action on EPA's part even if no actual release had occurred at the mining site." Surety Meeting Notes at 3.

- **Constraints on the Form and Function of the Allowable Financial Responsibility Instruments**: EPA is imposing technical limitations on specific financial instruments that are not typically seen in the market. For example, EPA has removed horizontal excess coverage for commercial insurance. This is a significant departure from typical insurance underwriting and structuring that eliminates necessary flexibility and therefore restrains the insurance markets. EPA's proposed rule also dictates new terms for multiple sureties that are inconsistent with common surety practices and therefore could limit participation of sureties in this market.

- **Undefined Release Processes**: EPA's failure to provide any details on the process for releasing HRM owners and operators from this obligation is also an impediment. *See* Surety Meeting Notes at 3 ("'Duration risk' is a concern"). The SFAA explained in the context of surety bonds that "long duration increases the risk to the surety." SFAA Letter at 3. Accordingly, "sureties typically raise their underwriting standards, and provide long-term bonds only to the largest and most financially sound operators." *Id.* The duration of the liability risk is a crucial element of the proposed rule, yet EPA provides little details on the release procedure. Furthermore, EPA provided no meaningful standard to determine if a facility presents "minimal" risk warranting release of the entire obligation. EPA's failure to clarify the petition process owners and operators would take to obtain a release from the CERCLA financial responsibility program will impact market capacity. EPA is effectively creating an indefinite obligation, regardless of the operating status of the facility. As EPA's Market Capacity Study itself shows, the appetite in the market to cover long-term liabilities with no end date has significantly eroded over the years. This scenario deprives the instrument providers from any certainty on the discontinuation of the obligations, which will ultimately limit market participation.

NMA is confident that other issues will be identified in the record that will provide a more comprehensive picture of the ways in which EPA's proposed rule and the terms related to the third-party instruments will result in a significantly constrained market. This will have substantial ramifications on the HRM sector's ability to procure affordable instruments to cover the full-face value of their estimated CERCLA financial responsibility obligations. EPA's failure to adequately assess market capacity and seek

the advice of the financial and banking industries throughout the entire rulemaking process has resulted in a proposed rule that exposes the HRM industry to liability obligations that far surpass the sector's risk-profile and the existing market capacity. Considered as a whole, these significant errors support the agency's ultimate withdrawal of the proposed rule.

VI. Implementation Issues

While NMA believes that EPA's proposed rule is unlawful and unsupported by the record and should be withdrawn, NMA provides the following brief comments on two implementation issues: (1) EPA's decision to only apply the CERCLA § 108(b) obligation on currently active facilities and not inactive facilities or legacy sites; and (2) EPA's proposed requirements for public notice as outlined in Section 320.9.

A. CERCLA § 108(b) is Prospective in Nature and Should Not Apply to Inactive HRM Facilities

First, NMA agrees with EPA that any CERCLA § 108(b) financial responsibility requirements should only apply to "current owners or operators of facilities that are authorized to operate, or should be authorized to operate, on or after the effective date of the rule." *See* 82 Fed. Reg. at 3486 (Proposed § 320.2(a)); *See also id.* at 3404 ("EPA intends for this proposal to be focused upon an easily-identified, particular subset of parties that has control over and are thus in the best position to control and address hazardous substance management activities."). The text of CERCLA § 108(b) makes it clear that financial responsibility requirements are prospective only and can only be made applicable to releases from units at facilities that are active on the date the regulations go into effect. *See* 42 U.S.C. § 9608(b)(1) & (2). Specifically, Congress chose to use language in the present tense to describe the operations to which this requirement would apply. *See* 42 U.S.C. § 9608(b)(1) (identifying "production, transportation, treatment, storage or disposal of hazardous substances"); *Compared to* 42 U.S.C. § 9607(a)(2)-(4) (imposing liability on those who are presently disposing of, transporting, or arranging for disposal of hazardous substances, as well as those who "owned or operated" any facility at the time hazardous substances were disposed, or who "arranged" for disposal or treatment of hazardous substances, or who "accept or accepted" hazardous substances for transport.). Moreover, the financial instruments described in CERCLA § 108(b)(2) are also prospective mechanisms for covering those requirements. *See* 42 U.S.C. § 9608(b)(2). Financial responsibility under CERCLA is intended to address current and future risks from ongoing and future mining operations, not to fund the cleanup from legacy mining sites or inactive units at currently operating facilities.

This "forward looking" reading of CERCLA § 108(b) is also confirmed by how EPA has implemented financial responsibility requirements under RCRA. As the legislative history supporting CERCLA § 108(b) indicates, these financial responsibility requirements were modeled on the financial assurance provisions of RCRA. *See* Report of the Senate Committee on Environment and Public Works, No. 96-848 (July 11, 1980)

("Senate Report") at 92. (CERCLA § 108(b) "is modeled on similar provisions in the Clean Water Act and the Solid Waste Disposal Act."). The wording of the relevant financial assurance provisions of RCRA is in many respects identical to the wording in CERCLA § 108(b). RCRA § 3004(a)(6) provides that EPA may promulgate requirements relating to financial responsibility applicable to owners and operators of facilities for the "treatment," "storage" or "disposal" of hazardous waste, that are "consistent with the degree and duration of risks associated with [such] treatment, storage and disposal." 42 U.S.C. § 6924(a)(6). This wording is very similar to the wording of Section 108(b), which provides for financial responsibility requirements "consistent with the degree and duration of risk associated" with the "treatment," "storage" or "disposal" of hazardous substances, as well as with the "production" or "transportation" of hazardous substances. *See also* RCRA § 3004(t), 42 U.S.C. § 6924(t) (discussing the forms of allowable financial assurance, and the manner in which the United States may proceed against the guarantor, in terms that are identical to those contained in Section 108(b) of CERCLA). The only fair reading is that financial responsibility requirements apply only to active units (at the time the rule goes into effect), or those that become operational in the future.[96]

Finally, a wholly prospective reading of CERCLA § 108(b) is also compelled by the legislative history of the statute. The Senate Report – which provides the only real discussion of Section 108(b) – states that Section 108(b) "requires those engaged in businesses involving hazardous substances to maintain evidence of financial responsibility commensurate with the risk which they present." Senate Report at 92 (emphasis added). A fair reading of this sentence is that Section 108(b) requirements are meant to apply only to those currently engaged in handling or otherwise managing hazardous substances – not to wholly inactive businesses or to inactive portions of ongoing businesses. This reading of Section 108(b) is also supported by testimony given by EPA before Congress in 1979. At that time, Thomas C. Jorling, the EPA Assistant Administrator for Water and Waste Management, testified before a Senate subcommittee that new financial responsibility requirements in a hazardous substance liability law would be important to increase "standards of care" with respect to

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[96] Other federal financial assurance programs only apply prospectively. For example, EPA's financial assurance requirements for underground storage tanks (UST) under RCRA § 9003 apply only to tanks operating on or after the compliance date specified in the regulations. *See* 40 C.F.R. § 280.90(b) ("Owners and operators of petroleum UST systems are subject to these requirements if they are in operation on or after the date for compliance established in § 280.91.") The same is the case for the functionally equivalent financial assurance requirements imposed on the HRM industry by the BLM and U.S. Forest Service pursuant to other statutes. For instance, the BLM, in its Part 3809 regulations, and the U.S. Forest Service, in its Part 228 regulations, impose financial assurance for reclamation only with respect to units that were in operation on the effective date of the regulations, or that came into existence thereafter. *See* 45 Fed. Reg. 78,902, 78,906 (Nov. 26, 1980) (original BLM financial guarantee requirements do "not apply to those areas that were disturbed prior to the effective date of this final rulemaking unless operations continue or begin again in the same project area"); 36 C.F.R. § 228.2 (U.S. Forest Service requirements "apply to operations hereafter conducted").

management of such substances.[97] Mr. Jorling testified that this goal is not "relevant" to sites where releases have occurred in the past, where "it is already too late; emergency assistance and containment are required." *Id.*

B. NMA Opposes EPA's Proposed Requirements for Public Notice

EPA is proposing that owners and operators subject to CERCLA § 108(b) requirements create specific websites that would make public certain information regarding their compliance with this rule. Specifically, each covered company would post their initial notification forms that are required under proposed Section 320.5. Companies would also be required to post information on: (1) the initial financial responsibility amount and subsequent changes; (2) application for release from the requirements; (3) when a claim is made on the instrument; (4) upon receiving notification of cancellation of an instrument; (5) upon transfer of ownership of the facility; and (6) upon submitting notice to a regulator of a facility's closure. 82 Fed. Reg. at 3410. According to EPA, this public website will provide incentives for companies to fully comply with the requirement and ensure that the formula is applied as EPA intended. EPA also claims that this public website would support the CERCLA response actions taken by the U.S. government, states, and private parties by making information readily available. *Id.* at 3409.

Public disclosure on a company website is unwarranted and unnecessary. EPA has not offered a justifiable reason for putting this onus on the HRM industry. First, it is overreaching and not within the scope of the statutory language. Second, the agency has implemented financial assurance, for example under RCRA, without requiring this type of extensive public disclosure. Third, EPA should not hide behind the self-implementing nature of this rule to create even more regulatory burden on the HRM industry. If EPA wants to disclose this information for transparency, the agency should create its own clearinghouse of information. To suggest that company websites will create more accurate financial responsibility estimates or compel a higher level of compliance is simply absurd. Companies will have every incentive to determine the appropriate level of financial assurance and obtain coverage for that requirement simply to avoid enforcement by the agency. As EPA is aware, the agency retains enforcement authority over the level of financial responsibility a company establishes through this self-implementing rule. *See* 82 Fed. Reg. at 3401 ("If EPA determines the financial responsibility amount submitted by the owner or operator to be inadequate, EPA may choose to initiate enforcement proceedings."). EPA cannot simply create this burdensome regulatory requirement and then walk away from any responsibility in its implementation, particularly regarding future claims against the instruments.

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[97] *See* Statement of Thomas C. Jorling, Assistant Administrator for Water and Waste Management, USEPA regarding S.1341/S.1480 (Sen. Comm. on Env't and Public Works, Subcommittees on Resource Protection and Environmental Pollution, June 20, 1979).

Conclusion

NMA appreciates the opportunity to comment on this important proposed rule. NMA respectfully requests that EPA withdraw this proposal and publish a final notice of action determining that no new financial responsibility requirements are warranted under CERCLA § 108(b) because the HRM industry does not present the "highest level of risk of injury" or present the "degree and duration of risk" contemplated under the statute. Accordingly, a CERCLA § 108(b) program is unwarranted for the HRM industry. If you have any questions regarding NMA's comments, please contact me at tbridgeford@nma.org or (202) 463-2629.

Appendix A

Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule

Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule

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July 2017

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List of Exhibits

List of Acronyms	
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADEQ	Alaska Department of Natural Resources
ADNR	Arizona Department of Environmental Quality
AKWQS	Alaska Water Quality Standard
AMLRA	Arizona Mined Land Reclamation Act
AP	Acid Generating Potential
APP	Aquifer Protection Permit (Arizona)
A.R.S.	Arizona Revised Statutes
BADCT	Best Available Demonstrated Control Technology
BLM	U.S. Bureau of Land Management
BMP	Best Management Procedures or Practices
CCR	Colorado Code Regulations
CDPHE	Colorado Department of Public Health and Environment
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CRB	Clean Water Act
CWA	Colorado Reclamation Board
DMO	Designated Mining Operation (Colorado)
DMR	Division of Mine Reclamation (California)
DOGAMI	Department of Geology and Mineral Industries (Oregon)
DRMS	Division of Reclamation, Mining, and Safety (Colorado)
EAW	Environmental Assessment Worksheet (Minnesota)
EMNRD	Energy, Minerals, and Natural Resources Department (New Mexico)
EPA	U.S. Environmental Protection Agency
FA	Financial Assurance
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FLMA	Federal Land Management Agency
HLDE	Heap Leach Draindown Estimator (Nevada)
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
IFM	Interim Fluid Management (Nevada)
IWMP	Integrated Waste Management Permit (Alaska)
LCRS	Leak Collection and Recovery System
LQD	Land Quality Division (Wyoming)
MAR	Montana Administrative Rule
MCA	Montana Code Annotated
MCL	Maximum Contaminant Level
MCL	Michigan Compiled Laws
MEPA	Minnesota Environmental Policy Act
MIDEQ	Michigan Department of Environmental Quality
MMRA	Minnesota Mineland Reclamation Act

List of Acronyms	
MMMRA	Montana Metal Mine Reclamation Act
MNDNR	Minnesota Department of Natural Resources
MOU	Memorandum of Understanding
MMD	Mining and Minerals Division (New Mexico)
MPCA	Minnesota Pollution Control Agency
MTDEQ	Montana Department of Environmental Quality
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NDWR	Nevada Division of Water Resources
NMA	National Mining Association
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMMA	New Mexico Mining Act of 1994
NMSA	New Mexico Statutes Annotated
NMWQCA	New Mexico Water Quality Control Act
NP	Neutralization Potential
NPDES	National Pollutant Discharge Elimination System
NAS/NAS	National Research Council/National Academy of Science
NREPA	Natural Resources and Environmental Protection Act (Michigan)
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
OOGM	Office of Oil, Gas, and Minerals (Michigan)
PCMS	Process Component Monitoring System
PCWQCA	Porter Cologne Water Quality Control Act (California)
PFCE	Process Fluid Cost Estimator (Nevada)
PFS	Process Fluid Stabilization (Nevada)
POC	Point of Compliance
PTM	Permit to Mine (Minnesota)
QAPP	Quality Assurance Project Plan (Alaska)
RCE	Reclamation Cost Estimate (Nevada)
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RWQCB	Regional Water Quality Control Board (California)
SEPA	State Environmental Policy Act (Washington)
SMARA	Surface Mining and Reclamation Act (California)
SMCRA	Surface Mining Control and Reclamation Act of 1977
SMGB	State Mining and Geology Board (California)
SRCE	Standardized Reclamation Cost Estimator (Nevada)
SRK	SRK Consulting
TSF	Tailings Storage Facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UDOGM	Utah Division of Oil, Gas, and Mining
UDWR	Utah Division of Water Resources
UMLRA	Utah Mined Land Reclamation Act

List of Acronyms	
WAR	Wyoming Administrative Rule
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WDR	Waste Discharge Requirement (California)
WEQA	Wyoming Environmental Quality Act
WMMMA	Washington Metals Mining and Milling Act
WPCF	Water Pollution Control Facility (Oregon)
WYDEQ	Wyoming Department of Environmental Quality

INTRODUCTION

The National Mining Association ("NMA") retained Debra W. Struhsacker, Environmental Permitting and Government Relations Consultant, and SRK Consulting to prepare this report on the environmental protection and financial assurance regulations for hardrock mining in 15 mining states. The states included in this report are: Alaska, Arizona, California, Colorado, Florida, Idaho, Michigan, Minnesota, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. NMA is submitting this report to the U.S. Environmental Protection Agency ("EPA") as part of NMA's response to EPA's January 2017 Proposed Rule entitled Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry ("Proposed Rule")[1].

This report focuses on how the environmental protection regulations in the above-listed states work in tandem with their financial assurance requirements to minimize the degree and duration of risks associated with potential releases of hazardous substances from hardrock mines. The information presented in this report provides substantial evidence that the environmental protection and FA requirements in these states are "consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances" pursuant to the Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended, 42 U.S.C. 9601 *et seq*. ("CERCLA") § 108(b)(1).

The state profiles presented in Section III of this report provide overwhelming evidence that there is no justification for EPA's Proposed Rule, which would impose an additional and unnecessary layer of financial responsibility on the hardrock mining industry. As clearly documented in this report, the states' existing environmental protection and FA requirements fully address the Congressional mandate in CERCLA § 108(b)(1) to evaluate the need for an EPA financial responsibility program for classes of facilities that pose the "highest level of risk of injury." As explained in the National Mining Association's comments, EPA has incorrectly identified the hardrock mining industry as having risks that fall under Congress' CERCLA § 108(b)(1) directive.

[1] Federal Register Vol. 82, No. 7 ("FR") pp. 3388 – 3512.
[2] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands
[3] The Bureau of Land Management ("BLM") and the U.S. Forest Service ("Forest Service")
[4] EPA's analysis includes the tables in Appendix IV in EPA's November 2016 "Comprehensive

I. THE NATIONAL ACADEMY OF SCIENCES STUDY FINDINGS ON THE FEDERAL REGULATIONS FOR HARDROCK MINING AND IMPLICATIONS FOR THE CERCLA § 108(B) RULEMAKING

Responding to a Congressional request, the National Research Council's National Academy of Sciences ("NAS") published a study in 1999 entitled "Hardrock Mining on Federal Lands[2]" ("NAS Study") that evaluated "the adequacy of the regulatory framework for hardrock mining on federal lands." In this study, the NAS:

- Identified the federal and state statutes and regulations applicable to environmental protection of federal lands in connection with mining activities;

- Considered the adequacy of statutes and regulations to prevent undue and unnecessary degradation of the federal lands; and

- Made recommendations for the coordination of federal and state regulations to ensure environmental protection, increase efficiency, avoid duplication and delay, and identify the most cost-effective manner for implementation.

The findings of this NAS Study are relevant to EPA's January 2017 Proposed Rule for several reasons. First, the NAS Study found that the combined state and federal regulatory framework for mining effectively protects the environment. Secondly, this 1999 study identified several regulatory gaps that the Federal Land Management Agencies ("FLMAs")[3] subsequently filled, including gaps pertaining to closure and long-term management that correspond to several of the CERCLA § 108(b) response criteria. Exhibit 1 lists the provisions in the FLMAs' surface management regulations governing hardrock mining that address the thirteen CERCLA § 108(b) response categories.

The FLMAs' actions to fill the gaps identified in the NAS Study are important in answering the key question of whether EPA should have a future role pursuant to CERCLA §108(b) in managing an FA program for the hardrock mining industry. It is clear from the FLMAs' expansion of their FA programs to fill the identified gaps that the FLMAs already have demonstrated their ability to modify their requirements as may be appropriate to address any identified gaps or inadequacy in their rules.

The FLMAs' gap-filling history clearly demonstrates there is no need for EPA to insert itself and impose a new, duplicative FA program under CERCLA § 108(b). In the event the need for future refinements to the FLMAs' FA programs becomes evident, the FLMA can use their existing authorities to make these refinements.

The following sections describe the specific NAS Study findings germane to the Proposed Rule.

[2] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands

[3] The Bureau of Land Management ("BLM") and the U.S. Forest Service ("Forest Service")

A. Effectiveness of the Regulations

The key finding of the NAS Study was that the federal and state laws and regulations for hardrock mining work together to provide comprehensive environmental protection:

> "The overall structure of the federal and state laws and regulations that provide mining-related environmental protection is complicated but generally effective. The structure reflects regulatory responses to geographical differences in mineral distribution among the state, as well as the diversity of site-specific environmental conditions…BLM and Forest Service should continue to base their permitting decisions on the site-specific evaluation process provided by NEPA. The two land management agencies should continue to use comprehensive performance-based standards rather than using rigid, technically prescriptive standards. The agencies should regularly update technical and policy guidance documents to clarify how statutes and regulations should be interpreted and enforced." (NAS Study at 5.)

Applicability to the Proposed Rule

These findings are directly relevant to the Proposed Rule for two reasons. First, although the existing state and federal regulatory regimes may be complex (meaning there are multiple state and federal regulations and regulatory agencies governing environmental protection and FA requirements at hardrock mines) they are nonetheless effective and comprehensive. This complexity does not lend itself to a simple survey of requirements and is not adequately reflected in EPA's analysis for the CERCLA § 108(b) rulemaking of the status of current regulatory requirements[4]. Understanding the complexity and the interdependent connections between the various regulatory programs is essential in understanding the scope of the existing regulatory and FA framework for hardrock mines.

Secondly, the NAS Study explicitly states that regulatory requirements for mines must be based on site-specific conditions and specifically discourages the uniform methods EPA has used in the Proposed Rule. EPA's Proposed Rule takes a one-size-fits-all approach that uses "rigid and technically prescriptive" factors in the response category formulas because the agency determined a site-specific rule would be too hard to implement. In marked contrast, the States' and the FLMAs' environmental protection regulations and FA requirements are based on site-specific performance criteria. As discussed below, both the States and FLMAs have taken the NAS Study site-specific recommendations to heart by using site-specific criteria. They have also continued to refine their regulatory and FA programs in response to newly identified circumstances since the NAS Study was published in 1999. For example, the FLMA currently

[4] EPA's analysis includes the tables in Appendix IV in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (EPA-HQ-SFUND-2015-0781-0144) and the state summaries in the rulemaking docket generally located at (EPA-HQ-SFUND-2015-0781-XXXX). Neither the tables nor the summaries provide complete or accurate descriptions of the States' regulatory and FA programs.

hold approximately $3.5 billion in FA. Some of this FA corresponds to the gap-filling measures that BLM and the Forest Service developed in response to the NAS Study.

B. Financial Assurance Recommendations

The NAS Study found that FA was lacking for small projects affecting five acres or less and recommended that: "Financial assurance should be required for reclamation of disturbances to the environment caused by all mining activities beyond casual use, even if the disturbance is less than five acres." (NAS Study at 8).

Applicability to the Proposed Rule

In response to this finding, the FLMA now require FA for any disturbance. This is just one example of the continuous improvement of the FLMAs' FA programs, demonstrating the ability of the FLMA to modify their FA programs to fill what was identified as a gap in 1999. The FLMA's response underscores the importance of keeping the FA program with the two land management agencies rather than duplicating it with an EPA-managed FA program under CERCLA § 108(b). Similarly, if any gaps are identified in the future, the States and FLMAs are capable of filling such gaps as may be appropriate. Additional CERCLA § 108(b) regulations are not warranted.

C. Project Modifications

The NAS Study examined the FLMAs' existing authorities to require modifications to plans of operation and concluded:

> "BLM and the Forest Service should revise their regulations to provide more effective criteria for modification to plans of operations, where necessary, to protect the federal lands." (NAS Study at 8).

Applicability to the Proposed Rule

This is another example of how BLM and the Forest Service modified their regulations to fill this NAS-identified gap. Today, the FLMA have ample regulatory authority to require mine operators to submit modified plans of operation to address any identified issues stemming from monitoring data results, a project upset, or any other circumstance, and to provide FA to cover the required changes. Thus, the FLMAs' FA requirements are not static at any given site, are always subject to agency review, and must be updated to keep pace with inflation even if there are no project changes[5].

[5] See, for example, 36 CFR § 228.13 and Forest Service Manual 2817.24 and 43 CFR § 3809.552

D. Closure Plans

The NAS Study identified a gap pertaining to the FLMAs' authorities to deal with mines in temporary closure and to require interim management measures applicable to temporary closure:

> "BLM and the Forest Service should adopt consistent regulations that: a) define the conditions under which mines will be considered to be temporarily closed; b) require that interim management plans be submitted for such periods; and c) define the conditions under which temporary closure becomes permanent and all reclamation and closure requirements must be completed (NAS Study at 8).

Applicability to the Proposed Rule

Both FLMAs added specific requirements to their regulations pertaining to temporary closure, interim management plans, final closure, and corresponding FA in response to this NAS Study recommendation. The addition of these requirements since 1999 provides "cradle-to-grave" FA for projects on federal lands that specifically address the following CERCLA § 108(b) response cost categories: interim operations and management ("O&M"); long-term O&M including long-term monitoring; and water treatment for sites where these measures are necessary to protect the environment and provide adequate FA.

E. Post-Closure Management

The NAS Study also identified a gap dealing with the FLMAs' post-closure management authorities and recommended:

> "BLM and the Forest Service should plan for and assure the long-term post-closure management of mine sites on federal lands." (NAS Study at 9).

Applicability to the Proposed Rule

As discussed above, BLM and the Forest Service modified their regulations to fill gaps identified in the 1999 NAS Study pertaining to long-term, post-closure management. Today, the FLMA can require a trust fund or other source of long-term funds to monitor and manage a site following final closure. BLM can require an operator to provide a trust fund pursuant to 43 CFR § 3809.552(c):

> "When BLM identifies a need for it, you must establish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, post-mining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later."

Similarly, the Forest Service modified Manual 6500 in 2016 to add the authority to require an operator to provide a long-term trust:

> "Long-term trusts must be established…as a financial assurance for activities that are required to prevent post-reclamation damage. Post-reclamation activities may include water treatment, dam maintenance, and care and maintenance of infrastructure."

The addition of long-term trust FA requirements is another example of how the FLMAs eliminated an identified gap, demonstrating why EPA does not need to develop a FA program pursuant to CERCLA § 108(b). The FLMAs have clear authority and a proven track record in modifying and expanding their regulatory and FA programs to respond as appropriate to identified gaps. There is no need for EPA to insert itself and develop FA under CERCLA § 108(b). In fact doing so would create an unnecessary and duplicative regulatory and FA program.

II. OVERVIEW OF STATE REGULATORY PROGRAMS

The NAS Study finding that "[t]he overall structure of the federal and state laws and regulations that provide mining-related environmental protection is complicated but generally effective" (NAS Study at 5) is applicable to the States' regulatory framework as well as to the federal regulations. This complexity must be thoroughly understood in order to evaluate the States' comprehensive and effective environmental regulatory and FA programs. The states' environmental protection regulations and the corresponding FA requirements are typically lodged in different parts of each states' laws and regulations. In most states, the laws and regulations applicable to hardrock mining are administered by more than one state agency. EPA's analysis of the states' environmental protection regulations and FA authorities does not adequately capture this complexity.

The regulatory and FA framework governing tailings storage facilities ("TSF") are instructive in understanding the complex but comprehensive nature of many states' regulatory and FA requirements for hardrock mining because different agencies and regulations govern different parts of the TSF in a number of states. For example, in some states the regulatory authority with jurisdiction over water resources administers regulations pertaining to dam design, construction, and operation. These dam safety regulations impose rigorous design standards to promote public safety by reducing the risk of dam failure and the potential for the release of tailings and any water or hazardous substances that may be stored in the impoundment. Thus, in the context of the Proposed Rule, the dam safety regulations are very important because they minimize the potential for a tailings spill and a release of hazardous substances from a TSF.

States typically have environmental regulations based on environmental protection statutes, which establish minimum design and containment standards for the tailings impoundment and any hazardous substances that may be present in the tailings impoundment. These regulations protect groundwater and surface water during operation, reclamation, closure, and post-closure of a TSF. A state's department of environmental protection or environmental quality administers the groundwater protection regulations applicable to a TSF.

Finally, a third set of regulations typically governs the reclamation of both the tailings embankment and the impoundment. In some states like Nevada, the regulatory agency charged with environmental protection also has jurisdiction over the reclamation regulations. In other states, like Arizona or Utah, a third and separate regulatory body with jurisdiction over mining is in charge of the reclamation regulations. One or more agencies administer the FA requirements for a TSF.

Although the regulations governing environmental protection, reclamation, closure, and FA for a TSF are typically a shared responsibility among two or more state agencies, these regulations work as a package. The coordination of these regulatory programs effectively minimizes the potential risk of a release of hazardous substances from a TSF. By focusing solely on FA requirements under state regulations, EPA's summaries of the states' FA programs do not adequately describe this complexity or fully comprehend how the states' regulatory structures and environmental protection requirements are coordinated with its FA programs and the relationship of the environmental protection requirements to the amount of necessary FA.

Because the regulations governing dam safety are a key component of minimizing the risk of a release of hazardous substances from a TSF, they must be considered in evaluating the degree and duration of risk that would drive the need for the Proposed Rule.

The NAS Study emphasizes that mining regulations must be site specific:

> "Hardrock mining operations in the United States are regulated by a complex set of federal and state laws and regulations intended to protect the environment…The scope and degree of regulation depends on the type and size of the mining operation; the kinds of land, water, and biological resources affected; the state in which the operation is located; the organization of the state and local permitting agencies' and the ways federal and state agencies implement relevant statutes and regulations." (NAS Study at 3.)

The Proposed Rule, which is based on a one-size-fits-all approach, conflicts with this finding and recommendation of the NAS Study. The need for long-term water treatment illustrates this point. The costs for water treatment at a number of the mines in EPA's in Exhibits B-6, through B-8 of EPA's Regulatory Impact Analysis (Docket No. EPA-HQ-SFUND-0781) should be zero and not the values indicated. EPA has incorrectly assumed that all mines will require post-closure water treatment facilities and thus should have FA for long-term operation and maintenance of these facilities.

EPA has apparently overlooked the process water discharge restrictions contained in the Clean Water Act ("CWA") at 40 CFR Part 440 Ore Mining and Dressing Point Source Category Effluent Limitations Guidelines and New Source Performance Standards (FR Vol 47, No. 233, pp. 54598 – 5462) and more importantly, that any surface water discharges so authorized are regulated under site specific CWA permits. Mines in net annual evaporation settings therefore do not typically have water treatment facilities – even during operation – and rarely require them during closure and post-closure. In contrast, mines in net annual precipitation settings may need long-term water treatment facilities that need to be considered in the FA requirements. For those facilities at which a discharge is authorized, the operator must secure the appropriate discharge permit from either the EPA or the state regulatory agency with CWA primacy and the discharge must meet prescribed effluent limitations. Thus the absence of water treatment facilities at mines in net evaporation locations is <u>not</u> a deficiency; rather it's a regulatory requirement. The calculated FA requirement described in the Proposed Rule thus mischaracterizes the need for and purported absence of water treatment facilities at many mines."

It also appears that EPA may have confused long-term water <u>management</u>, which may be required at many sites, with long-term water <u>treatment</u> that requires improving water quality by operating a water treatment plant. Many sites require some type of post-closure monitoring and water management, which is reflected in the FA for these sites. For example, evaporation cells are commonly used as passive long-term water management facilities to capture and contain the small volume of fluids that drain from closed heap leach facilities in Nevada. Nevada FA calculations include funds to monitor and maintain these cells. These sites do not require operation of a water treatment plant. Despite this fact, Exhibits B-6 though B-8 in EPA's

Regulatory Impact Analysis incorrectly show sizeable water treatment costs for many Nevada mines.

Other site-specific characteristics also dictate whether long-term water management facilities are necessary. For example, open-pit mines that become hydrologic sinks when mining is completed are not a source of hazardous substances requiring water treatment because they provide hydrologic containment and do not release hazardous substances to the environment. The one-size-fits-all analysis in EPA's Regulatory Impact Analysis is a simplistic approach that fails to consider project- and site-specific conditions that are the key factors in determining mine closure and long-term maintenance and monitoring requirements upon which FA should be based.

In general, EPA's analysis of the sufficiency of the states' FA programs has examined the states' FA regulations in a vacuum that fails to consider the interaction between each state's environmental protection and FA laws and regulations. Consequently, EPA has overlooked three essential facts:

- First, the states' environmental protection laws and regulations are designed to prevent environmental degradation due to a release of a hazardous substance and thereby substantially minimize the degree and duration of risk of releases of hazardous substances;

- Secondly, the environmental monitoring systems and reporting requirements in state operating permits act as real-time, early-warning systems that provide state regulators and operators with indicators of a possible release of a hazardous substance. If project monitoring data indicate there may be a release, state regulations compel the operator to investigate the potential release and remediate a confirmed release. The timely corrective response actions triggered by monitoring data showing a release minimize both the *degree* and the *duration* of risk associated with that release. In marked contrast to pre-regulation sites where a release may have gone undetected for years, the monitoring systems at today's highly regulated mining operations provide meaningful information about the performance of the site's environmental controls and reveal if there may be a problem that needs to be investigated straightaway. Thus if there is a release, the magnitude of the release ("*the degree*") and the length of time of the release ("*the duration*") are limited at modern mines. Additionally, the states all have the authority to revoke or suspend operators' permits for failure to respond properly to a release.

- Third, the costs associated with operating and maintaining the environmental controls[6] specified in mine operating permits are included in the FA. The FA requirements extend far beyond physical reclamation; they include costs to operate and maintain a project's environmental controls in order to remain in compliance with the environmental protection and performance standards in the mine's operating permits.

[6] Examples of environmental controls includes impermeable liners, leak detection and recovery systems, surface water and groundwater monitoring, reclamation covers, surface water management structures, and dam safety and maintenance requirements.

In evaluating the adequacy of the states' FA programs, EPA must fully consider how the environmental protection regulations work in concert with the FA requirements to define the environmental controls and monitoring systems that must be included in a site's FA calculations. EPA's analysis has missed this fundamental point.

Section III presents state profiles of the regulatory and FA requirements for hardrock mining and mineral processing facilities for the following states:

Alaska	Section III. A.
Arizona	Section III. B.
California	Section III. C.
Colorado	Section III. D.
Florida	Section III. E.
Idaho	Section III. F.
Michigan	Section III. G.
Minnesota	Section III. H.
Montana	Section III. I.
Nevada	Section III. J.
New Mexico	Section III. K.
Oregon	Section III. L.
Utah	Section III. M.
Washington	Section III. N.
Wyoming	Section III. O.

These profiles discuss how the different parts of the states' environmental protection laws and regulations influence the states' FA programs. The state profiles consist of narratives describing the environmental protection requirements that minimize the risk of releases of hazardous substances and the integration of each state's environmental protection regulations with its FA programs. Tables listing the laws and/or regulations that establish the environmental protection and FA requirements for the thirteen response categories in the CERCLA § 108(b) Proposed Rule follow the narratives for each state.

The state profiles in Section III provide overwhelming evidence that the combination of the states' existing environmental protection requirements and their FA requirements fully address the mandate in CERCLA § 108(b)(1) for classes of facilities to:

> "…establish and maintain evidence of financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances."

The evidence presented in this report clearly demonstrates that the states' existing environmental protection regulatory requirements effectively minimize the "degree and duration of risk." Therefore there is no justification for EPA to require additional FA to satisfy the directive in CERCLA § 108(b)(1).

EPA's Proposed Rule and supporting documentation in the docket for this rulemaking fail to consider the integration of the states' environmental protection regulations with their FA requirements and consequently do not accurately describe the breadth and adequacy of the states' existing FA programs. As discussed in Section III, EPA's state summaries and the tables in Appendix IV, Table C in the November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances" (Docket No. EPA-HQ-SFUND-2015-0781-0144) are inaccurate and incomplete. Therefore, EPA must not rely on these documents in assessing the need for the Proposed Rule.

Although not discussed in the state profiles, it is important to consider the FLMA's FA programs, which apply on BLM- and Forest Service-administered lands in western states with locatable minerals. Because many mines in western states operate on federal lands, the FLMAs' environmental protection and FA requirements play an important role in determining FA requirements. For mining and mineral processing operations on federal land, the FLMA's environmental protection and FA requirements also minimize the "degree and duration of risk."

In most western states, the FLMAs' regulatory and FA requirements are coordinated with State regulators through Memoranda of Understanding ("MOUs"). The Forest Service has statewide and/or project-specific MOUs in Alaska, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, and Washington. The Forest Service also has MOUs that apply to hardrock leasable minerals on acquired lands. Similarly, BLM has MOUs with the following states: Alaska, California, Colorado, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.

III. STATE PROFILES

A. Alaska

As shown in Table A-2 below, Alaska has the statutory and regulatory authorities to oversee mining, reclamation, closure, and post-closure on state, federal, municipal, and private land and water subject to mining operations. The State of Alaska Departments of Natural Resources (ADNR) and Environmental Conservation (ADEC) implement statutes and regulations that regulated all aspects of mining. FA requirements can apply to operations from material sites, small placer mines to large underground and open pit hardrock operations. FA, as required by Alaska Statutes (AS) Section 27.19.040, enables ADNR to establish the amount of the financial assurance to reflect the reasonable and probable costs of reclamation. The FA amount may not exceed $750 for each acre of mined area, except that the $750 an acre limitation **does not apply** to the FA amount required for a lode mine (in place mineralized rock or other metallic minerals in highly consolidated material). A miner may satisfy the requirement for FA by providing, in a form acceptable to and approved by ADNR in any of the following:

1) a surety bond;
2) a letter of credit;
3) a certificate of deposit;
4) a corporate guarantee that meets the financial tests set in regulation by the commissioner;
5) payments and deposits into the trust fund established in AS 37.14.800; or
6) any other form of financial assurance that meets the financial test or other conditions set in regulation.

ADNR Alaska Dam Safety regulations require financial assurance be established for the costs of dam closure and post-closure activities. Specifically, financial assurance must be adequate to:

- Pay for costs of safely breaching the dam at the end of the dam's service life and restoring the stream channel and reservoir land to natural conditions, or for the costs of performing reclamation and post-closure monitoring and maintenance (11 AAC 93.171(f)(2)(C)).
- Pay for the cost of post-closure monitoring, operation, maintenance and inspection (11 AAC 93.172(a)(6)(C)) if the final configuration of a mine tailings dam constitutes a dam under AS 46.17.900 after mine closure (11 AAC 93.172(a)(5)(D)) and remains subject to the Alaska dam safety regulations

The Dam Safety regulations require that applicants obtain approval of the method of demonstrating or providing financial assurance after submitting the preliminary design package and before submitting the final construction package (11 AAC 93.171(d)). After ADNR reviews and approves the type of financial assurance, then the final construction package must include a certified cost estimate and posting of approved financial assurance (11 AAC 93.171(f)(4)(F)).

AS 37.14.800 established a mine reclamation trust fund to address agency and public concerns with long-term post-closure reclamation liabilities associated with some mines. The mine reclamation trust fund is established as a separate trust fund of the state. The principal and earnings of the fund are to be held by the state for the purpose of protecting the public interest in reclaiming mine sites in the state. The fund is composed of the mine reclamation trust fund

income account and the mine reclamation trust fund operating account. The mine reclamation trust fund income account consists of payments and deposits made by miners to satisfy the miners' reclamation bonding or FA obligation under AS 27.19.040 or AS 27.21.160 and earnings on the income account. The mine reclamation trust fund operating account consists of appropriations by the legislature of the annual balance of the mine reclamation trust fund income account and any earnings on those appropriations while in the operating account. Before payments are accepted into the mine reclamation trust fund income account for a particular mining operation, the ADNR and the miner may execute a memorandum of understanding that outlines a schedule of expected payments into the trust fund and the relationship of the payments and accumulated earnings in the trust fund to reclamation obligations of the miner under AS 27.19.040 or AS 27.21.160. The memorandum of understanding may also address expected use of the fund under AS 37.14.820. If the memorandum of understanding addresses investment of the fund with respect to payments made by the miner, the commissioner of the Department of Revenue must also sign the memorandum.

ADEC, under the authority of Alaska Statute (AS) 46.03.100(f) and 18 Alaska Administrative Code (AAC) 60.265, requires proof of financial responsibility to cover the cost of closing a permitted facility, if monitoring is required, the cost of post-closure monitoring if the department determines proof of FA is necessary to protect the public health, safety, or welfare, or the environment. Proof of FA may be demonstrated by: 1) self insurance; 2) insurance, surety; or 3) other guarantee approved by the department to assure compliance with applicable standards and post closure monitoring requirements.

Alaska's large-scale exploration and operating hardrock mines have the FA listed in Table A-1 to cover reclamation/closure and post-closure obligations.

ADEC has the authority under AS 46.03.100 to issue an Integrated Waste Management Permit (IWMP) that applies to large industrial operations, including mines, for management and disposal authorization covering multiple related or unrelated waste management or disposal activities to be conducted at a facility, including generation, treatment, storage, and disposal of solid or liquid waste. An IWMP may include the prior authorizations for individual and general permits and a water-quality-related certification required by 33 U.S.C. 1341 for the discharge of dredged or fill materials or of pollutants to surface waters from point sources. Any mine related facility that has material (e.g., waste rock, tailings, etc.) that has the potential to adversely affect surface or ground water quality can be regulated under the IWMP. The IWMP may require the submission of plans for review and written approval before construction, extension, installation, modification, operation, or closure of the facility.

An ADEC typical permit coverage for large hardrock gold operations is provided as an example of the comprehensive program in Alaska. Facilities and names are omitted, but similar stipulations apply to all lead, zinc, silver, and gold operations in Alaska

ADEC Typical Coverage

Ore mined is either processed in the mill or heap leached. At the mill, higher grade ore is crushed, followed by gravity separation, cyanide leaching with a carbon in-pulp circuit, and gold doré is produced on site. As required to meet the conditions of ADEC's permit, tailings may be subject a cyanide detoxification prior to disposal in the Tailings Storage Facility/ Dry Stack

Tailings Facility (TSF). At the heap leach pad, lower grade run-of-mine ore is stacked on an impermeable liner, followed by cyanide leaching with a carbon-in-column circuit that involves rinsing ore with a barren cyanide solution, capturing the pregnant solution containing leached gold, and removing the gold from solution. After heap leach ore is processed, it remains in place for permanent disposal.

Table A-1
Individual FA Amounts for Large Hardrock Mine and Exploration Projects in Alaska

Project	Status	Amount	Type (Holder)
Greens Creek Mine	Operating	$72,831,187	Surety Bonds (2 USFS; State 1)
Red Dog Mine	Operating	$558,350,000	Letters of Credit (State);
Fort Knox Mine	Operating	$96,645,691	Letter of Credit (State)
Kensington Mine	Operating	$28,727,011	Surety Bonds (USFS)
Pogo Mine	Operating	$71,907,739	Letter of Credit (State)
Nixon Fork	Operating	$6,033,000	Surety Bond (BLM)
Niblack Exploration Project	Approved temporary suspension of operations (Oct. 31, 2018)	$1,409,959	Surety Bond (State)
True North	Post-closure	$620,336	Letter of Credit (State)
Rock Creek ("Nanuuq") Mine	Post-closure	$30,000	Letter of Credit (State)
	TOTAL	**$836,570,923**	

ADEC's typical permits cover disposal of waste or monitoring at the following sites:

TSF

The TSF consists of deposited tailings, decant pond, dam, seepage interception system, and the seepage monitoring system. The TSF decant pond is located within the tailings deposition area upstream of the TSF dam. It impounds all tailings generated by the mill, as well as surface runoff and process water. Impoundment water is not discharged but is recycled to the mill for reuse in the gold ore beneficiation process. Seepage that passes beneath the TSF is captured by pump-back and interceptor systems. The pump-back system includes a pump-back sump together with a pumping and piping system designed to return the seepage to the TSF. Most seepage passing beneath the dam feeds into a large lined sump from which the seepage is pumped back to the decant pond. Any seepage not captured directly by the pump-back system is captured by the interceptor system, which depresses the phreatic surface below the dam. It creates a hydraulic barrier preventing seepage from migrating down-gradient and assuring the TSF must operate as a zero discharge facility.

Heap Leach Facility (heap leach pad)

Lower grade run-of-mine ore from the main pit is deposited onto the heap leach pad. Drip or sprinkler emitters apply a cyanide containing solution to the material placed on the heap. The

solution is collected and processed in carbon in-pulp columns next to the mill for gold recovery.

Inert Solid Waste Landfills

These facilities are intermittent inert solid waste landfills located in waste rock piles, which depending on the geochemical characteristics may be exempt from Solid Waste Regulations. Non- hazardous incidental solid waste created from mine operation is disposed in these cells.

Surface Water Monitoring Sites

Surface water downgradient of the TSF dam is monitored.

Groundwater Monitoring Sites

Groundwater monitoring wells associated with the heap leach pad include the heap underdrain system consisting of three collinear monitoring wells in the following locations: the base platform, the bench of the in-heap storage pond embankment, and the crest of the in-heap storage pond embankment, and an upgradient well, Wells downgradient of the TSF dam and several dewatering wells around the main pit.

Process Water Monitoring Sites

Process water monitoring associated with the TSF includes the tailings waste slurry, TSF decant, TSF interceptor well system, and seepage pump-back system. Process water monitoring associated with the heap leach pad includes the Process Component Monitoring System (PCMS) and Leachate Collection and Recovery System (LCRS).

Permits also cover monitoring requirements for the main pit and development rock (overburden and waste rock) for characterization of acid rock drainage, monitoring of the heap leach facility solution, and hazardous chemical storage and containment, reclamation and closure activities of the TSF, inert solid waste landfills, and the heap leach facility, including disposal of wastewater at closure with ADEC approval.

ADEC may set or modify permit conditions based on monitoring results or changes in facility processes according to permit amendment or modification procedures. In addition to the stipulations in permits, the permittee must adhere to the requirements of 18 AAC 15 Administrative Procedures,18 AAC 60 Solid Waste Management Regulations, 18 AAC 70 Alaska Water Quality Standards (AKWQS), and 18 AAC 72.500 – 72.600 Non-Domestic Wastewater Disposal. The permittee must also adhere to ADEC-approved plans authorized under the permit. When the terms of this permit differ from the terms of the project documents adopted by reference in this section, the terms of this permit override the terms contained in the project documents.

Environmental management documents must also be updated incorporating any changes necessary to be consistent with the terms of the permit. ADEC- approved plans adopted by reference into permit may include, but are not limited to, the following documents:

1) Waste Management Permit Application;
2) Water Resources Management Plan;
3) Plan of Operations;
4) Reclamation and Closure Plan;

5) Solid Waste Management Plan;
6) Waste Rock Management Plan;
7) Monitoring Plan;
8) Heap Leach Pad Operations & Maintenance Manual; and,
9) TSF Operations & Maintenance Manual;

ALASKA SPECIFIC CONDITIONS REGULATED BY ADEC

WASTE DISPOSAL FACILITIES

All Waste Disposal Facilities identified as having potential adversely affect the environmental (e.g., human, health, air quality, surface and groundwater, etc.)- Waste disposal sites may include TSF, heap leach pad, inert solid waste landfills, and pit lakes provided that the conditions stipulated in the permit are satisfied.

Limitations

ADEC set site specific "Upper Tolerance Limits" for monitoring wells and surface water samples. If any of the upper tolerance limits stipulated are exceeded, then corrective action as designated must be implemented.

The permittee must control and treat onsite surface water, groundwater and seepage as necessary to prevent offsite water quality exceedances.

Activities at the site which will cause a greater amount of waste material to be treated and disposed of than initially considered are prohibited without the prior approval by ADEC

The following materials must not be disposed onsite, unless approved in writing by the ADEC:

1) Treated or untreated process water in quantities or concentrations exceeding cyanide and pH limitations stipulated in the permit;
2) Chemical containers (unless triple-rinsed) and discarded, unused chemicals;
3) Discarded, unused chemicals not associated with the beneficiation process; however, discarded, unused chemicals associated with the beneficiation process may be discarded into the TSF as long as they are in concentrations that would not violate the limits stipulated in the permit;
    a. Dry methods must be used for initial cleanup of oil spills in the maintenance shop. When wash water is generated at the vehicle maintenance shop, it must be processed through an oil/water separator before discharge to the TSF.
4) Contaminated soils, spill boom, liners used for the containment of spilled materials, chemicals used in the cleanup of spills or other spill cleanup wastes other than chemicals used in the beneficiation process;
5) Uncombusted household waste;
6) Laboratory wastes other than wash waters, neutralized acids and neutralized bases, however disposal or recycling of refinery slag, fire assay crucibles and cupels through the grinding and leaching circuit is permitted;

7) Untreated sewage solids;

8) Asbestos waste;

9) Acute hazardous wastes, as defined by 18 AAC 60.990(157), including radioactive material, explosives, strong acids and untreated pathogenic waste, however, this prohibition does not preclude disposal of natural minerals found in mine rock or residual wastes included as byproducts of the beneficiation process due to recycling of refinery slag, fire assay crucibles and cupels;

10) Fuels, oil, transformers, paint, or associated equipment and packing material,

11) Glycol and solvents; and

12) Batteries.

The permittee must operate the TSF in conformance with the current *Certificate of Approval to Operate a Dam* issued by Alaska Department of Natural Resources (ADNR), Division of Mining, Land and Water, Dam Safety and Construction Unit.

Heap Leach Pad – The following conditions are representative of some of the project-specific permit stipulations applied to heap leach pads by ADEC.

1) The maximum tonnage of material that may be deposited on the heap leach pad is specified

2) The maximum gallons per minute of overall leach solution flow rate is stipulated.

3) Surface, groundwater, heap process water, and any other water originating from the heap leach pad must meet the following requirements.

4) If WAD cyanide concentration above 10 mg/L is detected in the heap's sumps, then all sump water must remain contained within heap leach system, ADEC must be notified within one working day of discovery and the frequency and location of monitoring in the underdrain system must be expanded as approved by ADEC. Limits as they apply to the underdrain monitoring system as specified the permit.

5) If WAD cyanide concentration above 0.2 mg/L is detected in the underdrain system, the permittee must notify ADEC within one working day of discovery. The permittee must then demonstrate to the ADEC's satisfaction that all water is directed approved containment or appropriate process component.

6) At closure all water draining from heap leach pad must comply with the AKWQS.

7) Ponding or pooling of process solution water on the heap leach pad is prohibited. If ponding or pooling of process solution is discovered on the heap leach pad, immediate action must be taken to protect wildlife from exposure to the solution.

8) The heap liner may not be punctured before heap closure and without written Department approval. At heap closure, the water quality from the heap must be evaluated based upon "rebound potential," an increase in cyanide concentration without further addition of cyanide, and may not be drained until projected rebounding concentrations meet AKWQS.

9) The permittee must operate the heap leach pad in conformance with the current *Certificate of Approval to Operate a Dam* issued by ADNR, Division of Mining,

Land and Water, Dam Safety and Construction Unit.

10) All work associated with the construction of the heap, heap liner, and appurtenances must comply with the approved plans, drawings and specifications, and for developing the construction completion report. Construction must be observed and inspected according to the project construction quality assurance/quality control plan by a qualified engineer according to 18 AAC 72.600 and 72.990(29).

Inert Solid Waste Landfills - The following conditions may apply to inert solid waste landfills.

Disposal of non-hazardous incidental wastes is allowed, including:

1) settled solids from sumps, ditches, and degritting basins;
2) ash and residue from a SmartAsh cyclonic barrel burner;
3) ash from combustion of scrap wood material;
4) iron (drill steel, balls, empty cans, etc.);
5) empty plastic and glass containers;
6) inert, non-putrescible, domestic waste;
7) construction debris;
8) tires;
9) spill cleanup debris approved by ADEC;
10) non-terne plated used oil filters that have been gravity hot-drained; and
11) such other material as would otherwise be disposed of in an inert solid waste landfill facility without special handling.

The permittee must comply with the provisions in the most recent ADEC- approved solid waste management plan, conduct weekly visual inspections to ensure the active landfills are being operated in accordance with the most recent ADEC approved solid waste management plan and close the inert solid waste landfill trenches within 60 days after waste is last deposited in that area, using a soil or rock material at least two feet thick and graded to prevent water from ponding.

The permittee must not place solid waste in water in the inert solid waste landfill facilities, and shall not allow solid waste to wash or blow away from the facility.

ADEC SITE CONSTRUCTION, MAINTENANCE, & OPERATION STIPULATIONS

General

Changes that may have a significant impact on mine closure, reclamation, or water quality, information on engineering changes to the mill, new waste treatment processes, changes to solid waste disposal facilities, changes to the groundwater interception and monitoring well system, and the addition of new waste streams that discharge to the TSF or pit must be submitted to ADEC and approval must be obtained prior to any such changes or discharges.

The permittee must develop the site in accordance with ADEC-approved plans and amendments thereof, which are submitted by the applicant as required by this permit. Pollution prevention concepts shall be incorporated into operations plans for the project.

Any area of open water in the permitted disposal area must not become an attractive area for waterfowl or shorebirds.

Secondary Containment

Secondary containment of all hazardous substances, as defined at AS 46.03.826(5), must be impermeable to those stored hazardous substances.

The permittee must provide and maintain secondary containment for all process piping and chemical mix tanks containing hazardous or toxic materials. Secondary containment is considered to be 110% of the largest tank within a containment area or the total volume of manifolded tanks. The permittee must design and install secondary containment structures in a manner that ensures that solid waste and leachate will not escape from the structures. To prevent such discharges, facilities must be maintained in good working condition at all times by the permittee.

Notification

The permittee shall notify the Department in writing at least 15 days before the introduction of a new chemical into the process or waste treatment streams. Safety Data Sheets on new chemicals must be forwarded to ADEC at time of notification and maintained onsite. Introduction of new chemicals into the process requires written Department approval.

Under 18 AAC 72.600, the permittee shall submit engineering plans to ADEC at least 60 days before construction or modification of an applicable system, and receive Department approval of any changes that will significantly modify the quality or quantity of a discharge, the operation of a waste treatment component, or the disposal facilities.

The permittee must submit to ADEC within 90 days after completing construction of a significant modification to an existing process component:

1) As-built drawings of the process component(s) which show any changes of those aspects that would affect performance of that process component as required in 18 AAC 72.600,
2) A summary of the quality control activities that were carried out during construction, and
3) The revised operating plans that reflect modifications made during construction.

Fuel and Hazardous Substances

The permittee shall design all process piping and chemical mix tanks to allow for routine inspections for leaks. Process piping outside of the mill building must not be buried unless secondary containment is used that provides the ability to inspect for leaks. This stipulation does not apply to the recycle water return lines leading from the TSF to the mill.

The permittee shall maintain fuel handling and storage facilities in a manner that will prevent the discharge of hazardous substances.

Satellite Pits - Ore from satellite pits may be processed and disposed provided that the following conditions are satisfied, and ADEC determines that there will be insignificant impact on mine closure, reclamation, and water quality. The permittee must submit a report

containing each of the following:

1) A comparison of the chemistry of new ore to the chemistry of currently mined ore and add any additional constituents found in the new ore to the analytical profile stipulated in the monitoring plan;
2) A determination of the ore ratio (tons of ore being processed from site ore to tons of satellite pit ore) and perform a Meteoric Water Mobility Procedure (ASTM E2242) on mixed ore samples prior to beneficiation. The permittee must analyze rinse water and leachate using the profile stipulated in the monitoring plan.
3) An acid base accounting on mixed ore (ratios) prior to beneficiation. If net neutralization potential (NP) to acid generating potential (AP) is less than 3:1, then a humidity cell (kinetic) test of adequate duration will be required; leachate analysis will use the profile stipulated in the monitoring plan.
4) A characterization of the processed tailings liquor (post cyanide detoxification) using the profile stipulated in the monitoring plan; the results must be compared to the original tailings liquor.
5) The results of a Meteoric Water Mobility Procedure (ASTM E2242) on processed tailings solids (after cyanide detoxification) using the profile stipulated in the monitoring plan, the results must be compared to the original data.
6) All changes to the beneficiation or treatment processes which may affect monitoring, closure, tailings, water quality, or any other permit condition.

MONITORING

The monitoring plan approved by ADEC, are incorporated into this permit. Future ADEC-approved changes to project monitoring will be included as modifications to the monitoring plan and do not require re-issuance or modification of the permits. The monitoring plan shall maintain monitoring procedures to include the following and must be updated within 60 days of permit issuance.

1) Visually monitor the facilities for signs of damage or potential damage from settlement, ponding, leakage, thermal instability, frost action, erosion, thawing of the waste, or operations at the site. Visual monitoring shall be weekly and documented.
2) Monitor surface and groundwater near the site to ensure that AKWQS are not exceeded and that sample results are statistically valid.
3) Required monitoring locations include the following:
    a) process stream slurry prior to it being discharged to the TSF,
    b) interceptor water returned to the TSF, any discharge over the spillway at the TSF,
    c) groundwater observation wells below the intercepthoor system,
    d) surface water at the upper end of the developed wetlands,
    e) surface water in upper Victoria Creek,
    f) groundwater observation wells between the TSF and Victoria Creek,
    g) wetlands flow immediately prior to entering the freshwater reservoir,
    h) freshwater reservoir,
    i) pit lake and contributing waters to the pit lake,

j) heap leach pad discharges, which include heap water to the TSF and leak detection monitoring in the LCRS and PCMS sumps, and

k) heap underdrain system consisting of three collinear monitoring wells in the following locations: the base platform (HL-1), the bench of the in- heap storage pond embankment (HL-2), and the crest of the in-heap storage pond embankment (HL-3), and groundwater monitoring wells including the old batch plant well.

To maintain limits established in the permit, continuously monitor the LCRS including hydraulic head on the secondary liner in the sump, flow from the sump, and the hydraulic head on the primary liner in the pregnant solution pond. Compile monthly summaries of data including maximums, ranges, and trends, and report according to permit stipulations.

Geochemical monitoring of overburden, development rock, run-of-mine ore that is placed on the heap leach pad, and tailings samples from the mine is required to ensure that there is low potential for production of leachate that is acidic or contains levels of metals that would contaminate surface or groundwater. In the event that humidity cell (kinetic) tests are performed, ADEC approval is required before termination of those tests.

Monitoring of the tailings prior to placement in the TSF to ensure that the limitations contained in the permit are met.

Water quality, flow, and management monitoring is required to account for process water discharged to the TSF, process water recycled to the mill, water entering the pit, water entering the interceptor well system, water used in the heap leach pad, including the LCRS and each PCMS sump, and water levels in the underdrain monitoring wells.

Wildlife monitoring must be conducted as required the permit.

The permittee must develop a quality assurance project plan (QAPP) for all monitoring required by this permit. The QAPP may be contained in an overall monitoring plan for the entire project. The QAPP, or the QAPP portion of an overall monitoring plan, must be completed within 60 days of the effective date of this permit and made available upon request. Any changes made to the existing QAPP shall be completed according to the permit.

1) The QAPP must be designed to assist in planning for the collection and analysis of water samples in support of the permit and in explaining data anomalies when they occur and the QAPP must be formatted as specified in the most recent edition of Elements of a Tier 2 Water Quality Monitoring Quality Assurance Project Plan (QAPP) by ADEC, Division of Water, Water Quality Standards, Assessments and Restoration Program.
2) Throughout all sample collection and analysis activities, the permittee must use chain-of-custody procedures described in the most recent edition of Elements of a Tier 2 Water Quality Monitoring Quality Assurance Project Plan (QAPP) by ADEC, Division of Water, Water Quality Standards, Assessments, and Restoration Program.
3) The permittee must amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP.
4) A copy or copies of the QAPP must be kept onsite and made available to ADEC upon request.

The permittee must monitor the TSF and the heap leach pad in conformance with current

Certificates of Approval to Operate a Dam issued by ADNR, Division of Mining, Land and Water, Dam Safety and Construction Unit.

Samples taken as required by the permit shall be analyzed in conformance with the most recent monitoring plan and QAPP approved by ADEC.

1) A sample from any compliance well or surface water compliance location that detects WAD cyanide shall be reported to the Department as soon as possible, but no later than the end of the next working day. Re-sampling for measurement confirmation shall be performed as soon as practical.
2) The permittee shall track cells of inert solid waste by surveying and recording the location of each cell and at closure of each cell, recording the total volume of the cell. A map indicating the locations of all the cells shall be included in the annual report required in section 2.4.4.
3) Maintenance of inspection and sampling logs and procedures for processing, consolidating, and reporting inspection and sampling data shall be in conformance with the most recent monitoring plan and QAPP as approved by the Department.
4) Groundwater and surface water monitoring and corrective action monitoring shall be in accordance with section 2.5, 18 AAC 60 Solid Waste Management Regulations, and the most recent monitoring plan and QAPP as approved by the Department or modified by amendment to this permit.
5) The Department may modify monitoring requirements, including the establishment of additional compliance points in response to trends showing changes in the concentration of parameters being monitored.
6) If the permittee monitors any influent, effluent, receiving water, or solid waste characteristic in addition to those identified in this permit, or more frequently than required, the permittee shall notify the Department that the additional monitoring has occurred in the next quarterly report after the monitoring has occurred. The results of such monitoring shall be available for inspection by the Department at the project site, or other location proposed by the permittee and agreed upon by the department. The permittee shall provide copies of the results to the Department upon request.
    a) Results detecting WAD cyanide shall be reported in accordance with the permit.
    b) All exceedances of AKWQS shall be reported as stipulated in the permit.

REPORTING

The permittee shall provide the Department with quarterly monitoring reports summarizing inspection and monitoring results required in the permit. Reports shall satisfy the following conditions.

1) Due Dates - Reports for the first three calendar quarters are due within 60 days after the quarter ends, and the report for the fourth calendar quarter shall be submitted by March 1st of the following year.
2) Form – Reports shall be provided in electronic form using commercially available software or according to other electronic reporting requirements approved by the Department. Paper copies of the reports are not required unless specifically requested.
3) Content - Reports shall contain a narrative portion discussing data and

information collected during the preceding quarter.

4) Graphing - Reports shall present water quality data in graphical form indicating trends as well as the margin of compliance with limits.
   a) Graphs of concentration measurement versus time must including the past five years of data, if available, and may contain all historic data.
   b) The graphs must also include the parameter, units, and applicable permit limit or AKWQS.
   c) Multiple stations, identified using symbols in a legend, may be included in the same graph.
   d) Scales shall be proportioned to display the limit or AKWQS, as indicated by a highlighted line, near the top of the graph or when data exceeds the limit, the maximum value shall be near the top of the graph.
   e) Formatting shall allow addition of new data to each graph's cumulative data when producing the next quarterly report.
   f) For graphical purposes, non-detect values shall be plotted at one half the method detection limit (MDL), and values between the minimum level of quantification (ML) and MDL shall be plotted at the value of the qualified measurement.

When an exceedance of a AKWQS is discovered at a groundwater or surface water monitoring location, or if noncompliance with a requirement set out in the permit is discovered, the permittee shall verbally notify ADEC no later than the end of the next working day after discovery, and shall conduct corrective actions according to permit stipulations.

Annual Report - The fourth calendar quarter report serves as the annual report. The annual report shall:

1) Be submitted to the ADEC by March 1st of the following year;
2) Contain an electronic copy (preferably Excel) of the water quality data for the reporting year, including the past five years' data, if available, and may contain all historic data in spreadsheet form. When a value is less than the ML, it must be identified as less than the ML, and the ML must be provided. Non-detect values must be identified as less than the MDL or non-detect and the MDL must be provided in the electronic water quality data spreadsheets;
3) Address the adequacy of the financial responsibility including, but not limited to, inflation, significant changes in reclamation activity costs, concurrent reclamation, expansion or other changes to the operation of the facility;
4) Be presented at an annual meeting with ADEC and ADNR and open to the public; and
5) Be submitted to ADEC at least two weeks prior to the annual meeting.

The permittee shall maintain an updated plan of operations and reclamation and closure plan, as required by ADNR, showing site use and development plans and provide ADEC with copies of any amendments to that plan of operations affecting the waste disposal operations authorized by the permit.

All records and information and reports resulting from the monitoring activities required by the permit, including but not limited to all records of analyses performed, calibration and

maintenance of instrumentation, and recordings from continuous monitoring instrumentation, must be retained in Alaska for observation by ADEC for a minimum of five years. Upon request from the ADEC, the permittee shall submit certified copies of such records.

Any onsite wildlife casualties shall be reported within one working day of discovery to the appropriate state agencies, including the ADEC.

Knowingly making a false statement, by the permittee, the operator or other employees, including contractors, on any such report may result in the imposition of criminal penalties as provided under AS 46.03.790.

CORRECTIVE ACTIONS

The permittee shall comply with 18 AAC 60.815 if the visual monitoring program discovers damage or potential damage to the waste disposal-related facility that could lead to water quality violations.

The permittee shall comply with 18 AAC 60.820-860 if a statistically significant increase in a constituent concentration above background water quality in any of the water sampling locations is discovered. Statistical significance shall be determined using one of the methods outlined in 18 AAC 60.830(h). The permittee shall comply with the notification requirements in 18 AAC 60.850(c) upon determining a statistically significant increase in a constituent concentration.

For a single constituent, when a statistically significant increase in concentration is discovered at a water monitoring station or if noncompliance with a requirement set out in the permit is discovered, the permittee shall:

1) Orally notify ADEC no later than the end of the next working day.
2) Determine the extent of the exceedance or noncompliance.
3) In consultation with ADEC and documented in writing, implement a plan to determine the cause and source of the exceedance or noncompliance.
4) Submit to ADEC, within seven working days after an exceedance or noncompliance is verified by the permittee, a plan for corrective actions to prevent adverse environmental impacts and avoid future exceedances of a similar nature.
5) Implement the corrective action plan as approved by ADEC.

SUSPENSION OF OPERATIONS

Suspension of operations is defined as a suspension of mining and milling/processing activities for more than 90 days but less than three years. The length of time for the period of suspension may be extended beyond three years by written authorization from ADEC. The permittee shall submit a conceptual suspension of operations plan to ADEC within 90 days of permit issuance.

The permittee must notify ADEC within three days of suspending operations. The notice shall provide the nature of and reason for the suspension and its anticipated duration. No later than ten days after operations have been suspended, the permittee shall submit a detailed suspension of operations plan that replaces the suspension of operations conceptual plan required by the permit with current information and specific details. The suspension plan shall address the following:

1) Explanation of what would reasonably result in resuming or permanently

terminating mining or milling/processing activities;

2) Reclamation or construction activities during the period of temporary suspension;
3) Procedures, methods, and schedule to be implemented for the treatment, disposal, or storage of process water;
4) The control of surface and groundwater drainage to and from the facility and the surrounding area;
5) The control of erosion from the drystack, waste rock disposal areas, mill and camp site, and any other disturbed areas within the facility boundary;
6) The secure storage of chemicals during the period of suspended operations; and
7) Procedures for maintaining and monitoring the TSF dam and water balance.

ADEC has 15 days to review and approve or request modifications to the suspension plan and once a suspension of operations plan has been approved, it becomes enforceable under the conditions of this permit and full implementation of the approved suspension plan is required. The plan can be amended by submitting a revised plan to ADEC for approval.

During suspension of operations, the permittee shall:

1) Continue pollution control activities associated with the TSF, heap leach pad, and inert solid waste landfills including, but not limited to, dust control, placement of interim cover, maintenance of the drainage diversion structures, maintenance of all discharge and leakage control structures and processes, and maintenance of the TSF as specified by the current *Certificate of Approval to Operate a Dam* and the suspension plan.
2) Continue monitoring and reporting activities of all active portions of the site as specified by this permit or the suspension plan.
3) Continue reclamation and corrective action requirements under the reclamation and closure plan in light of the nature of the closure.
4) Written Department approval is required before resuming operations after a period of temporary closure.

TERMINATION OF MINING & MILLING

Termination of mining and milling/processing activities is defined as the permanent cessation of those activities. Updated reclamation and monitoring plans must be submitted for approval within 90 days after initiating termination of mining and milling/processing. The updated plans must address current conditions at the facility. Updates and changes to those plans must be approved in writing by ADEC.

1) Termination of mining and milling at the site must be implemented and completed according to the conditions of this permit and with the reclamation and closure plan approved by ADEC and incorporated by reference into this permit.
2) Closure of the waste disposal facilities will be complete when the following criteria are met.
3) ADEC-approved covers are installed on the TSF, heap leach pad, and inert solid waste landfills and drainage channels are constructed and stable.
4) A stable vegetative cover is established on the waste rock, re-contoured areas, and other

infrastructure or other facilities as prescribed in reclamation and closure plan approved by ADEC determines that active water treatment is no longer required for any water discharged from the facility.

Closure must be achieved before terminating any care and maintenance activities required by the permit and the approved suspension plan if a period of suspended operations immediately preceded termination of mining and milling.

The permittee must maintain the facility correcting any erosion or settlement of the TSF, heap leach pad, inert solid waste landfills, waste rock disposal sites, and drainage channels that may impair water quality or otherwise threaten the environment, up until the time that this permit, or any successor permit, is transferred to another entity or terminated by ADEC.

Disposal of demolition debris onsite may be approved during closure activities according to a plan approved by ADEC.

Post-closure monitoring of ground and surface water quality and visual monitoring for settlement, seeps, and erosion is required in years 1, 2, 5, 10, 15, 20, and 30 after satisfying the criteria in section 2.7.3. Post-closure monitoring shall be performed according the reclamation and closure plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.

FACILITY AUDIT

ADNR and ADEC have permit stipulations for the large mining operations to conduct a third-party environmental audit during the final year of the permit term or sooner if final closure starts during the permit term. The scope of the environmental audit includes compliance with all aspects the IWMP, Plan of Operations, environmental management plans incorporated into ADNR and ADEC permits by reference, other agency permits e.g., Alaska Department of Fish and Game Fish Passage and Habitat Permit (AS 16.05.841 and AS 16.05.871), and applicable federal agency (U.S. Army Corps of Engineers, Bureau of Land Management, U.S. Forest Service) permits or authorizations.

The intent of the environmental audit is to evaluate whether both operations management and permit administration provide reasonable assurances that the facility and environmental controls are functioning as intended. The environmental audit includes an evaluation of the adequacy of the approved financial assurance.

FA is adjusted prior to the permit renewal, significant modifications to the operation, and/or recommendation based on finding from the environmental audit. Unless the operator can demonstrate to the satisfaction of ADEC and ADNR that long-term post-closures monitoring and remediation (e. g., water treatment) will not be required, the operator must provide FA to cover those costs. FA amounts are calculated assuming that state regulators will have to manage the reclamation/closure and post-closure activities using third-party contractor costs.

Table A-2
CERCLA 108(b) Response Category Equivalents in Alaska Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Alaska Department of Natural Resources	Alaska Department of Environmental Conservation	Alaska Department of Fish and Game
Solid/Hazardous Waste Disposal	AS 27.05; AS 27.19; AS 27.20; AS 38.05; 11 AAC 97;	AS 46.03; 18 AAC 60; 18 AAC 62;	
Open Pit	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; AS 46.15; 11 AAC 93; 11 AAC 97;		AS 16.05.841; AS 16.05.871;
Underground Mine	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; 11 AAC 97	AS 46.03; 18 AAC 70;	
Tailings Facility	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; AS 38.05.255; AS 46.17; 11 AAC 93.171 11 AAC 93.172; 11 AAC 97;	AS 46.03; 18 AAC 60	AS 16.05.841; AS 16.05.871;
Waste Rock	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; 11 AAC 97;	AS 46.03; 18 AAC 60;	AS 16.05.841; AS 16.05.871;
Heap/Dump Leach	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; 11 AAC 97;	AS 46.03; 18 AAC 60;	AS 16.05.841; AS 16.05.871;
Process Pond/Reservoir	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020;	AS 46.03; 18 AAC 60	AS 16.05.841; AS 16.05.871;

Table A-2
CERCLA 108(b) Response Category Equivalents in Alaska Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Alaska Department of Natural Resources	Alaska Department of Environmental Conservation	Alaska Department of Fish and Game
	AS 46.15; AS 46.17; 11 AAC 93; 11 AAC 93.171; 11 AAC 93.172; 11 AAC 97		
Drainage	AS 27.19; AS 27.20.021; AS 46.15; 11 AAC 93; 11 AAC 97;	AS 46.03; 18 AAC 60; 18 AAC 70; 18 AAC 72;	AS 16.05.841; AS 16.05.871;
Water Treatment		AS 46.03; 18 AAC 60; 18 AAC 70; 18 AAC 72;	AS 16.05.841; AS 16.05.871;
Short-Term O&M/ Monitoring	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; AS 46.17; 11 AAC 93.171; 11 AAC 93.172; 11 AAC 97;	AS 46.03; 18 AAC 60	AS 16.05.841; AS 16.05.871;
Interim O&M	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; AS 46.17; 11 AAC 93.171 11 AAC 93.172; 11 AAC 97	AS 46.03; 18 AAC 60	AS 16.05.841; AS 16.05.871;
Long-Term O&M/ Monitoring	AS 27.05; AS 27.19; AS 27.20; AS 38.05.020; AS 46.17; 11 AAC 93.171; 11 AAC 93.172; 11 AAC 97;	AS 46.03; 18 AAC 60; 18 AAC 70; 18 AAC 72;	AS 16.05.841; AS 16.05.871;
Slag Pile	N/A	N/A	N/A

B. Arizona

As shown in Table B below, the Arizona Mined Land Reclamation Act (AMLRA), Ariz. Rev. Stat. ("A.R.S.") Ann. §§ 27-901 through 1026, and the Aquifer Protection Permit (APP), Ariz. Rev. Stat. Ann. §§ 49-241 through 252, regulate mining and FA requirements for Arizona hardrock mines and mineral processing facilities. The AMLRA and APP provide FA for each of the thirteen CERCLA § 108(b) Response Categories. The Arizona State Mine Inspector administers the AMLRA. The Arizona Department of Environmental Quality ("ADEQ") has jurisdiction over the APP program. Projects located on federal land in Arizona also have to comply with the FLMAs' regulatory and FA requirements, as well as other substantive regulatory requirements administered by ADEQ.

The AMLRA applies to any property that is owned, operated, or managed by the same person to develop, mine, concentrate, or leach metalliferous minerals and all associated recovery activities. The AMLRA also applies to exploration activities outside a mining operation, including building access roads and drill pads, to determine the presence, location, extent, depth, or grade of metalliferous minerals. Non-metals are similarly covered under the separate Aggregate Mined Land Reclamation Act (A.R.S. § 27-1201, et seq.).

The environmental protection requirements under Arizona's APP program minimize the potential for a release of hazardous substances. The Arizona APP program protects groundwater quality by preventing releases of hazardous substances to the environment by requiring mining operations to be "so designed, constructed and operated as to ensure the greatest degree of discharge reduction achievable through application of the best available demonstrated control technologies, processes, operating methods or other alternatives, including where practicable, a technology permitting no discharge of pollutants." A.R.S. § 49-243.B.1.

As is the case in many arid western states, groundwater in Arizona is regulated as a potential source of drinking water. Consequently, drinking water protection standards apply to all groundwater in Arizona. A.R.S. § 49-224.B. Arizona's APP program implements this groundwater protection requirement for mining and mineral processing operations by ensuring that aquifer water quality standards are met in groundwater at applicable points of compliance ("POCs") that are typically groundwater monitoring wells located immediately downgradient of specific mining operation facilities. A.R.S. § 49-243.B.2. ; A.R.S. § 49-244 Aquifer water quality standards are established based on EPA's primary drinking water maximum contaminant levels (MCLs) pursuant to the federal Safe Drinking Water Act. A.R.S. § 49-223.A. The permits for mining operations require mine operators to collect groundwater monitoring samples and report the results of the groundwater monitoring program on a regular basis.

The collection and reporting of groundwater monitoring data gives Arizona mine operators and regulators real-time documentation of whether a facility is operating as designed and in compliance with its operating permits. In the event monitoring data suggest there may be a release of a hazardous substance, the monitoring data provide operators and regulators with the necessary information to take appropriate actions. Arizona's regulations authorize regulators to require an operator to investigate a possible release and remediate a documented release, thus ensuring that the operator, state regulators, or both manage a release.

In the event an operator fails to respond to a release, the APP program provides FA that the ADEQ can use to remediate any releases. A.R.S. § 49-243.N; A.A.C. R18-9-A203. Arizona's APP program protects the drinking water quality of groundwater in all state aquifers through permit conditions that regulate and address the discharge or release of pollutants and hazardous substances "directly to an aquifer or the land surface or the vadose zone in such a manner that there is a reasonable probability that the pollutant will reach the aquifer." A.R.S. § 49-201.12. This is accomplished through standard APP conditions that obligate the permittee to notify ADEQ and engage in emergency response and corrective actions to address any unauthorized releases of hazardous substances to the environment.

The Arizona APP program governs any release of a pollutant, whether on-site or off-site of any mining operation and applies to releases at any type of facility both directly associated with the mine site as well as smelters, refineries, stand-alone operations, and other facilities. The types of mining-related facilities where releases of pollutants may occur and therefore typically require an individual APP permit include the following: (1) surface impoundments, including holding, storage, settling, treatment or disposal pits, ponds and lagoons; (2) solid waste disposal facilities; (3) injection wells (e.g., in-situ leaching operations); (4) mine tailings piles and ponds; and (5) mine leaching operations, and wetlands associated with mine water treatment.

Under the APP program, Arizona's FA requirements ensure that Arizona regulators have adequate FA to respond to a release if an operator does not or cannot due to bankruptcy or other constraints. The FA covers the response action liabilities for any unauthorized releases if the mining operation fails to comply with its financial capability requirements or files for bankruptcy.

The APP establishes very broad requirements for providing FA for the entire lifecycle of a mining operation (e.g., operations, reclamation, closure, and post-closure). Arizona's APP program requires hardrock mining operators to demonstrate "financial capability [for the costs] to construct, operate, close and ensure proper post-closure care of the facility" in order to protect the Arizona taxpayer from bearing the response action liabilities and costs of any releases of hazardous substances to the environment during its operation. A.A.C. R18-9-A203(B). Pursuant to this financial capability authority, Arizona APPs routinely contain emergency response and contingency measures, including corrective actions, to address environmental impacts from unauthorized releases of hazardous substances to the environment from an APP-permitted mining operation.

Arizona's APP program also requires that specific facilities at mining operations (e.g., tailing impoundments, leaching facilities, process impoundments, etc.) to be designed, constructed, and operated to meet best available demonstrated control technology ("BADCT"), which is intended to control potential releases of hazardous substances. A.R.S. § 49-243.B.1. The required use of BADCT technology substantially minimizes the potential risk of a release of hazardous substances during all phases of a mining operation – from operation to post-closure. In the event of a release, Arizona regulators have the necessary regulatory authority to compel the operator to respond to the release or to use the FA for an agency-led response.

In addition to the requirement to meet BADCT and to comply with aquifer water quality standards at applicable POCs, the APP program imposes specific closure and post-closure requirements to address environmental impacts from releases of hazardous substances once a mine has been closed. A.R.S. §§ 49-201.5, 49-201.30, & 49-252; A.A.C. R18-9-A209. Pursuant to these requirements, Arizona APPs for mining operations contain closure and long-term, post-closure obligations necessary to ensure that aquifer water quality standards are met at applicable POCs and that any appropriate remedial, mitigative, or corrective actions are implemented to meet the closure requirements and to address unauthorized releases of hazardous substances.

A key element of Arizona's APP program that further reduces the potential for an un-bonded release of hazardous substances is the requirement to cover response action liabilities for authorized/permitted releases of hazardous substances at mining operations. In fact, the FA requirement for "closure" and "post-closure monitoring and maintenance" under the Arizona APP program is defined broadly to include "all actions specified in an aquifer protection permit …,as well as elimination, to the greatest degree practicable, of any reasonable probability of further discharge from the facility," and those activities that are necessary to "keep the facility in compliance with…the aquifer water quality standards" and to "perform any remedial, mitigative or corrective actions or controls as specified in the aquifer protection permit." A.R.S. §§ 49-201.5 and 49-201.30.

Both the AMLRA and APP programs allow various forms of FA including cash (annuities, cash deposits, certificates of deposit, letters of credit and trust funds), surety bonds and insurance, as well as corporate guarantees and self-assurance. A.R.S. § 27-991.B (AMLRA); A.R.S. § 49-243.N.3 (APP). Both programs require the sufficiency of a project's FA to be reviewed every five years. A.R.S. § 27-992.D (AMLRA); A.R.S. § 49-243.N.4 (APP). Additionally, depending on the type of FA instrument, the APP requires operators to document as frequently as every two years that the instrument is being maintained in good standing. State regulators have the authority to require an update in response to a project change or upset. FA amounts are calculated assuming that state regulators will have to manage the reclamation and closure activities and use third-party contractor costs.

It is important to note that the materials EPA compiled pertaining to Arizona's regulatory and FA requirements for hardrock mining and mineral processing facilities are incomplete and fail to provide an accurate and objective discussion of the comprehensive scope of these programs. For example, EPA's "Summary of Arizona Financial Responsibility Requirements" (Docket No. EPA-HQ-SFUND-2015-0781-2173) does not adequately describe the AMLRA and the APP regulatory and FA programs, which are much broader than described in EPA's Arizona regulatory summary. EPA's discussion omits the salient fact that the APP program is specifically designed to cover the entire lifespan of a mine – from design and operation to reclamation, closure, and post-closure. It also fails to discuss how the APP BADCT requirements apply to the design and operation of embankments at TSFs thereby minimizing the potential for a release of hazardous substances from Arizona TSFs. Secondly, Appendix IV, Table C in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (Docket No. EPA-HQ-SFUND-2015-0781-0144), does not accurately described the way in which Arizona's

laws and regulations interact and are coordinated to provide comprehensive environmental protection and FA.
Additionally, it is important to note that ADEQ's "solid waste" and "hazardous waste" regulations apply to the generation and management of waste at mines. ADEQ is authorized to implement the federal "hazardous waste" program in Arizona. 40 C.F.R. § 272.151. ADEQ also invested significant effort to develop a "solid waste" general permit that imposes detailed management and disposal requirements for existing and future "solid waste" landfills located at mining facilities in the State. That general permit, discussed at Ariz. Admin. Code ("A.A.C.") R18-13-802, includes siting, operational, monitoring, and notification requirements specifically catered to mining facilities.

Arizona's environmental regulatory and FA programs for mining are an example of a "complicated but generally effective" regulatory program as described in the NAS Study. EPA's analysis for this rulemaking of Arizona's regulatory and FA program fails to comprehend either the complexity or effectiveness of Arizona's mining regulations and FA requirements and is therefore inaccurate and incomplete. A proper evaluation would reveal that Arizona's site-specific environmental protection and FA requirements are comprehensive and far superior to the one-size-fits-all formulas EPA used in the Proposed Rule. There are no gaps in Arizona's program that need to be filled with an EPA-driven FA program pursuant to CERCLA § 108(b).

Because the APP program explicitly governs "liability for the release of a hazardous substance," the Proposed Rule would completely duplicate Arizona's effective and comprehensive FA requirements. Additionally, because Arizona's program already covers liability for releases of a hazardous substance, the Proposed Rule clearly falls within the scope of the federal preemption provisions in CERCLA § 114(d) if EPA promulgates federal financial responsibility requirements for response action liabilities.

Table B – Arizona
CERCLA 108(b) Response Category Equivalents in Arizona Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Arizona Statute and Rules *Closure/Post Closure Citations*
Solid/Hazardous Waste Disposal	A.R.S. §§ 49-241.B.1 & 49-241.B-.2. (surface impoundments and any "solid waste disposal facilities" (not including mining overburden and wall rock that has not been and will not be subject to mine leaching operations) are categorically regulated as APP facilities, and are subject to full closure and post-closure requirements under the APP program. A.R.S. §§ 49-721, 49-761; 40 C.F.R. § 272.151 (Arizona is authorized to implement the federal "hazardous waste" program and has authority to impose financial assurance for "solid waste" facilities. For instance, Arizona has developed a "solid waste" permit specifically regulating solid waste facilities at mines at A.A.C. R18-13-802 ("Disposal General Permit: Non-Municipal Solid Waste Landfills at Mining Operations"))
Open Pit	A.R.S. § 49-243.G.1. Demonstration of hydrologic isolation (passive containment) – regulated but not as an APP discharging facility; still subject to applicable closure and post closure monitoring and maintenance requirements to ensure maintenance of passive containment For open pits that do not create passive containment or are otherwise deemed to have the potential to discharge – same as waste rock
Waste Rock	<u>CLOSURE AND POSTCLOSURE</u> A.R.S. § 49-243.A.8., K.6, and N. (requirements for closure strategy or plan and financial assurance) A.R.S. § 49-201.5 (clean closure) A.R.S. § 49-201.7 (closed facility) A.R.S. § 49-201.30 (post closure monitoring and maintenance) A.R.S. § 49-252 (Requirements for clean closure and closure) A.C.C. R18-9-A201.B.5 (cost estimates for construction, operation, maintenance, closure, and post closure in application) A.C.C. R18-9-A202.A.10 (closure and post closure strategies and plans in application) A.C.C. R18-9-A203 (financial requirements in application and maintained in permit)

CERCLA § 108(b) Response Category	Arizona Statute and Rules *Closure/Post Closure Citations*
	A.C.C. R18-9-A209 (closure and post closure plan requirements) A.A.C. R18-9-A209.C.1.e (Post-closure includes requirements for "operation and maintenance procedures proposed for maintaining aquifer quality protection devices, such as liners, treatment systems, pump-back systems, surface water and stormwater management systems, and monitoring wells" CORRECTIVE ACTIONS R18-9-A204 (contingency plan for exceedances or violations of permit conditions, including emergency response and corrective actions) R18-9-A205, A206 (monitoring requirements, including alert levels, discharge limitations, and aquifer quality limits) R18-9-A207 (reporting requirements for permit exceedances and violations) RECLAMATION The Arizona State Mine Inspector implements a comprehensive system of mine land reclamation. A.R.S. § 27-901 – 1026 (Mined Land Reclamation) including § 27-991 *et seq* "Financial Assurance". Also A.A.C R11-2-801 through 822. A.A.C. R12-5-1805: The Arizona State Land Department implements bonding for surface reclamation for mining on state trust lands. 43 CFR 3809: bonding for surface reclamation for mining on lands administered by BLM
Heap/Dump Leach	Same as waste rock
Tailings Facility	Same as waste rock
Process Ponds/Reservoir	Same as waste rock
Underground Mine	Not considered an APP discharging facility (dry no addition of pollutants); discharges may be regulated under CWA.
Slag Pile	Same as waste rock
Drainage	Same as waste rock
Interim O&M	Same as waste rock
Water Treatment	Same as waste rock
Short-Term O&M/Monitoring	Same as waste rock.
Long-Term O&M/Monitoring	Same as waste rock

C. California

Two California state statutes have primary jurisdiction over various aspects of hardrock mines in California: 1) the California Surface Mining and Reclamation Act ("SMARA"); and 2) the Porter Cologne Water Quality Control Act ("PCWQCA"). Both statues include FA requirements. The California Department of Conservation, Division of Mine Reclamation ("DMR") administers SMARA. The State Water Quality Control Board administers the PCWQCA through nine Regional Water Quality Control Boards ("RWQCB"). Generally, SMARA establishes FA requirements for the physical reclamation of all mine features and facilities. The PCWQCA requires closure and post-closure FA for mine waste disposal facilities that focuses on the environmental controls and design features that prevent pollution of the State's surface water and ground water resources.

As shown in in Table C, the combination of SMARA and PCWQCA provides environmental protection and FA for each of the response categories in CERCLA § 108(b). The interaction of SMARA and PCWQCA is another example of a complicated but effective regulatory framework consistent with the NAS Study findings. Working together, SMARA and PCWQCA and their implementing regulations provide comprehensive environmental protection that minimizes the risk of releases of hazardous substances and FA to provide California state regulators with the resources to respond to a release in the event a mine operator fails to respond properly. Projects located on federal land in California also have to comply with the FLMAs' regulatory and FA requirements.

The scope of SMARA is broader than the name implies because the definition of mined lands "includes the surface, subsurface, and ground water of an area in which surface mining operations will be, are being, or have been conducted, including private ways and roads appurtenant to any such area, land excavations, workings, mining waste, and areas in which structures, facilities, equipment, machines, tools, or other materials or property which result from, or are used in, surface mining operations are located. SMARA § 2729. Consequently, SMARA's reclamation requirements extend to underground mine features and to groundwater and the prevention of water degradation:

> "Reclamation means the combined process of land treatment that minimizes water degradation, air pollution, damage to aquatic or wildlife habitat, flooding, erosion, and other adverse effects from surface mining operations, including adverse surface effects incidental to underground mines, so that mined lands are reclaimed to a usable condition that is readily adaptable for alternate land uses and create no danger to public health or safety." SMARA § 2733

Moreover, because mining wastes are defined as "including the residual of soil, rock, mineral, liquid, vegetation, equipment, machines, tools, or other materials or property directly resulting from, or displaced by, surface mining operations" (SMARA § 273), the Act broadly applies to all types of mine wastes including mine-impact water.

In contrast to the one-size-fits-all approach in the Proposed CERCLA § 108(b) Rule, SMARA emphasizes the importance of site-specific conditions:

> "The reclamation plan shall be applicable to a specific piece of property or properties, shall be based upon the character of the surrounding area and such characteristics of the property as type of overburden, soil stability, topography, geology, climate, stream characteristics, and principal mineral commodities, and shall establish site-specific criteria for evaluating compliance with the approved reclamation plan, including topography, revegetation and sediment, and erosion control." SMARA § 2773(a)

Similarly, the Department of Conservation's FA Guidelines[7] implementing SMARA emphasizes that FA must be based on site-specific factors:

> "The SMGB (State Mining and Geology Board) recognizes that the amount of financial assurance is based on the size, complexity, environmental setting, and type of operation described in the approved reclamation plan. The amount of financial assurance must be calculated on a site specific basis that reflects the elements in the related site specific reclamation plan." FA Guidelines at 3.

California mine operators must provide FA "continuously throughout the life of the mining operation, (including idle periods and extended monitoring periods), until the reclamation is completed pursuant to the approved reclamation plan and verified by the lead agency and the Department, and the lead agency, the Department, and any other beneficiary agencies have approved the release of the financial assurances." SMARA §§ 2770(h), 2773.1(a), and 2773.1(a)(2). The DMR must review the amount of the FA annually and require the operator to make any necessary adjustments.

SMARA requires operators to prepare Interim Management Plans if a mining property is idle for one year or more and to provide FA for interim management. The Interim Management FA must be sufficient to reclaim the site in accordance with the agency-approved reclamation plan. DMR must review the sufficiency of Interim Management FA on an annual basis. FA Guidelines at 18, SMARA §§ 2727.1 and 2770(h)(2).

The SMARA requirements and DMR Rule are integrated with and cross-referenced to the PCWQCA. See, for example, the DMR Rule § 3712 performance standards for tailings impoundments and the DMR Rule § 3704.1 performance standards for pit backfilling, which specifically mention the PCWQCA.

The PCWQCA establishes detailed and stringent requirements for the design, operation, and closure of all mine waste facilities and also requires FA for mine waste management facilities. The FA required pursuant to the PCWQCA is separate from and in addition to the FA required under SMARA. The PCWQCA defines mining waste as follows:

> "Mining waste means all solid, semisolid, and liquid waste materials from the extraction, beneficiation, and processing of ores and minerals. Mining waste

[7] http://www.conservation.ca.gov/smgb/Guidelines/Documents/FA_GUIDELINES.pdf

> includes, but is not limited to, soil, waste rock, and overburden, as defined in Section 2732 of the Public Resources Code, and tailings, slag, and other processed waste materials, including cementitious materials that are managed at the cement manufacturing facility where the materials were generated. PCWQCA § 13050(q)(1).

Under the PCWCQA, mine operators must submit a Report of Waste Discharge (i.e., a permit application) for any proposed facility that could "affect the quality of the waters of the state" to the appropriate RWQCB. The RWQCB issues a permit called a Waste Discharge Requirement ("WDR") that includes FA obligations for the operator. PCWQCA § 13260(k) establishes specific information requirements for a Report of Waste Discharge for a mine waste facility that include the following:

> "(1) A report on the physical and chemical characteristics of the waste that could affect its potential to cause pollution or contamination. The report shall include the results of all tests required by regulations adopted by the board, any test adopted by the Department of Toxic Substances Control pursuant to Section 25141 of the Health and Safety Code for extractable, persistent, and bioaccumulative toxic substances in a waste or other material, and any other tests that the state board or regional board may require, including, but not limited to, tests needed to determine the acid-generating potential of the mining waste or the extent to which hazardous substances may persist in the waste after disposal.
>
> (2) A report that evaluates the potential of the discharge of the mining waste to produce, over the long term, acid mine drainage, the discharge or leaching of heavy metals, or the release of other hazardous substances."

Once an applicant has submitted permit applications to the RWQCB and the DMR, the lead agency must prepare an environmental evaluation pursuant to the California Environmental Quality Act ("CEQA"). The county in which the proposed mining operation is located is typically the Lead Agency responsible for preparing the CEQA document.

Title 27, Chapter 7, Division 2 Special Treatment, Storage, and Disposal Units, Subchapter 1, Mining Waste Management at §§ 22470 *et seq.* ("RWQCB Rule") implements the PCWQCA and governs the issuance of Waste Discharge Requirements. The RWQCB Rule § 22490 includes the following facility siting and construction standards and criteria:

- Siting criteria prohibiting locating facilities near active faults;
- Flood protection requirements;
- General containment structure standards;
- General construction and discharge standards;
- Specifications for the design of synthetic and clay liner systems and leachate collection and removal systems; and
- Stormwater management and control requirements.

The RWQCB Rule § 22480 defines three groups of mining wastes:

- Group A wastes, which must be managed as hazardous waste if the Regional Board determines that the mining waste poses a significant threat to water quality;

- Group B wastes, which consist of or contain non-hazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause degradation of waters of the state; and

- Group C wastes, which are generally benign wastes associated with discharges that would be in compliance with the applicable water quality control plan for water quality objectives other than turbidity.

The RWQCB Rule § 22480(d) requires that mining wastes "shall be treated or neutralized whenever feasible to minimize the threat to water quality and minimize the need to install waste containment structures."

In determining whether to issue a WDR (i.e., the permit) for a proposed mine waste facility the RWQCB must evaluate whether the facility is designed to minimize the potential to pollute or contaminate waters of the state during operation and after closure. The PCWQCA has the following specific directive that focuses on long-term pollution prevention for WDRs for mine waste facilities:

> "Before a regional board issues or revises waste discharge requirements pursuant to Section 13263 for any discharge of mining waste, the regional board shall first determine that the proposed mining waste discharge is consistent with a waste management strategy that prevents the pollution or contamination of the waters of the state, particularly after closure of any waste management unit for mining waste." PCWQCA § 13262.1

California's PCWQCA and its RWQCB Rules include comprehensive environmental standards and protection requirements that minimize the potential for releases of hazardous substances both during and after mine operation. The following RWQCB provisions require FA covering the closure and post-closure phases of the mining lifecycle:

> **Mining Unit Closure Funding —** For mining units only, the discharger shall provide for adequate funding to pay for the costs of closure as required by the mining regulations of Article 1, Subchapter 1, Chapter 7 of this division (§22470 et seq.). The discharger shall provide assurance of financial responsibility acceptable to the RWQCB. The RWQCB shall periodically review financial assurances for mining Units and shall modify the financial assurances as necessary to provide continued compliance with this section. RWQCB Rule § 22207(b).
>
> **Mining Units —** The discharger shall provide for adequate funding to pay for the costs of post closure maintenance at mining Units, as required by the mining regulations of Article 1, Subchapter 1, Chapter 7 of this division (§22470 et seq.).

> The discharger shall provide assurance of financial responsibility acceptable to the RWQCB. The RWQCB shall periodically review financial assurances for mining Units and shall modify the financial assurances as necessary to provide continued compliance with this section. RWQCB Rule § 22212(b).

RWQCB Rule § 22500 establishes detailed water quality monitoring requirements that specify monitoring locations and points of compliance for mine waste disposal facilities. The RWQCB must develop applicable water quality protection standards and identify concentration limits for constituents of concern in the WDR issued for mine waste facilities. (See RWQCB Rule § 20358 through § 20430). A site's monitoring program must include sampling points to collect monitoring data from surface waters, unsaturated zones (i.e., soil pore liquid in the vadose zone), and groundwater. The monitoring requirements include response action triggers if monitoring data indicate evidence of a release or a potential release.

If the site monitoring data detect a release to surface waters, ground water, or the unsaturated zone that does not comply with the site's WDR, the operator must submit an amended Report of Waste Discharge to the RWQCB with a proposed corrective action program that includes a detailed description of the measures to be taken to achieve compliance with the applicable water quality protection standard(s) in the WDR for the site. The operator must continue to implement the corrective action program until the RWQCB concurs that the monitoring data indicate that the concentration of all constitutes of concern have been reduced to comply with the applicable standards. RWQCB Rule §§ 20425, 20430.

The PCWQCA and RWQCB requirements go beyond the CERCLA § 108(b)(1) statutory directive for EPA to "develop financial responsibility consistent with the degree and duration of risk associated with the production, transportation, storage, or disposal of hazardous substances." California mine operators are explicitly required to *prevent* pollution or contamination of waters of the state – both during operation and after closure.

As listed in Table C, California's detailed and rigorous laws (SMARA and PCWCQA) and the implementing regulations (DMR Regulations and the RWQCB Rules) address the thirteen CERCLA § 108(b) cost categories. Working in concert, these laws and regulations establish detailed environmental protect standards and requirements that provide comprehensive environmental protection that minimizes the potential for a release of hazardous substances from California mining and mineral processing operations. The extensive monitoring requirements in the RWQCB Rule provide contemporaneous warnings of a potential release thus limiting the degree and duration of a release. Finally, if a release occurs, California regulators have ample authority to use a project's FA to respond to a release in the event the mine operator fails to do so.

There are no gaps in California's regulatory framework that need to be filled with a federal FA program under CERCLA § 108(b). In light of California's regulatory framework and associated FA requirements there is no justification for EPA to impose redundant and unnecessary federal FA under CERCLA § 108(b).

Table C – California
CERCLA 108(b) Response Category Equivalents in California Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	California Regulations
Solid/Hazardous Waste Disposal	RWQCB Rule § 22480(b), (c)
Open Pit	SMARA § 2735 DMR Regulation § 3704.1
Waste Rock	RWQCB Rule § 21090(a-c) RWQCB § 22207(b) RWQCB § 22212(b) RWQCB Rule § 22490 DMR Regulation § 3704.1 DMR § 3712 cross referece Porter Cologne PCWQCA § 13260(k)(2) PCWQCA § 13262.1
Heap/Dump/Leach	RWQCB Rule § 21090(a-c) RWQCB § 22207(b) RWQCB § 22212(b) RWQCB Rule § 22490 DMR Regulation § 3704.1 PCWQCA § 13260(k)(2) PCWQCA § 13262.1
Tailings Facility	RWQCB Rule § 21090(a-c) RWQCB § 21400(a) RWQCB § 22207(b) RWQCB § 22212(b) RWQCB Rule § 22490 DMR Regulation § 3704.1 DMR § 3712 cross referece Porter Cologne PCWQCA § 13260(k)(2) PCWQCA § 13262.1
Process Pond/Reservoir	RWQCB Rule § 21090 (a-c) RWQCB § 22207(b) RWQCB § 22212(b) RWQCB § 22490 RWQCB Rule § 22490(i) PCWQCA § 13260(k)(2) PCWQCA § 13262.1
Underground Mine	SMARA § 2733
Slag Pile	Not applicable
Interim O&M	SMARA Sections 2727.1 and 2770(h)(1)(2)(3)(4) RWQCB Rule § 20385 through § 20430)

CERCLA § 108(b) Response Category	California Regulations
Water Treatment	RWQCB Rule § 204030 RWQCB Rule § 22480(d) RWQCB Rule §§ 20385 -20430)
Short-term O&M Monitoring	RWQCB Rule § 22470(c)(3) RWQCB Rule § 22500 RWQCB Rule §§ 20385 - 20430) SMARA § 2773.1
Long-term O&M Monitoring	RWQCB Rule § 20950 RWQCB Rule § 22470(b) RWQCB Rule § 22470(c)(3) RWQCB Rule § 22500 RWQCB Rule § 22510 RWQCB Rule § 22510(f) RWQCB Rule §§ 20385 - 20430 PCWQCA § 13260(k)(2) PCWQCA § 13262.1

D. Colorado

As shown in Table D below, the Colorado Hard Rock, Metal, and Designated Mining Operations rules ("DMO Rules") at 2 Colorado Code Regulations (CCR) § 407-1 establish specific requirements governing the design, operation, reclamation, closure, and post-closure of Colorado mining and mineral processing facilities. The DMO Rules implement the Colorado Mined Land Reclamation Act at Title 34: Mineral Resources, Article 32, Colorado Mined Land Reclamation Act, Colorado Revised Statute §34-32. The Colorado Department of Natural Resources/Division of Reclamation, Mining, and Safety ("DRMS") administer these regulations. The Colorado Reclamation Board ("CRB") oversees the activities of DRMS.

The 205-page DMO Rules contain comprehensive mine design, environmental protection, and FA requirements that cover the thirteen CERCLA § 108(b) response categories. These rules were enacted in 1977 and have been amended 25 times since then. Many of the amendments were developed in direct response to the problems encountered at the Summitville Mine. The subsequent changes in the DMO Rule have closed the gaps in Colorado's regulations that led to the inadequate regulatory oversight and FA at Summitville. The substantial changes to the DMO Rules over time are an excellent example of how state regulators have the authority and are ideally positioned to amend state regulations to fill identified gaps or shortcomings.

In addition to obtaining authorization under the DMO Rules, many Colorado mines also have to obtain an NPDES permit from the Colorado Department of Public Health and Environment ("CDPHE"), Water Quality Control Division, which has primacy for implementing the federal Clean Water Act. The NPDES permitting requirement is integrated into the DMO Rules at 6.4.7(5), 6.4.13, and 6.4.21(4)(a). Similarly, Colorado mine operators must obtain the applicable federal air quality permits from CDPHE, Air Pollution Control Division. The air quality permitting requirements are integrated into the DMO at 6.4.13 and 6.4.21(4)(a).

It is necessary to understand the integration and overlap of the DMO rules specific to mining and the CDPHE's media-specific environmental protection regulations in evaluating the comprehensive environmental protection and financial assurance rules governing Colorado hardrock mines. As is the case in many other states, no single regulation, program, or agency governs mining in Colorado. The multiple rules and regulatory agencies with jurisdiction over specific activities and facilities at Colorado mining operations are another example of a complex but effective regulatory structure described in the NAS Study.

In addition to the several Colorado state agencies that regulate mining, the FLMA have jurisdiction over Colorado mines developed on public lands. The DRMS has a MOU with both BLM and the US Forest Service that coordinates the states and the FLMAs' regulatory and FA requirements. For mines on federal lands, the DMO at 1.2.4 requires operators to apply for a DMO permit in addition to any applicable federal permits required for the project.

The DMO Rule 3, Reclamation Performance Standards, Inspection, Monitoring, and Enforcement, establishes reclamation standards that are designed to achieve the State's environmental protection requirements once mining and mineral processing activities are completed. Section 3.1.3 establishes reclamation time limits stating: "reclamation shall be carried

to completion." Reclamation must be completed within five years after the reclamation activities for a given mine feature start.

DMO Rule 3 includes broad environmental protection standards that are directly applicable to several CERCLA § 108(b) cost categories as shown in Table D. For example, § 3.1.5(5) mandates management of "acid forming or toxic producing" mined materials to protect "the drainage system from pollution." This provision, which is applicable to the Open Pits, Waste Rocks, Heaps, Tailings and Ponds CERCLA § 108(b) cost categories, means that these features at Colorado mines must not be a source of a release of a hazardous substance. Similarly, § 3.1.5(10) and § 3.1.5(11) specifically require Colorado mine operators to handle all materials "to prevent any unauthorized release of pollutants to the surface drainage system" and prohibit "unauthorized release of pollutants to groundwater."

Section 3.1.6 of the DRO Rule requires compliance with all applicable federal and Colorado water quality laws and regulations including statewide water quality standards, and applicable federal and Colorado dredge and fill requirements. The DRO Rule also establishes specific groundwater protection standards that require compliance with all statewide groundwater quality standards. The DMO Rule at §§ 3.1.7(1)(e)(f) and (g) include specific groundwater requirements for in situ leach mining operations.

Pursuant to DMO Rule § 3.1.7(8), Colorado regulators can require a mine operator to maintain FA for an extended period of time after mine closure if necessary to demonstrate that "reclamation has been achieved so that existing and reasonably potential future uses of groundwater are protected." The inspection and monitoring provisions in DMO Rule § 3.2 give DRMS broad authority to inspect Colorado mining operations at any time and require inspections on a site-specific frequency to ensure compliance with the site permit, the DMO Rule, and all other applicable Colorado regulations.

The enforcement authorities in DMO Rule § 3.3 provide DRMS with the authority to issue cease and desist orders in the event of an uncured violation of the DMO Rule, seek injunctive relief and initiate surety forfeiture proceedings if an operator fails to comply with the DMO Rule, including the mine closure and reclamation requirements. Consequently, Colorado operators have a strong incentive to comply with the DMO Rule and all permit conditions and to address any potential problems identified in project monitoring data. In this manner, Colorado regulators are authorized to compel an operator to address a potential release of a hazardous substance or to use the project FA to respond to a release if an operator refuses to take appropriate action. The DMO Rule § 3.3 enforcement provisions thus mean that Colorado's mining regulations minimize the potential for an un-funded release of hazardous substances from a Colorado mine. In the event of a release, the operator responds to the release or DRMS uses the FA to respond; there is no taxpayer liability for the response.

The heart of the DMO Rule 6 application process is the Environmental Protection Plan (Exhibit U) at DMO Rule § 6.4.21, which requires detailed information about how a proposed mining will be designed, built, operated, closed, and reclaimed in compliance with all relevant environmental protection standards. The data requirements for the Environmental Protection Plan inform how the mine must be designed, operated, closed, and reclaimed in order to comply with all relevant

environmental protection standards. The resulting closure and reclamation requirements define the amount of required FA (DMO Rule at § 4.2.1(1)).

As detailed in the Exhibit U, Environmental Protection Plan requirements, an applicant must provide information on leach facilities, heap leach pads, tailings storage or disposal areas, impoundments, waste rock piles, temporary or permanent stock piles, land application sites, and in situ leach operations or conventional uranium operations.[8] Some of the other Environmental Protection Plan information requirements include the following:

- The types of chemicals and reagents to be used in the mineral processing facilities and how using these chemicals could affect the environment (§ 6.4.21(5));

- Groundwater quality data (§ 6.4.21(9));

- Engineering designs for containing process solutions, stormwater management, and managing surface water run-off from the mine facilities (§ 6.4.21(10));

- Surface water quality and flow data (§ 6.4.21(11));

- A water quality monitoring plan to document the mine is operating in compliance with the Environmental Protection Plan (§ 6.4.21(12)); and

- Waste characterization data to evaluate the geochemical behavior of the mined materials (§ 6.4.21(14)).

It should be noted that Exhibit U § 6.4.21 of the DMO Rule emphasizes that an applicant must provide site-specific data to satisfy the requirements of the Environmental Protection Plan. This site-specific approach is markedly different from the one-size-fits-all model advocated in the Proposed Rule.

The DMO Rule 4, "Performance Warranties and Financial Warranties" establishes detailed requirements for the amount of required FA, the types of acceptable FA instruments, and the duration of the FA obligation. In order to be acceptable, DRMS must be able to convert the FA instrument into cash within 180 days. DMO Rule § 4.1.2(8).

DMO Rule § 4.1(7) requires FA to be "…maintained in good standing for the entire life of any permit issued under the Act and these Rules." This provision gives Colorado regulators the authority to require an operator to maintain FA for so long as the DRMS deems a permit is necessary. Pursuant to this authority, DRMS can require FA to remain in place for all phases of the mining life cycle including closure and post-closure corresponding to the interim, short-term, and long-term O&M cost categories in the Proposed Rule. Moreover, maintaining a permit in good standing obviously means that all of the required environmental controls and structures remain in place and are properly operated and maintained. This combination of environmental

[8] The DMO Rule establishes numerous specific requirements for in situ leach mines and conventional uranium mines.

controls, coupled with the FA to maintain and operate these controls, minimizes the likelihood of a release of hazardous substances at Colorado mines.

DMO Rule § Section 4.2.1 directly ties the amount of required FA to the Environmental Protection Plan:

> "All Financial Warranties shall be set and maintained at a level which reflects the actual current cost of fulfilling the requirements of the Reclamation Plan; and for Designated Mining Operations, fulfilling the applicable requirements of the reclamation and Environmental Protection Plans during site closure and reclamation." (DMO Rule at § 4.2.1(1))

Section 4.2.1(2) of the DMO Rule gives DRMS the authority to review the adequacy of the Financial Warranty (i.e., the FA) and demand an increase in the required amount if the Agency determines the current amount is insufficient to fulfill the requirements of the Reclamation Plan or comply with the Environmental Protection Plan. The State of Colorado accepts numerous types of financial instruments and establishes detailed provisions in DMO Rule §§ 4.3 through 4.13 pertaining to each FA instrument type.

The DMO Rule includes detailed information requirements for permit applications to explore for minerals and to develop and operate mining projects in Colorado. Rule 5 pertains to Prospecting Operations (i.e., exploration.) Rule 6.3 applies to smaller and limited impact mining operations. Rule 6.4 governs larger operations called "Designated Mining Operations". Both Rules 6.3 and 6.4 include numerous information requirements that are to be provided as Exhibits to the prospecting or mining application. The exhibits describe the detailed project information, environmental baseline data, engineering studies, reclamation plan, and reclamation cost calculations necessary to obtain a permit.

As listed in Table D, Colorado's detailed and rigorous DMO Rule and Dam Safety regulations addresses the thirteen CERCLA § 108(b) cost categories. The DMO Rule and the associated DPHE media-specific environmental regulations and permit requirements provide comprehensive environmental protection that minimizes the potential for a release of hazardous substances from Colorado mining operations. If the project monitoring data document that a release has occured, Colorado regulators have access to a project's FA to respond to a release in the event the mine operator fails to do so. In light of these specific DRO mandates, imposing a new layer of federal regulation pursuant to CERCLA § 108(b) would be redundant and therefore unnecessary.

Table D – Colorado
CERCLA 108(b) Response Category Equivalents in Colorado Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Colorado Regulations 2 CCR § 471-1/DMO Rule
Solid/Hazardous Waste Disposal	DMO Rule § 3.1.5(5) DMO Rule § 3.1.13 DMO Rule § 3.1.5(11) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.4.21(4)(a) DMO Rule § 6.4.21(5) DMO Rule § 6.4.21(6) RCRA permit and financial assurance requirements
Open Pit	DMO Rule § 3.1.2 DMO Rule § 3.1.5(2) DMO Rule § 3.1.5(3) DMO Rule § 3.1.5(4) DMO Rule § 3.1.5(7) DMO Rule § 3.1.5(9) DMO Rule § 3.1.6(1) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 6.5 DMO Rule § 7.1.4 DMO Rule § 7.2.8
Waste Rock	DMO Rule § 3.1.2 DMO Rule § 3.1.5(5) DMO Rule § 3.1.5(7) DMO Rule § 3.1.5(10) DMO Rule § 3.1.5(11) DMO Rule § 3.1.6(3) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 6.5 DMO Rule § 7.1.4 DMO Rule § 7.2.8

CERCLA § 108(b) Response Category	Colorado Regulations 2 CCR § 471-1/DMO Rule
	DMO Rule § 7.3.1
Heap/Dump/Leach	DMO Rule § 3.1.2 DMO Rule § 3.1.5(5) DMO Rule § 3.1.5(10) DMO Rule § 3.1.5(11) DMO Rule § 3.1.6(3) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 6.5 DMO Rule § 7.1.4 DMO Rule § 7.2.8 DMO Rule § 7.3.1
Tailings Facility	DMO Rule § 3.1.2 DMO Rule § 3.1.5(7) DMO Rule § 3.1.5(10) DMO Rule § 3.1.5(11) DMO Rule § 3.1.6(2) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 6.5 DMO Rule § 7.1.4 DMO Rule § 7.2.8 DMO Rule § 7.3.1
Process Pond/Reservoir	DMO Rule § 3.1.2 DMO Rule § 3.1.5(7) DMO Rule § 3.1.5(10) DMO Rule § 3.1.5(11) DMO Rule § 3.1.6(2) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 7.1.4 DMO Rule § 7.2.8

CERCLA § 108(b) Response Category	Colorado Regulations 2 CCR § 471-1/DMO Rule
	DMO Rule § 7.3.1
Underground Mine	DMO Rule § 3.1.2 DMO Rule § 3.1.5(6) DMO Rule § 3.1.5(10) DMO Rule § 3.1.5(11) DMO Rule § 3.1.6(1) DMO Rule § 3.1.7(1) DMO Rule § 3.1.7(2) DMO Rule § 3.1.7(3) DMO Rule § 6.3 Exhibits A – L: Limited Impact Operations DMO Rule § 6.4 Exhibits A – U: Designated Mining Operations DMO Rule § 6.4.21 – Environmental Protection Plan DMO Rule § 7.1.4 DMO Rule § 7.2.8
Slag Pile	DMO Rule § 3.1.2 DMO Rule § 3.1.5(11)
Interim O&M	DMO Rule § 3.1.7(8) DMO Rule § 3.2 DMO Rule § 4.1(7) DMO Rule § 4.1(9) DMO Rule § 4.1.1 DMO Rule § 4.1.2 DMO Rule § 7.2.11
Water Treatment	DMO Rule § 4.2.1(4)
Short-term O&M Monitoring	DMO Rule § 3.1.7(8) DMO Rule § 3.2 DMO Rule § 4.1(7) DMO Rule § 4.1(9) DMO Rule § 4.1.1 DMO Rule § 4.1.2 DMO Rule § 7.2.11
Long-term O&M Monitoring	DMO Rule § 3.1.5(9) DMO Rule § 3.1.7(8) DMO Rule § 3.2 DMO Rule § 4.1(7) DMO Rule § 4.1(9) DMO Rule § 4.1.1 DMO Rule § 4.1.2 DMO Rule § 7.2.11

E. Florida

The Florida Department of Environmental Protection ("FDEP") has extensive regulatory requirements governing both phosphate mines and facilities that manufacture mined phosphate into fertilizer (hereinafter, fertilizer manufacturing plants). As described in FDEP's August 19, 2016 letter to Ms. Linda Barr and Mr. Barnes Johnson, EPA Office of Resource Conservation and Recovery, FDEP contends that Florida's phosphate mines and fertilizer manufacturing plants are not hardrock mining facilities and should not be subject to CERCLA § 108(b).

FDEP's August 2016 letter to EPA asserts that EPA has improperly classified Florida's phosphate mines and fertilizer manufacturing plants as hardrock mining and mineral processing operations. As noted in FDEP's letter, neither Florida's phosphate mines nor its fertilizer manufacturing plants have attributes typical of hardrock mining or mineral processing facilities. Thus they should not be considered hardrock mining operations or subject to the Proposed Rule. FDEP's letter explains that EPA has based its classification of Florida's phosphate mines as hardrock mines on an EPA Office of Inspector General's 2004 report that erroneously states Florida's phosphate mines have the potential to generate acid mine drainage. They do not, and this report is incorrect.

Florida's phosphate mines are separate operations and independent of fertilizer manufacturing plants. The mines excavate phosphate pebble deposits, which are comprised of sand, clay, and phosphate. The geology and mineralogy of Florida's phosphate deposits categorically precludes them from becoming a source of acid mine drainage. Thus, EPA used factually incorrect information to classify Florida phosphate mines as acid-generating hardrock mines and to include them in the Proposed Rule.

It is possible that EPA's 2004 report confused the low-pH (i.e., acidic) process water at Florida's phosphate fertilizer manufacturing plants with clay settling ponds at the phosphate mines. Florida's phosphate fertilizer manufacturing operations contain and manage the acidic process water in engineered facilities. These processing operations produce a by-product called phosphogypsum, which is created when sulfuric acid is reacted with phosphate during processing to produce phosphoric acid.

An EPA website describes the phosphogypsum by-product as follows and acknowledges that Florida has special closure rules for the facilities known as stacks that manage and contain the phosphogypsum:

> "Phosphate rock contains the mineral phosphorus, an ingredient used in some fertilizers to help plants grow strong roots. Phosphate rock also contains small amounts of naturally occurring radionuclides, mostly uranium and radium. When processing phosphate rock to make fertilizer, the phosphorous is removed by dissolving the rock in an acidic solution. The waste that is left behind is called phosphogypsum. Most of the naturally occurring uranium and radium found in phosphate rock end up in this waste. As a result, phosphogypsum has a higher concentration of these naturally occurring radioactive elements. Uranium decays to radium and radium decays to radon, a radioactive gas...Some states have

> worked with EPA to write rules for managing phosphogypsum. *In Florida, companies have to follow special rules to close (shut down) a stack that won't be used any more.*[9] (Italics emphasis added).

As discussed below and shown in Table E, Florida has developed specific regulatory programs governing the phosphate mines and fertilizer manufacturing plants. Additionally, the federal requirements for secondary containment and Spill Prevention Control and Countermeasure Plans pursuant to 40 CFR 112 also apply to Florida's fertilizer manufacturing plants. However, it must be noted that the inclusion of Florida's phosphate mines and fertilizer manufacturing plants in this report in no way suggests that these operations should be considered under the Proposed Rule or that EPA has correctly classified Florida's phosphate mines and fertilizer manufacturing plants as hardrock mining and mineral processing facilities. This report includes the Florida environmental protection and FA laws and regulations for completeness sake and to demonstrate that notwithstanding their misclassification, the existing regulatory and FA framework for these facilities minimizes the risk of a release of hazardous substances.

Florida's law governing phosphogypsum management (Florida Statute Title XXIX, Chapter 403, Part 4154, Environmental Control, Phosphogypsum Management Program) establishes extensive environmental protection and FA requirements programs applicable to the phosphate fertilizer manufacturing plants. Florida Administrative Code ("F.A.C") Chapter 62-673 implements this statute. Florida also has detailed reclamation and FA regulations for phosphate mines at F.A.C. Chapter 62-16, as do many counties where the mines are located. Because these phosphate mines produce inert clay and sand waste products that do not resemble the waste rocks or tailings from hardrock mines, and the definitions of these terms as used in the proposed CERCLA § 108(b) FA formula are not applicable, they will not be discussed further.

Table E lists the numerous provisions in the Chapter 62-673 F.A.C. phosphogypsum regulations that minimize the risks of a release of a hazardous substance from phosphate fertilizer manufacturing plants. These regulations cover the phosphogypsum stacks used to manage and store the phosphogypsum waste product produced from the phosphate processing operation and the associated water management ponds, pipes, ditches, and conveyance systems. Those regulations are detailed and comprehensive, and cover design, construction, operation, closure, and post-closure care standards. The Chapter 62-673 F.A.C. regulations also require long-term monitoring and long-term care and FA for these activities.

The performance standard governing phosphogypsum stacks dictates that:

> "A phosphogypsum stack system shall be designed, constructed, operated, maintained, closed, and monitored throughout its design period to control the movement of waste and waste constituents into the environment so that ground water and surface water quality standards of Chapters 62-303 and 62-520 F.A.C., will not be violated beyond the applicable zone of discharge specified for the system." § 62-673.340(1) F.A.C.

[9] https://www3.epa.gov/radtown/fertilizer-production.html

Surface water management at these sites requires them to be "operated to provide for the collection, control, recycling and treatment of surface runoff from the site as necessary to meet the applicable water quality standards of Chapters 62-520 and 62-302 F.A.C." § 62-673.340(5) F.A.C.

The phosphogypsum management regulations at § 62-673.340(7) F.A.C. include the following specific provisions governing interim management:

"(7) Interim Stack System Management Plan (ISSMP). The owner or operator of each phosphogypsum stack system shall submit a written ISSMP to the Department by July 1st following the effective date of these amendments (July 2, 2005). The ISSMP shall provide instructions for two years of operation and management of the specific phosphogypsum stack system should a shutdown occur such that no phosphoric acid will be produced at the facility for a two-year period. By July 1 of each following year, the owner or operator shall submit an updated ISSMP, taking into account the process wastewater levels and the existing stack system configuration as of June 1 of that year. The ISSMP shall include:

(a) A detailed description of process wastewater management procedures that will be implemented to insure that the stack system operates in accordance with all applicable Department permit conditions and rules. The procedures shall address the actual process wastewater levels present at the facility as of June 1 of each year and shall assume that the facility will receive average annual rainfall during the two year planning period;

(b) A detailed description of the procedures to be followed for the daily operation and routine maintenance of the stack system (including required environmental sampling and analyses) as well as for any maintenance or repairs recommended following annual inspections of the system;

(c) Identification of all machinery, equipment and materials necessary to implement the plan as well as actions that would be taken to assure the availability of these items during the planning period;

(d) Identification of the sources of power or fuel necessary to implement the plan as well as the actions that would be taken to assure the availability of power or fuel during the planning period; and

(e) Identification of the personnel necessary to implement the plan, including direct labor required for paragraphs (a) and (b) above, and any necessary direct supervisory personnel, as well as the actions that would be taken to assure their availability and any required training of these personnel."

These regulations include prescriptive closure plan requirements at § 62-673.610 F.A.C that mandate a closure design that controls, minimizes, or eliminates the post-closure release to ground water or to surface water of phosphogypsum, process waste water, leachate, and contaminated runoff. Closure plans require stacks to be closed with a cover system that minimizes infitration into the stack and requires little or no long-term maintenance. Process waste water in ponds or ditches must be treated. Sludges in ponds must be removed or treated. Leachate control systems must prevent leachate from violating applicable water quqlity standards.

Section 62-673.630 F.A.C of the phosphogypsum management rules establishes long-term care requirements that mandate operators "shall be responsible for monitoring and maintenance of the facility in accordance with an approved closure plan for 50 years from the date of closing." FDEP has the authority to extend the timeframe for the long-term monitoring and maintenance requirements if the "closure design or closure operation plan is found to be ineffective."

The FA requirements at § 62-673.640 F.A.C require operators to provide FA before FDEP can issue operating permits and requires FA throughout the lifecycle of the fertilizer manufacturing plant. The 50-year long-term care FA amount must be based on the estimated costs to close the stack and provide for long-term care and water management. Operators must submit updated estimated closure costs on an annual basis to adjust for inflation and any changes in the closure plan.

Even if EPA continues to assert that phosphogypsum stacks somehow are a component of hardrock mineral processing facilities subject to the Proposed Rule, the State of Florida has FA requirements for these facilities, including provisions for long-term care (i.e., long-term O&M), that are identical to EPA's FA long-term care requirements for hazardous waste disposal facilities pursuant to RCRA. Because the FA requirements in § 62-673.640(5) are consistent with RCRA, there is clearly no need for a duplicative FA requirement under CERCLA § 108(b).

The two EPA documents describing the regulatory requirements for Florida's phosphate mines and phosphate fertilizer manufacturing plants do not describe the comprehensive environmental protection, reclamation requirements, and FA provisions in Florida's laws and regulations. The document entitled: "Summary of Florida Financial Responsibility Requirements" (EPA-HQ-SFUND-2015-0781-2224) focuses mainly on the physical reclamation requirements applicable to the clay ponds and sand disposal facilities at the phosphate mines. It does not mention the standards and FA requirements imposed under applicable County codes to the same mine properties, and it only mentions in passing the stringent Chapter 62-673 F.A.C. regulatory program for Florida's phosphogypsum stacks and completely overlooks the incorporation by reference of the RCRA long-term care FA requirements in this chapter.

The second document, Table F in Appendix IV in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (EPA-HQ-SFUND-2015-0781-0144), also fails to describe the breadth of Florida's regulations and FA requirements for the phosphogypsum stacks. Like EPA's summary document, Appendix IV/Table F focuses mainly on the reclamation requirements for Florida's phosphate mines and does not include an adequate discussion of the environmental protection and FA requirements for Florida's phosphogypsum stacks.

EPA should eliminate Florida's phosphate mines and fertilizer manufacturing plants from the Proposed Rule because these facilities are not hardrock mines and processing facilities. EPA should similarly eliminate Florida's phosphogypsum stacks from the Proposed Rule for two reasons: 1) they are not hardrock mineral processing facilities and are erroneously included in the Proposed Rule; and 2) Florida regulates these facilities as hazardous waste disposal operations that are subject to regulations that mirror RCRA requirements, including the mandate for

operators of phosphogypsum stacks to provide FA for long-term care, analogous to the FA requirements under RCRA.

E – Florida
CERCLA 108(b) Response Category Equivalents in Florida Rules for Hardrock Mining*

CERCLA 108(b) Response Category	Florida Regulations
Solid/Hazardous Waste Disposal	F.A.C. § 62C-16.0051(9)(c) F.A.C. § 62-730 F.A.C. § 62-673.610 F.A.C. § 62-673-640(f) as the equivalent of 40 C.F.R. 264.143(f)(1) and 264.145(f)(1) F.A.C. § 62-777 F.A.C. § 62-780
Open Pit (mine cuts)*	F.A.C. § 62C-16.0051 F.A.C. § 62C-16.0075
Waste Rock (clay settling ponds and sand disposal facilities)*	F.A.C. § 62C-16.0051 F.A.C. § 62C-16.0075 F.A.C. § 62-673.320 F.A.C. § 62-673.340(4), (7) F.A.C. § 62-673.400 F.A.C. § 62-673.600 F.A.C. § 62-673.610
Heap/Dump/Leach	Not applicable
Tailings Facility (Phosphogypsum Stack)*	F.A.C. § 62C-16.0051 F.A.C. § 62C-16.0075 F.A.C. § 62-303 F.A.C. § 62-520 F.A.C. §§ 62-672.100 - .870 F.A.C. § 62-673.320 F.A.C. § 62-673.340 F.A.C. § 62-673.400 F.A.C. § 62-673.600 F.A.C. § 62-673.610 F.A.C. § 62-673.630 F.A.C. § 62.673.640
Process Pond/Reservoir (Phosphogypsum Stack)	F.A.C. § 62C-16.0051 F.A.C. § 62-673.320 F.A.C. § 62-673.400 F.A.C. § 62-673.600 F.A.C. § 62-673.610
Underground Mine	Not applicable
Slag Pile	Not applicable
Interim O&M	F.A.C. § 62-673.340(7) F.A.C. § 62-673.610(7)

CERCLA 108(b) Response Category	Florida Regulations
Water Treatment	F.A.C. § 62C-16.0051 (7)(a) F.A.C. § 62-660.400(1)(e)31 F.A.C. § 62-671.300 F.A.C. § 62-303 F.A.C. § 62-520 F.A.C. §§ 62-673.340(5), (6) F.A.C. § 62-673.610
Short-term O&M Monitoring	F.A.C. § 62C-16.0067 F.A.C. § 62-673.320(n) F.A.C. § 62-673.340(4)
Long-term O&M Monitoring	F.A.C. §§ 62-673.320(3)(n), (4), (5) F.A.C. § 62-673.340(4) F.A.C. §§ 62-673.610(3), (4), (6), (7) F.A.C. § 62-673.630 F.A.C. § 62-673.640 F.A.C. § 62-673-640(5) as the equivalent of 40 C.F.R. 264.143(f)(1) and 264.145(f)(1)

***** Note: EPA has improperly classified Florida's phosphate mines and phosphate mineral processing facilities as hardrock mining and mineral processing facilities

F. Idaho

As shown in Table F below, three regulatory programs and state agencies govern the design, operation, and closure of Idaho mines, and require FA for specific components of Idaho mining and mineral processing operations. The Idaho Department of Lands ("IDL") administers the Idaho Administrative Procedures Act ("IDAPA") 20, Title 03, Chapter 02 Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities ("Reclamation and Closure Rule")[10]. The Idaho Department of Environmental Quality ("IDEQ") administers the IDAPA 58, Title 01, Chapter 13 Rules for Ore Processing by Cyanidation ("Cyanidation Processing Rule"). The Idaho Department of Water Resources ("IDWR") administers the IDAPA 37 Title 03, Chapter 05 Mines Tailings Impoundment Structures Rules.[11]

In addition to these specific mining-related rules, Idaho mining and mineral processing facilities must comply with Idaho's stringent antidegradation policy at IDAPA 58, Title 01, Chapter 02, Section 051) to protect existing and designated beneficial uses of surface waters and "all applicable laws and rules of the state of Idaho" governing Idaho's water quality standards, waste water treatment requirements, groundwater quality, hazardous and solid waste management, and stream channel protection. (See generally, IDAPA § 20.03.02.001.04). IDL must deny a Reclamation and Closure permit application for proposed projects that cannot affirmatively demonstrate compliance with Idaho's antidegradation policy protecting beneficial uses of the waters of the State. IDAPA § 20.03.02.08.07.

Idaho's regulatory and FA requirements for mining and mineral processing apply to all lands in the state regardless of ownership. Operators with projects on public lands must obtain permits from IDL, IDEQ, and IDWR and provide these state agencies with FA in addition to securing any necessary permits from the applicable FMLA and satisfying federal FA requirements. In 1996, Idaho developed the Idaho Joint Review Process, which is a structured interactive consultation process between Idaho state agencies and the FLMA. The Idaho Joint Review Process coordinates and facilities the interaction of state and federal laws and regulations governing mineral development proposals on public lands in Idaho.

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[10] The Idaho Mining Association has started a dialogue with stakeholders about asking Idaho State legislators to amend the Idaho Surface Mining Act (Idaho Code Chapter 15, Title 47) to extend the application of the Act to the surface effects of underground mines that are not associated with cyanidation mineral processing facilities. Underground mines must already comply with numerous Idaho environmental protection regulations including the antidegradation rules. Tailings impoundments associated with underground mining operations must comply with the Mine Tailings Impoundment Structure Rules. The Cyanidation Processing Rule already applies to a tailings impoundment at an underground mine that uses cyanide as the principal leaching chemical in its mineral processing facility.

[11] Idaho's dam safety rules specific to the design, operation, and FA requirements for tailings impoundments are unusual. Most states apply their more general dam safety regulations to tailings storage facilities and do not have a separate regulation dealing specifically for impoundments designed to impound mine tailings.

The package of regulations for mining and mineral processing facilities in Idaho provides comprehensive environmental protection and FA for Idaho mines and mineral processing facilities. As shown in Table F below, this regulatory package governs all of the CERCLA § 108(b) response categories in the Proposed Rule and gives Idaho regulators the authority to require FA for each category.

The Idaho regulatory framework applicable to mining and mineral processing is another example of a "complicated but generally effective" regulatory framework described in the NAS Study. This framework involves three different state regulatory agencies, interaction of two separate regulatory programs applicable to cyanidation facilities, and numerous portions of Idaho's administrative code governing environmental protection and providing for public health and safety. A distinguishing aspect of Idaho's regulatory programs is the combination and interaction of the IDAPA § 20.03.02 and IDAPA § 57.01.13 rules governing cyanidation facilities. Working as a whole, Idaho's regulations establish comprehensive and stringent environmental protection and FA requirements that minimize the potential for a release of hazardous substances from an Idaho mine and give Idaho state regulators FA in the event an operator fails to respond to a release.

IDL's Reclamation and Closure Rule establishes detailed information requirements that permit applicants must provide to develop and operate a surface mine or mineral processing facility that uses cyanide as a principal processing chemical. IDEQ's Cyanidation Processing Rule works in tandem with the IDL rules. Together the Reclamation and Closure Rule and the Cyanidation Processing Rule govern the entire mining and mineral processing life cycle. The Reclamation and Closure Rules include the following definition of "post closure":

> "The period after completion of permanent closure when the operator is monitoring the effectiveness of the permanent closure activities. Post closure shall last a minimum of twelve (12) months, but may extend until the cyanidation facility is show to be in compliance with the stated permanent closure objectives and the requirements of the chapter." (IDAPA § 20.03.02.001.39)

Some of the environmental protection information requirements that applicants for a permit under the Reclamation and Closure Rule include the following (IDAPA § 20.03.02.070 - .071):

- An estimate of total reclamation costs in the event the operator fails to implement the permanent closure plan and assuming a third party under contract to IDL must perform the permanent closure activities;

- A description of site-specific impacts from acid rock drainage and Best Management Procedures ("BMPs") that will be used to mitigate any impacts from acid rock drainage;

- The procedures and schedule for neutralizing process waters and stabilizing mined materials;

- An estimate of the duration of the post-closure period;

- A closure and post-closure water management plan that is consistent with the Cyanidation Processing Rule;

- The design and operation of BMPs during closure and post-closure to provide for water management;

- The design and maintenance of engineered caps and covers designed by a professional engineer registered in Idaho for cyanidation facilities that must be designed to minimize the interaction of meteoric waters, surface waters, and groundwaters with wastes containing pollutants that are likely to be mobilized and discharged to waters of the state;

- Closure and post-closure monitoring plans for surface water and groundwater to ensure compliance with the permanent closure plan and the state requirements; and

- A solid and hazardous waste management plan to comply with state and federal laws and regulations governing solid and hazardous waste management and disposal (i.e. the federal Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 *et seq.*)

Applicants for a Reclamation and Closure permit may be required to pay for an independent third-party to review and verify the accuracy of the permanent closure cost estimate.

IDL's review and approval process for a Reclamation and Closure permit is coordinated with IDEQ's review and approval of the Cyanidation Processing permit. IDEQ is authorized to impose additional permanent closure requirements in the Cyanidation Permit.

Idaho regulators can require an operator to amend a Reclamation and Closure permit to respond to new or unanticipated site-specific conditions or if the operator proposes to modify or expand its operation. (IDAPA §§ 20.03.02.090-091, 100). IDEQ can also require an operator to amend the Cyanidation Processing permit to address unanticipated circumstances. IDL and IDEQ coordinate their authority to require permit amendments.

Operators seeking to close a surface mine and cyanidation processing facilities must submit a Permanent Closure Report that complies with the information requirements in IDAPA §§ 20.03.03.111-112. The Permanent Closure Report must document that permanent closure has resulted in "long-term neutralization of process waters and material stabilization." Operators must submit the following documentation:

- The effectiveness of material stabilization and the water management plan;

- The adequacy of the monitoring plan;

- The post-closure operation, maintenance, and monitoring requirements, and the estimated cost to complete these activities;

- The source control systems (i.e., caps and covers) constructed to eliminate, mitigate, or contain short- and long-term discharge of pollutants from cyanidation facilities;

- Ownership and responsibility for the site during the permanent and post-closure periods; and

- The future beneficial uses of the land, surface water and ground water in and adjacent to the closed cyanidation facilities.

IDL will disapprove of a Permanent Closure Report if the applicant cannot demonstrate compliance with the above-listed requirements. In the event of such disapproval, the operator must continue to manage the closed site in compliance with all of the applicable operating permits including the Reclamation and Closure Permit, the Cyanidation Processing Permit, and the Tailings Impoundment Dam Safety Permit. The operator must also continue to maintain the FA instruments it has provided to IDL, IDEQ, and IDWR.

Idaho's Surface Reclamation and Closure regulation establishes specific FA requirements for the Reclamation Plan at IDAPA § 20.03.02.120, "Performance Bond Requirements for Surface Mining" and for Cyanidation Facilities at IDAPA § 20.03.02.121 "Performance Bond Requirements for Cyanidation Facilities". IDEQ will not issue a permit pursuant to Idaho's Cyanidation Processing regulations until an operator has satisfied the FA requirements in IDAPA § 20.03.02.120-121.

The Tailings Impoundment Structure Rules establish specific and stringent criteria governing the structural design of the embankment to provide long-term stability (IDAPA § 37.03.05.045) that apply to tailings dams built in conjunction with both surface and underground mines. Mine tailings impoundments must be certified by IDWR before tailings can be deposited in the impoundment and re-certified every two years.

Under the Tailings Impoundment Structure Rules at IDAPA § 37.03.05.040, Idaho operators must provide IDWR with FA that covers "the active life of the tailings disposal site…to provide a means by which the tailings impoundment can be placed in a safe maintenance-free condition if abandoned by the owner without conforming to an abandonment plan approved by the Director." The bond amount is subject to review every two years (when the structure is recertified) and is adjusted to account for inflation and to reflect current costs.

In addition to the environmental protection and FA requirements in Idaho's Reclamation and Closure Regulations, the IDEQ's Cyanidation Processing Rule establishes requirements for the design, operation, and closure of mineral processing facilities that use cyanide as a primary leaching agent. The Cyanidation Processing Rule ensures that cyanide-bearing process waters are safely contained, controlled and treated. Like the Reclamation and Closure Regulation, the Cyanidation Processing Rule mandates protection of beneficial uses of waters of the state.

The Cyanidation Processing regulatory program requires permit applicants to provide detailed information about the design of the environmental controls that will be employed to contain and treat all cyanide-bearing process waters. This IDEQ-managed program is cross-referenced to and coordinated with the IDL's Reclamation and Closure program. IDAPA § 50.01.13.200 establishes minimum design and performance standards to protect public health and waters of the

state. Although the minimum design and performance standards apply to all cyanidation facilities, IDEQ is authorized to apply more stringent site-specific criteria as necessary to meet the objectives of this regulation. Key components of the engineering design and performance criteria include the following:

- Design storm event, engineered containment criteria, and project water balance that includes snowmelt and contingency plans to manage excess process water;
- Specifications for the engineered sub-base, primary and secondary synthetic liners, and compacted clay liners;
- Redundant power and pumping capabilities in the event of power failures;
- Leak detection and collection systems;
- Procedures for loading ore onto leach pads to minimize the potential for damaging the liner;
- System performance monitoring plans to document the performance of the containment measures;
- Caps and covers to minimize infiltration of meteoric water into heaps and tailings impoundments;
- Surface water and groundwater monitoring and reporting programs;
- Temporary and seasonal closure plans; and
- Quality assurance and quality control plans for data collection and analysis.

In 2016, the Idaho State Legislature amended Idaho Code § 47-1512 to increase the programmatic upper limit for the surface mining performance bond from $2,500 per acre to $15,000 per acre. As a practical matter, this limit functions as a guideline because IDL can determine that a higher bonding level is required to address site-specific conditions. In the event IDL requires FA that exceeds the $15,000 per acre calculation, the operator may request a hearing before the Board of Land Commissioners. Similarly, IDAPA § 20.03.02.121 establishes a programmatic ceiling of $5 million for the cyanidation performance bond. IDL may set a higher site-specific FA amount if the Agency determines that site conditions warrant a higher level of FA in order to comply with the Reclamation and Closure rules. Like the surface mining performance bond, there is not an upper limit to the amount of the cyanidation performance bond if site-specific conditions dictate that more than $5 million in FA is necessary. An operator may request a hearing if IDL requests a higher level of FA for the cyanidation performance bond.

In August 2016, Idaho Govenor, Butch Otter, sent EPA Administrator, Gina McCarthy, a letter in conjunction with EPA's federalism consultation effort for the CERCLA § 108(b) rulemaking. Governor Otter's letter emphatically states that a CERCLA § 108(b) FA program is unnecessary

in light of Idaho's comprehensive regulatory program for hardrock mining. As stated in the Governor's letter, a permanent closure plan and associated bond pursuant to Idaho's Cyanidation Facility regulatory program must also meet the requirements of the Federal Resource Conservation and Recovery Act, U.S.C. Sections 6901 et seq.; the Idaho Hazardous Waste Management Act, Chapter 44, Title 39, Idaho Code; and the Idaho Solid Waste Management Act, Chapter 74, Title 39, Idaho Code.

Governor Otter's letter documents the success of Idaho's regulatory and FA programs for hardrock mines:

> "No hardrock mine approved since 1986 for which financial assurances were posted has defaulted on the financial assurances such that the Mine was not closed and reclaimed in accordance with: (1) the reclamation/closure plan approved by the relevant Federal and/or State agencies; and (2) the financial assurances retained by the agencies."

Although it is complex, Idaho's multi-agency, multi-regulations regulatory framework for Idaho hardrock mines provides effective and comprehensive environmental protection that determines site-specific FA requirements on a project-by-project basis. The three state agencies with jurisdiction over mining (e.g., IDL, IDEQ, and IDWR) coordinate and administer their regulatory programs in a manner that eliminates regulatory gaps. This package of environmental protection, regulations, FA requirements, and design and operating requirements for mine tailings impoundments provides complete, seamless, and gap-free environmental protection and FA. Consequently, imposition of an FA requirement under CERCLA § 108(b) would be duplicative and potentially preempt the Idaho State FA programs.

The two EPA documents analyzing Idaho's law and regulations governing hardrock mining are seriously deficient and do not adequately describe the scope of Idaho's regulatory and FA programs. First, Appendix IV, Table G in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (Docket No. EPA-HQ-SFUND-2015-0781-0144) omits the Idaho law and regulations governing the design, operation, and closure of mine tailings impoundments. It also fails to mention Idaho's antidegradation requirements. Second, the "Summary of Idaho Financial Responsibility Requirements (Docket No. EPA-HQ-SFUND-2015-0781-2039) completely overlooks the IDEQ Ore Processing by Cyanidation Rule, which is an essential component of Idaho's regulatory program that minimizes the potential risk of releases of hazardous substances. This summary includes irrelevant information about Idaho's rules for placer and dredge mining, which are not subject to the Proposed Rule and does not include the updated $15,000 per acre modification to the IDL's rules.

As stressed in Governor Otter's August 2016 letter to EPA and shown in Table E below, there is no justification in Idaho for EPA's proposal to add another layer of FA under CERCLA § 108(b).

Table F – Idaho
CERCLA 108(b) Response Category Equivalents in Idaho Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Idaho Regulations
Solid/Hazardous Waste Disposal	IDAPA § 20.03.02.071 IDAPA § 20.03.02.111 IDAPA § 20.03.02.140 IDAPA § 58.01.02.051 IDAPA § 58.01.05 IDAPA § 58.01.06 IDAPA § 58.01.13.100 IDAPA § 58.01.13.501 IDAPA § 37.03.05.045
Open Pit	IDAPA § 20.03.02.070 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.140 IDAPA § 58.01.02.051
Waste Rock	IDAPA § 20.03.02.070 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.140 IDAPA § 58.01.02.051
Heap/Dump/Leach	IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.500 IDAPA § 58.01.13.750 IDAPA § 58.01.02.051

CERCLA § 108(b) Response Category	Idaho Regulations
Tailings Facility	IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.500 IDAPA § 58.01.13.750 IDAPA § 58.01.02.051 IDAPA § 37.03.05.035 IDAPA § 37.03.05.040 IDAPA § 37.03.05.045
Process Pond/Reservoir	IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.500 IDAPA § 58.01.13.750 IDAPA § 58.01.02.051
Underground Mine	IDAPA § 58.01.02.051
Slag Pile	Not applicable
Interim O&M	IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 20.03.02.150 IDAPA § 58.01.13.100

CERCLA § 108(b) Response Category	Idaho Regulations
	IDAPA § 58.01.13.200 IDAPA § 58.01.13.501 IDAPA § 58.01.13.502 IDAPA § 58.01.13.750 IDAPA § 58.01.13.850 IDAPA § 58.01.13.900
Water Treatment	IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.112 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.501 IDAPA § 58.01.13.502 IDAPA § 58.01.13.750 IDAPA § 58.01.13.850 IDAPA § 58.01.13.900 IDAPA § 58.01.02.051
Short-term O&M Monitoring	IDAPA § 20.030.010.39 IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.112 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 20.03.02.150 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.501 IDAPA § 58.01.13.750 IDAPA § 58.01.13.850 IDAPA § 58.01.13.900

CERCLA § 108(b) Response Category	Idaho Regulations
Long-term O&M Monitoring	IDAPA § 20.03.02.001.39 IDAPA § 20.03.02.070 IDAPA § 20.03.02.071 IDAPA § 20.03.02.080 IDAPA § 20.03.02.090 IDAPA § 20.03.02.091 IDAPA § 20.03.02.111 IDAPA § 20.03.02.112 IDAPA § 20.03.02.120 IDAPA § 20.03.02.121 IDAPA § 20.03.02.140 IDAPA § 20.03.02.150 IDAPA § 58.01.13.100 IDAPA § 58.01.13.200 IDAPA § 58.01.13.501 IDAPA § 58.01.13.750 IDAPA § 58.01.13.850 IDAPA § 58.01.13.900

G. Michigan

Most of Michigan's environmental regulations are included in the Natural Resources and Environmental Protection Act ("NREPA"), Michigan Compiled Laws ("MCL") 1994 PA 451, as amended. MCL Part 632, Nonferrous Metals Mining §§ 324.63201 through 324.63223, governs nonferrous, metallic (i.e., hardrock) mining and mineral exploration. Rule 425§§ 101 – 602 implements the Part 632. MCL Part 631 applies to metallic ferrous mining (i.e., iron ore mining). As shown in Table G and discussed below, MCL Part 632 and the Rule 425 include provisions that correspond to the thirteen CERCLA 108(b) response categories, including specific requirements for long-term care. The Michigan Department of Environmental Quality ("MIDEQ")/Office of Oil, Gas, and Minerals ("OOGM") administers MCL Part 632 and Rule 425.

MCL Part 315 establishes dam safety requirements that apply to dams that are over six feet in height and cover more than 5 acres. These dam safety requirements apply to tailings dams for both ferrous and nonferrous mining projects. They would also apply to large above-ground process ponds (i.e., ponds constructed with a 6-ft high or higher ring-dike embankment.)

In enacting MCL Part 632 § 324.63202(c) – (e) Michigan legislators drew the following distinction between nonferrous, metallic mining and metallic ferrous mining:

> "(c) Nonferrous metallic sulfide deposits are different from the iron oxide ore deposits currently being mined in Michigan in that the sulfide minerals may react, when exposed to air and water, to form acid rock drainage. If the mineral products and waste materials associated with nonferrous metallic sulfide mining operations are not properly managed and controlled, they can cause significant damage to the environment, impact human health, and degrade the quality of life of the impacted community.
>
> (d) The special concerns surrounding nonferrous metallic mineral mining warrant additional regulatory measures beyond those applied to the current iron mining operations.
>
> (e) Nonferrous metallic mineral mining may be an important contributor to Michigan's economic vitality. The economic benefits of nonferrous metallic mineral mining shall occur only under conditions that assure that the environment, natural resources, and public health and welfare are adequately protected."

In order to secure a mining permit under MCL Part 632 for a hardrock mine in Michigan, an operator must provide a detailed mining and reclamation plan that documents the proposed project will minimize adverse environmental impacts including preventing and controlling acid-mine drainage. The permit application must also include a contingency plan outlining how the operator would respond to any accidents, failures, or upsets of the project's environmental controls. MIDEQ will not approve a mine permit application unless the applicant can prove that "the proposed mining operation will not pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources." MCL Part 632 § 324.62305(11).

MCL Part 632 requires an operator to reclaim and remediate a mining project and the affected area to achieve a "self-sustaining ecosystem…that does not require perpetual care following closure." MCL Part 632 § 324.63209(8), R 425.204(b)(vi). The goal applicable to reclaimed mines is to return the site and the surrounding area to the "ecological conditions that approximate pre-mining conditions."

Projects with reactive materials (defined as including overburden, ore, waste rock, peripheral rock, and tailings) must be managed to "minimize actual and potential adverse impacts on groundwater and surface water by preventing leaching or runoff of acid-forming waste products and other waste products from the mining process. R 425.409. Facilities with reactive materials must be designed with a composite liner system and leachate collection and leak detection systems. During closure, these facilities must be covered as soon as practicable to isolate the reactive materials from precipitation and air.

MCL Part 632 § 324.63211(1) establishes detailed FA requirements for hardrock mining and milling operations that require an operator to maintain FA during mining, reclamation, closure, and for a 20-year long post-closure monitoring period. The 20-year post-closure monitoring period is stipulated in MCL Part 632 § 324.63209(6). The MIDEQ has the authority pursuant to MCL Part 632 § 324.63209(6)(a) to extend the post-closure monitoring period in increments of up to 20 years unless "there is no significant potential for water contamination resulting from the mining operation." The post-closure monitoring requirement in MCL Part 632 law provides FA for long-term monitoring that is analogous to the CERCLA § 108(b) long-term O&M cost category. Mine operators are required to update the FA cost calculation at least as frequently as every three years. R 425.308(1).

Although MCL Part 632 requires an extended period of post-closure monitoring, which is typically at least 20 years long, the law also stipulates that a project must be reclaimed in a manner that does not require perpetual care. *See* MCL Part 632 § 324.63209(8) and R 425.204(b)(vi). This prohibition against perpetual care means that mine operators must design and operate their facilities with effective measures to isolate reactive materials.

Michigan mine operators are required to submit an annual mining and reclamation report to MIDEQ by March 15 of each year during operation and throughout the 20-year (or longer) post-closure monitoring period to document the facilities are complying with all permit conditions and requirements. MCL Part 632 § 324.63213. The annual report must include the monitoring results for the preceding year. If the monitoring results reveal an exceedance in a monitoring parameter, the operator must notify MIDEQ immediately:

> "A permittee shall promptly notify the department and each emergency management coordinator having jurisdiction over the affected area of any incident, act of nature, or exceedance of a permit standard or condition at a mining operation that has created, or may create, a threat to the environment, natural resources, or public health and safety." MCL Part 632§ 324.63213(2).

Upon receiving the operator's notification of an incident or exceedance of a permit standard, MCL Part 632 provides MIDEQ with substantial enforcement authorities to require the operator

to implement appropriate response actions to abate or eliminate the exceedance and to correct the violation, to suspend the operating permit, or even to revoke the permit. If an operator fails to take the necessary actions to remediate a problem, MIDEQ can "take whatever action is necessary to curtain and remediate any damage to the environment and public health resulting from the violation." If MIDEQ remediates the problem, the operator and the surety provider remain "jointly and severally liable for all expenses incurred by the department." MCL Part 632 § 324.63221(5).

MCL Part 632 § 324.63213 provides an excellent example of how state regulators use project monitoring data to verify a project is complying with the surface water, groundwater, and other environmental performance standards specified in its permits. The MIDEQ and their counterparts in the other mining states discussed in this report use monitoring results as a real-time indicator of whether there is any indication of a potential release of a hazardous substance and if the environmental controls at a mining operation are functioning properly. If the monitoring results indicate there may be a release, operators are required to investigate to determine the extent and nature of the release and to undertake appropriate response measures.

As part of the Michigan mine permitting process, applicants must prepare an environmental protection plan and a contingency plan. R 425.201(d), (e). The contingency plan must be updated annually and provided in the annual mining and reclamation report. As specified in R 425.205, the contingency plan must include an assessment of the risk to the environment or public health and safety associated with potential accidents or failures involving the items listed below and the response measures the operator proposes to implement to abate the environmental or public health and safety problem:

- Release or threat of release of toxic or acid-forming materials;
- Storage, transportation, and handling of explosives;
- Fuel storage and distribution;
- Fires;
- Wastewater collection and treatment system;
- Settling pond or tailings disposal area embankment failure;
- Air emissions;
- Spills of hazardous substances;
- Power disruption;
- Unplanned subsidence; and
- Leaks from containment systems for stockpiles or storage or disposal facilities.

These very detailed requirements for the contingency plan clearly address a broad array of scenarios that could result in a release of a CERCLA hazardous substance.

The scope of the FA that operators must provide pursuant to R 425.301 includes FA for "remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit and for "reasonable contingencies" that an operator would estimate based on the contingency plan. See R. 425.301(c)(ii) and R. 425.301(c)(iv). Michigan's FA requirements, which require bonding for remediation as well as contingencies that include a release of a

hazardous substance, clearly cover the thirteen CERCLA § 108(b) response categories as shown in Table G.

Michigan's requirements for ferrous mines under MCL Part 631 are commensurate with the types of impacts typically associated with ferrous mines. Consequently, the MCL Part 631 requirements are not as detailed or as stringent as the MCL Part 632 requirements for nonferrous metallic (hardrock) mines. Operators of ferrous mines must submit annual reports analogous to the annual report requirement for nonferrous metallic mines. Permits must remain in good standing until MIDEQ "determines the mining activity has not polluted, impaired, or destroyed the air, water or other natural resources or the public trust in those resources." MCL Part 631 § 324.63101c(1)(b). MIDEQ is authorized to issue an immediate suspension order "if the department finds there exists an emergency endangering the public health and safety or an imminent threat to the natural resources of the state." MCL Part 631 § 324.63103(2).

Michigan regulators are authorized to require FA for ferrous mining operations if there are concerns about an operator's "financial ability to comply with the rules." MCL Part 631 § 324.63107. Because ferrous mines are typically developed in inert rocks that do not produce acid mine drainage, Michigan legislators have determined that FA is not categorically required and that the environmental issues associated with iron ore mines are much simpler than for hardrock mines. *See* MCL Part 632 § 324.63202(c). Consequently, the risk of a release of a hazardous substance from the State's iron ore mines is lower than for nonferrous metallic mines, which are typically developed in sulfide minerals that may produce acidic and/or metals-bearing leachates if not properly managed.

EPA's analysis of Michigan's laws and regulations governing hardrock mining in its "Summary of Michigan Financial Responsibility Requirements" in Docket No. EPA-HQ-SFUND-2015-0781-2041 is seriously deficient because it fails to describe the breadth of Michigan's FA requirements. For example, there is no discussion of the 20-year (or longer) post-closure monitoring requirement or how that significantly limits the degree and duration of a potential release of a hazardous substance.

Similarly, EPA's summary does not mention the requirement for Michigan mine operators to restore mined areas to a "self-sustaining ecosystem…that does not require perpetual care following closure." This very demanding standard requires operators to use special mine waste handling procedures and state-of-the-art liners and covers to reduce the risk of long-term management of acid rock drainage and/or metal leaching.

There is virtually zero risk of an un-bonded release of a hazardous substance from a hardrock mine in Michigan as a result of the state's stringent and comprehensive FA requirements for hardrock mines and mineral processing facilities. Michigan's laws and regulations give MIDEQ the necessary financial resources to respond in the event of a release. Consequently, there is no justification for EPA to impose additional FA pursuant to CERCLA § 108(b). EPA's Proposed Rule is duplicative and unnecessary in Michigan.

Table G – Michigan
CERCLA 108(b) Response Category Equivalents in Michigan Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Michigan Laws and Regulations
Solid/Hazardous Waste Disposal	R 425.203(c)(xvi) R 425.204(b)(ii) R 425.205(viii) R 425.301
Open Pit	R 425.203(c)(iii), R 425.203(c)(v) R 425.203(c)(vii) R 425.203(c)(x) R 425.204(b)(ii) R 425.301 R 425.409 MCL Part 631 § 324.63101 (ferrous mines) MCL Part 631 §324.63103 (ferrous mines)
Waste Rock	R 425.203(c)(v) R 425.203(c)(xix) R 425.204(b)(iii) R 425.301 R 425.409 MCL Part 631 § 324.63101 (ferrous mines) MCL Part 631 §324.63103 (ferrous mines)
Heap/Dump/Leach	R 425.203(c)(ii) R 425.203(c)(v) R 425.204(b)(iii) R 425.301 R 425.409 MCL Part 631 § 324.63101 (ferrous mines)
Tailings Facility	R 425.203 R 425.203(c)(v) R 425.203(c)(xiii) R 425.203(c)(xix) R 425.204(b)(iii) R 425.205(vi) R 425.301 R 425.409 MCL Part 315 (ferrous and nonferrous mines) MCL Part 631 § 324.63101 (ferrous mines) MCL Part 631 §324.63103 (ferrous mines)
Process Pond/Reservoir	R 425.203(c)(xiii) R 425.204(b)(iii) R 425.205(vi) R 425.301

CERCLA § 108(b) Response Category	Michigan Laws and Regulations
Underground Mine	R 425.203(c)(viii), (ix), (xi) R 425.204(b)(ii) R 425.205(xi) R 425.301
Slag Pile	R 425.204(b)(iii) R 425.301
Interim O&M	MCL Part 632 § 63209(3) MCL Part 632 § 324.63209(6) MCL Part 632 § 324.63211 R 425.205 R 425.301
Water Treatment	MCL Part 632 § 324.63211(2) R 425.203(c)(xxi) R 425.203(c)(xxii) R 425.203(h) R 425.205(v) R 425.301(c)(ii) R 425.409
Short-term O&M Monitoring	MCL Part 632 § 324.63211 MCL Part 632 § 324.63213 MCL Part 632 § 324.63215 R 425.203(c)(xxiv) R 425.203(g) R 425.203(m) R 425.204 R 425.301
Long-term O&M Monitoring	MCL Part 632 § 324.63209(6)(a) MCL Part 632 § 324.63211 MCL Part 632 § 324.63213 MCL Part 632 § 324.63215 R 425.203(c)(xxiv) R 425.203(m) R 425.204(c) R 425.301

H. Minnesota

As shown in Table H below, activities related to permitting of mining operations, assignments, or amendments, are delegated to the Minnesota Department of Natural Resources (MNDNR), Division of Lands and Minerals. This includes the entire period of operation from mine planning, construction, operation, and reclamation through final closure. Permit requirements for ferrous, peat, and nonferrous mines are described in the Minnesota Mineland Reclamation Rules Chapters 6130, 6131, and 6132, respectively. Both Minnesota ferrous and nonferrous metallic mineral leases generally contain conditions and obligations that are specifically designed to mitigate the environmental impacts of exploration and/or mining, through the design, operation, and closure processes, and require FA for specific components of Minnesota mining and mineral processing operations.

The Minnesota Mineland Reclamation Act (MMRA) provides regulatory authority for reclamation of areas subject to mining, such as open pits, waste rock and surface material stockpiles, tailings basins, buildings and equipment, and infrastructure no longer needed for any other use. It also requires revegetation of disturbed ground, and mitigation of impacted wetlands. These rules were adopted under MN Statute, Chapter 93.

Responsibilities of the Minnesota MNDNR for mine permitting include:

- Processing Permit to Mine (PTM) applications;
- Issuing of the PTM;
- Reviewing annual reports and operating plans for conformance to PTM requirements;
- Reviewing and assessing plans for FA and verifying reclamation cost estimates;
- Reviewing and administering permit amendment proposals;
- Reviewing deactivation and closure plans;
- Evaluating operations for reclamation release; and
- Developing reclamation rules and amendments, as needed.

In addition to its responsibilities regarding the issuance and administration of the PTM (which includes both the mining and reclamation permit), the MNDNR conducts an Environmental Review of any proposed mining project or significant expansion of an existing operation. An initial Environmental Assessment Worksheet (EAW) is generally completed for all projects and expansions. In most cases, a more comprehensive Environmental Impact Statement is subsequently prepared, as stated in Minnesota Administrative Rules (Minn. R.), part 4410.4300, subparts 11-12 & Minn. R., part 4410.4400, subparts 8-9. These rules were adopted under the Minnesota Environmental Policy Act (MEPA), MN Statute 116D.

Regulations pertaining to ferrous metallic mineral mining operations (taconite and iron ores) are promulgated under Minn. R. 6130 *et seq*., and include specific reclamation standards for mine-related facilities, including stockpiles, stormwater control features, rock, lean ore, and coarse tailings stockpiles, overburden, tailings basins. The regulations also address standards for revegetation, air quality, and subsidence, along with criteria for release of the permit. While not currently required as part of the upfront permitting of a ferrous metallic mine in Minnesota, at any time during the PTM application process, during the mining operation, or following the

completion of mining but prior to the release of the permittee, the MNDNR may require the operator to furnish a performance bond (FA) if the agency determines that the operator has failed to:

- Perform any part of a reclamation measure required by the PTM or any amendment or modification thereto;
- Comply with a provision of Minn. R. 6130;
- Perform any research required, pursuant to Minn. Statutes, sections 93.44 to 93.51; or
- May require the operator to furnish a performance bond if there is reasonable doubt that the operator will be financially able to comply with the requirements of the PTM.

The absence of mandatory FA for ferrous metallic mineral projects reflects the inert nature of most taconite and iron ore projects. Unlike metallic non-ferrous mines, which typically involve sulfide minerals that may generate acidic and metals-bearing leachate, the hydrogeochemistry of most taconite and iron projects is benign. Thus iron ore mines have a substantially reduced risk of a release of a hazardous substance. Nonetheless, the MNDNR has the discretionary authority to require operators of ferrous mineral mines to provide FA if there are site characteristics that warrant FA or if regulators have concerns about the financial stability of the operator.

Regulations pertaining to nonferrous metallic mineral mining operations are promulgated under Minn. R. 6132 *et seq*., and include specific reclamation standards for mine-related facilities, including reactive mine waste stockpiles, overburden and other storage piles, tailings basins, and heap and dump leaching facilities. The regulations also address standards for revegetation, air quality (dust suppression), subsidence, along with closure and post-closure maintenance requirements. Minn. R. 6132.1200 covers the up-front FA requirements for nonferrous metallic mining operations as part of the application for a PTM, which documents the estimate of costs necessary to implement the contingency reclamation plan. This estimate includes closure and post-closure maintenance activities required if operations cease within the first calendar year.

The MNDNR administers the PTM and determines the appropriate amount of FA and financial instruments during the permitting process. The amount and type of financial instruments are reviewed annually by the mining company and the agency, and adjusted, as appropriate. This annual review is beneficial because it allows for adjustments to be made based on actual, recent operating data, rather than long-term models or predictions.

To accomplish the purposes of Minn. R. 6132.0100 to 6132.5300, it is the policy of the MNDNR that mining be conducted in a manner that will reduce impacts to the extent practicable, mitigate unavoidable impacts, and ensure that the mining area is left in a condition that protects natural resources and minimizes to the extent practicable the need for maintenance. This shall be accomplished through the use of mining, mine waste management, and passive reclamation methods that maximize physical, chemical, and biological stabilization of areas disturbed by mining, as opposed to the use of ongoing active treatment technologies. The department recognizes, however, that in some cases, passive treatment alone will not entirely meet all reclamation goals. In these cases, active treatment technologies may be necessary and provisions for continued maintenance of the treatments will be required.

With respect to the management of tailings disposal facilities, the MNDNR's Dam Safety Permit Program regulates the construction and enlargement of dams, repair, alteration, maintenance, operation, abandonment and transfer of ownership. Minn. R. 6115.0300 *et seq*., establishes minimum standards and criteria for dam classification and regulation. These regulations cover both initial permitting and ongoing regulatory oversight. These actions are administered and monitored by the MNDNR Dam Safety Unit of the Division of Ecological and Water Resources (EWR).

Unless the [tailings] dam is completely removed, the owner shall perpetually maintain the dam and appurtenances so as to ensure the integrity of the structure. In addition, the owner/operator will be financially responsible for carrying out the activities required for perpetual maintenance, and that adequate funding will exist. With respect to dams utilized for waste disposal (i.e., tailings dams), the owner/operator shall prepare and submit plans for termination of operations and perpetual maintenance, which will address both an unanticipated or premature termination of operations and for the ultimate intended termination of operations. The plans for termination of operations and perpetual maintenance shall, at a minimum, address the following issues, where applicable:

- Perpetual maintenance and safety of the dam including adequate monitoring programs;
- Disposal and treatment of ponded and channeled waters;
- Monitoring and mitigation of surface water and groundwater pollution;
- Silt, sedimentation, and erosion control; and
- Vegetation and landscaping.

In Minnesota, commercial entities that produce any amount of hazardous waste are regulated as hazardous-waste "generators." Treatment, storage, and disposal of hazardous waste is regulated under the Resource Conservation and Recovery Act (RCRA) and Minn. R. 7045. The Minnesota Pollution Control Agency (MPCA) regulates and provides assistance to hazardous waste generators, as well as jurisdictional oversight of the following programs:

- Air Emissions (PSD, Title V);
- Water Discharge (federal NPDES, and state SDS);
- Stormwater (Construction & Industrial);
- Wetlands Impacts (CWA Section 401 Certification);
- Solid Waste; and
- Storage Tanks (AST and UST).

Solid waste, as defined by Minn. R. 7035, includes waste materials from mining operations (though no definition of mining operation is provided). These regulations include design criteria for solid waste land disposal facilities, operational requirements, as well as closure and post-closure activities (including post-closure monitoring and maintenance). While Minn. R. 7035.2665 *et seq*. established the requirements for FA for closure, post-closure care, and corrective action at certain solid waste land disposal facilities (as well as FA instruments that are acceptable), these FA requirements appear to be exclusive of mining operations.

Appendix IV, Table I in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (EPA-HQ-SFUND-2015-0781-0144) shows the Minnesota regulations applicable to ferrous and nonferrous hardrock mining. This table does not include Minnesota's dam safety regulations under Minn. R. 6115, which covers mine waste disposal facilities (i.e., tailings impoundments) and fails to acknowledge the FA requirements of mining operations in the state (both ferrous and nonferrous), including the closure and post-closure O&M requirements of FAs. There are no gaps in Minnesota's regulatory programs that need to be filled with an EPA-driven FA program pursuant to CERCLA § 108(b).

Table H - Minnesota
CERCLA 108(b) Response Category Equivalents in Minnesota Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Minnesota Regulations
Solid/Hazardous Waste Disposal	Minn. R. 7035 (Solid Waste) Minn. R. 7045 (Hazardous Waste)
Open Pit	Minn. R. 6130.1400 Minn. R. 6130.2900 Minn. R. 6130.3600 Minn. R. 6130.4100 Minn. R. 6132.1100, Subp. 6. Mining and reclamation plan Minn. R. 6132.2300
Waste Rock	Minn. R. 6130.2400 – 6130.2800 (Ferrous) Minn. R. 6130.3600 Minn. R. 6132.2400 Minn. R. 6132.2700
Heap/Dump/Leach	Minn. R. 6130.3600 Minn. R. 6132.2600 Minn. R. 6132.2700
Tailings Facility	Minn. R. 6115.0300 *et seq.* Minn. R. 6130.3000 Minn. R. 6130.3600 Minn. R. 6132.2500 Minn. R. 6132.2700
Process Pond/Reservoir	Minn. R. 6132.2600
Underground Mine	Minn. R. 6130.4000 (Ferrous – Subsidence) Minn. R. 6132.3000 (Nonferrous – Subsidence)
Slag Pile	Minn. R. 6130.2100 (general design & construction of stockpiles)
Interim O&M	Minn. R. 6130.4100, Subp. 2 Minn. R. 6132.3200 Minn. R. 6115.0300 *et seq*.
Water Treatment	Minn. R. 6132.0200 (recognized need for possible active treatment techniques) Minn. R. 7050 (anti-degradation performance standards) Minn. R. 7053 (effluent discharges)
Short-term O&M Monitoring	Minn. R. 6130.4100, Subp. 2 Minn. R. 6132.3200
Long-term O&M Monitoring	Minn. R. 6130.4100, Subp. 2 Minn. R. 6132.3200 Minn. R. 6115.0300 *et seq*.

I. Montana

As shown in Table I below, the Montana Metal Mine Reclamation Act ("MMMRA"), Montana Code Annotated ("MCA") §§ 82-4-301 through 390 and the implementing regulation under Montana's Environmental Quality rules and regulations at Chapter 24, Subchapter 1, Rules and Regulations Governing the Montana Hard Rock Mining and Reclamation Act, Montana Administrative Rule (MAR) §§ 17.24.101 through 189 ("MAR § 17.24 Rule)" are the principal law and regulations governing the design, operation, closure, and reclamation of Montana hard rock mines[12].

The Montana Department of Environmental Quality ("MTDEQ") administers the MMMRA and the MAR § 17.24 Rule as well as all of Montana's media-specific environmental laws and regulations. The media-specific regulations governing air quality, water quality, and solid and hazardous waste disposal have a fundamental influence on how Montana hard rock mines are designed, operated, closed, and reclaimed. The environmental performance standards in the media-specific laws and regulations have a direct bearing on FA requirements, which must include the costs for the environmental controls necessary to comply with Montana's laws and regulations.

In contrast to some western mining states where more than one regulatory agency has jurisdiction over hard rock mines, the MTDEQ is the principal Montana state regulatory agency with jurisdiction over mining. MTDEQ's jurisdiction over mining projects includes dam safety issues pertaining to tailings storage facilities, which is unlike some states where dam safety is regulated by the state's water authorities. The MMMRA and the MAR § 17.24 Rule include specific provisions governing tailings impoundment design including MCA §§ 82-4-335, 82-4-376 and MAR § 17.24.168(2)(b). Pursuant to these MMMRA and MAR 17.24 Rule provisions, MTDEQ requires detailed design, operating, and monitoring plans that must be reviewed by an independent panel of engineers to verify that impoundments and mining-related water reservoirs are safe and stable.

The MMMRA includes detailed reclamation requirements for specific mining and mineral processing facilities that must "tak[e] into account the site-specific conditions and circumstances". MAC § 82-4-336(1) This emphasis on site-specific conditions stands in marked contrast to the one-size-fits-all CERCLA § 108(b) Proposed Rule. The MMMRA's site-specific approach recognizes the range of site-specific factors that must be considered in the design, operation, closure, and reclamation of mining and milling facilities:

> "Mining and exploration for minerals take place in diverse areas where geological, topographical, climatic, biological, and sociological conditions are significantly different, and the specifications for reclamation and tailings storage facilities must vary accordingly." MCA § 82-4-301(3).

[12] The MMMRA and MAR § 17.24 Rule also include numerous stringent provisions, including FA requirements for mineral exploration projects.

An example of Montana's site- and facility-specific laws and regulations include the provisions governing open-pit closure requirements. The MMMRA specifies that an open pit in which the floor or walls of the pit expose rocks that are acid generating or leach metals must be covered with inert materials to minimize the formation of acidic or metals-bearing leachate. The law also stipulates that water accumulating in a pit may require water treatment. MCA § 82-4-336(7). Reclamation plans for a tailings storage facility must include a post-closure monitoring plan if applicable. MCA § 82-4-336(13).

The MAR § 17.24 Rule requires detailed groundwater and surface water monitoring plans for milling facilities. Operators must collect groundwater and surface water quality data "until continuous compliance with water quality standards is demonstrated." Operators must also provide a contingency plan in case of accidental discharge describing remedial action. MAR § 17.24.168(1)(b)(xvii).

The reclamation plan for a milling facility must include detailed information about groundwater or surface water remediation if necessary:

> "a description of the methods by which surface and ground water will be restored or maintained to meet the criteria of Title 75, chapters 5 and 6, MCA…including methods to monitor for accidental discharge of objectionable (potential toxic or acid-producing) materials, plans for detoxification or neutralization of such materials, and remedial action plans for control and mitigation of discharges to surface or ground waters." MAR § 17.24.170(1)(d)

The explicit provisions in the MAR § 17.24 Rule demanding compliance with the Clean Air Act of Montana (MCA Title 75, Chapter 2), Montana's Clean Water Act (MCA Title 75, Chapter 5), and Montana law governing public water supplies, distribution, and treatment (MCA Title 75, Chapter 6) are a key element of Montana's regulatory framework for hardrock mining. MAR § 17.24.102 (13)(f) specifically defines reclamation as requiring "…steps necessary to assure long-term compliance with Title 75 chapters 2 and 5, MCA." MAR § 17.24.140(1) dealing with the determination of bond amount states:

> "The department shall require submission of bond (*sic*) in the amount of the estimated cost to the department if it had to perform the reclamation, contingency procedures and associated monitoring activities required of an operator subject to bonding requirements under the Act…This amount is based on the estimated cost to the state to ensure compliance with Title 75, chapters 2 and 5, MCA, the Act, the rules adopted thereunder, and the approved permit…"

The cross-referencing of Montana's air quality and water quality laws and the explicit requirement to comply with these media-specific environmental statutes provides comprehensive environmental protection and FA requirements at Montana hardrock mining and milling operations. Sites must be in compliance with the air and water quality environmental protection standards before the MTDEQ will release the FA for a mining project. The air quality and water quality compliance mandate at MAR § 17.24.140(1) gives the MTDEQ broad authority to require an operator to maintain the FA deemed necessary to ensure compliance with Montana's air and water quality protection laws. This authority means the timeframe in which an operator

must maintain FA following mine closure is determined on the basis of site-specific monitoring data to indicate whether that project is in compliance with all applicable air or water quality standards. This provides MTDEQ with the authority to require FA for long-term O&M if site-specific monitoring data indicate it is necessary.

Montana's laws and regulations governing hardrock mining are an excellent example of how a state's media-specific environmental protection requirements and performance standards influence the calculation of the required FA amount. Compliance with Montana's Clean Water Acts, Clean Air Act, and other environmental protection laws define the required outcome for closed and reclaimed mine sites and in turn determine the necessary FA to ensure that closed and reclaimed mines achieve this outcome.

MAR § 17.24.140(1)(d) specifically authorizes MTDEQ to require FA to cover the Agency's costs to manage, operate, and maintain a site that is temporarily closed, abandoned, or where the operator is insolvent. This provision provides MTDEQ with sufficient FA resources until the full FA instrument can be liquidated and is analogous to the Interim O&M cost category in the Proposed Rule.

MAR § 17.24.141 requires MTDEQ to review the amount of FA ("performance bond") annually and to conduct a comprehensive bond review at least every five years. MTDEQ is authorized to conduct a comprehensive review of the bond amount in response to circumstances and to require an increase in FA. Pursuant to MCA § 82-4-335, MTDEQ cannot decrease or release a bond without holding a public hearing to give the public an opportunity to provide comments on the proposed FA reduction or release.

To satisfy the requirements of MAR § 17.24.140(1), the bond cost estimate must be based on:

- Production and productivity data in current machinery production handbooks and publications;

- The additional estimated costs to MTDEQ which may arise from additional design work, applicable public contracting requirements or the need to bring personnel and equipment to the operating area after its abandonment by the operator (i.e., personnel and equipment mobilization and demobilization costs); and

- Inflation factors.

MAR § 17.24.128 provides MTDEQ with broad inspection authorities that require a minimum of annual inspections. MTDEQ must inspect the following operations at least three times per year: 1) operations that use cyanide or metal leaching solvents or reagents; 2) operations with permits that specify monitoring requirements for potential acid rock drainage; or 3) operations with a permitted project area that exceeds 1,000 acres. These rigorous inspection requirements provide MTDEQ with timely information about whether an operation is complying with the environmental performance standards and other requirements in its operating permits. In the event these inspections and monitoring data indicate there may be a problem, MTDEQ can require an increase in the required FA pursuant to MAR § 17.24.141.

MCA § 82-4-338(7)(a) provides MTDEQ with the authority to require operators to amend the reclamation permit and augment the FA for a project if unanticipated circumstances are discovered that pose a threat to public health and safety or the environment. This reclamation plan and FA amendment provision is triggered if MTDEQ determines that a 10 percent or greater increase in the FA is needed to address the newly discovered issues.

The Agency must suspend a permit if the operator's bond coverage expires, is canceled, or is insufficient. MAR § 17.24.117(1)(c). MTDEQ must also suspend a permit if the operator fails to provide an annual report with the required monitoring data to determine if the mine is in compliance with its operating permit. MAR § 17.24.118(14). MTDEQ is authorized to suspend a permit and forfeit the FA in the event a mining operation poses an imminent danger to the public or there is a reasonable expectation that the mine is expected to cause imminent environmental harm to land, air, or water resources. MAR §§ 17.24.129, 17.24.132, and 17.24.133. The agency may also suspend a permit pursuant to MAR § 17.24.137 and direct the operator to abate the source of the imminent danger or environmental harm.

In the event of an "imminent threat to public health, public safety, or the environment" that an operator does not properly abate, MTDEQ may revoke the permit, declare the permittee in default, and forfeit a portion of the bond. The amount of the bond forfeiture is not to exceed $150,000 or 10 percent of the bond, whichever is less, that is necessary to abate the problem. If this amount of bond forfeiture is inadequate, MTDEQ may forfeit additional amounts of the bond. MCA § 82-4-338(10)(a).

Although the primary FA requirements for Montana hardrock mines are the within the MMMA and the MAR § 17.24 Rule discussed above, the Montana Comprehensive Environmental Cleanup Act (CECRA) at MCA §§ 35-10-701 through 728 provides some additional FA coverage applicable to parties liable for Superfund cleanup at Montana hardrock mines (and at other types of facilities). CECRA, which is similar to the federal Superfund (CERCLA), authorizes MTDEQ to investigate and clean up facilities where there are hazardous substances. CECRA also gives MTDEQ the authority to require responsible parties to investigate and pay for the clean up. The rules that implement the CECRA are found at MAR §§17.55.102 through 115.

CECRA adds another layer of environmental protection and FA on top of the MMMRA because it can be used to fund the cleanup of a release of a hazardous substance at a Montana mining operation. CECRA compels responsible parties to provide FA for cleanup and remediation activities. Like the federal Superfund, responsible parties under CECRA are jointly and severally liable. Responsible parties can include present owners, past owners and operators, those who arrange for disposal of a hazardous substance, and transporters of hazardous substances. The amount of required FA under CECRA is "an amount that the department determines will ensure the long-term operation and maintenance of the remedial action site." MCA § 75-10-721(7).

Finally, Montana's Clean Water Act at MCA § 75-5-405 includes voluntary bonding provisions. An applicant for a water quality discharge permit may "voluntarily file a performance bond or other surety" to enable MTDEQ to reclaim any land disturbed by authorized activities. The bond amount must be "sufficient to enable the state to reclaim the land…" MCA § 75-5-405. MTDEQ

may release the bond or surety if all reclamation efforts have been satisfactorily completed and MTDEQ verifies that pollution of state waters has not occurred. MTDEQ may pursue bond forfeiture if the land is not reclaimed in a satisfactory manner to prevent pollution of state waters.

In summary, the MMMRA, the MAR § 17.24 Rule, CECRA, and the voluntary bonding program under Montana's Clean Water Act provide comprehensive and seamless environmental protection and FA for Montana mines. There are no gaps in Montana's regulatory framework that need to be filled with a federal FA program under CERCLA § 108(b).

EPA's analysis of Montana's laws and regulations governing hardrock mining is incomplete because it does not fully describe how Montana's Clean Water Act and Clean Air Act fundamentally influence FA requirements. EPA's document entitled: "Summary of Montana Financial Responsibility Requirements" (EPA-HQ-SFUND-2015-0781-2013) is a simplistic discussion of Montana's FA requirements that completely overlooks the jurisdiction of Montana's environmental protection laws governing air quality, surface water quality, groundwater quality, and waste disposal and the interaction of these laws and regulations with the MAR § 17.24 Rule. As stated above, MAR § 17.24.102 (13)(f) explicitly defines reclamation as requiring environmental controls to assure long-term compliance with Montana's environmental protection statutes.

Similarly, Appendix IV, Table J in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (EPA-HQ-SFUND-2015-0781-0144) fails to describe how the Title 75 Chapters 2, 5, and 6 laws dovetail with the MMMA to require that mines be designed, built, operated, and closed to protect the environment in a manner that minimizes the risk of releases of hazardous substances.

EPA's Table J does not show that the environmental protection regulations define the performance standards that apply during a mine's entire lifecycle – including closure and post-closure and in turn determine the level of necessary FA. The powerful and all-inclusive integration of Montana's laws and regulations governing environmental protection and mining minimizes the potential for a release of a hazardous substance. These laws and regulations also require comprehensive FA that gives MTDEQ the necessary financial resources to respond in the event of a release. There is no justification for adding another layer of FA under CERCLA § 108(b).

Table I – Montana
CERCLA 108(b) Response Category Equivalents in Montana Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Montana Laws and Regulations
Solid/Hazardous Waste Disposal	MAR §§ 17.24.116(3)(l), (n), (o) MAR § 17.24.168(1)(b)(ix)
Open Pit	MAR § 17.24.117(1)(c) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MCA § 82-4-336(7)
Waste Rock	MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.165 MAR § 17.24.166 MAR § 17.24.167 MAR § 17.24.168 MAR § 17.24.169
Heap/Dump/Leach*	MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.165 MAR § 17.24.166 MAR § 17.24.167 MAR § 17.24.168 MAR § 17.24.169
Tailings Facility	MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.165

CERCLA § 108(b) Response Category	Montana Laws and Regulations
	MAR § 17.24.166 MAR § 17.24.167 MAR § 17.24.168 MAR § 17.24.169 MCA § 82-4-335 MCA § 82-4-336(7) MCA § 82-4-376
Process Pond/Reservoir	MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR § 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.165 MAR § 17.24.166 MAR § 17.24.167 MAR § 17.24.168 MAR § 17.24.169
Underground Mine	MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153
Slag Pile	MCA §§ 75-10-1401 through 1411
Interim O&M	MAR § 17.24.115(1)(n) MAR § 17.24.116(3)(l) MAR § 17.24.117(1)(c) MAR §§ 17.24.118(4), (8), (9), (10) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140(1)(d) MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.168(1)(b)(xvii) MAR § 17.24.170(2) MCA § 82-4-338(7) MCA §§17.55.102 through 115 (CECRA)

CERCLA § 108(b) Response Category	Montana Laws and Regulations
Water Treatment	MAR § 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.165(2) MAR § 17.24.169(1)(d) Voluntary bonding, Title 75, Chapter 5 MCA §§17.55.102 through 115 (CECRA)
Short-term O&M Monitoring	MAR § 17.24.115(1)(n) MAR § 17.24.116(3)(l) MAR §§ 17.24.118(4), (8), (9), (10) MAR §§ 17.24.117.120(c), (e) MAR § 17.24.121 MAR § 17.24.140 MAR § 17.24.141 MAR § 17.24.153 MAR § 17.24.168(1)(b)(xvii) MCA §§17.55.102 through 115 (CECRA)
Long-term O&M Monitoring	MAR § 17.24.115(1)(n) MAR § 17.24.153 MCA § 82-4-336(7) MCA §§17.55.102 through 115 (CECRA) Voluntary bonding, Title 75, Chapter 5

* MCA § 82-4-390 prohibits the use of cyanide at heap leaching or vat leaching mineral processing facilities that were not in operation as of November 3, 1998.

J. Nevada

As shown in Table J, three chapters of Nevada's Administrative Code ("NAC"), chapters NAC 535, NAC 445A, and NAC 519A, govern mine development, operation, and closure. This regulatory package effectively addresses each of the thirteen CERCLA § 108(b) response categories in the Proposed Rule. The NAC §§ 519A.010 – NAC 519A.445 regulations "Reclamation of Land Subject to Mining Operations and Exploration Projects – Regulation of Mining Operations and Exploration Projects" establish the FA requirements for Nevada mineral exploration and development projects. The NAC 519A regulations work hand-in-hand with the NAC §§ 445A.350 – NAC 445A.447, "Water Controls – Mining Facilities" regulations and the NAC §§ 535.010 – NAC 535.420 "Dams and other Obstructions" regulations. In order to gain an accurate understanding of how Nevada's environmental regulations for mining operate, it is essential to consider these three regulations working in concert because the water control and dam safety regulations are the foundation for Nevada's FA program.

The NAC 445A water pollution control regulations and the NAC 535 dam design and safety regulations establish the design, environmental protection, and performance criteria for all mine features during the mining lifecycle (i.e., construction, operation, reclamation, and closure) and dictate how mine features must be designed, reclaimed, and closed in order to protect the environment and prevent degradation of waters of the state. The reclamation and closure designs and requirements are the basis for the amount of required FA. The Nevada Division of Environmental Protection/Bureau of Mining Regulation and Reclamation ("NDEP") administers the NAC 445A and NAC 519A regulatory programs. The State Engineer's Office/Division of Water Resources ("NDWR") administers the NAC 535 dam design and safety program.

The multi-agency, multi-regulations structure of Nevada's regulatory framework applicable to mining-related environmental protection and FA is an excellent example of the "complicated but effective" and comprehensive regulatory programs described in the NAS Study. The environmental regulations that are the foundation of the NAC 519A reclamation and closure FA requirements span three separate chapters of Nevada's administrative code and are administered by two separate regulatory agencies. The three regulatory programs are coordinated and dovetailed so there are no gaps. This integration of the environmental protection and regulatory requirements for Nevada mines provides complete, seamless, and gap-free environmental protection and FA.

For example, the NAC 535 dam design and safety regulations govern the design and operation of tailings embankments that have a crest height of 20 feet or higher, as measured from the downstream to the crest, or a crest height of less than 20 feet but impound more than 20 acre-feet. In addition to governing embankments, these regulations also apply to certain large process ponds at mine sites if they exceed the 20 acre-feet storage criterion.

The NAC 445A regulations govern the design of a tailings impoundment and process ponds and include minimum design criteria to achieve zero-discharge of process solutions to surface waters and minimum discharge to groundwater. The NAC 445A regulations also govern storm event design requirements, engineering containment standards, minimum liner design criteria, closure

stabilization criteria, temporary and permanent closure requirements, and operational and post-mining monitoring requirements.

It is important to note that NAC § 445A.433.1(a) establishes that "In areas where annual evaporation exceeds annual precipitation, a process component must achieve zero-discharge." In Nevada, where annual evaporation exceeds annual precipitation, mines must contain all process fluids to comply with the state and federal Clean Water Act requirements pertaining to zero discharge to surface waters. The only allowable discharges are stormwater discharges that do not come into contact with process components.

The NAC 519A reclamation regulations govern the reclamation and closure of both the tailings embankment and the impoundment. The zero-discharge environmental protection requirement at NAC § 445.A.433.1(a) applies to tailings impoundments throughout the life of the impoundment, including closure and post-closure. These requirements drive the closure design for the tailings facility to minimize infiltration of meteoric waters into the reclaimed tailings impoundment with the goal of achieving zero-discharge to surface waters and minimal discharge to groundwater. Thus the interaction of the three Nevada regulatory programs, NAC 535, NAC 445A, and NAC 519A, provides lifecycle environmental protection during all phases of a mining project, including reclamation, closure, and post-closure. This fully integrated gap-free regulatory system applies to all process components at Nevada mines.

Just as the FLMA modified their FA requirements in response to gaps identified in the NAS Study, Nevada regulators have continually refined Nevada's regulatory and FA program for hardrock mining. NDEP has modified and augmented its FA program a couple of times since the NAC 519A bonding regulation went into effect in 1990, demonstrating that the state – not EPA – is in the best position to enhance its bonding programs if and when circumstances demand additional FA.

In response to documented shortfalls in the Nevada program that were revealed when a couple of mine operators with reclamation bonds went bankrupt in the late 1990s and early 2000s, NDEP expanded the scope of its FA requirements to require bonds that provide state regulators immediate access to funds for emergency management and interim fluid management. As explained in detail in Parshley and Struhsacker (2008), *see* Exhibit 2, NDEP developed a number of enhancements to its bonding program including Interim Fluid Management ("IFM") and Process Fluid Stabilization ("PFS") cost estimating tools. NDEP, the FLMA (especially BLM), and industry representatives worked together to develop the Heap Leach Draindown Estimator ("HLDE") and the Process Fluid Cost Estimator ("PFCE"). NDEP and the FLMA use these tools when calculating the level of FA an operator must provide.

The resulting modifications to the Nevada FA program significantly increased the amount of FA that Nevada mine operators have provided as shown in Figure 1. The substantial increase in Nevada's FA program since 2005, from $721 million to $2.66 billion, is mainly due to the addition of the IFM, PFS, and PFCE as required components in FA amount calculations.

NDEP's development of these gap-filling enhancements to its FA requirements vividly demonstrates why it is best to leave any adjustments or gap-filling measures in the hands of state

regulators who have a first-hand knowledge of operations and site conditions in their states. If a currently unanticipated event develops at a Nevada mine that points to the need for additional refinement and augmentation of Nevada's FA program, it is clear that NDEP would respond as it has in the past to fill in any identified gap with the objective of producing comprehensive and conservative bonds that consider all likely contingencies based on agency costs to manage, close, reclaim, and maintain sites requiring government intervention.

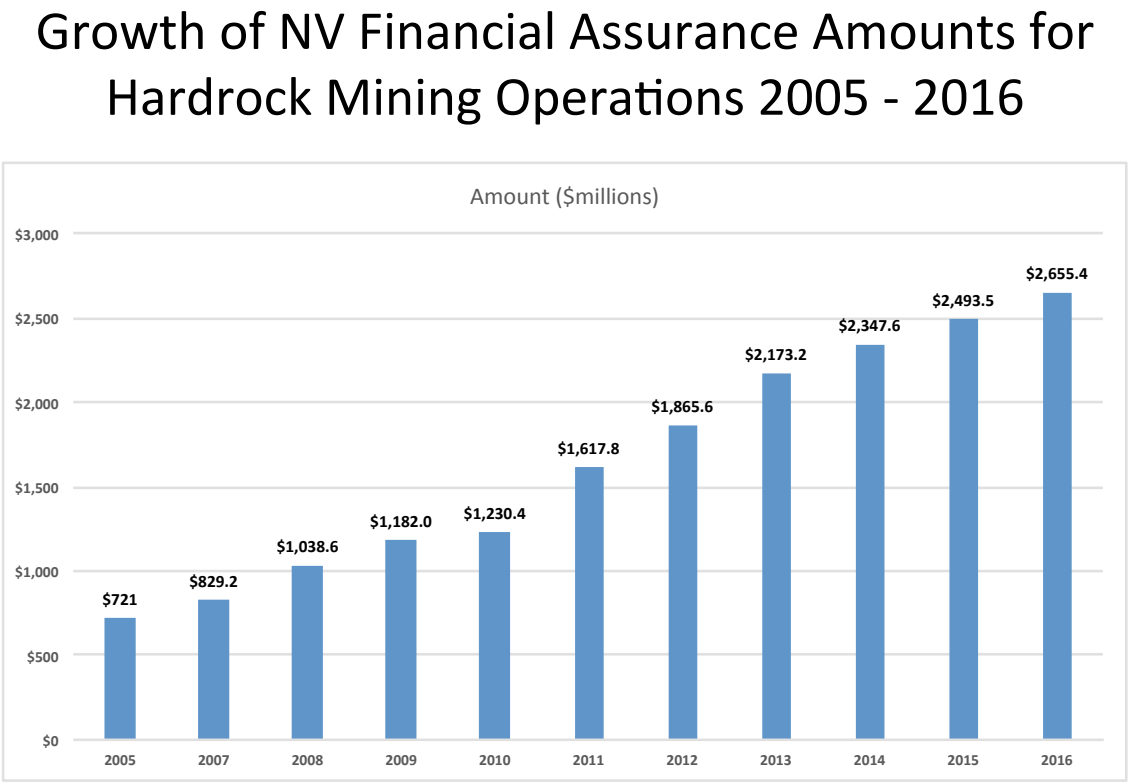

Figure 1. Cumulative Financial Assurance Held by the State of NV, BLM & USFS
Data provided by NV Division of Environmental Protection, 9/12/16

The NDEP uses the Standardized Reclamation Cost Estimator ("SRCE software"), which NDEP developed working with BLM and industry representatives, to calculate reclamation costs. The data inputs to SRCE are detailed site-specific factors and engineering cost estimates that result in a comprehensive and conservative Reclamation Cost Estimate ("RCE") that establishes the required FA amount. FA requirements calculated using the SRCE consider all likely contingencies and are based on agency costs to implement, manage, and complete closure and reclamation of sites in the event government intervention is required. The SRCE software is widely recognized as a state-of-the-art tool for calculating comprehensive and site-specific FA requirements. The FLMAs and other states use the SRCE software, or cost estimating tools similar to the SRCE. In fact, the SRCE is used in mining jurisdictions around the world.

NDEP has a Memorandum of Understanding with the FLMAs to jointly administer the Nevada FA program. For projects located on federal land or a combination of federal and private lands,

the FLMA that administers the land holds the FA instrument. For projects located solely on private land, NDEP holds the FA.

Appendix IV, Table K in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances (Docket No. EPA-HQ-SFUND-2015-0781-0144) shows the Nevada regulations applicable to hardrock mining and mineral processing. This table does not include Nevada's dam safety regulations and fails to capture how the different parts of Nevada's administrative code work in tandem to require that mines be designed, built, operated, and closed to protect the environment and minimize the potential for a release of hazardous substances. Table K does not describe how the environmental protection regulations define the performance standards that apply during a mine's entire lifecycle – including closure and post-closure. As explained above, these environmental performance standards mandate that Nevada mines must prevent degradation of waters of the state at all times, and determine how mines must be operated, closed and reclaimed and the required FA to achieve this performance standard for the entire life span of the project.

Similarly, EPA's "Summary of Nevada Financial Responsibility Requirements" (Docket No. EPA-HQ-SFUND-2015-0781-2104) is seriously deficient because it doesn't discuss the NAC 445A or the NAC 535 regulations or the state-of-the-art SRCE software that calculates lifecycle FA requirements. Consequently the EPA summary completely omits two of the three essential components of Nevada's regulatory framework dictating the environmental protection and FA requirements and overlooks the widely used SRCE tool, which is recognized worldwide as one of the best methodologies for determining FA amounts.

Given the significant shortcomings in Table K and EPA's summary, EPA has not fully appreciated the breadth and merits of Nevada's regulatory and FA programs. Consequently, EPA's analysis for this rulemaking is inaccurate and incomplete. A proper evaluation would reveal that Nevada's site-specific environmental protection and FA requirements are comprehensive and far superior to the one-size-fits-all formulas EPA used in the Proposed Rule. There are no gaps in Nevada's program that need to be filled with an EPA-driven FA program pursuant to CERCLA § 108(b).

Table J – Nevada
CERCLA 108(b) Response Category Equivalents in Nevada's Regulations for Hardrock Mining

CERCLA § 108(b) Response Category	Nevada Regulations and SRCE Worksheet Tabs
Solid/Hazardous Waste Disposal	NAC § 519A.270.14(e) NAC § 519A.345.8(a) NAC § 445A.424 NAC § 459.953471 SRCE Waste Disposal Tab SRCE Landfills Tab
Open Pit	NAC § 519A.345.9 NAC § 445A.424 NAC § 445A.429 NAC § 519A.250 NAC § 519A.260 NAC 519.270 NAC § 519A.295 SRCE Pits Tab
Waste Rock	NAC § 519A.345.3 NAC § 519A.270 NAC § 519A.270 (d)(3) NAC § 519A.295 NAC § 445A.424 NAC § 445.433.1 SRCE Waste Rock Dump Tab
Heap/Dump Leach	NAC § 519.345.6 NAC § 519A.270 NAC § 519A. 270(d)(2) NAC § 519A.295 NAC § 445A.424 NAC § 445A.430 NAC § 445A.433.1 NAC § 445A.434 NAC § 445A.436 NAC § 445A.438 NAC § 445A.440 NAC 445A.442 SRCE Heap Leach Tab Heap Leach Draindown Estimator Process Fluid Cost Estimator Interim Fluid Management
Tailings Facility	NAC § 519A.345.4 NAC § 519A.345.5 NAC § 519A.270 NAC § 519A. 270 (d)(1)

CERCLA § 108(b) Response Category	Nevada Regulations and SRCE Worksheet Tabs
	NAC § 445A.424 NAC § 445A.431 NAC § 445A.433.1 NAC § 445A.437 NAC § 445A.438 NAC § 445A.442 NAC 535.010 – .420 SRCE Tailings Tab Tailings Draindown Estimator (in preparation)* Process Fluid Cost Estimator Interim Fluid Management
Process Pond/Reservoir	NAC § 519A.345.7 NAC § 445A.433.1 NAC § 519A.260 NAC § 519A.270 NAC § 519A. 270 (d)(1), (2) NAC § 519A.295 NAC § 445A.424 NAC § 445A.433.1 NAC § 445A.435 NAC § 445A.438 NAC § 445A.442 NAC § 535.010-.420 SRCE Process Ponds Tab Interim Fluid Management
Underground Mine	NAC § 519A.345.10 NAC § 519A.260 NAC § 519.270 NAC § 519A.295 NAC § 445A.424 NAC § 445A.433 SRCE Underground Openings Tab
Slag Pile	N/A - pertains to smelters. There are no NV smelters.
Drainage	NAC § 519A.345.7 NAC § 519A.260 NAC § 519A.270 NAC § 519A.295 NAC § 445A.424 NAC § 445A.433.1 SRCE Sediment and Drainage Control Tab
Interim O&M	NAC § 445A.440 NAC § 519A.260 NAC § 519A.270.16 NAC § 519A.295

CERCLA § 108(b) Response Category	Nevada Regulations and SRCE Worksheet Tabs
	NAC § 519A.350 NAC § 445A.440 SRCE Monitoring Tab SRCE Construction Management Tab Heap Leach Draindown Estimator Process Fluid Cost Estimator Interim Fluid Management
Water Treatment	NAC § 519A.270 NAC § 519A.295 NAC § 519A.360 This line item is not specifically included in the SRCE, but there is unlimited potential in the SRCE to include infinite customized User Tabs specific to site needs or regulatory requirements. Cost calculations are specific to each operation and require custom calculation sheets.
Short-Term O&M/ Monitoring	NAC § 445A.440 NAC § 519A.270 NAC § 519A.295 NAC § 519A.350 NAC § 519A.360 NAC § 445A.440 NAC § 445A.442 SRCE Monitoring Tab SRCE Construction Management Tab Heap Leach Draindown Estimator Process Fluid Cost Estimator Interim Fluid Management
Long-Term O&M/ Monitoring	NAC § 445A.440 NAC § 519A.270 NAC § 519A.295 NAC § 519A.350 NAC § 519A.360 NAC § 519A.380 NAC § 445A.440 NAC § 445A.446 SRCE Monitoring Tab SRCE Construction Management Tab Heap Leach Draindown Estimator Process Fluid Cost Estimator Interim Fluid Management

* NDEP currently uses the operator's project-specific information to estimate the tailings draindown schedule. The Tailings Draindown Estimator will provide a more standardized approach that uses site-specific data.

K. New Mexico

New Mexico has two integrated state programs administered by two state agencies that comprehensively regulate hard rock mines and that work together to reduce or eliminate the risk that hard-rock mines will need any future action under CERCLA. The New Mexico Environment Department (NMED) administers a permit program for hard rock mines pursuant to the New Mexico Water Quality Act (NMWQA) and regulations adopted by the Water Quality Control Commission ("WQCC"). The WQCC regulations include standards for surface water and ground water quality, a permit program to ensure that discharges to ground water or surface waters meet applicable standards and other requirements, and abatement regulations to ensure cleanup when water quality standards are exceeded. NMED also administers an air quality program with standards and requirements consistent with federal law. The New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division (MMD) administers the Mining Act Reclamation Program which implements the requirements of the New Mexico Mining Act of 1994 (NMMA). which applies to hardrock mines. The following section focuses on MMD's oversight of the hardrock mining industry under the NMMA as it pertains to the design, operation, and reclamation of New Mexico mines. The two programs are integrated, particularly as it relates to compliance with air, water quality and other environmental standards, Financial assurance is required for closure and reclamation of hard rock mines under both programs.

Under the NMWQCA, NMED Discharge Permits are required at all mine sites that may affect groundwater. The purpose of the NMED Discharge Permit process is to prevent groundwater pollution, which could result from discharges of effluent or leachate, and to abate any groundwater pollution that occurs at permitted facilities. The WQCC regulations include ground water quality standards that address various water contaminants, including the metals that are most commonly associated with releases of hazardous substances to water. 20.6.2.3103 NMAC. The standards are generally consistent with federal primary drinking water standards under the Safe Drinking Water Act. Discharge permits are required for all discharges of effluent or leachate that may move directly or indirectly into groundwater that has an existing concentration of 10,000 mg/L or less of total dissolved solids (TDS). Mill tailings, waste rock stockpiles, leach ore stockpiles, as well as other mine facilities, are regulated under this requirement. A discharge permit may not be issued unless NMED determines that the discharge will not cause ground water quality standards to be exceeded at any place of withdrawal of water for present or reasonably foreseeable future use or resulting in a hazard to public health or undue risk to property. 20.6.2.3109.C NMAC. Consequently, the mine facilities must be designed and demonstrated to protect ground water quality, substantially reducing the risk of any need for a CERCLA action to address releases. The NMWQCA regulations require monitoring, procedures to detect failures in a discharge system, and contingency plan and a closure plan including FA. 20.6.2.3107.A(11) NMAC. In addition to the state permit program, under the federal Clean Water Act, mines that require discharges of dredged or fill material into waters of the U.S. are subject to permit requirements under section 404 and mines with discharges to waters of the U.S. are subject to NPDES permit requirements under section 402, with these programs administered by the U.S. Army Corps of Engineers and EPA Region 6, subject to state certification of compliance with surface water quality standards under section 401.

The recent NMED "Copper Rules" promulgated in 2013 under 20.6.7 NMAC as part of the NMWQCA, establish strict, consistent, clear, and comprehensive design, operational and closure requirements for protecting the quality of ground water impacted by copper mining operations in the state. The rules incorporate the requirements of discharge permits issued to mines under the general discharge permit regulations described above. The Copper Rules apply to copper mine facilities, which are defined as "all areas within which copper mining and its related activities that may discharge water contaminants occurs and where the discharge will or does take place including, but not limited to open pits; waste rock piles; ore stockpiles; leaching operations; solution extraction and electrowinning plants; ore crushing, ore milling, ore concentrators; tailings impoundments; smelters; pipeline systems, tanks or impoundments used to convey or store process water, tailings or impacted stormwater; and truck or equipment washing units." § 20.6.7.7.B(13) NMAC. Because the Copper Rule requirements reflect the requirements of discharge permits issued under the more general WQCC rules in 20.6.2 NMAC, the also reflect the permit requirements imposed on other mines.

The purpose of 20.6.7 NMAC is to supplement the general permitting requirements of 20.6.2.3000 through 20.6.2.3114 NMAC to control discharges of water contaminants specific to copper mine facilities and their operations to prevent water pollution. The Copper Rules include:

- New design features for new facilities and the expansion of existing facilities that are specifically intended to protect ground water;

- New criteria for closing a mine, including re-grading land and installing groundcover to minimize infiltration of precipitation into and through mined materials that might otherwise reach groundwater;

- New engineering design requirements for waste rock, leach stockpiles and impoundments; and

- Clear and specific design technology requirements for impoundments, tanks and pipelines.

In addition to specific design, construction, operating and closure requirements, the Copper Rules contain detailed monitoring requirements requiring monitoring locations to be placed as close as practicable to each mine unit. If monitoring detects ground water contaminant levels rising toward ground water quality standards, reporting and contingency plan requirements are triggered requiring investigation and corrective action. Contingency plan requirements also are triggered by other excursion of permit requirements so that action is taken before there is any release of contaminants to the environment.

The Copper Rules also contain specific closure and post-closure requirements to ensure protection of ground and surface water quality during and after closure and in post-closure. Under the Copper Rules and existing discharge permits, FA is required for the capital costs of constructing necessary water treatment or other water management facilities at closure and for 100 years of operation of the water management system, unless the discharge demonstrates to the agency's satisfaction that compliance with standards can be accomplished without treatment in a

shorter time frame. The NMED generally defers to the NMMA FA requirements, though it reserves the right to be more restrictive and not necessary accept FA instruments that would be allowed under the NMMA.

All of the requirements of NMWQA and WQCC Rules are enforceable through administrative compliance orders, injunctive relief, and civil and criminal penalties.Parts 1-14 of Title 19 - Natural Resources and Wildlife, Chapter 10 - Non-Coal Mining of the New Mexico Administrative Code (19.10 NMAC) establishes the regulatory framework to implement the NMMA as directed in New Mexico Statutes Annotated (NMSA) 69-36-7A. These regulations are designed to ensure proper reclamation through permitting for operations subject to the NMMA, in accordance with provisions and standards outlined in the NMMA. As discussed below, the NMMA also requires that reclamation plans be designed to meet applicable environmental standards and requires NMED, prior to MMD plan approval, to make a determination to that effect.

For existing mining operations, the NMMA and Rules focus on reclamation, to be proposed and approved through a "closeout plan." The NMMA and Rules criteria for a closeout plan is to demonstrate that closure will be implemented to meet all applicable environmental standards as well as to achieve a self-sustaining ecosystem following closure, as well as a post-mining land use. The self-sustaining ecosystem requirement may not apply for certain post-mining land uses, such as industrial use. For existing mining operations, the self-sustaining ecosystem requirement may be waived if it would be infeasible to achieve, but applicable environmental standards may not be waived. The closeout plan must consider site-specific characteristics including land disturbance from previous mining operations, mining methods used, geology, hydrology and climatology in designing reclamation to meet these criteria. Expansions of existing mining operations must be permitted through a mining permit modification or revision and are required to meet the following requirements, in addition to meeting applicable environmental standards:

- **Signs, Markers and Safeguarding**: Measures will be taken, to safeguard the public from unauthorized entry into shafts, adits, and tunnels and to prevent falls from highwalls or pit edges.

- **Wildlife Protection**: Measures shall be taken to minimize adverse impacts on wildlife and important habitat.

- **Cultural Resources**: Cultural resources listed on or eligible for listing on the National Register of Historic Places or the State Register of Cultural Properties, and any cemeteries or burial grounds shall be protected until clearance has been granted by the State Historic Preservation Office or other appropriate authority.

- **Hydrologic Balance**: Operations shall be planned and conducted to minimize negative impact to the hydrologic balance in both the permit and potentially affected areas.

- **Stream Diversions**: When streams are to be diverted, the stream channel diversion shall be designed, constructed, and removed in accordance with specific design parameters.

- **Impoundments**: If impoundments are required they shall be designed, constructed and maintained to minimize adverse impacts to the hydrologic balance and adjoining property and to assure the safety of the public.

- **Minimization of Mass**: Movement All man-made piles such as waste dumps, topsoil stockpiles and ore piles shall be constructed and maintained to minimize mass movement.

- **Riparian and Wetland Areas**: Disturbance to riparian and wetland areas shall be minimized during mining. Adverse effects to riparian and wetland areas shall be mitigated during reclamation unless the mitigation conflicts with the approved post-mining land use.

- **Roads**: Roads shall be constructed and maintained to control erosion.

- **Subsidence Control**: Underground and in situ solution mining activities shall be planned and conducted, to the extent technologically and economically feasible, to prevent subsidence which may cause material damage to structures or property not owned by the operator.

- **Explosives**: Blasting shall be conducted to prevent injury to persons or damage to property not owned by the operator. Fly rock shall be confined to the permit area. The Director may require a detailed blasting plan, pre-blast surveys or specify blast design limits to control possible adverse effects to structures.

In addition, the permit area shall be stabilized, to the extent practicable, to minimize future impact to the environment and protect air and water resources. Final slopes and drainage configurations must be compatible with a self-sustaining. ecosystem or approved post-mining land use. Reclamation of disturbed lands must result in a condition that controls erosion; and, to obtain the release of FA, revegetated lands must meet specific standards, as outlined in 19.10.5.508(E) NMAC.

The applicant for a mining permit shall provide a FA proposal to the MMD following the agency's determination that the permit application is approvable, but prior to the permit issuance. An applicant's FA proposal must be based upon estimates for a third-party contractor to complete reclamation work. The permit shall not be issued until receipt of the approved financial assurance by the MMD.

To ensure that compliance with environmental standards are fully addressed, before MMD can issue any permit under the NMMA the NMED Secretary must issue a written determination stating that the MMD mining application has demonstrated that the proposed activities to be authorized are expected to achieve compliance with all applicable air, water quality, and other environmental standards if carried out as described in the closeout plan. This determination shall address applicable standards for air, surface water and groundwater protection enforced by the NMED.

New mining operations require a detailed environmental assessment, including collection of baseline environmental data, before an application for a permit as a new mining operation can be submitted. The permit application must demonstrate that the mine will be designed, constructed and operated to meet the standards described above, including a reclamation plan to achieve all applicable environmental standards and to meet the self-sustaining ecosystem/post mining land use requirement. Financial assurance must be provided based on the cost of a third-party to implement the reclamation plan. In addition, all other local, state and federal permit requirements and regulations must be satisfied, including the air quality and water quality discharge permit requirements described above.

NMMA requirements, including permit requirements, are enforceable through a variety of mechanisms. These include notices of violation, cessation orders requiring cessation of mining, injunctive relief, and civil and criminal penalties.The Hazardous Waste Bureau (HWB) of the New Mexico Environment Department (NMED) has the responsibility for the regulation of hazardous wastes. The HWB receives its statutory authority from the New Mexico Hazardous Waste Act and, as the state program authorized to implement the federal program, from the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended 42 U.S.C. 6901 *et seq*.

The document in the docket for the Proposed Rule entitled "Summary of New Mexico Financial Responsibility Requirements" (Docket No. EPA-HQ-SFUND-2015-0781-2105) does not accurately describe the breadth of New Mexico's regulatory and FA requirements for hardrock mines because it incorrectly suggests that the NMWQA financial assurance requirements are minimal. EPA's summary fails to discuss how the NMMA, as administered by MMD, and the NMWQA, as administered by NMED, work together to provide comprehensive environmental protection to minimize the potential for releases of hazardous substances. Additionally, the FA requirements in the NMMA and NMWQA work in tandem.

For example, the NMMA explicitly requires mine operators to comply with environmental laws, including water quality standards and requirements, but defers decisions on those issues to the NMED in its administration and enforcement of the NMWQCA. Similarly, the NMWQA contains general FA requirements. Because of the overlap between the NMWQCA closure and the NMMA reclamation requirements, the FA details are for the most part delegated to the MMD pursuant to the NMMA regulations. The coordination of the two regulatory and FA programs between MMD and NMED provides a system of checks and balances that requires NMED to certify that the NMMA permit is expected to result in compliance with water quality and other applicable environmental standards and requirements.

As shown in Table K, New Mexico's laws and regulations governing hardrock mining cover the thirteen CERCLA § 108(b) response categories and minimize the potential for a release of hazardous substances from hardrock mines. In the event of a release, MMD and NMED can use a project's FA to remediate a release if the operator fails to respond properly. Consequently, EPA's Proposed Rule duplicates the States' program and is therefore unnecessary.

Table K – New Mexico
CERCLA 108(b) Response Category Equivalents in New Mexico Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	New Mexico Regulations
Solid/Hazardous Waste Disposal	Environmental Improvement Act New Mexico Hazardous Waste Act 20.4.1-20.4.3 NMAC
Protection of Water Quality	NM Stat. §§ 74-6-1 through 17 (WQA) 20.6.2 NMAC (WQA) 20.6.7 NMAC (Copper Rules) 20.6.4 NMAC surface water quality standards
Open Pit	NMMA 69-36-11 19.10.3.304 NMAC 19.10.5.506 NMAC 19.10.5.507 NMAC 19.10.5.508 NMAC 19.10.6.602 NMAC 20.6.2 NMAC (WQA) 20.6.7.24 NMAC 20.6.7.33 NMAC
Waste Rock	NMMA 69-36-11 19.10.5.506 NMAC 19.10.5.507 NMAC 19.10.6.602 NMAC 20.6.2 NMAC (WQA) 20.6.7.21 NMAC 20.6.7.33 NMAC
Heap/Dump/Leach	NMMA 69-36-7 19.10.5.502 NMAC 19.10.5.508 NMAC 20.6.2 NMAC (WQA) 19.10.6.602 NMAC 20.6.7.20 NMAC 20.6.7.33 NMAC
Tailings Facility	NMMA 69-36-5 19.10.6.602 NMAC 20.6.2 NMAC (WQA) 20.6.7.22 NMAC 20.6.7.33 NMAC
Process Pond/Reservoir	NMMA 69-36-5 19.10.6.602 NMAC 20.6.2 NMAC (WQA) 20.6.7.33 NMAC

CERCLA § 108(b) Response Category	New Mexico Regulations
Underground Mine	19.10.5.508 NMAC 20.6.2 NMAC (WQA) 20.6.7.25 NMAC 20.6.7.33 NMAC
Slag Pile	19.10.5.502 NMAC 19.10.5.508 NMAC 20.6.2 NMAC (WQA) 19.10.6.602 NMAC 20.6.7.22 NMAC
Interim O&M	19.10.12.1205 NMAC 20.6.2 NMAC (WQA) 20.6.7.33 NMAC
Water Treatment	19.10.6.602 NMAC 19.10.12.1205 NMAC NMSA 1978, §§ 7461 *et seq*. 20.6.2 NMAC (WQA) 20.6.7.33 NMAC
Short-term O&M Monitoring	19.10.6.602 NMAC 19.10.12.1205 NMAC 20.6.2 NMAC (WQA) 20.6.7.33 NMAC
Long-term O&M Monitoring	19.10.6.602 NMAC 19.10.12.1205 NMAC 20.6.2 NMAC (WQA) 20.6.7.35 NMAC

L. Oregon

Two Oregon state regulatory agencies have primary jurisdiction over mining: 1) the Oregon Department of Geology and Mineral Industries ("DOGAMI"); and 2) the Oregon Department of Environmental Quality ("ODEQ"). DOGAMI administers the Division 37 Consolidated Permitting of Mining Operations regulations at Oregon Administrative Rule ("OAR") § 632-037-0005 et seq. The Division 37 Rule governs all hardrock mining operations except for placer mines and mining projects with mineral processing facilities that only use gravity separation. The Division 37 Rule specifies FA requirements. ODEQ administers the Division 43 Chemical Mining Rules at OAR § 3340-043-0000 et seq. The Division 43 Rule establishes stringent design, operating and closure rules for mineral processing facilities that use "cyanide or other toxic chemicals" to extract metals or metal-bearing minerals from the ore and which produce waste or wastewaters containing toxic materials." OAR § 340-037-0000(1).

As shown in Table L, the combination of the DOGAMI Division 37 and ODEQ Division 43 rules provide comprehensive environmental protection that minimizes the potential for a release of a hazardous substance from an Oregon hardrock mining operation and provide FA in the event there is a release. In fact, DOGAMI's Division 37 regulations include the requirement to provide FA for a "credible accident" which may include a release of a hazardous substance:

> "Credible Accident means an unplanned discharge of ore processing solutions, ore processing solution contaminated water, or chemicals from a mine facility into surface water, ground water, soil, overburden, or living resources in sufficient quantity to impair the pre-mine quality of the receiving water, soil, overburden, or living resources, or that would exceed the discharge limitations of the Department of Environmental Quality. A credible accident may also include but is not limited to the following types of accidents: fires, unplanned detonation of explosives, equipment failures, fuel spills and accidents resulting from human errors." OAR § 632-037-0010(8)

The Division 37 FA requirements include the following bonding mandate for a credible accident:

> "A reclamation bond or alternative security acceptable to the Department shall be posted before the start of any construction, excavation or other ground disturbing activity associated with mining operations, other than baseline data collection. "Alternative security" shall include certificates of deposit or irrevocable letters of credit issued by a federally-insured bank. The purpose of the financial security shall be to allow the Department to meet the requirements of the reclamation and closure plan and to provide protection of surface and subsurface resources. The amount of the financial security shall be calculated on the basis of the estimated actual cost of reclamation and closure and shall not be limited. The calculation shall also consider environmental protection costs based on the credible accident analysis and the factors listed in section (6) of this rule." OAR § 623-037-0135(1)

It should be noted that OAR § 632-037-0135(1) explicitly establishes that there is no upper ceiling or limit to the amount of required FA for Oregon hardrock mines. Consequently, DOGAMI has considerable discretionary authority in setting FA amounts to cover both physical reclamation and to respond to a credible accident involving a release of a hazardous substance.

The Division 37 regulations also include a very stringent global environmental protection "Undamaged Ecosystem" standard that requires mine operators to reclaim a mine in a manner that virtually eliminates most impacts by "establishment of a self-sustaining ecosystem, comparable to undamaged ecosystems in the area of the mine" OAR § 632-037-010(28). The Division 37 regulations define "undamaged ecosystem" as follows:

> "Undamaged Ecosystem means an ecosystem that is comparable in utility and stability to the ecosystem surrounding the mine and/or the pre-mine ecosystem, and that retains the principal ecological characteristics reasonably expected to exist under local, climatic, geological, soil, hydrological and biological conditions." OAR § 632-037-0010(31).

Interpreted in the context of CERCLA §108(b), the requirement to reclaim a site and mitigate all impacts to comply with the undamaged ecosystem environmental performance standards means that an operator must respond to any release of a hazardous substance. Failure to respond to a release or to achieve this standard would be a permit violation that could trigger permit revocation and bond forfeiture.

The Division 37 rules include specific reclamation and mine closure standards at OAR § 632-037-0130 that require operators to use "the best, available, practicable and necessary technology to ensure compliance with environmental standards." The requirements explicitly include post-closure monitoring to ensure "compliance with decommissioning performance standards." The post-closure monitoring data are used to determine an operator's compliance with the undamaged ecosystem standard.

The Division 37 rules require DOGAMI to review the sufficiency of the reclamation costs annually. Operators must increase their bonds if DOGAMI finds that a higher bonding level is necessary. If an operator fails to provide the additional FA, DOGAMI must suspend all permits for the project. OAR § 632-037-135.

In establishing the required FA amount, DOGAMI must consider the costs to address the following factors as listed in OAR § 632-037-135(6):

(a) The reclamation estimate submitted by the applicant as part of the consolidated application;
(b) The impact analysis, including the credible accident analysis;
(c) Supervision;
(d) Mobilization;
(e) Costs of equipment;
(f) Costs of labor;
(g) Removal or disposition of debris, junk, equipment, structures, foundations and unwanted chemicals;

(h) Reduction or stabilization of hazards such as in-water slopes, highwalls, and landslides or other mass failure;
(i) Disposition of oversize, rejects, scalpings and overburden;
(j) Backfilling, contouring or regrading and topsoil replacement;
(k) Draining, establishment of drainage and erosion control;
(l) Soil tests;
(m) Seedbed preparation, seeding, mulching, fertilizing, netting, tackifiers or other stabilizing agents;
(n) Tree and shrub planting;
(o) Fencing;
(p) Liability insurance;
(q) Long-term stabilization, control, containment or disposition of waste solids and liquids;
(r) Final engineering design;
(s) Costs of remedial measure identified to clean up releases of contaminants associated with mining, processing or beneficiation that are reasonably likely to cause a threat to public health, safety or the environment;
(t) The estimated cost of detoxification or disposal of ore processing solutions and solution contaminated ore so as to meet the standards for reclamation approved for the operation in the operating permit issued by the Department and the standards established in ORS 517.952 to 517.989 and these rules;
(u) The estimated cost of restoration of contaminated soil, surface and ground water or living resources within the standards established in ORS 517.952 to 517.989 and these rules should an accident occur at the site;
(v) The estimated cost of removal and/or disposal of chemicals used on site;
(w) The spill prevention plan;
(x) Estimated Department-contracted service expenses including but not limited to supervision, mobilization, labor and equipment needs of the department for decontamination and restoration should the Department be required to perform such restoration.

Oregon's reclamation requirements clearly are not restricted to physical reclamation of surface disturbance because they require FA for a credible accident, release, or spill. They also include many environmental response requirements including the costs to remediate releases of contaminants (i.e., releases of CERCLA hazardous substances), detoxify and dispose of wastes, and remediate contaminated soil, surface water, and groundwater. FA must include the environmental controls, mitigation, and reclamation measures necessary to comply with the OAR § 632-037-135(6) requirements. OAR § 632-037-135(10) establishes that DOGAMI may require FA or an annuity for post-reclamation monitoring and care.

DOGAMI coordinates its administration of the Division 37 Rule with DEQ's administration of the Division 43 Chemical Mining Rule. The Division 43 Rule cross-references the Division 37 rule in establishing FA requirements and includes a specific section pertaining to an operator's assumption of liability:

> "The Reclamation Bond or alternative security required by ORS 517.987 and OAR 632-037-0135 for a chemical mining facility is intended to provide adequate resources to cover the costs of reclamation and a credible accident. The amount of security required is to be determined at the time permits are issued and adjusted as necessary during site operations…" OAR § 340-043-0025(1)(h)
>
> "…the Department shall require, prior to issuing or renewing a permit for a chemical mining facility, and as a condition of the permit, that those persons or entities who control the permittee assume liability for environmental injuries, remediation expenses, and penalties." OAR § 340-043-0025(2)

The ODEQ chemical mining Division 43 permit is either a National Pollutant Discharge Elimination System ("NPDES") permit if the project involves a point-source discharge to surface waters or a Water Pollution Control Facility ("WPCF") permit if there is no discharge.

The Division 43 rule establishes stringent and prescriptive requirements including the following:

- Liner system designs and specifications;
- Leak detection and leak collection systems;
- Tailings detoxification or neutralization requirements;
- Design, construction, and operation of heap leach facilities;
- Disposal of mill tailings;
- Disposal or storage of waste rocks, low-grade ore, and other mined materials;
- Closure of heap leach pads and tailings disposal facilities;
- Post closure monitoring;
- Wastewater disposal and treatment; and
- Closure of open-pit mines;

The focus of the Division 43 facilities design, operation, and closure requirements is to prevent releases of hazardous substances at each of the listed mine components.

Oregon's Division 37 and Division 43 stringent regulatory framework for hardrock mines clearly makes the Proposed Rule duplicative and unnecessary. The environmental performance standards in Oregon's Division 37 and Division 43 rules, which include the extremely rigorous undamaged ecosystem standard, significantly minimize the likelihood of a release of a hazardous substance from an Oregon hardrock mine. The credible accident FA provision in DOGAMI's Division 37 Rule give DOGAMI resources to respond to a release of a hazardous substance in the event an operator fails to remediate the release. Although the regulatory and FA programs in other mining states give state regulators broad authority to use FA instruments to respond to an environmental problem if an operator fails to do so, Oregon's credible accident FA requirement is unique because it is an explicit FA requirement that specifically deals with a hypothetical release of a hazardous substance.

There are no gaps in Oregon's environmental protection and FA requirements for hardrock mines. These regulations minimize the risk of a release of hazardous substances. Consequently, there is no justification for adding a superfluous layer of EPA-administered FA for hardrock mines in Oregon.

The document in the docket for the Proposed Rule entitled "Summary of Oregon Financial Responsibility Requirements" (Docket No. EPA-HQ-SFUND-2015-0781-2107) does not accurately describe the breadth of Oregon's regulatory and FA requirements for hardrock mines. EPA's summary omits any discussion of ODEQ's role and the Division 43 chemical mining rules. It also fails to recognize the importance of the credible accident or undamaged ecosystem provisions in the Division 37 Rule. Consequently, EPA has completely overlooked key elements of Oregon's regulatory and FA requirements for hardrock mines. EPA must not rely on this summary in evaluating the sufficiency of Oregon's regulatory and FA program in minimizing the risks associated with a release of a hazardous substance from an Oregon mining operation.

Table L – Oregon
CERCLA 108(b) Response Category Equivalents in Oregon Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Oregon Regulations
Solid/Hazardous Waste Disposal	OAR § 632-037-135(6) OAR § 340-043-0060
Open Pit	OAR § 632-037-0130(8), (10), (13) OAR § 632-037-135(6) OAR § 340-043-0030(2)(h) OAR § 340-043-0030(2)(j) OAR § 340-043-0080(4) OAR § 340-043-0180
Waste Rock	OAR § 340-043-0030(2)(h) OAR § 632-037-135(6) OAR § 340-043-0030(2)(j) OAR § 340-043-0100 OAR § 340-043-0140
Heap/Dump/Leach	OAR § 632-037-135(6) OAR § 340-043-0000(2)(a), (c) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0030(2)(h) OAR § 340-043-0030(2)(j) OAR § 340-043-0080(5) OAR § 340-043-0100 OAR § 340-043-0125 (1 - 4), (8), (9), (10), (11) OAR § 340-043-0150
Tailings Facility	OAR § 632-037-135(6) OAR § 340-043-0000(2)(a), (b), (c) OAR § 340-043-0000(2)(b) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0030(2)(h) OAR § 340-043-0030(2)(j) OAR § 340-043-0080(5) OAR § 340-043-0100 OAR § 340-043-0130 OAR § 340-043-0150 ORS 540 §§ 350-390
Process Pond/Reservoir	OAR § 632-037-135(6) OAR § 340-043-0000(2)(a), (c) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0080(5) OAR § 340-043-0125(1), (2), (3),(5), (6), (7) OAR § 340-043-0150
Underground Mine	OAR § 632-037-135(6)

CERCLA § 108(b) Response Category	Oregon Regulations
Slag Pile	Not applicable
Interim O&M	OAR § 632-037-0135(1) OAR § 632-037-135(6) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0025(2) OAR § 340-043-0040(2)(f) OAR § 340-043-0050(3) OAR § 340-043-0150 OAR § 340-043-0160
Water Treatment	OAR § 632-037-135(6) OAR § 340-043-0040(2)(c), (d) OAR § 340-043-0170 OAR § 340-043-0180(2)
Short-term O&M Monitoring	OAR § 623-037-0135(1) OAR § 632-037-135(6) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0025(2) OAR § 340-043-0040(2)(f) OAR § 340-043-0050(3)
Long-term O&M Monitoring	OAR § 623-037-0135(1) OAR § 632-037-135(6) OAR § 632-037-0130(3) OAR § 632-037-0135(10) OAR § 632-037-0140(5) OAR § 340-043-0025(1)(h), (i) OAR § 340-043-0025(2) OAR § 340-043-0040(2)(f) OAR § 340-043-0150

M. Utah

As shown in Table M below, the Utah laws and regulations that principally govern specific aspects of the design, operation, reclamation, closure, and post-closure of Utah mining and mineral processing facilities include the following:

- Utah Code Title 40, Mines and Mining - Chapter 8, Utah Mined Land Reclamation Act ("UMLRA"). Rule ("R") 647 implements this law;

- Utah Code Title 19, the Environmental Quality title. Several chapters of this title are applicable to mining: Chapter 01 – General Provisions; Chapter 02 – Air Conservation Act; Chapter 03 – Radiation Control Act; Chapter 04 – Safe Drinking Water Act; Chapter 05 – Water Quality Act; Chapter 06 – Hazardous Substances, and Chapter 08 – Voluntary Cleanup Programs. Numerous rules implement title 19, with R317-6, Ground Water Quality Protection, and R317-8 Utah Pollutant Discharge Elimination System (UPDES) being two of the most important rules; and

- Utah Code Title 73, Chapter 5a, which pertains to dam safety. There are three principle rules that implement this title: R655-10, Dam Safety Classifications, Approval Procedures and Independent Reviews, R655-11, Requirements for the Design, Construction and Abandonment of Dams, and R655-12, Requirements for Operational Dams.

The Utah Department of Environmental Quality ("UDEQ") administers Utah's Environmental Quality Code according to environmental media through the following Divisions: Air Quality, Drinking Water, Environmental Response and Remediation, Waste Management and Radiation Control, and Water Quality. The Utah Department of Natural Resources - Oil Gas and Mining ("DOGM") administers the UMLRA. The Utah Department of Natural Resources - Division of Water Rights ("UDNR-WaRi") administers Utah's dam safety code and regulatory program. A Memorandum of Understanding between UDEQ and DOGM explains the cooperative and collaborative approach between the agencies to implement the complementary regulations that share a common objective to protect human health and the environment.

The UMLRA mined land reclamation requirements address both landscape restoration and environmental protection during and after mining. The UMLRA and its implementing regulations reflect the following objectives:

- Return the land, concurrently with mining or within a reasonable amount of time thereafter, to a stable ecological condition compatible with past, present, and probable future local land uses;

- Minimize or prevent present and future on-site or off-site environmental degradation caused by mining operations to the ecologic and hydrologic regimes and to meet other pertinent state and federal regulations regarding air and water quality standards and health and safety criteria; and

- Minimize or prevent future hazards to public safety and welfare.

The UMLRA establishes design and operating criteria for mining facilities. Mining authorizations under the UMLRA require DOGM coordination with DEQ to ensure that the mining facility has obtained from DEQ all permits and approvals required by Title 19 and implementing regulations. Utah's Title 19 environmental protection code thus forms the basis for the environmental controls and mitigation measures that govern mine design, operation, and closure. Working together with the Permittee, the UMLRA and Rule 647, the dam safety regulations, and UDEQ's environmental protection regulations govern the management of hazardous substances during all phases of the mining lifecycle – from operation to closure and post-closure at all Utah mines and mineral processing facilities and protect human health and the environment by controlling the release or threat of release of such hazardous substances.

The UMLRA, the Title 19 environmental protection laws, and the UDWR dam safety regulations result in a regulatory package that covers the thirteen CERCLA § 108(b) response categories in the Proposed Rule. Utah FA requirements, in concert with Title 19 environmental controls, mitigation measures, and environmental performance requirements, present appropriate environmental management during all phases of the mining lifecycle.

The following are examples of some of the environmental performance standards in Rule 647 with which mines and mineral processing facilities must comply:

- All deleterious or potentially deleterious material[13] shall be safely removed from the site or kept in an isolated condition such that adverse environmental effects are eliminated or controlled. (R647-4-107.4 and R647-4-111.4).

- Operations shall be conducted in a manner such that sediment from disturbed areas is adequately controlled. (R647-4-107.3)

- Water impounding structures shall be reclaimed so as to be self-draining and mechanically stable unless shown to have sound hydrologic design and to be beneficial to the post-mining land use.

- Operations must minimize hazards to the public safety during operation (R647-4-107.1) and during reclamation (R647-4-111.1 and R647-1-111.6)

UDOGM's permit application for large mines, known as the Notice of Intention, requires detailed information about the design, engineering, construction, operation, reclamation, closure, and post-closure of a proposed mining project. Mines also require multiple UDEQ Title 19 permits that include specific environmental performance standards. The divisions that implement UDEQ's permitting requirements require permit applicants to provide extensive environmental

[13] "Deleterious Materials" means earth, waste or introduced materials exposed by mining operations to air, water, weather or microbiological processes, which would likely produce chemical or physical conditions in the soils or water that are detrimental to the biota or hydrologic systems. R647-1-106

baseline data and design information on the proposed environmental controls that will be employed to achieve compliance with the Title 19 requirements.

Rule 647 specifies that bond amounts shall be: "based upon (a) the technical details of the approved mining and reclamation plan, (b) the proposed post mining land use, and (c) projected third-party engineering and administrative costs to cover Division expenses incurred under a bond forfeiture circumstance." Throughout a project's life span, the required amount of FA includes estimated closure costs. However, towards the end of the active mining phase of a project, UDOGM may require more detailed closure and post-closure plans and FA that is based on these more detailed plans.

Once a mine is approved and in operation, both UDOGM and UDEQ have the authority to compel remediation if the site monitoring data indicate the project is not performing as authorized. Operators have a strong incentive to remain in compliance with their operating permits to avoid regulatory sanctions that can include an order to cease mining. In the event an operator fails to address a problem, state regulators can use the operators' FA to remediate the site.

Utah's Groundwater Quality Protection Program in Utah Administrative Code, ("UAC") Title R317, requires a groundwater discharge permit from UDEQ, that is applicable to numerous mining features including waste rock storage facilities, mining and milling operations, heap leach facilities, pits, ponds, and lagoons. Mining facilities may not discharge contaminants that cause groundwater to exceed an applicable groundwater quality standard. If the background concentration of the groundwater at a site exceeds an applicable water quality standard for one or more parameter, the facility may not cause an increase over the background concentrations.

One of the stated objectives of the Utah legislature in the UMLRA, Section 40-8-12, is to minimize or prevent future hazards to public safety and welfare. This mandate, along with the coordinated oversight memorialized in the MOU, provides Utah regulators with clear authority to protect water, air, and environmental resources through appropriate and applicable mitigation and control measures, which in some instances may include long-term water quality treatment.

Another important aspect of Utah's regulatory and FA framework is state regulators' authority to require operators to maintain FA throughout the entire mining life cycle to minimize the likelihood for a situation to develop that results in an un-bonded release of a hazardous substance. This requirement also provides UDOGM, at any time, an opportunity to update operating permits and adjust FA as may be appropriate in response to changing site- and project-specific factors: "…the Division may review the permit and require updated information and modifications when warranted." (R647-4-102). Additionally, UDOGM will not close project permits or relinquish a project's FA until they are assured that there is a reasonable likelihood that the closed and reclaimed project will not cause a future violation of an operating-phase permit condition (which effectively includes the release of CERCLA hazardous substances). Both the amount of and the duration of the required FA that an operator must provide to UDOGM are coordinated as appropriate with the UDEQ permits for the project.

As shown in Table M below, Utah's Title 19 Code establishes fees for hazardous and non-hazardous solid waste disposal (UAC 19-1-108, 19-6-118, and 19-6-119) that DEQ regulators can use to respond to issues. The solid waste disposal fee does not apply to Bevill-exempt mine wastes such as waste rocks and tailings.

Utah mines on BLM-administered lands must also comply with that agency's 43 CFR § 3809 surface management regulations governing metallic minerals and the 43 CFR Part 3500 regulations applicable to leasing and bonding of phosphate and solid minerals other than coal and oil shale. Similarly, Utah mines on National Forest System Lands must comply with the Forest Service's 36 CFR §228A regulations. BLM and Utah state regulators coordinate their mine regulatory and FA programs under the terms of a MOU. As shown in Exhibit 1, BLM's and the Forest Service's regulations provide comprehensive FA for each of the CERCLA § 108(b) response categories.

The two EPA documents in the docket for this rulemaking, Appendix IV, Table N in EPA's November 2016 "Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances" (Docket No. EPA-HQ-SFUND-2015-0781-0144), and Utah Summary of Financial Responsibility Requirements (Docket No. HQ-SFUND-2015-0781-2109) are deficient because they omit key details about Utah's regulatory framework for hardrock mining and mineral processing facilities. For example, EPA's Table N omits Utah's dam safety regulations. This table also fails to capture how the different parts of Utah's regulations work together to require that mines be designed, built, operated, and closed to protect the environment and minimize the potential for releases of hazardous substances.

EPA's Table N and its Utah summary overlook how the Title 19 laws and implementing environmental protection regulations work in tandem with Utah's FA requirements. The environmental protection regulations define the performance standards that apply during a mine's entire lifecycle and determine the amount of required FA to achieve compliance with all environmental performance standards.

Because EPA's analysis for Utah fails to understand the interaction of the three parts of Utah's code that govern Utah's regulatory and FA requirements for hardrock mines and mineral processing facilities, they present a very superficial picture of Utah's programs. Both of EPA's documents completely overlook the UDNR-WaRi's dam safety regulations, which are an essential component of Utah's regulatory program to minimize the potential for a release of hazardous substances from tailings storage facilities and other mine facilities that are regulated as dams.

EPA's summary incorrectly states that UDOGM cannot require an adjustment of a project's FA more frequently than every five years. As described above, DOGM's regulations allow more frequent revisions under appropriate circumstances.

EPA's summary oversimplifies UDOGM's policy to accept FA calculation based on the Minerals Regulatory Program's average dollars per acre reclamation costs. The average costs per acre pertain only to basic backfilling, grading, and revegetation tasks at small mines and nothing

more. Other reclamation activities, such as the disposal of deleterious materials, portal closure, and demolition, are addressed on a site-specific basis and added as separate line items to the cost estimate. Comparing reclamation costs to other sites involves evaluating numerous complex site factors. An operator must consider a broad range of site characteristics including the nature of the mined materials and the acid forming potential or any toxic characteristics of the project waste rocks and spent ore (see R647-4-106.4). Therefore, the comparison to other sites is not a simplistic acre-for-acre calculation.

Given the shortcomings in EPA's Table N and its Utah State summary, EPA has not accurately described the way in which Utah's laws and regulations interact to provide comprehensive environmental protection and FA. Utah's environmental regulatory and FA framework for mining is another example of a "complicated but generally effective" regulatory program as described in the NAS Study. EPA's analysis for this rulemaking of Utah's regulatory and FA programs is inaccurate and incomplete. A proper evaluation would reveal that Utah's site-specific environmental protection and FA requirements are comprehensive and far superior to the one-size-fits-all formulas EPA used in the Proposed Rule. Utah's program adequately protects the environment through the prevention of releases and imposes sufficient FA requirements on Utah mining operations. Therefore, an EPA-driven FA program pursuant to CERCLA § 108(b) is unnecessary.

Table M – Utah
CERCLA 108(b) Response Category Equivalents in Utah Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Utah Laws and Regulations
Solid/Hazardous Waste Disposal	R647-4-107.4 R647-4-109.5 R647-4-110.4 R647-4-111.4 R647-4-113 UAC Title 19-1-108 UAC Title 19-6-102 UAC Title 19-6-118 UAC Title 19-6-320 R315-268
Open Pit	R647-4-105.3 R647-4-106.3 R647-4-107.1 R647-4-109.1 R647-4-109.4 R647-4-109.5 R647-4-110.2 R647-4-110.4 R647-4-111.1 R647-4-111.4 R647-4-111.7 R647-4-113
Waste Rock	R647-4-106.3 R647-4-106.4 R647-4-106.9 R647-4-107.4 R647-4-107.3 R647-4-109.1 R647-4-109.4 R647-4-109.5 R647-4-110.2 R647-4-110.4 R647-4-111.4 R647-4-111.6 R647-4-113
Heap/Dump/Leach	R647-4-106.3 R647-4-106.4 R647-4-106.9 R647-4-107.4 R647-4-109.1 R647-4-109.4

CERCLA § 108(b) Response Category	Utah Laws and Regulations
	R647-4-109.5 R647-4-110.2 R647-4-110.4 R647-4-111.4 R647-4-113
Tailings Facility	R647-4-105.3 R647-4-106.3 R647-4-106.4 R647-4-106.9 R647-4-107.4 R647-4-109.1 R647-4-109.4 R647-4-109.5 R647-4-110.2 R647-4-110.4 R647-4-111.4 R647-4-111.9 R647-4-113 R313-24 (Uranium Mills and Mill Tailings) UAC Title 73, Chapter 5a, R655-10 R655-11 R655-12
Process Pond/Reservoir	R647-4-105.3 R647-4-106.3 R647-4-107.4 R647-4-109.1 R647-4-109.5 R647-4-110.2 R647-4-111.4 R647-4-111.9 R647-4-113
Underground Mine	R647-4-107.1.11 R647-4-109.1 R647-4-109.5 R647-4-110.2 R647-4-111.1.11 R647-4-113
Slag Pile	R315-266 UAC Title 19-6-108
Interim O&M	UAC Title 19-6-109 R647-4-109.1 R647-4-109.5

CERCLA § 108(b) Response Category	Utah Laws and Regulations
Water Treatment	R317-6-1 R317-6-6 R317-8 UAC Title 19-5-22 UAC Title 19-5-107
Short-term O&M Monitoring	R647-4-109.1 R647-4-109.5
Long-term O&M Monitoring	R647-4-109.1 R647-4-109.5

N. Washington

Two Washington State regulatory agencies have principal jurisdiction over hardrock mining, the Washington Department of Natural Resources ("WDNR") and the Washington Department of Ecology ("WDOE"). These agencies implement a regulatory framework that provides comprehensive environmental protection that minimizes the risk of a release of hazardous substances from Washington hardrock mines. The Washington State regulations also provide Washington State regulators with FA to address a release if an operator fails to respond properly. As shown in Table N below, the regulatory framework for hardrock mining and mineral processing in Washington addresses all of the CERCLA § 108(b) response categories in the Proposed Rule.

The WDNR is the primary state regulatory agency that administers the Washington Metals Mining and Milling Act ("WMMMA"), Revised Code of Washington ("RCW") Chapter 78.56 §§.010 – 902. However, the WDOE and other Washington state regulatory agencies also play a key role in implementing the WMMA. The WMMMA requires WDOE to prepare an Environmental Impact Statement pursuant to the State Environmental Policy Act ("SEPA") to provide a detailed evaluation of the environmental impacts of a proposed mining and milling operation. RCW 43.21C.031.

As part of the mine permitting process, a company must provide information to WDNR and WDOE about its past environmental performance track record in Washington and in other states and disclose the following information:

- Any past or present bankruptcies involving the applicant or its subsidiaries;

- Whether the applicant has ever abandoned a site that required state or federal regulators to remediate the site pursuant to state remedial cleanup programs or CERCLA; and

- If the applicant has ever forfeited a FA instrument due to noncompliance with reclamation or remediation requirements.

This information is made available to the public. It is highly unlikely that a permit applicant with a blemished environmental track record would be successful in securing operating permits in Washington given the numerous opportunities the public has to comment upon and influence the potential issuance of permits for a proposed mining operation.

In addition to the WMMMA, numerous other Washington state laws have specific requirements for hardrock mining and mineral processing operations. For example, Washington's Water Pollution Control Act governing discharges to surface water and NPDES permits under RCW Chapter 09.48.260 requires WDOE to inspect hardrock mining projects at least quarterly (RCW Chapter 90.48.090). The Pollution Disclosure Act of 1971 requires mine operators to submit annual water quality and air quality discharge reports. (RCW Chapter 90.52). RCW Chapter 90.52.040 "requires wastes to be provided with all known, available, and reasonable methods of treatment prior to their discharge or entry into waters of the state." The Washington state regulations pertaining to hazardous waste require WDOE to inspect metals mining and milling operations quarterly (RCW Chapter 70.105.310).

Washington also has specific dam safety requirements applicable to tailings storage facilities:

> "A metals mining and milling operation regulated under chapter 232, Laws of 1994 is subject to additional dam safety inspection requirements due to the special hazards associated with failure of a tailings pond impoundment. The department shall inspect these impoundments at least quarterly during the project's operation and at least annually thereafter for the postclosure monitoring period in order to ensure the safety of the dam or controlling works. The department shall conduct additional inspections as needed during the construction phase of the mining operation in order to ensure the safe construction of the tailings impoundment." RCW Chapter 90.03.350.

The WMMMA includes stringent mitigation standards that require operators to avoid adverse impacts wherever possible to minimize adverse impacts by limiting the scope of a proposed action and by using appropriate technology to reduce adverse impacts or restore the affected environment. If adverse impacts are unavoidable and cannot be reduced or restored, operators must rectify the adverse impact by repairing, rehabilitating, or restoring the affected environment RCW 78.56.020(6). Mitigation also requires monitoring of an adverse impact in order to take appropriate corrective measures.

In order to comply with RCW Chapter 78.56.100, tailings disposal facilities must be designed and operated to "prevent the release of pollution." Operators are required to use "all known available and reasonable technology to limit the concentration of potentially toxic materials in the tailings facility." RCW Chapter 78.56.100(1)(a) establishes the following stringent long-term, post-closure requirements for tailings and waste rock (i.e., "mine tailings") storage facilities:

> (iii) The toxicity of mine or mill tailings and the potential for long-term releases of regulated substances from mine or mill tailings shall be reduced to the greatest extent practicable through stabilization, removal, or reuse of the substances; and
>
> (iv) The closure of the tailings facility shall provide for isolation or containment of potentially toxic materials and shall be designed to prevent future release of regulated substances contained in the impoundment.

Additionally, Washington's regulations require WDOE to perform a detailed technical investigation that considers numerous site-specific criteria to determine the preferred location for the tailings disposal facility to "incorporate the requirements of all known available and reasonable methods in order to maintain the highest possible standards to insure the purity of all waters of the state." RCW Chapter 78.56.090. This site selection report must evaluate the feasibility of reclaiming and stabilizing the tailings facility and is typically coordinated with the Environmental Impact Statement required under SEPA.

RCW Chapter 78.56.100(b) requires applicants to develop a waste rock management plan that both WDOE and WDNR must approve. The waste rock management plan must emphasize pollution prevention and include, at a minimum, the following:

> (i) An accurate identification of the acid generating properties of the waste rock;
>
> (ii) A strategy for encapsulating potentially toxic materials from the environment to prevent the release of heavy metals and acid drainage; and
>
> (iii) A plan for reclaiming and closing waste rock sites which minimizes infiltration of precipitation and runoff into the waste rock and which is designed to prevent future releases of regulated substances contained within the waste rock.

RCW Chapter 56.110 prohibits WDOE from issuing any of the necessary permits for a mine or milling facility until the operator has provided an acceptable "performance security" (i.e., FA) to WDOE. The performance security must be conditions on "the faithful performance of the applicant or operator in meeting the following obligations:

> (ii) Compliance with the environmental protection laws of the state of Washington administered by the department of ecology, or permit conditions administered by the department of ecology, associated with the construction, operation, and closure pertaining to metals mining and milling operations, and with the related environmental protection ordinances and permit conditions established by local government when requested by local government;
>
> (iv) Postclosure environmental monitoring as determined by the department of ecology; and
>
> (v) Provision of sufficient funding as determined by the department of ecology for cleanup of potential problems revealed during or after closure. RCW 78.56.110(2)

The requirement that an applicant must provide satisfactory FA before WDOE can issue any of the necessary permits for the operation applies to the NPDES (RCW Chapter 90.48.260), air quality, hazardous waste, dam safety permits, and other WDOE-administered environmental protection permits. As a practical matter, this requirement means all WDOE-issued permits functionally have FA because the environmental controls necessary to satisfy the conditions in these permits determines the FA amount.

RCW Chapter 78.56.110(4) gives WDOE the authority to increase (or decrease) the amount of required FA "at any time to compensate for any alteration in the operation that affects meeting the obligations in subsection (2)." WDOE is required to review the adequacy of the FA at least every two years. The operator has liability for the FA until WDOE deems the operation has met all the requirements in its permit obligations.

If an operator fails to fulfill its compliance obligations, including performing any necessary reclamation or remediation, WDOE is authorized to forfeit the FA and perform the remediation.

In the event the amount of FA is insufficient, the Washington state attorney general may initiate legal action in the Washington superior court to recover the remaining costs from the operator. RCW Chapter 78.56.120.

RCW Chapter 56.78.160 permanently prohibits in situ mining in Washington. The requirements of RCW Chapter 78.56 apply to milling facilities like the Kettle River Mill in Ferry County, Washington, that are not adjacent to a mine.

Local governments also have a role in the permitting process for Washington mine and milling operations. WDOE must coordinate with local government "to the fullest extent practicable" in preparing the SEPA environmental impact statement. RCW Chapter 78.56.050. Additionally, local governments are involved in the issuance of other WDOE permits including the NPDES, air quality, and hazardous waste permits.

The WDNR and WDOE regulatory framework for Washington hardrock mines provides comprehensive environmental protection that minimizes the risk of a release of hazardous substances. It also provides WDOE with FA to respond to a release in the event an operator fails to do so. As shown in Table N below, the Washington state laws governing mining and milling and the other permitting requirements applicable to mining and milling cover the thirteen CERCLA § 108(b) response categories. Consequently, there is no justification for EPA to impose an EPA-administered FA program pursuant to CERCLA § 108(b) for hardrock mines in Washington.

The document in the docket for the Proposed Rule entitled "Summary of Washington Financial Responsibility Requirements" (Docket No. EPA-HQ-SFUND-2015-0781-2110) does not fully discuss the detailed requirements of the WMMMA. Consequently, it overlooks the scope of Washington's FA requirements, which functionally extends to all WDOE-issued project permits and the extraordinarily stringent statutory environmental protection requirements that mandate pollution prevention from tailings and waste rock disposal facilities. These pollution prevention statutory requirements categorically prohibit the release of hazardous substances from Washington mining and milling facilities and provide Washington state regulators with powerful regulatory and enforcement tools to prevent releases and FA to respond to an unauthorized release.

Table N - Washington
CERCLA 108(b) Response Category Equivalents in Washington Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Washington Regulations
Solid/Hazardous Waste Disposal	RCW 79.95C.200 RCW 70.105.310 RCW 78.56.100 RCW 78.56.150
Open Pit	RCW 78.44.031(11) RCW 78.44.141(4)(g) RCW 78.56.110(2)
Waste Rock	RCW 78.44.031(11) RCW 78.44.141(4)(g) RCW 78.56.100 (1)(a), (b) RCW 78.56.110(2)(c)
Heap/Dump/Leach	RCW 78.44.031(11) RCW 78.44.141(4)(g) RCW 78.56.110(2)(c)
Tailings Facility	RCW 78.44.031(11) RCW 78.44.141(4)(g) RCW 78.44.141(6) RCW 78.56.090 RCW 78.56.100 RCW 78.56.110(2)(c) RCW 78.56.150 RCW Chapter 90.03.350
Process Pond/Reservoir	RCW 78.44.031(11) RCW 78.44.141(6) RCW 78.56.110(2)(c) RCW 78.56.150
Underground Mine	RCW 78.44.031(11) RCW 78.44.280 RCW 78.56.110(2)(c)
Slag Pile	Not applicable
Interim O&M	RCW 78.56.020(6) RCW 78.56.100
Water Treatment	RCW 78.56.020(6) RCW 78.56.110(2)(d) RCW 90.48.090 RCW 90.52.040
Short-term O&M Monitoring	RCW 78.56.020(6) RCW 78.56.100 RCW 90.03.350 RCW 90.48.090

CERCLA § 108(b) Response Category	Washington Regulations
Long-term O&M Monitoring	RCW 78.56.020(6) RCW 78.56.100 RCW 78.56.110(2)(c) RCW 78.56.110(5)

O. Wyoming

As shown in Table O below, the Wyoming Environmental Quality Act ("WEQA"), Wyo. Stat. § 35-11-401 through 436 regulates air, water, and land quality, including remediation of contaminated sites. WEQA and its implementing regulations include specific environmental protection mandates and broad FA authority for Wyoming hardrock mining operations that cover the thirteen CERCLA § 108(b) cost categories in the Proposed Rule. WEQA Article 4, Land Quality, which deals specifically with mining, is cross-referenced to other relevant WEQA articles including Air Quality (Article 2), Water Quality (Article 3), and Solid Waste Management (Article 5).

The Wyoming Department of Environmental Quality ("WYDEQ") administers WEQA. The Land Quality Division ("LQD") of WYDEQ has principal regulatory jurisdiction over Wyoming mining projects and issues licenses and permits for all non-coal mine production (i.e., hardrock mining) in Wyoming. Other WYDEQ divisions have specific permitting authorities applicable to some mining projects. For example, the Water Quality Division issues surface water discharge (WYPDES) permits in conjunction with Wyoming mining projects

The purpose of WEQA is:

> "…to enable the state to prevent, reduce and eliminate pollution; to preserve, and enhance the air, water and reclaim the land of Wyoming; to plan the development, use, reclamation, preservation and enhancement of the air, land and water resources of the state; to preserve and exercise the primary responsibilities and rights of the state of Wyoming; to retain for the state the control over its air, land and water and to secure cooperation between agencies of the state, agencies of other states, interstate agencies, and the federal government in carrying out these objectives." Wyo. Stat. § 35-11-102.

In addition to this universally applicable environmental protection requirement, WEQA includes the following provision that specifically mandates that mining operations must prevent pollution of waters of the state:

> "Prevention of pollution of waters of the state from mining operations, substantial erosion, sedimentation, landslides, accumulation and discharge of acid water, and flooding, both during and after mining and reclamation;" Wyo. Stat. § 35-11-402(a)(iv)

In order to remain in compliance with an operating permit, the operator must adhere to numerous environmental protection mandates including the following specific requirements for operators to prevent releases of pollutants (e.g., hazardous substances):

> "Cover, bury, impound, contain or otherwise dispose of toxic acid forming, or radioactive material or any material determined by the administrator to be hazardous to health and safety, or which constitutes a threat of pollution to surface or subsurface water as may be required in the approved reclamation plan;" Wyo. Stat. § 35-11-415(b)(iv)

> "Prevent, throughout the mining and reclamation operation, and for a period of five (5) years after the operation has been terminated, pollution of surface and subsurface waters on the land affected by the institution of plantings and revegetation, the construction of drainage systems and treatment facilities including settling ponds and the casing, sealing of boreholes, shafts, and wells so that no pollution is allowed to drain untreated into surface or subsurface water in accordance with state or federal water quality standards, whichever are higher, as may be required in the approved reclamation plan;" Wyo. Stat. § 35-11-415(b)(viii)

Elsewhere, WEQA authorizes WYDEQ to require an operator to maintain a permit and FA for at least five years after partial bond release. Wyo. Stat. § 35-11-417(e).

WEQA also includes numerous requirements dealing specifically with in-situ mining at Wyo. Stat. §§ 35-11-426 through 430. In situ mining is a commonly used mining technique for extracting uranium in Wyoming. Many other mining states do not have specific requirements for in situ mining because there are no in situ mining operations and little likelihood of future in situ mining.

The FA requirements in WEQA are very broad and extend to all Wyoming projects that require a WYDEQ permit to operate. This comprehensive bonding mandate is defined in terms of compliance with all applicable laws and regulations, which includes mine land reclamation but is much broader than that:

> "The purpose of any bond required to be filed with the administrator by the operator shall be to assure that the operator shall faithfully perform all requirements of this act and comply with all rules and regulations of the board made in accordance with the provisions of this act." Wyo. Stat. § 35-11-417(a)

The explicit directive at Wyo. Stat. § 35-11-417(a), which defines bonding requirements in the context of environmental compliance, clearly means that Wyoming's FA requirements for hardrock mines go far beyond bonding for the physical reclamation of surface disturbance at a mine pursuant to the site reclamation plan. Rather, WEQA requires FA for the environmental controls at a Wyoming mine that are necessary to ensure compliance with the air, water, solid waste, and other environmental protection mandates in WEQA. The requirement for operators to provide a bond to "perform all requirements of this act and comply with all rules and regulations" includes bonding for the release of hazardous substances.

This seamless interaction between the WEQA environmental protection requirements and the state's FA requirement address the CERCLA § 108(b) cost categories and make the Proposed Rule unnecessary in Wyoming. The environmental protection mandates in WEQA substantially minimize the potential for a release of hazardous substances at a Wyoming mine. In the event a release occurs and the operator fails to respond appropriately, WYDEQ has the necessary FA to respond to the release.

WEQA specifically establishes FA requirements for remediation activities at mine sites. For example, WEQA mandates operators of in situ mines to provide initial bonds that include, among other things, the cost of "restoring, any groundwater disturbed by in situ mining during the first year of operation under each permit." Wyo. Stat.§ 35-11-417(c)(i). WEQA defines reclamation to include groundwater restoration, Wyo. Stat. § 35-11-103(f)(vi), and defines "groundwater restoration" to mean:

> "…the condition achieved when the quality of all groundwater affected by the injection of recovery fluids is returned to a quality of use equal to or better than, and consistent with the uses for which the water was suitable prior to the operation by employing the best practicable technology." Wyo. Stat. § 35-11-103(f)(iii).

WEQA Wyo. Stat. § 35-11-417(c)(i) requires Wyoming mine operators to establish an initial bond that includes an "amount equal to the estimated cost of reclaiming the affected land disturbed and restoring, as defined in W.S. 35-11-103(f)(iii), any groundwater disturbed by in situ mining during the first year of operation under each permit."

Mine operators must subsequently provide annual reports pursuant to Wyo. Stat § 35-11-411 and renewal bonding to include "the amount equal to the estimated cost of reclaiming the land to be disturbed during that renewal period, and the estimated cost of completing reclamation of unreleased lands and groundwater disturbed during prior periods of time." Wyo. Stat.§ 35-11-417(c)(ii). An increase in the amount of land or groundwater to be disturbed triggers a concomitant increase in the amount of required FA. Wyo. Stat. § 35-11-417(f).

The LQD must inspect an operation following receipt of the Annual Report. Wyo. Stat. § 35-11-411(c). Following the inspection, LQD will determine the amount of the required renewal bond. Wyo. Stat. § 35-11-411(d). Wyoming regulators thus have the authority to demand an increase in the bond amount to fit site-specific conditions described in the annual report (which must include monitoring data) and the annual site inspection.

WEQA provides for partial release of the FA when reclamation is completed but gives WYDEQ the authority to require bonding indefinitely (i.e., long-term bonding) if necessary based on site-specific conditions to ensure restoration of groundwater quality:

> "When the reclamation plan for any affected land has been completed, the administrator may recommend to the director the release of up to seventy-five percent (75%) of the bond required for that affected land. The remaining portion of the bond shall be not less than ten thousand dollars ($10,000.00), and shall be held for a period of at least five (5) years after the date of reduction to assure proper revegetation and restoration of groundwater." Wyo. Stat. § 35-11-417(e).

WYDEQ must forfeit a bond if it is determined that an operator has caused "any violation of this act." Pursuant to the bond forfeiture procedures, the Wyoming Attorney General must provide the operator with written notice of the violation and pending bond forfeiture and the operator is offered an opportunity to present its case at a hearing. Wyo. Stat § 35-11-421. If there is inadequate FA to address the violation (including a release of a hazardous substance), the

Attorney General shall bring suit against the operator to recover the reclamation costs. Wyo. Stat. § 35-11-422.

EPA's "Summary of Wyoming Financial Responsibility Requirements" included in the docket for the Proposed Rule (Docket No. EPA-HQ-SFUND-2015-0781-2111) is an incomplete and simplistic description of Wyoming's regulatory and FA requirements to minimize releases of hazardous substances from hardrock mining operations. EPA's summary fails to discuss how WEQA at Wyo. Stat. § 35-11-417(a) explicitly ties FA requirements to the State's environmental protection mandates. Consequently, Wyoming has comprehensive FA requirements that cover the thirteen CERCLA § 108(b) cost categories in the proposed rule.

EPA's summary incorrectly states: "Neither the WEQA nor its regulations address whether long-term water treatment is a cost that must be included in calculating financial responsibility amounts." To the contrary, Wyo. Stat. § 35-11-415(b)(viii) clearly includes water treatment as one of several post-reclamation environmental control measures that may be required to maintain compliance with WEQA. Moreover, other provisions of WEQA in Article 3 (Water Quality) require compliance with Wyoming's water quality standards for surface water and groundwater. For example the WYDEQ/Division of Water Quality's rules at Wyoming Administrative Rule ("WAR") Chapter 8 § 4(a)(iv) include standards to protect groundwater quality "from pollution which may result from surface mining operations."

As illustrated in Table O, WEQA and its implementing regulations establish requirements to minimize the release from all of the mine facilities included in EPA's CERCLA § 108(b) response categories and provide associated FA pursuant to Wyo. Stat § 35-11-417(a). Imposition of a federal FA program under CERCLA § 108(b) would be duplicative and is therefore unnecessary to minimize the degree and duration of risk of a release of a hazardous substance from a Wyoming hardrock mine.

Table O – Wyoming
CERCLA 108(b) Response Category Equivalents in Wyoming Statutes and Rules for Hardrock Mining

CERCLA § 108(b) Response Category	Wyoming Laws and Regulations*
Solid/Hazardous Waste Disposal	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 2 § 2(b)(iii) WAR 3 § 2(c)(v) WAR 9 § 2(e)(n)(r) WAR 9 § 3(a) WAR 9 § 3(c)(i)(B)(C)(H) WAR 9 § 10 WAR 9 § 13
Open Pit	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 3 § 2(b)(ii)(iii) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 8 § 4(a) WAR 9 § 3(c)(i)(C) WAR 9 § 10 WAR 9 § 13
Waste Rock	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 2 § 2(b)(iii) WAR 3 § 2(c)(iv)(E) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 8 § 4(a) WAR 9 § 2(r) WAR 9 § 3(c)(i)(C) WAR 9 § 4(a) WAR 9 § 10 WAR 9 § 13
Heap/Dump/Leach	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 3 § 2(h)(i)(ii) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 8 § 4(a) WAR 9 § 2(y) WAR 9 § 3(c)(i)(C)

CERCLA § 108(b) Response Category	Wyoming Laws and Regulations*
	WAR 9 § 4(a) WAR 9 § 10 WAR 9 § 13
Tailings Facility	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat. § 35-11-407 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 3 § 2(g) WAR 3 § 2(h)(i)(ii) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 8 § 4(a) WAR 9 § 2(r) WAR 9 § 2(y) WAR 9 § 3(c)(i)(C) WAR 9 § 4(a) WAR 9 § 10 WAR 9 § 13
Process Pond/Reservoir	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 3 § 2(h)(i)(ii) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 8 § 4(a) WAR 9 § 2(y) WAR 9 § 3(c)(i)(C) WAR 9 § 4(a) WAR 9 § 10 WAR 9 § 13
Underground Mine	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 3 § 2(k)(ii)(A)(IV) WAR 3 § 2(l) WAR 4 § 2(a) WAR 9 § 3(a) WAR 8 § 4(a) WAR 9 § 3(c)(i)(C) WAR 9 § 4(a) WAR 9 § 10 WAR 9 § 13

CERCLA § 108(b) Response Category	Wyoming Laws and Regulations*
Slag Pile	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 1 § 3(a) WAR 8 § 4(a) WAR 9 § 2(e)(r) WAR 9 § 10 WAR 9 § 13
Interim O&M	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 3 § 2(k)(ii)(C) WAR 3 § 2(g) WAR 9 § 3(a) WAR 9 § 3(c)(i)(C) WAR 9 § 10(a)(b)
Water Treatment	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat. § 35-11-415(b)(viii) Wyo. Stat. § 35-11-417(a)
Short-term O&M Monitoring	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) WAR 9 § 10(a) WAR 9 § 10(b)(i)-(v)
Long-term O&M Monitoring	WY Environmental Quality Act: Wyo. Stat. § 35-11-401 through 436 Wyo. Stat § 35-11-417(a) Wyo. Stat. § 35-11-417(e) WAR 9 § 10(a) WAR 9 § 10(b)(iii)

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* Notes: WAR Chapters 1 through 4 refer to the WYDEQ/Land Quality Division Rules
WAR Chapters 8, 9, and 14 refer to the WYDEQ/Water Quality Division Rules

EXHIBIT 1
CERCLA 108(b) Response Category Equivalents in the BLM's and Forest Service's Regulations for Hardrock Mining

Exhibit 1 CERCLA 108(b) Response Category Equivalents in BLM's and the Forest Services' Rules for Hardrock Mining		
CERCLA 108(b) Response Category	**BLM Regulations 43 CFR §3809**	**Forest Service Regulations 36 CFR §228**
Solid/Hazardous Waste Disposal	§3809.420(b)(6) §3809.421[1]	§228.8 (b) §228.8 (c) §228.8 (g)(3) §228.13
Open Pit	§3809.401(b)(2)(i), (ii) §3809.401(b)(3)(iii) §3809.421[1]	§228.8 (b) §228.8 (g)(1) §228.8 (g)(2) §228.8 (g)(3) §228.8 (g)(4) §228.13
Waste Rock	§3809.401(b)(2)(i), (ii) §3809.420(a)(2), (4), (5), (6) §3809.420(b)(2), 3(i) (A-D), (4), (5), (7), (11)(i), (ii), (iii) §3809.421[1] §3809.592[6] §3809.595[7]	§228.8 (b) §228.8 (c) §228.8 (d) §228.8 (e) §228.8 (g)(1) §228.8 (g)(2) §228.8 (g)(3) §228.8 (g)(4) §228.13
Heap/Dump Leach	§3809.401(b)(2)(i), (ii) §3809.420(a)(2), (4), (5), (6) §3809.420(b) 3(i) (A-D), (4), (5), (7), (11)(i), (ii), (iii), (12)(i-vii) §3809.421[1] §3809.431(c)(1-7)[4] §3809.592[5] §3809.595[7]	§228.8 (a) §228.8 (b) §228.8 (c) §228.8 (d) §228.8 (e) §228.8 (g)(1) §228.8 (g)(2) §228.8 (g)(3) §228.8 (g)(4) §228.13
Tailings Facility	§3809.401(b)(2)(i), (ii) §3809.420(a)(2), (4), (5), (6) §3809.420(b) 3(i) (A-D), (4), (5), (7), (11)(i), (ii), (iii), (12)(i-vii) §3809.421[1] §3809.431(c)(1-7)[4] §3809.592[6]	§228.8 (a) §228.8 (b) §228.8 (c) §228.8 (d) §228.8 (e) §228.8 (g)(1) §228.8 (g)(2) §228.8 (g)(3)

Exhibit 1 CERCLA 108(b) Response Category Equivalents in BLM's and the Forest Services' Rules for Hardrock Mining		
CERCLA 108(b) Response Category	**BLM Regulations 43 CFR §3809**	**Forest Service Regulations 36 CFR §228**
	§3809.595[7]	§228.8 (g)(4) §228.13
Process Pond/Reservoir	§3809.401(b)(2)(i), (ii) §3809.420(a)(2), (4), (5), (6) §3809.420(b) 3(i) (A-D), (4), (5), (7), (11)(i), (ii), (iii), (12)(i-vii) §3809.421[1] §3809.431(c)(1-7)[4] §3809.592[6] §3809.595[7]	§228.8 (b) §228.8 (e) §228.8 (g)(2) §228.8 (g)(5) §228.13
Underground Mine	§3809.5 §3809.421[1] §3809.431(c)(1-7)[4] §3809.592[6] §3809.595[7]	§228.8 (all) §228.13
Slag Pile	N/A – pertains to smelters	N/A – pertains to smelters
Drainage	§3809.5, §3809.420(b)(11)(i, ii, iii), §3809.431(c)(1) §3809.421[1] §3809.431(c)(1-7)[4] §3809.592[6] §3809.595[7]	§228.8 (b) §228.8 (f)(1-4) §228.8 (g)(1) §228.8 (g)(2) §228.8 (g)(3) §228.13
Interim O&M	§3809.116 §3809.401(b)(5) §3809.421[1] §3809.423[2] §3809.424(a), (b)[3] §3809.431(a)[4] §3809.592[6] §3809.595[7] §3809.598[8]	§228.8 (all) §228.10 §228.13
Water Treatment	§3809.421[1] §3809.424(a), (b)[3] §3809.431(a), (c)(3)[4] §3809.552(c)[5]	§228.8 (b) §228.8 (c) §228.8 (g)(1) §228.8 (g)(2)

Exhibit 1 CERCLA 108(b) Response Category Equivalents in BLM's and the Forest Services' Rules for Hardrock Mining		
CERCLA 108(b) Response Category	**BLM Regulations 43 CFR §3809**	**Forest Service Regulations 36 CFR §228**
	§3809.592[6] §3809.595[7] §3809.598[8]	§228.8 (g)(3) §228.13
Short-Term O&M/ Monitoring	§3809.116 §3809.421[1] §3809.423[2] §3809.424(a), (b)[3] §3809.592[6] §3809.595[7] §3809.598[8]	§228.8 (all) §228.10 §228.13
Long-Term O&M/ Monitoring	§3809.116 §3809.421[1] §3809.423[2] §3809.424(a), (b)[3] §3809.552(c)[5] §3809.592[6] §3809.595[7] §3809.598[8]	§228.8 (all) §228.10 §228.13

[1] §3809.421 Enforcement of performance standards:
Failure of the operator to prevent unnecessary or undue degradation or to complete reclamation to the standards described in this subpart may cause the operator to be subject to enforcement as described in §§3809.600 through 3809.605 of this subpart.

[2] §3809.423. How long does my plan of operations remain in effect?
Your plan of operations remains in effect as long as you are conducting operations, unless BLM suspends or revokes your plan of operations for failure to comply with this subpart.

[3] §3809.424(a) What are my obligations if I stop conducting operations?
(i) You must follow your approved interim management plan submitted under §3809.401(b)(5); (ii) You must submit a modification to your interim management plan to BLM within 30 calendar days if it does not cover the circumstances of your temporary closure per §3809.431(a); (iii) You must take all necessary actions to assure that unnecessary or undue degradation does not occur; and (iv) You must maintain an adequate financial guarantee.
The BLM will require you to take all necessary actions to assure that unnecessary or undue degradation does not occur, including requiring you, after an extended period of non-operation for other than seasonal operations, to remove all structures, equipment, and other facilities and reclaim the project area.
BLM may initiate forfeiture under §3809.595. If the amount of the financial guarantee is inadequate to cover the costs of reclamation, BLM may complete the reclamation, and the operator and all other responsible persons are liable for the costs of such reclamation. See §3809.336(a) for indicators of abandonment.

§3809.424 (b)
Your reclamation and closure obligations continue until satisfied.

[4] §3809.431 When must I modify my plan of operations?

(a) Before making any changes to the operations described in your approved plan of operations;
(b) When BLM requires you to do so to prevent unnecessary or undue degradation; and
(c) Before final closure, to address impacts from unanticipated events or conditions or newly discovered circumstances or information, including the following:

(1) Development of acid or toxic drainage;
(2) Loss of surface springs or water supplies;
(3) The need for long-term water treatment and site maintenance;
(4) Repair of reclamation failures;
(5) Plans for assuring the adequacy of containment structures and the integrity of closed waste units;
(6) Providing for post-closure management; and (7) Eliminating hazards to public safety.

[5] §3809.552(c) What must my individual financial guarantee cover?

When BLM identifies a need for it, you must establish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, post-mining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later.

[6] §3809.592 Does release of my financial guarantee relieve me of all responsibility for my project area?

(a) Release of your financial guarantee under this subpart does not release you (the mining claimant or operator) from responsibility for reclamation of your operations should reclamation fail to meet the standards of this subpart.
(b) Any release of your financial guarantee under this subpart does not release or waive any claim BLM or other persons may have against any person under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 *et seq.,* or under any other applicable statutes or regulations.

[7] §3809.595 When may BLM initiate forfeiture of my financial guarantee?

BLM may initiate forfeiture of all or part of your financial guarantee for any project area or portion of a project area if-
(a) You (the operator or mining claimant) refuse or are unable to conduct reclamation as provided in the reclamation measures incorporated into your notice or approved plan of operations or the regulations in this subpart;
(b) You fail to meet the terms of your notice or your approved plan of operations; or
(c) You default on any of the conditions under which you obtained the financial guarantee.

[8] §3809.598. What if the amount forfeited will not cover the cost of reclamation?

If the amount forfeited is insufficient to pay for the full cost of reclamation, the operators and mining claimants are liable for the remaining costs as set forth in §3809.116[9]. BLM may complete or authorize completion of reclamation of the area covered by the financial guarantee and may recover from responsible persons all costs of reclamation in excess of the amount forfeited.

[9] §3809.116. As a mining claimant or operator, what are my responsibilities under this subpart for my project area?

(a) Mining claimants and operators (if other than the mining claimant) are liable for obligations under this subpart that accrue while they hold their interests.

(b) Relinquishment, forfeiture, or abandonment of a mining claim does not relieve a mining claimant's or operator's responsibility under this subpart for obligations that accrued or conditions that were created while the mining claimant or operator was responsible for operations conducted on that mining claim or in the project area.

(c) Transfer of a mining claim or operation does not relieve a mining claimant's or operator's responsibility under this subpart for obligations that accrued or conditions that were created while the mining claimant or operator was responsible for operations conducted on that mining claim or in the project area until-

(1) BLM receives documentation that a transferee accepts responsibility for the transferor's previously accrued obligations, and

(2) BLM accepts an adequate replacement financial guarantee adequate to cover such previously accrued obligations and the transferee's new obligations.

EXHIBIT 2

The Evolution of Federal and Nevada State Reclamation Bonding Requirements for Hardrock Exploration and Mining Projects

Jeffrey V. Parshley and Debra W. Struhsacker
January 2008

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THE EVOLUTION OF FEDERAL AND NEVADA STATE RECLAMATION BONDING REQUIREMENTS FOR HARDROCK EXPLORATION AND MINING PROJECTS:

A Case History Documenting How Federal and State Regulators Used Existing Regulatory Authorities to Respond to Shortcomings in the Reclamation Bonding Program

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Introduction and Executive Summary

This Northwest Mining Association (NWMA) white paper documents the evolution of the federal and the Nevada state bonding requirements for hardrock exploration and mining projects. Although this white paper focuses primarily on Nevada –the state with the most exploration and mining activity on federal land and the hub of the U.S. gold mining industry – other western states have similar regulatory programs and reclamation bonding requirements for hardrock mineral activities.

Key findings in this white paper include:

- The Nevada mining industry and state and federal regulators recently worked together to update and refine bonding requirements.
    - The resulting modifications to the Nevada bonding program reflect a collaborative effort to develop comprehensive and conservative bonds that consider all likely contingencies based on agency costs to implement, manage, and complete reclamation of sites requiring governmental intervention.
- Existing federal and Nevada state laws and regulations governing hardrock exploration and mining clearly provided the necessary authority and flexibility for regulators to make changes in response to the problems encountered during agency reclamation of several bankruptcy sites.
    - Federal and Nevada regulators – with the mining industry's full participation and concurrence – have significantly improved and expanded reclamation bonding requirements in the last few years based on the lessons learned at the bankruptcy sites.
- Existing federal and Nevada state laws and regulations include comprehensive environmental protection and reclamation bonding requirements for hardrock mines.
    - These laws and regulations already give regulators the necessary tools to protect the environment, to ensure proper reclamation, and to deal effectively with problems, gaps, or unforeseen situations should they develop in the future.
- The recent changes that federal and Nevada regulators made to the bonding program clearly demonstrate that the current federal and state regulations work well.
- The sweeping changes to the nation's environmental and regulatory programs governing hardrock mining that are included in the House Mining Law bill (H.R. 2262) are not needed.
    - The environmental provisions in H.R. 2262 are solutions in search of a problem which seek to fix a system that is working well and does not need "fixing."

Historical Overview of Federal and Nevada Reclamation Bonding Programs

The U.S. Forest Service Has Required Reclamation Bonds Since 1974

The U.S. Forest Service (USFS) has had bonding requirements for mineral projects on National Forest System lands dating back to 1974. The USFS's bonding program is included in Section 13 of the USFS's surface management regulations at 36 C.F.R. Part 228 Subpart A ("the 228A regulations".) In contrast to the original version of the Bureau of Land Management's (BLM's)

regulations, which did not require bonds for small projects, the USFS regulations have always given District Rangers the discretionary authority to require a reclamation bond for any mineral activity that requires a Plan of Operations. Therefore, since 1974 when the 228A regulations went into effect, the USFS has almost always required a bond for all exploration road building, trenching, and drilling projects and for all major mineral projects on National Forest System lands. Like the BLM bonding program described below, when calculating bonds for operations on National Forest System lands, the agency assumes it will perform the reclamation work using government contracting procedures.

BLM Has Required Bonds Since 1981

Since 1981, companies conducting exploration or mining activities affecting more than five acres of BLM-administered public lands have had to secure BLM's approval of a Plan of Operations that includes a Reclamation Plan and a reclamation cost estimate, and have also had to provide BLM with a reclamation bond. This bonding requirement is part of BLM's Surface Management Rules for Hardrock Minerals at 43 C.F.R. Subpart 3809 ("the 3809 regulations.") The amount of the required bond reflects the assumption that BLM – not the company – will perform the reclamation using third-party contractors in accordance with government contracting procedures. This means the reclamation cost estimate is calculated using Davis-Bacon wage rates and includes government administration fees and other charges related to BLM's management of the reclamation effort.

The original 1981 version of the 3809 regulations did not include a bonding requirement for Notice-level projects that disturbed fewer than five acres of public land. As discussed below, in 2001 BLM expanded its bonding program to include Notice-level projects.

During the early years (1981 to 1990) of the 3809 regulations and BLM's bonding program, reclamation cost estimates were typically based on a uniform reclamation cost per acre factor that was simply multiplied by the amount of surface disturbance at a site. Although this approach simplified the preparation and review of bond cost estimates, it also increased the risk of inaccurate cost estimates. In the early 1990s, reclamation plans became considerably more detailed and were designed based on site specific conditions. This produced more detailed and realistic reclamation cost estimates.

Nevada's State Bonding Regulations Started in 1990

Nevada's regulations for "Reclamation of Land Subject to Mining Operations or Exploration Projects" (NAC 519A) became effective in October 1990. The Nevada mining industry supported the development of these regulations and the authorizing statute (NRS 519A).

The Nevada regulations include stringent requirements for reclamation plans and reclamation bond cost estimates for projects on public, state, and private lands. Therefore, with the advent of the NAC 519A regulations, all Nevada mines and exploration projects affecting more than five acres – regardless of land status – require a reclamation bond. The Nevada Division of Environmental Protection/Bureau of Mining Regulation and Reclamation (NDEP) manages the Nevada reclamation bonding program cooperatively with BLM and the USFS under the terms of an interagency Memorandum of Understanding.

BLM Expanded the 3809 Bonding Program in 2001

By the late 1990s, all Plans of Operations had an accompanying detailed reclamation plan and cost estimate upon which the reclamation bond was based. But exploration projects that

disturbed fewer than five acres were still operating under a Notice without a reclamation bond on BLM-administered lands.

In 1999, the National Research Council (NRC) published a study entitled "Hardrock Mining on Federal Lands." One of the recommendations from the NRC study was that BLM should require a bond for all surface disturbing activities, including Notice-level exploration projects affecting fewer than five acres. The mining industry supported this finding and encouraged BLM to modify the 3809 regulations to expand the bonding requirements to include Notice-level exploration projects. In 2001, BLM implemented a new bonding requirement for Notice-level projects.

USFS Updates its Bonding Guidance in 2004

By the 21st century, the USFS, BLM and state agencies had acquired significant experience in reclaiming and closing abandoned and bankrupt mine sites. In order to document this knowledge and experience, and to ensure that reclamation bonds are adequate to fund reclamation and closure, the USFS issued a document entitled "Training Guide for Reclamation Bond Estimation and Administration" in April 2004. This Guide is designed to be used in estimating new bonds and updating existing bonds for projects on National Forest System lands.

Agency Reclamation of Several Bankrupt Cites Revealed the Need for Expanded Bonding Requirements

By the late 1990s, the industry had closed a number of modern mine sites using the techniques commonly included in BLM and Nevada State reclamation plans of that era. However, NDEP and the federal land management agencies (i.e., BLM and the USFS) had closed and reclaimed only a few sites using funds from reclamation bonds.

In the late 1990s – early 2000s timeframe, historically low metal prices forced a few companies to declare bankruptcy. These bankruptcies tested the scope and efficacy of the federal and state reclamation bonding programs – programs that were supposed to provide regulators with sufficient financial resources to reclaim abandoned or bankrupt mines. However, as NDEP and the federal agencies used the reclamation bonds to close and reclaim the bankrupt sites, program-wide deficiencies and inefficiencies became readily apparent. This led to the realization that the bonds for nearly all of the bankrupt sites were inadequate for NDEP, BLM, and the USFS to implement and complete the approved reclamation plans.

The Nevada mining industry, NDEP, and federal regulators readily agreed that this situation was unacceptable and that changes in the bonding requirements were needed. Working cooperatively over the next few years, the industry and state and federal regulators identified the specific deficiencies and found solutions to address each one to ensure that adequate funding would be immediately available to state and federal agencies should any other bankruptcies occur.

This cooperative effort between the mining industry and regulatory agencies in Nevada has resulted in a program that is embraced as being fair, defensible, and accurate. All parties recognize this program may result in somewhat conservative cost estimates. However, the shared commitment to capitalize upon the lessons learned from responding to unexpected situations at the bankrupt sites and to modify the bonding program to eliminate the shortfalls that were due to these unexpected situations makes a conservative approach essential. The resulting bonding program provides comprehensive cost estimates that consider all likely contingencies.

Similar industry-agency collaboration recently occurred in Montana where the Montana Mining Association and the Montana Department of Environmental Quality worked together to update Montana's bonding requirements. This cooperative effort resulted in a bill, HB 460, which Montana Governor Brian Schweitzer recently signed into law to amend the Montana Metal Mine Reclamation statue to provide for temporary bonding in unanticipated circumstances.

The Cooperative Industry – Agency Review Revamped the Bonding Program to Address all Identified Shortcomings

The following are the major issues identified during the review and revamping of the mine closure and reclamation bonding requirements. The identified shortcomings were rectified as described below:

Identified Shortcoming: Some types of costs which would be incurred should a regulatory agency assume responsibility for closing a mine site had not been adequately anticipated or included in the previous cost estimates. Because the agencies' and industry's experience with mine closure at that time was based on planned and orderly closure performed by the mine owner, some costs associated with government management and the timing of mine closure had not been anticipated. For example, some sites required immediate management of process solutions to ensure that the environment was protected, but the process of obtaining the money from the bonds often took several months, during which time bond funds to manage the site were not available. Other emergency funding programs were used to cover this deficiency at that time.

> *Implemented Solution: The Nevada mining industry set up and funded a program to ensure that funds would be immediately available for site management at any site declaring bankruptcy. Now all bonds calculated in the state of Nevada must include the cost for managing the site including all process fluids, for a period of six months under typical care and maintenance conditions.*

Identified Shortcoming: The hourly equipment rates used in the bond cost estimates did not reflect the agencies' costs to contract the work to third parties. The equipment rates used in the bonds were based on a number of sources and varied widely from site to site.

> *Implemented Solution: A small working group comprised of Nevada mining industry professionals and regulators investigated a number of options to provide realistic hourly equipment rates and ultimately decided that the local equipment suppliers' monthly, single-shift rental rates were most appropriate – even though it is highly unlikely that a contractor would only work their equipment for 40 hours per week on this type of job.*

Identified Shortcoming: Some of the bonds assumed that the equipment at the site would be the same types of equipment used for reclamation. Because some of the equipment used at mine sites is larger than the equipment a reclamation contractor would typically have available, this assumption was inappropriate and produced inaccurate reclamation cost estimates.

> *Implemented Solution: Another small working group comprised of Nevada mining industry representatives and regulators reviewed the types and sizes of equipment readily available from contractors and suppliers in Nevada and limited the equipment choices for reclamation bond costs to that equipment.*

Identified Shortcoming: The productivity (quantity of work performed per hour) used for different equipment varied considerably in some of the bond cost estimates. Because the productivity of reclamation equipment has a direct impact on the time required to perform the reclamation activities, it also affects the cost estimate.

> *Implemented Solution: Nevada mining industry experts and the regulatory agencies determined that equipment productivities should be calculated based on accepted, published sources such as equipment manufacturers' handbooks, engineering manuals, and published construction cost databases to provide defensibility and consistency. In addition, typical correction factors were defined to ensure that the productivities represented an average range of conditions. This is believed to represent a conservative approach because the contractors typically used in the western U.S. for reclamation work have highly experienced staff.*

Identified Shortcoming: The costs for and timing of process fluid stabilization and management were inconsistently calculated. The time required to stabilize a site for long-term passive management is directly related to the time needed to reduce the inventory of any remaining process fluids and ensure that the reclamation plan will limit the amount of water that must be managed in a passive management system. Estimating a short- and long-term water balance for a site requires a combination of science, engineering and experience. The industry has spent considerable effort globally in recent years to better understand this process for sites in closure. Most importantly, it is recognized that although common approaches can be applied, each site is different and requires detailed analysis to define the parameters that will affect closure costs.

> *Implemented Solution: Standard approaches and tools that use site specific data have been defined by federal land management agencies and state regulatory agencies along with minimum design criteria and site data required to properly estimate the time and effort required to manage any solutions remaining on-site at closure.*

Identified Shortcoming: The estimate of both long-term site management and monitoring were not always adequate. The requirements and period required for long-term site management and monitoring are highly site-specific. However, the same approach used to bring consistency to the calculation of process fluid stabilization can be used to determine what, if any, long-term management and monitoring is required.

> *Implemented Solution: Site-specific studies and design requirements will determine the need and requirements for long-term site management and monitoring. Often, it is uncertainty that will dictate if or how much funding must be in place for long-term site management. In these cases, trust fund-type approaches are often used to ensure that there will be funding for both expected and unknown future site requirements. Monitoring requirements are typically based on the need to demonstrate stability at the site based on trends in empirical data. This will vary by site, but most regulatory agencies have guidelines for minimum requirements. Nevada's Water Pollution Control regulations allow NDEP to require a 30-year monitoring period, or longer if needed.*

Identified Shortcoming: Some miscellaneous costs were not adequately captured in some cost estimates. The cost for removal of small infrastructure (e.g. power lines, substations, pipelines, etc.) were not included or underestimated. Other miscellaneous costs such as fence

removal or installation, hazardous waste removal, construction or removal of erosion and sediment controls were inconsistently addressed.

> *Implemented Solution: Nevada mining industry personnel and the regulatory agencies cooperatively developed a checklist of miscellaneous costs that must be considered for each site.*

Identified Shortcoming: The cost to mobilize and demobilize (mob/demob) equipment from the sites was often excluded or inadequately estimated. The cost to move equipment to and from a site being reclaimed will be added by a contractor to the overall cost of reclamation. Although this cost primarily included the direct costs to transport equipment and materials to the site, some contractors also include other costs in this line item.

> *Implemented Solution: The specific items that should be included in the mob/demob cost were defined by a small working group and local transport companies were contacted to determine the cost incurred to transport the necessary equipment to and from the site by a third-party transporter. Other common costs such as the establishment and use of office trailers, portable power and sanitary facilities were added to Nevada reclamation bonding guidelines as separate line items.*

Identified Shortcoming: Out of date costs were used in some bond cost estimates. Although Nevada's regulations require that bond costs be updated every three years, the hourly rates often change annually based on economic conditions. Although most annual variations are generally small, cost estimates should be based on current rates.

> *Implemented Solution: NDEP and federal regulatory agencies update equipment, labor and material rates each year and post the current rates on a public web site for use in reclamation bond cost estimates.*

Appendix B
Review of Cost Estimate Formula for EPA's CERCLA §108(b) Proposed Rule

Review of Cost Estimate Formula for EPA's CERCLA §108(b) Proposed Rule

Report Prepared for

National Mining Association

Report Prepared by

SRK Consulting (U.S.), Inc.
503400.010
July 11, 2017

Review of Cost Estimate Formula for EPA's CERCLA §108(b) Proposed Rule

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List of Abbreviations

BLM – Bureau of Land Management

CERCLA -- Comprehensive Environmental Response, Compensation, and Liability Act

EPA – United States Environmental Protection Agency

FA – financial assurance as defined by state and federal land management regulations

FLMA – federal land management agency (e.g. BLM, Forest Service)

FR – financial responsibility as defined in *EPA proposed rule Financial Responsibility Requirements Under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry*

HRM – hard rock mining

NAS - National Academy of Sciences

NCP – National Contingency Plan

NRC - National Research Council

NRC Study – *Hardrock Mining on Federal Lands* by National Research Council/National Academy of Sciences

NRD – natural resource damages

RIA -- regulatory impact analysis

SBA – Small Business Administration

1 Introduction

The National Mining Association (NMA) has engaged SRK Consulting (U.S.), Inc. (SRK) to review the United States Environmental Protection Agency's (EPA) draft rule that proposes to *"create a new Part in the CERCLA regulations to require financial responsibility [FR] under CERCLA § 108(b), define requirements for demonstration of financial responsibility, define requirements for maintenance of financial responsibility instruments, and establish criteria for owners and operators to be released from financial responsibility requirements."* [1] (Proposed Rule), and its supporting docket. This review examined both the basis for and details of EPA's proposed methodology for calculating response costs to support financial assurance estimates. The key documents reviewed for this work are listed in Appendix A.

Financial responsibility (FR) are the *"funds necessary to address the CERCLA liabilities at [mine] facilities, thus preventing owners or operators from shifting the burden of cleanup to other parties, including the taxpayer."*[2] In other words, FR as defined in the Proposed Rule is the estimated cost of expected response actions necessary to reduce or eliminate the degree and duration of risk from the release or potential release of a hazardous substance as defined in CERCLA. Financial assurance (FA) is the estimated cost of all actions necessary to implement a site-specific reclamation and closure plan, which likewise reduce the degree and duration of a release or potential release. FA is required for all hard rock mining (HRM) facilities under existing federal and state regulatory programs. For the purpose of this report these two cost estimates are considered distinct and are referred to as FR and FA, respectively.

2 EPA has not demonstrated a need for the Proposed Rule

EPA provides two key reasons to justify the need for the Proposed Rule. The first is that there are unfunded liabilities related to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response costs for which the government (i.e., the taxpayer) could potentially be responsible. The second reason is that the implementation of the Proposed Rule will *"provide an incentive for implementation of sound practices at hardrock mining facilities and thereby decrease the need for future CERCLA actions."*[3]

EPA's assertion that there are unfunded liabilities requires that at least one of the four following scenarios exists:

1. There are shortcomings in the existing federal and state programs that regulate the design, operation, closure, and post-closure management of HRM facilities around the country.
2. Mine operators are not complying with existing regulations or using corporate resources to remediate an identified release of a hazardous substance.
3. CERCLA response actions fundamentally differ in some way from those used in closure or reclamation, for which existing mining operations already post FA.
4. Regulatory agencies, both state and federal, that are currently responsible for overseeing existing closure and reclamation requirements at HRM facilities do not have the necessary

[1] 82 Fed. Reg at 3388 (Jan. 11, 2017)
[2] Ibid.
[3] Ibid.

enforcement tools or are not competently enforcing their own promulgated regulations, thus creating situations into which EPA must engage and enforce.

From a thorough review of the Proposed Rule, and the supporting information provided in the docket (Appendix A), it is SRK's professional opinion that EPA has not demonstrated that any of the aforementioned scenarios exist at any currently operating hardrock mine or existing regulatory program across the country, and therefore cannot provide a reasonable justification for the Proposed Rule. Additional discussion of SRK's position is provided in Sections 2.1, 2.2 and 0.

Regarding EPA's second justification for the Proposed Rule, in that it will incentivize "sound" practices at hardrock mining facilities, SRK cannot find and does not believe there is any reasonable support for this assertion. First, hardrock mines that operate in today's regulatory environment are already operated in a "sound" manner.[4] Historical operating practices that led to the need for large-scale CERCLA type responses in the past (e.g., direct disposal of tailings into streams, uncontrolled infiltration/discharge of mine impacted water, discharge of mine waste into dumps or impoundments without mitigating potential release mechanisms, etc.) are no longer utilized by the modern mining industry or compliant with current state and federal regulatory requirements. The mining industry routinely designs modern mining operations using detailed scientific and engineering investigations such as groundwater and surface water modeling, environmental risk assessments, and stability analyses which contribute to sound design and operating practices intended to protect human health and the environment. Risks are further reduced at currently operating HRM sites using technologies such secondary containment systems, seepage collection systems, surface water management systems, liners, and active monitoring systems to reduce or eliminate the risk of a release. In the event that a release or potential release is identified through installed monitoring systems, remedial actions are immediately implemented as required by regulatory programs using technologies such as interceptor wells, cutoff walls, hydraulic capture zones, etc.

Finally, EPA's Proposed Rule does not contribute any additional reclamation, closure or any other type of action that is not already in use, where appropriate, by the industry (see Section 2.2).

2.1 Incorrect Assumption 1: There are shortcomings in the existing federal and state programs that regulate the design, operation, closure, and post-closure management of mines.

EPA specifically mentions the potential for inadequacies in existing mining programs when discussing its rejection of an alternative approach to calculating the CERCLA § 108(b) cost estimate in the Proposed Rule:

> *"This could integrate CERCLA § 108(b) requirements into the existing Federal and state financial responsibility requirements applicable at hardrock mining facilities, and allow for more consistency among financial responsibility requirements nationally, as the CERCLA § 108(b) amount would in concept, fill in any gaps EPA identified under other programs."*[5]

However, EPA does not provide a single example of any inadequacies in the FA provisions of any existing federal or state regulatory program. Furthermore, current mining regulatory programs

[4] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.
[5] 82 Fed. Reg at 3401 (Jan. 11, 2017)

administered by federal land management agencies (FLMAs) and state agencies are specifically designed to minimize the risk of a release of a hazardous or deleterious substance that could affect human health or the environment. [6,7] Monitoring required by current regulatory programs is an essential component that provides early warning of a release or potential release, thereby reducing the degree and duration of any detected release or eliminating that release altogether. If there is a release at a regulated HRM site, the degree and duration is minimized by appropriate response actions and operators are compelled to implement those actions at their own cost, eliminating taxpayer liability.[8]

These existing regulatory programs address the design, construction, operation, closure and post-closure phases of the mining life cycle. The programs are designed to protect the environment and have been constantly evolving to address new information, and have been updated regularly to address any shortcomings, as they are identified. Closure and reclamation plans required by these programs must demonstrate that they will minimize any risks associated with physical safety hazards and the potential for the release of hazardous substances. All of these programs require adequate FA to ensure that the government can properly close the site in the event of a bond forfeiture.

Responding to a Congressional request, the National Research Council/National Academy of Sciences ("NRC/NAS") published a study in 1999 entitled "Hardrock Mining on Federal Lands" ("NRC Study") that evaluated "the adequacy of the regulatory framework for hardrock mining on federal lands."[9] This study concluded that:

> *"The overall structure of the federal and state laws and regulations that provide mining-related environmental protection is complicated but generally effective. The structure reflects regulatory responses to geographical differences in mineral distribution among the states, as well as the diversity of site-specific environmental conditions…BLM and Forest Service should continue to base their permitting decisions on the site-specific evaluation process provided by NEPA. The two land management agencies should continue to use comprehensive performance-based standards rather than using rigid, technically prescriptive standards. The agencies should regularly update technical and policy guidance documents to clarify how statutes and regulations should be interpreted and enforced." (NRC Study at* ***Error! Bookmark not defined.****.)*

EPA also says that it would be difficult to create a FR instrument that would only address inadequacies identified in the engineering requirements. In doing so, the EPA acknowledges that using a site-specific approach to determine costs would demonstrate significant overlaps with existing regulatory programs.[10] If the proposed rule significantly overlaps existing programs, then the rule duplicates existing programs and is therefore unnecessary. In SRK's opinion, EPA has failed to identify any shortcomings in the existing regulatory framework and has not demonstrated a need for further FA.

[6] The U.S. Bureau of Land Management ("BLM") and the U.S. Forest Service ("Forest Service").
[7] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.
[8] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.
[9] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands
[10] 82 Fed. Reg. at 3401.

2.2 Incorrect Assumption 2: Mine operators are not complying with existing regulations or using corporate resources to remediate an identified release of a hazardous substance.

Although EPA asserts *"that despite changes in regulations and practices, the release of CERCLA hazardous substances as a result of mining and mineral processing activities is an ongoing issue across varying industry management practices"*[11], it ignores the fact that required compliance with current mining regulatory programs significantly reduces the potential for a release and in the event of a release those programs compel operators to utilize corporate resources, not taxpayer funds to remediate any release and modify any procedures or designs that led to the release.[12]

Based on anecdotal evidence, the EPA further asserts that *"[i]n addition to mining and processing activities, operator bankruptcy and abandonment were also associated with releases"*, particularly *"for smaller mining companies with relatively limited resources."*[13] This assertion fails to address the significant changes made to federal regulatory and state programs following a number of bankruptcies that occurred in the late 1990s and early 2000s.[14]

Some of the changes in regulatory programs include the 2000 update to the BLM "3809" regulations:

> *"BLM has decided that to protect and restore the environment and to limit taxpayer liability, financial guarantees for reclamation should be required at 100 percent of the estimated cost for BLM to have the reclamation work performed. This includes any costs that may be necessary for long-term water treatment or site care and maintenance."*[15]

The USDA Forest Service's development of new bonding guidelines in 2004[16] to address reclamation plan and FA deficiencies that lead to underfunded abandoned sites on National Forest lands is another important example. This evolution of regulatory programs is not strictly limited to the FLMAs. The state of Nevada, along with the FLMAs, worked cooperatively with the mining industry to develop the Standardize Reclamation Cost Estimator (SRCE) to ensure that FA estimates for all HRM sites in Nevada will include all closure and post-closure activities necessary to protect human health and the environment.[17] Compliance with these regulations is obligatory.

2.3 Incorrect Assumption 3: A CERCLA response fundamentally differs in some way from closure or reclamation, for which existing operations already post financial assurance.

EPA asserts that the FR associated with the Proposed Rule is intended to cover actions that are different from closure or reclamation activities performed under and covered by FA as part of current regulatory programs. However, for the Proposed Rule and its supporting documentation, EPA fails to

[11] Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances - Final Report, pg. 5.
[12] Struhsacker D., and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017
[13] Ibid. pg. 8.
[14] J Parshley & D. Struhsacker, The Evolution of Federal and Nevada State Reclamation Bonding Requirements for Hardrock Exploration and Mining Project"; White Paper for the Northwest Mining Association for submission to U.S. Congress, January 2008.
[15] https://www.blm.gov/nhp/news/regulatory/3809-Final/3809f/3809f_1.html
[16] Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A, 2004
[17] J Parshley et. al., "An evolution of the methods for and purposes of mine closure cost estimating", in Mine Closure 2009 - A.B. Fourie, M. Tibbett, September 2009

identify a single material CERCLA-related response action that is not already incorporated into existing closure and reclamation plans, when applicable. Furthermore, EPA undercuts its own position through the use of closure and reclamation costs to develop the CERCLA 108(b) FR estimates and the inclusion of reductions in the Proposed Rule. EPA selected public information from reclamation and closure plans "*to accumulate as much recent, high quality cost information for currently-operating hardrock mining facilities as possible.*"[18] EPA selected these sources for use in its formula development because it could link remedy types implemented at some CERCLA HRM facilities to the reclamation and closure actions contained in the source documents.[19] Therefore, in spite of EPA's contention that "*CERCLA § 108(b) financial responsibility is inherently different from financial responsibility that complements reclamation and closure programs*"[20], it acknowledges that reclamation and closure plans do contemplate the types of actions necessary to minimize the degree and duration of risk of a hazardous substance that would be applied under CERCLA.

EPA states that calculation of site-specific cost estimates would require an evaluation of each facility to determine appropriate engineering controls[21] and that such an effort "*would present a significant regulatory burden on the Agency*".[22] However, EPA has based its formula on "*current engineering cost estimates of similar activities*"[23] obtained from mine closure and reclamation cost estimates prepared under the authority of other federal and state regulatory programs. By selecting these sources, EPA acknowledges that those programs already require an adequate evaluation of appropriate engineering controls needed to reduce the degree and duration of risk associated with the release or potential release of a hazardous substance during operation, closure and post closure phases of mining operations. Therefore, the existing regulatory programs do address the actions contemplated by EPA in the Proposed Rule. If not, then use of those costs would be inappropriate in the development of the formula.

This review of the Proposed Rule discusses EPA's reduction concept in detail in Section 5. However, the concept of Reductions, which is intended to reduce the amount of FR required under CERCLA § 108(b) to take into account existing FA required by federal and state regulatory programs, is an implicit acknowledgment by the EPA that existing FA does cover actions that CERCLA § 108(b) is also intended to address. Therefore, although EPA states that FR under CERCLA § 108(b) is "*inherently different*" from FA required by other regulatory agencies,[24] it is clear that EPA believes that a comprehensive closure plan will reduce the degree and duration of risk to the point that a CERCLA response is greatly reduced or highly unlikely and additional bonding pursuant to CERCLA § 108(b) is not required [i.e., full compliance with CERCLA § 108(b) reductions will reduce CERCLA § 108(b) bonding to $550,000 (HHRA component)]. Furthermore, EPA's proposed reductions do not require any risk mitigation measures or provide any guidelines that do not already exist in some form in the existing closure programs.

Therefore, EPA has implicitly acknowledged that existing closure and reclamation plans fully overlap with the Proposed Rule and, further, it has acknowledged that the costs that are utilized in the programs are reliable and of a high quality. With existing closure and reclamation plans fully

[18] 82 Fed. Reg. at 3462.
[19] Ibid.
[20] 82 Fed. Reg. at 3430.
[21] 82 Fed. Reg. at 3401.
[22] 82 Fed. Reg. at 3400.
[23] CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 3-1.
[24] 82 Fed. Reg. at 3430

overlapping with CERCLA § 108(b), and the cost estimates in those plans being of a high quality, SRK sees no justification for the addition of CERCLA § 108(b) FR.

2.4 Incorrect Assumption 4: Regulatory agencies that are currently responsible for overseeing existing closure and reclamation requirements do not have the necessary enforcement tools or are not competently enforcing the current regulations.

As discussed in Sections 2.1 and 2.2, existing regulatory programs fully overlap with CERCLA § 108(b), the FA cost estimates in those programs are reliable and high quality, and there are no identified shortcomings in the existing regulatory programs. As such, the only remaining reason that EPA could justify a need for additional FR under CERCLA § 108(b) is if the agencies themselves are not properly implementing the existing regulatory programs, or that the personnel within those state and federal agencies are not sufficiently competent to enforce their own regulations. EPA does not assert that existing mining regulatory programs are improperly implemented or enforced. Furthermore, in rejecting the closure plan approach, EPA stated that:

> *"EPA has policy concerns about overseeing other Federal and state programs' financial responsibility requirements for adequacy, given other authorities' expertise with mining regulation."*[25]

The existing regulations provide the tools necessary to identify a release or potential release at currently operating HRM sites.[26,27] These include regular inspections, frequent monitoring and annual reporting. In the event that a release or potential release is identified, a number of options for enforcement by federal and state agencies including notices, fines, consent decrees and even cease-and-desist orders. Although rarely needed because most operators voluntarily comply with all applicable regulations, the regulating agencies have not hesitated to use whatever enforcement tool is most appropriate for a particular circumstance. Mining operations on National Forest land are regulated under 36 CFR § 228A, which includes site-specific requirements for environmental protection and bonding.[28,29] In 2004, the Forest Service prepared training guidance for site-specific estimation and administration of bonds for mining of projects on National Forest lands.[30] Mining operations conducted on lands managed by the BLM are regulated under 43 CFR § 3809, which likewise require site-specific measures to protect the environment and a site-specific closure cost estimate to ensure compliance with approved closure plans.[31] Most of the states in which mining occurs have promulgated regulations that site-specific protect the environment and require operators to site-specific calculate and post FA instruments as noted in the 1999 NRC study.[32] Some states, such as Nevada have developed detailed guidance and tools to assist operators in preparing management plans and cost estimates. Some of these tools developed by FMLAs and state

[25] 82 Fed. Reg. at 3401
[26] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands
[27] Struhsacker D., and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017
[28] 36 CFR § 228.8
[29] 36 CFR § 228.13
[30] USDA Forest Service, Training Guide for Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A USDA – Forest Service, April 2004
[31] 43 § 3809.401
[32] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands

regulatory agencies, such as the NV Standardized Reclamation Cost Estimator, have been so successful they have been adopted for use in other states.

3 EPA's generic formulaic approach is fundamentally flawed

In addition to failing to demonstrate the purpose and need for the Proposed Rule, SRK believes that the proposed approach to estimating FR is fundamentally flawed. From a conceptual standpoint, EPA's reliance upon a generic, one-size-fits-all formulaic approach based on limited input variables and using statistical manipulation to estimate FR costs is a highly inaccurate, outdated and overall erroneous approach. The assumption that one formula can produce valid estimates of the cost of response actions for any facility type on any hardrock mine site is unreasonable. This generic approach does not consider critical, site-specific conditions that can profoundly affect the cost of such actions.[33] For example, sites located in semi-arid environments will have a number of lower cost options available for management of solutions at the site. Likewise, the presence or absence of acid generating rock at a site can have a significant impact on site objectives, and therefore, the actions taken to achieve those objectives.

In contrast, the federal and state regulatory agencies began requiring site-specific closure and reclamation costs to estimate FA obligations nearly 30 years ago, after abandoning the overly simplistic formulaic approach previously used. The change was based upon actual experience with mine design, operations and closure, which showed that the simplistic approach would not provide accurate cost estimates, sometimes seriously underestimating closure and reclamation costs. For example, prior to 1989, mine sites in Nevada were only required to post FA of $2,500/acre, an arbitrary amount that subsequent experience by the agencies and the mining industry was shown to be wholly inadequate.[34]

Although some international jurisdictions still use this type of overly simplistic method for FA estimates, jurisdictions with mature mining industries and advanced regulatory programs have abandoned, or are abandoning this approach in favor of requiring site-specific closure cost estimates. For example, in Australia, long considered a leader in mine closure regulation, the states of Queensland and New South Wales abandoned a simplistic cost estimating approach based on acreage in favor of site-specific, full value closure cost estimates. In 2011, the government of Chile modified their mining law to require site-specific FA based on all closure costs during the life of the mine (LOM) and all post closure costs.[35] The government of Kazakhstan is currently changing their existing fee-based system based on operational costs in favor of site-specific FA cost estimates during revision of their mining law.

3.1 EPA's rejection of a site-specific approach is arbitrary and indefensible

While EPA acknowledges that a site-specific approach "*is the most precise approach of the three approaches considered by EPA*,"[36] it abandoned this approach in favor of their simplistic formulaic approach because the site-specific approach "*is the most resource intensive to implement*."

Existing regulatory programs managed by FLMAs and state agencies already require that mine operators prepare detailed site-specific management plans, including reclamation and closure plans

[33] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands
[34] Although some states still use cost/acre as a regulatory guideline, those regulations require consideration of other site-specific factors and regulators have the discretion to consider other factors, and may increase the total bond above the guideline, if needed.
[35] Ley Núm 20.551, "Regula El Cierre De Faenas e Instalaciones Mineras" (November 11, 2011), Article 50 (Chile).
[36] 82 Fed. Reg at 3460 (Jan. 11, 2017)

that do exactly that: identify the site-specific conditions that could affect the risk of a release or potential release.[37] Each closure and reclamation plan must include measures to minimize or eliminate these risks and provide FA to implement those measures in the event of FA forfeiture. Each plan is site-specific and designed to protect human health and the environment during and after closure. Plans are intended to cover all actions associated with proper closure of the site, including any post-closure activities such as water management and site maintenance. The accompanying FA must provide sufficient funds for the administering agency to implement the entire reclamation and closure plan as approved, including government administration costs, contingencies, engineering costs and in accordance with government contracting rules. The requirements for closure and reclamation plans and FA cost estimates are described various regulations such as Nevada's NAC 445A and NAC 519A and in detail in a number of guidance documents prepared by regulating agencies such as the Forest Service.[38] These plans and FA estimates are prepared by industry and undergo rigorous review by FLMAs and/or state regulatory agencies and are submitted for public comment, including in some cases, public hearing. Although EPA contends that it is rejecting a site-specific approach to estimate FR, it uses the site-specific FA costs presented in these plans and other regulatory documents as the basis for its simplistic formulas to calculate FR costs. Clearly, the current regulatory programs already perform site-specific assessment of risks and require and provide FA for all actions necessary to reduce the degree and duration of risk associated with the release or potential release from HRM sites.[39]

EPA also claims that a site-specific cost estimate could not be determined until after a release or threatened release has been identified, and a process similar to the National Contingency Plan (NCP) is applied to identify the remedy.[40] Yet, such a statement completely contradicts the process that EPA dictates for releasing owners and operators from the FR requirements. To obtain a release from FR, EPA requires the owner or operator of a site to submit "*evidence that demonstrates that the degree and duration of risk associated with production, transportation, treatment, storage and disposal of hazardous substances is minimal"*.[41] However, EPA does not identify nationwide criteria for this demonstration, and instead proposes a site-specific evaluation of facility risk to determine whether an owner or operator warrants release from the obligation.[42]

If it is possible for EPA to determine risk without identifying a release or threatened release in order to approve an operator's request for release from FR requirements, then it should be possible for EPA to determine, on a site-by-site basis, the appropriate amount of FR in the first place. In fact, EPA supports site-specific release evaluations based on the agency's "*substantial experience making individualized determinations of site risk, as this practice is consistent with EPA's practice under the Superfund program, for example, in selecting remedies under the NCP*."[43]

Because the reclamation and closure plans required by existing regulatory programs, and used by EPA as a basis for their simplistic formulae, are based on site-specific risks, each plan contains risk-based closure approaches that EPA acknowledges are similar to response actions historically

[37] Struhsacker D., and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017
[38] USDA Forest Service, Reclamation Bond Estimation and Administration for Mineral Plans of Operation authorized and administered under 36 CFR 228A, 2004
[39] Struhsacker D., and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017
[40] 82 Fed. Reg. at 3460
[41] Proposed § 320.27(a).
[42] 82 Fed. Reg. at 3415.
[43] 82 Fed. Reg. at 3415.

required at HRM CERCLA sites. Therefore, the actions included in the reclamation and closure plans and FA provided should be sufficient to eliminate the need for CERCLA § 108(b) FR. Examples include placement of covers on mine waste facilities or capture and management of seepage from the site.

To abandon a site-specific analysis at the first step in the process because it would burden the agency's resources is arbitrary and indefensible. This is particularly concerning considering EPA reserves the right to apply site-specific risk evaluations to increase an owner or operator's FR obligation.[44] As discussed above, existing federal and state mining, reclamation, and closure programs have successfully accomplished the same site-specific risk evaluation over the last 30 years, and those programs have been appropriately updated to improve the accuracy of the risk assessments and FA calculations. EPA states it has the expertise, yet abandons it altogether at the most important step in the process – determining the amount potentially required in the event of a release from a regulated facility.

4 EPA's formula is fatally flawed

Even if EPA were to choose to continue with this fundamentally flawed, overly simplistic approach, the data and statistical manipulation it utilizes also contains serious flaws, which amplify the limitations of and errors in the agency's analysis. These fatal flaws preclude adoption of the Proposed Rule.

4.1 Flaws in the data collection

As noted by Commenter 4 in the combined review document[45] there are indications in the dataset collected by EPA that those persons collecting and collating the data had a limited understanding of mine reclamation and closure. While the universe of sites from which EPA collected data covered most types of mining operations and commodity types, the focus on a limited number of criteria to which EPA intended to correlate costs indicates a significant lack of understanding of the variables that contribute to mine closure planning and costs. There were also errors noted by Commenter 4 in the numbers presented in the EPA dataset when compared to the source documentation.

For some operations, site-specific facility configurations, such as the construction of visual barrier waste rock berm at Rosemont was mis-categorized by EPA as a pit closure activity rather than a waste rock dump construction.[46] EPA's response to Commenter 4 with respect to this mis-categorization was that EPA was trying to represent the intent of the regressions rather than represent what the facilities actually were.[47] Further, EPA indicated they were relying on reduction criteria to account for the differences in calculated costs. EPA's response is untenable in that they admit their use of the data was incorrect, but assert an equally flawed process (see below) would address any discrepancies.

Some of the source data used by EPA are now obsolete. Typically, most regulatory programs require periodic updates, at least every five years, and Nevada requires cost estimate updates at least every three years. Furthermore, operations commonly submit modifications to plans, which also triggers an update of FA calculations. Because regular updates to the site-specific cost estimates

[44] 82 Fed. Reg. at 3461.
[45] Hardrock Mining Peer Review – Combined Documents, MDB, Inc., November 23, 2016
[46] Response to Peer Review Comments: CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities Background Document, pg. 2-9
[47] Response to Peer Review Comments: CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities Background Document, pg. 2-11

required by FLMAs and state agencies are the norm, more recent site-specific data is available, but not used by EPA and only 16% of the sites used source data that are less than five years old. While the use of out of date plans by itself is not likely to materially change the outcome of the analyses performed by EPA, it provides additional doubt as to the reliability of EPA's data and associated analyses.

It is possible that the errors in data collection were not attributable to those collecting the data, but to those directing the effort. During the Environmental Roundtable hosted by the Small Business Administration on February 3, 2017, when questioned on whether EPA had validated its formula against the original cost data, EPA stated that their formula was not meant to reflect costs associated with closure and reclamation (the same actions linked by the EPA to CERCLA remedy types for each response category). Instead, EPA stated that the purpose of the formula was to produce an aggregate cost that was of similar magnitude to those costs incurred at pre-regulation CERCLA HRM sites "such as Summitville". This suggests that EPA had a pre-determined result in mind. If, in fact, the outcome was pre-determined, then the process was not only biased, but also performed in an unscientific manner and is therefore arbitrary and capricious.

4.2 EPA ignored zero cost data points

One of the most serious flaws in the EPA's approach is the exclusion of zero-cost data points. EPA's formulas assume that if a specific site feature is present, it will always require EPA's full suite of closure actions, such as water treatment and source controls. Therefore, when EPA developed its formulas based on its closure plan database, it assumed that where a specific response was not included (e.g., water treatment), the cost was overlooked or missing. In those cases, EPA did not include that data point in the analysis. In fact, there are numerous sites where many of the response actions that EPA is trying to cost are simply not required due to site-specific factors. Therefore, the cost for those response components for those sites is in fact zero.

Because EPA is not accounting for the probability of occurrence for any specific type of response cost, and instead assumes that every site receives the full suite of costs, EPA's formulas fail to consider the possibility that the response cost could be much lower than the formula estimate or even zero. In developing the components of the formula, EPA should have entered a zero cost for these categories on a site-specific basis instead of including cost calculations for these response categories when no response, and therefore zero cost, are necessary. This error results in heavily biased data sets, which is especially apparent in the water treatment, source control and natural resource damages data sets.

4.3 EPA fails to address the probability of occurrence and assumes that all facilities will require CERCLA responses in the future

As discussed in Section 4.2, the EPA formulas assume that all response categories will be required at all sites under a CERCLA response action. This contradicts its own data used to create the formulas and actions implemented at CERCLA HRM sites. EPA provided no evidence in the Administrative Record for the Proposed Rule to support this assumption. Nor has the EPA provided an example of a CERCLA HRM site that required response actions for every site feature. EPA even explicitly acknowledges the improved performance of the HRM industry in the rule:

> *"The Agency recognizes, however, that past operating procedures, before the advent of environmental laws, were likely in many cases to give rise to environmental*

problems that current regulations and modern operating practices can prevent or minimize."[48]

Nonetheless, EPA has ignored its own comments, the NRC Study, and the industry's recent track record and does not take into account the very low probability that a modern mine will require a CERCLA response. Required monitoring programs provide early detection and responses to any release or potential release minimize the degree and duration of risk. These current requirements and practices ensure that releases at currently operating mines do not go undetected for years as they did at many legacy sites.

Even if a mine were to require a CERCLA response, the response would likely be limited to a specific problem or problems (e.g., a waste rock dump or tailings pond), and not every single feature on the site as EPA has assumed in preparing its FR formulas. At each site referenced by EPA in support of the proposed rule, EPA identified a specific release or media issue. For example, at Buckhorn Mine EPA cites water management as the concern while at Jerritt Canyon EPA notes seepage from tailings impoundments as the issue.[49] EPA notes leach pad releases from the Goldstrike and Florida Canyon mines and tailings impoundment releases from the Robinson Operation.[50] In each of these cases, the releases occurred at one primary mine component. Moreover, each of these release examples was regulated by the relevant state agency to obtain compliance (i.e. did not require a CERCLA response). Identifying and mitigating the risks associated with these types of issues is precisely what the current regulatory programs are intended to accomplish through design and implementation of mine operating and closure plans, and accompanying FA requirement. EPA has provided no analysis that shows the probability of occurrence of any CERCLA response that justifies its Proposed Rule or its flawed and biased FR formulas.

4.4 Correlation is not causation

Numerous variables must be considered to prepare an accurate closure and reclamation cost estimate for any mine facility or site. The same is true in determining appropriate levels, if any, of FR under EPA's program. EPA has incorrectly reduced this complexity to three variables (area, net precipitation, and flow) with only one (area) being used to determine the cost for most of the response categories. EPA's justification for this decision is that there is a correlation between cost and acreage. However, the correlation factors for all of the response categories, except water treatment, are very poor to moderate, with R-Square values between 0.16 and 0.65.[51,52] EPA inexplicably, however, concludes that simply because some correlation exists, causation is probable. This is referred to as a *questionable cause logical fallacy.*[53] This type of fallacy can occur when the reasoning behind the conclusion is based on an inadequate understanding of the variables being used or the existence of other factors that could significantly influence the relevant variables.

EPA's highest correlation factor in the regression analyses provided to support the cost formulas occurs for the water treatment unit. This unit has an R-Square value of 0.91, which suggests a

[48] 82 Fed. Reg. at 3461.
[49] 82 Fed. Reg. at 3471.
[50] 82 Fed. Reg. at 3474.
[51] The R^2 value is a measure of the correlation between two variables. An R^2 value of 1 means that 100% of the change in the dependent variable can be attributed to change in the independent variable. Therefore, an R^2 of 1 means perfect correlation, 0 means no correlation.
[52] CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, Appendix J.
[53] http://www.txstate.edu/philosophy/resources/fallacy-definitions/Questionable-Cause.html

strong correlation (and likely causation). However, EPA's regression of water treatment cost to flow rate is misleading, as flow rate is not the actual variable that is used to calculate the water treatment cost (it is an intermediate step). The actual variables that go into the calculation of water treatment are Total Disturbed Area, Underground Flow and In-Situ Leach Flow.[54] EPA's regression analysis, and other statistical tests, completely ignore these three variables, which makes the regression of water treatment cost to flow meaningless and misleading. For the analysis to have any meaning, the regression must test the correlation between water treatment cost and the three variables driving this cost. EPA does not present any results of statistical tests for these variables.

EPA's belief that accurate FR costs can be based on a single factor is a serious oversimplification of what is required to properly estimate FR costs. Based on SRK's experience with developing closure and reclamation plans, these costs (or similar response actions) must be based on numerous, site-specific factors, not a single, relatively generic input. For example, costs associated with closure and reclamation of a heap leach facility depend on area, heap height, total quantity of ore, grain size distribution, clay content and mineralogy, mineral geochemistry, leach solution chemistry, groundwater chemistry, material stacking methods, particle size segregation in the heap, solution application schedules, annual precipitation, annual evaporation, precipitation patterns, sublimation, wind velocities and directions, and a number of other factors. A partial list of factors typically considered by SRK in developing risk-based management plans, including reclamation and closure plans, is attached in Appendix B. All of these factors are directly related to potential risk from a particular facility. Similarly, costs for all of the other 10 response categories should be determined by numerous factors, not one.

EPA's simplistic assumption that a single variable can be used to determine FR for the response categories demonstrates a serious lack of understanding of mine closure and reclamation. First, risk of a release cannot be accurately assessed based on a single factor. Second, mine closure and reclamation programs reduce the same risks that EPA seeks to reduce with the CERCLA § 108(b) rulemaking. This lack of understanding on the part of EPA could be due, in part, to the complexity of the interrelated regulations used to regulate the mining industry, as pointed out by the NRC Study (NRC Study at **Error! Bookmark not defined.**). This complexity does not lend itself to a simple survey of requirements and is not adequately reflected in EPA's analysis for the CERCLA § 108(b) rulemaking of the status of current regulatory requirements.[55] Understanding the complexity and the interdependent connections between the various regulatory programs is essential in understanding the scope of the existing regulatory and FA framework for hardrock mines. EPA's lack of understanding was pointed out by Commenter 4": "*I am also not confident that those collecting the primary data from the source documents correctly understood the information in the documents or mine reclamation in general*"[56].

[54] Note that EPA has not provided a definition for flow from in situ recovery operations. There are a number of flow rates (e.g. average flow from recovery wells, peak flow from recovery wells, average flow from injection wells, peak flow from injection wells, average restoration flow, peak restoration flow, bleed flows, etc.) that can be calculated at in situ operations and these flow rates vary significantly which means FR estimates will vary significantly without definition. Further, as EPA has not provided any of its source data related to in situ operations, SRK has not been able to review this aspect of EPA's formula in any way.
[55] Struhsacker & SRK, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, June 2017
[56] Response to Peer Review Comments: CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities Background Document, pg. 2-9

Although the existing state and federal regulatory regimes may be complex (meaning there are multiple state and federal regulations and regulatory agencies governing environmental protection and FA requirements at hardrock mines) they are nonetheless effective and comprehensive.[57]

The NRC Study finding that *"[t]he overall structure of the federal and state laws and regulations that provide mining-related environmental protection is complicated but generally effective*"[58] is applicable to the states' regulatory framework as well as to federal regulations. This complexity and how the multiple regulations work together must be thoroughly understood in order to evaluate the states' comprehensive and effective regulatory and FA programs.

4.5 EPA used skewed data sets and smear factors

The overly simplistic FR formulas that EPA has developed for CERCLA § 108(b) do a very poor job of predicting reliable cost estimates because they are not based on realistic or plausible scenarios for today's operating HRM facilities (i.e., the formulas have very poor precision) and duplicate the FA already held by these facilities. The formulas are also highly inaccurate because they produce significantly overinflated estimates. This is due to a combination of three factors:

- The treatment of outlier data points;
- EPA's use of smear factors; and
- EPA's handling of source control contributions.

The resulting highly biased formula outputs is consistent with EPA's comment during the February 3, 2017 SBA Environmental Roundtable that it was not trying to recreate closure and reclamation costs representative of mines subject to current regulatory requirements, but instead, was attempting to generate a total FR cost similar to costs experienced at past CERCLA HRM sites (e.g., Summitville). This also strongly supports the assertion in Section 4.1 that the development of the formulas was biased to achieve a particular predetermined result, and is, on that basis alone, arbitrary and capricious.

4.5.1 Outliers

For almost every response category that EPA includes in its formula development, there are obvious outlier results that reside at the extreme upper range of the data sets EPA utilized. Typically, a mild outlier is defined as a data point that is greater than the third quartile plus 1.5 times the interquartile ("IQ") range (the difference between the first and third quartile of a data set) and an extreme outlier is greater than the third quartile plus 3.0 times the IQ range.[59] Nine of the eleven data sets (Interim O&M and Long Term O&M are the two exclusions) have outlier data points in the extreme range.[60] Most of these data points are well outside the extreme threshold, in most instances they range from the third quartile plus 5x – 10x the IQ range, and two are approximately 20x the IQ range (compared to the extreme definition of 3x).

The inclusion of these data points significantly skews the regression analysis for EPA's formulas to the high side. For example, the open pit data set includes six extreme outliers. Excluding just a

[57] Struhsacker & SRK, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, June 2017
[58] https://www.nap.edu/catalog/9682/hardrock-mining-on-federal-lands
[59] NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/, accessed April 2017.
[60] Data from the spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)".

single point (which has a value of the third quartile plus 21.8x the interquartile range), would reduce the average open pit reclamation cost in the source data by 33%[61] and excluding all of the extreme outlier data would reduce the average cost by 82%.[62] This means that by including the single most extreme data point, the average of the source data is 50% higher than if it were excluded. Including all six outliers means the average of the source data is 450% higher than if they were excluded.

Notably, while EPA has chosen to include the outliers in its regression analysis for each of the site features, for its Natural Resource Damages data set it performs an outlier test and chooses to exclude the extreme outliers.[63] This exclusion of outliers in the NRD data set results in a higher NRD multiple (and therefore higher FR cost estimate) and the inclusion of outliers in the site feature analysis also results in higher FR cost estimates. This lack of consistency in methodology calls into question EPA's understanding of the statistics it is utilizing or suggests that there was a purposeful bias in how it used the data to reach a predetermined outcome of the largest possible FR cost estimate possible.

The presence of these outlier data points means that the result of a generic formulaic approach will either: 1) generally be in the range of the majority of the data points, but significantly underestimate the handful of outlier data points, or, 2) be in the range of the outliers, but severely overestimate the majority of the data. EPA has apparently chosen to select the method that results in a severe overestimation of the majority of data points in an attempt to reach the extreme level of the few outliers. This approach, in the context of CERCLA § 108(b), is highly arbitrary, unreasonable, and unjustifiable, as it creates a significant and unrealistic cost burden on the majority of operations. This skewed nature of the data strongly supports the critique that the use of a simplistic formula based on the average of all sites cannot reasonably estimate realistic CERCLA response costs at HRM sites operating under current regulatory programs and that FR or FA costs should be calculated through a site-specific approach, as is already in place with existing regulatory programs.

4.5.2 Smear factors

EPA has incorporated smear factors into its analysis that are meant to account for the potential that there were excluded data points at the extreme of the range of the data set (i.e. EPA assumes that the data have a lognormal distribution and data points even higher than those included in the analysis are present). However, EPA has failed to identify what these data points might be, has provided no justification for this assumption, and its inclusion appears to be another statistical manipulation of the data set to skew the formula output to be as high as possible. These smear factors range from a low of 1.16 (water treatment) to a high of 9.56 (drainage). Effectively, this means that costs based on a simple regression of the data are being increased by a minimum of 16% (in the instance of water treatment) to a maximum of 856% (in the instance of drainage) by the smear factors.

Using the example of the open pit costs, the addition of the smear factor increases the average estimate an additional 407% (smear factor of 5.07) and results in the formula predicting costs that

[61] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Comparison of average of "Adjusted Source Document Estimate $/acre" for Open Pit with and without Site_ID 46.
[62] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Comparison of average of "Adjusted Source Document Estimate $/acre" for Open Pit with and without Site_ID 26, 28, 37, 44, 46 and 59.
[63] CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 5-6

are approximately 640% higher than the source data, on average, for the 31 data points that do not classify as extreme outliers (Figure 4-1). [64]

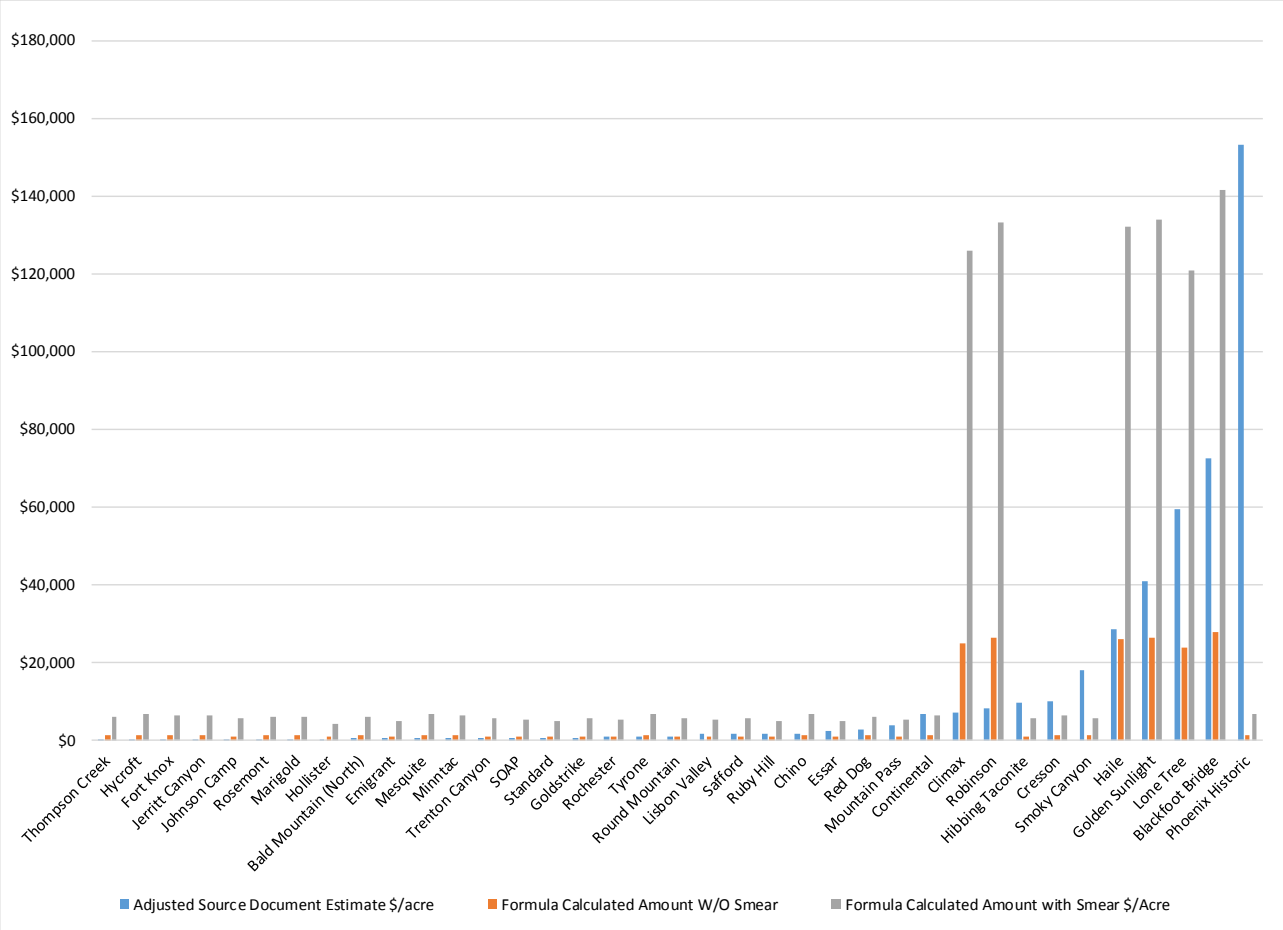


Figure 4-1: Comparison of Open Pit source estimates and formula estimates (with and without smear)[65]

The addition of smear factors to the formulas further amplifies the imbalance between the extreme overestimation of the majority of the closure costs in an attempt to bring the average estimate as close to the extreme upper data points as possible. For example, when comparing to the source data, for open pits the inclusion of the smear factor in EPA's formula significantly over-predicts every cost except the most extreme (Phoenix), which it significantly under-predicts (Figure 4-1).[66]

4.5.3 Source controls

EPA's analysis for Open Pit, Waste Rock, Heap Leach and Tailings included costs for source controls, whether the source data included source controls or not. EPA describes source controls as closure activities meant to reduce seepage, such as amendments or synthetic barriers, but SRK

[64] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Comparison of average of "Adjusted Source Document Estimate $/acre" and "Formula Calculated Amount with Smear $/Acre for Open Pit" without Site_ID 26, 28, 37, 44, 46 and 59.
[65] Does not include Source Control. Data from "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)"
[66] Ibid.

could not locate a formal definition in the Proposed Rule or supporting docket, which makes it very difficult to evaluate EPA's actual methodology. For example, open pit backfill could be classified as a source control method, yet it has been excluded from this category without explanation. This significantly skews the base Open Pit formula (excluding source control) because of two data points that include what should be considered source control (i.e. they include pit backfill). EPA then applies the source control multiple on top of this skewed data, which effectively is double counting source controls. EPA does not provide any sort of formal criteria for an action to classify as source control. This is a critical omission as EPA's application of source control costs has a significant impact on the formula outputs and overall FR estimates.

EPA appears to have performed a regression on source control separately from the rest of the costs for those site features, and likely planned to estimate source control costs separately. However, in the Proposed Rule, EPA appears to have arbitrarily decided that source controls would be required at every site, for four of the site features (Open Pit, Waste Rock, Heap Leach and Tailings) and has applied the additional source control cost distribution at all sites. EPA provides no justification for this assumption, and this appears to be another example of the misuse of data to reach a predetermined outcome.

Although EPA's analysis of source controls is not adequately described, and therefore cannot be fully reviewed, it appears that EPA applied a regression of source control costs that was developed only for sites that included source controls (i.e., zero costs associated with source controls were not included in the regression). This is another example of EPA failing to account for the probability of occurrence, which, for source control, only ranges between 7% - 16% for these four site features[67], while still excluding zero cost data points. This also means that only a handful of data points (as source controls are typically not necessary) are driving a significant portion of the actual cost calculation, further weakening any statistical basis for EPA's calculations.

The addition of source controls at all sites significantly inflates the cost estimates (Figure 4-2) as the sites with source controls are typically extreme outlier data points. However, instead of simply skewing the average upward (with additional skew added through smear factors), the EPA has effectively created a large multiplier effect by also excluding the zero data points and may even be double counting costs (the description of EPA's actual analysis is not adequate to assess if EPA appropriately excluded source control estimates from sites where they already exist prior to adding source control costs on top of the other costs). Therefore, the impact of the arbitrary inclusion of source controls for all sites has resulted in estimated costs where source controls are not required being shifted upwards by 1,900% (i.e., 19 times) for Open Pits, as an example.[68]

[67] Percentage of sites flagged as requiring source controls in spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)" for Open Pit, Waste Rock, Heap Leach and Tailings
[68] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Average of the multiple derived by dividing "Formula w/smear and source control $/acre" by "Formula Calculated Amount with Smear $/Acre for Open Pit" for every site in the data set.

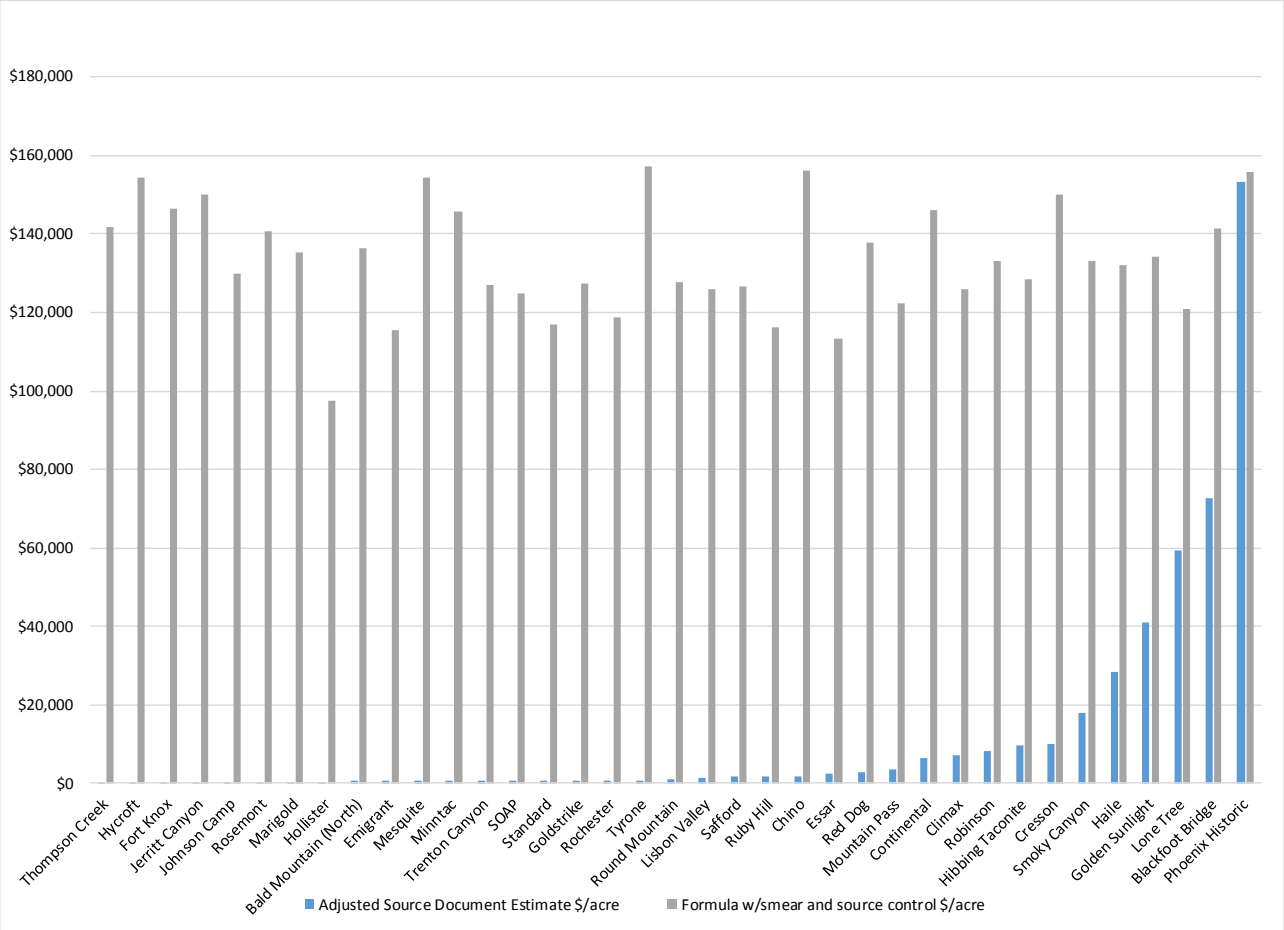


Figure 4-2: Comparison of Open Pit source estimates and full formula estimates[69]

4.5.4 Cumulative impact of outliers, smear factors and source controls

Because of the compounding effects of the presence of extreme outliers, the inappropriate calculation of smear factors, and the mishandling of source control data, EPA has generated formulas that calculate FR costs that are significantly higher than the original FA estimates for closure actions that they are based on and which EPA has linked to remedy types that had been implemented at HRM CERCLA sites. While there are other flaws in EPA's methodology in developing formulas supporting FR amounts (which also serve to inflate the calculated FR amount), the impact isolated to the outliers, smear factors and source control is so severe that the predicted costs are often multiple orders of magnitude higher than the original source data it is derived from, simply by the way these three factors are handled by EPA.[70] Even excluding all other flaws in EPA's methodology, these three factors result in a formula-predicted cost that has no resemblance whatsoever to the original data from which it is derived.

It is clear that EPA's inappropriate statistical manipulation produces highly inflated and unrealistic results rather than accurately predicting the costs to perform the remedial actions. For example, the

[69] Data from "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)"
[70] As presented in the spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)"

formula calculated Open Pit costs are on average 32,300% higher (i.e., 323 times higher) than the original source costs they are derived from[71], with the most significantly over-predicted cost +3,000 times its original cost estimate (i.e., over-predicted by more than 300,000%).[72] In fact, for the Open Pit category, EPA's formula output results in an estimated cost that is higher than the original cost estimate, which it is supposed to represent, for every single site in the data set, including the most extreme outlier (see Figure 4-2).

This overestimation of the data is not limited to the Open Pit response cost category. A comparison of original source data to the final EPA formula estimate for all site features is provided in Table 4-1. EPA provides no rational justification to support these significantly overinflated estimates. The consistent skew to the data strongly suggests EPA's formulas are biased and intentionally designed to produce unrealistically high outcomes.

Because of the highly variable site-specific conditions, there will always be sites for which a generic formulaic approach will incorrectly estimate the cost of appropriate actions. Therefore, SRK believes that existing, site-specific reclamation and closure FA required by existing mining regulatory programs, provides a more appropriate and justifiable approach to ensuring that sufficient funds are available to cover the cost of actions needed to minimize the degree and duration of risk from the release or potential release of hazardous substances at regulated mining operations.

Table 4-1: Formula multipliers for all response categories[73]

Site Feature/EPA Response Cost Category	Ratio of Formula Calculated Amount to Adjusted* Source Estimate
Open Pit	323x
Waste Rock	17x
Heap Leach	25x
Tailings	12x
Process Pond	3x
UG Mine	5x
Drainage	54x
Short Term O&M	5x
Long Term O&M	3x
Interim O&M	2x
Water Treatment	3x

[71] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Average of the multiple derived by dividing "Formula w/smear and source control $/acre" by "Adjusted Source Document Estimate $/acre" for every site in the data set.
[72] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Multiple derived by dividing "Formula w/smear and source control $/acre" by "Adjusted Source Document Estimate $/acre" for Site_ID 29.
[73] Calculated using spreadsheet "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)". Average of the multiple derived by dividing "Formula w/smear and source control $/acre" by "Adjusted Source Document Estimate $/acre" for every site in the data set for each site feature.

4.6 Validation of response costs calculated by EPA's formulas

EPA has not performed any validation of the costs estimated via their formulas against the costs estimated for closure and reclamation. EPA peer reviewers were not provided the results of the 49 sites used by EPA in the Regulatory Impact Assessment (RIA) for review. When questioned about validation of the formula during the Environmental Roundtable hosted by the Small Business Administration on February 3, 2017, EPA responded that they had only validated the statistical regressions and had not validated the formula results against the closure and reclamation costs. Their reasoning was twofold.

First, they stated that the requirements of CERCLA §108(b) are completely different from the requirements under federal and state mining programs for mine closure and reclamation. This is not correct, as discussed in detail in Section 2.2.

Second, they stated that they were not trying to compare the numbers for each response category with the reclamation and closure costs, but only to produce a total response cost that reflects what "felt right" based on their experience with HRM CERCLA sites, "such as Summitville". Since nearly all of the existing HRM CERCLA sites are legacy sites operated prior to current environmental laws and mining regulatory and FA programs, such a goal will produce cost estimates that do not reflect the designed, engineered, controlled, and regulated modern mining operations and the resultant reduction in liabilities associated with these current mining operations. Furthermore, this ignores the numerous federal and state regulatory programs that significantly reduce the degree and duration of risk of a release.

4.7 Natural Resource Damages

As highlighted throughout this review, while EPA's formulaic approach to development of response cost estimates has significant flaws, its approach to the Natural Resource Damages (NRD) multiplier is even more fundamentally flawed. This is because EPA's development of estimates of potential NRD cost associated with HRM sites uses a completely different approach than used for all of the other response cost categories. The most important differences follow:

- EPA did not perform a statistical analysis in support of its assertion that NRD costs are related to response costs,
- EPA excluded data points it wrongly considered to be outliers, and
- EPA utilized cost data from legacy mining and processing sites with CERCLA responses.

Even with these deviations in methodology, EPA still used some of the flawed methodology pervasive in its other formulas, the most notably the exclusion of zero data points from its analysis. The common theme in all of these analytical flaws is that they bias the resulting calculations high (i.e. increase the calculated FR). This bias, which is consistent with the results for other aspects of the formula, suggests the selected approach was intended to increase the calculated FR amount.

4.7.1 No statistical analysis in support of assertion that NRD costs are related to response costs

In justifying the appropriateness of tying potential NRD costs to the magnitude of response costs, EPA provides a reference to the *Regulatory Impact Analysis from EPA's 2015 RCRA Final Rule Regulating Coal Combustion Residual (CCR) Landfills and Surface Impoundments At Coal-Fired*

Electric Utility Power Plants (EPA-HQ-RCRA-2009-0640-12034).[74] In referencing this document, EPA includes the statement *"As with that previous study, the natural resource damages and response costs are uncertain, but EPA found that a similar relationship between damages and costs was presented."*[75]

SRK reviewed the document referenced by EPA to attempt to check EPA's analysis on the relationship between CERCLA response costs and associated NRD costs. When reviewing the referenced document, SRK was not able to identify any statistical analysis that demonstrates NRD costs are a function of response costs. In addition, the analysis itself is a poor comparison to this Proposed Rule as it is specific to the NRD costs associated with the release of coal combustible residuals (CCR) from an impoundment (i.e. a very specific type of response). Given that potential releases associated with HRM sites are highly variable (e.g. sources, pathways for release, contaminants, etc.), the comparison to an analysis supporting a very specific type of release for a specific contaminant is not valid. One valuable point that can be taken from this CCR document is that EPA acknowledges the importance of calculating the probability of occurrence of a release and incorporates it into its formula to estimate NRD costs associated with CCR impoundments[76], which SRK believes should have been included in the HRM Proposed Rule as well (see Section 4.3).

As a test, SRK examined the data EPA utilized in developing its multiplier for the Proposed Rule (Table 5-4 from U.S. EPA, CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 5-4) to assess any correlation between actual response costs and NRD costs. SRK's examination determined that there is not even a weak correlation. SRK has plotted this data in Figures 4-3 and 4-4.[77] As can be seen in these figures, there is no visible correlation and the actual correlation coefficients are 0.0012 and 0.047, neither of which demonstrate any statistical correlation. Therefore, EPA's assertion that NRD costs are a function of response costs is not valid and the application of NRD costs as a multiplier on top of CERCLA response costs is not appropriate. EPA has asked the question of whether it is more appropriate to use a mean or median from its data set, but in reality, EPA should not be using a multiplier at all.

" From U.S. EPA, CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. xiv.
[75] Ibid.
[76] *"Using the methodology for remediation costs, for each year of the analysis, this RIA calculates expected NRD costs as the sum of the probability of an impoundment being active and experiencing a release (i.e., accounting for the effects of structural integrity requirements) multiplied by its assigned potential NRD cost."* From the Regulatory Impact Analysis from EPA's 2015 RCRA Final Rule Regulating Coal Combustion Residual (CCR) Landfills and Surface Impoundments At Coal-Fired Electric Utility Power Plants. pg 5-18
[77] Note that this figure excludes data points EPA has excluded as outlier data. SRK does not agree with this exclusion.

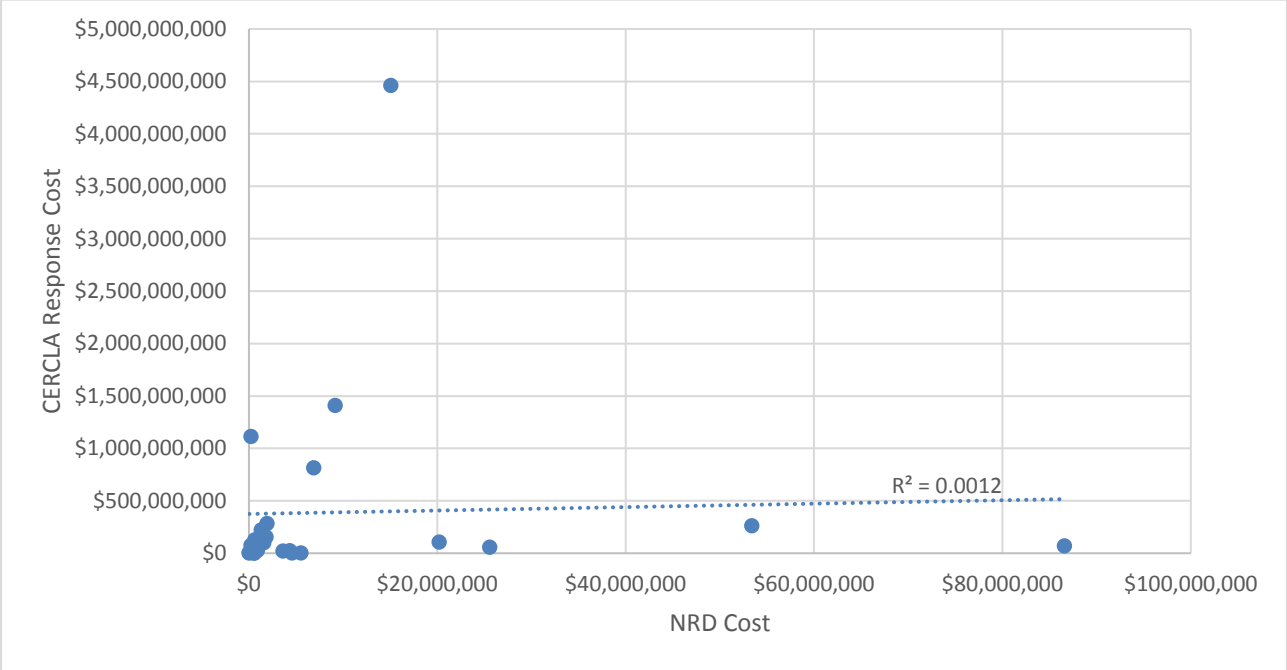


Figure 4-3: CERCLA Response Cost Versus NRD Cost[78]

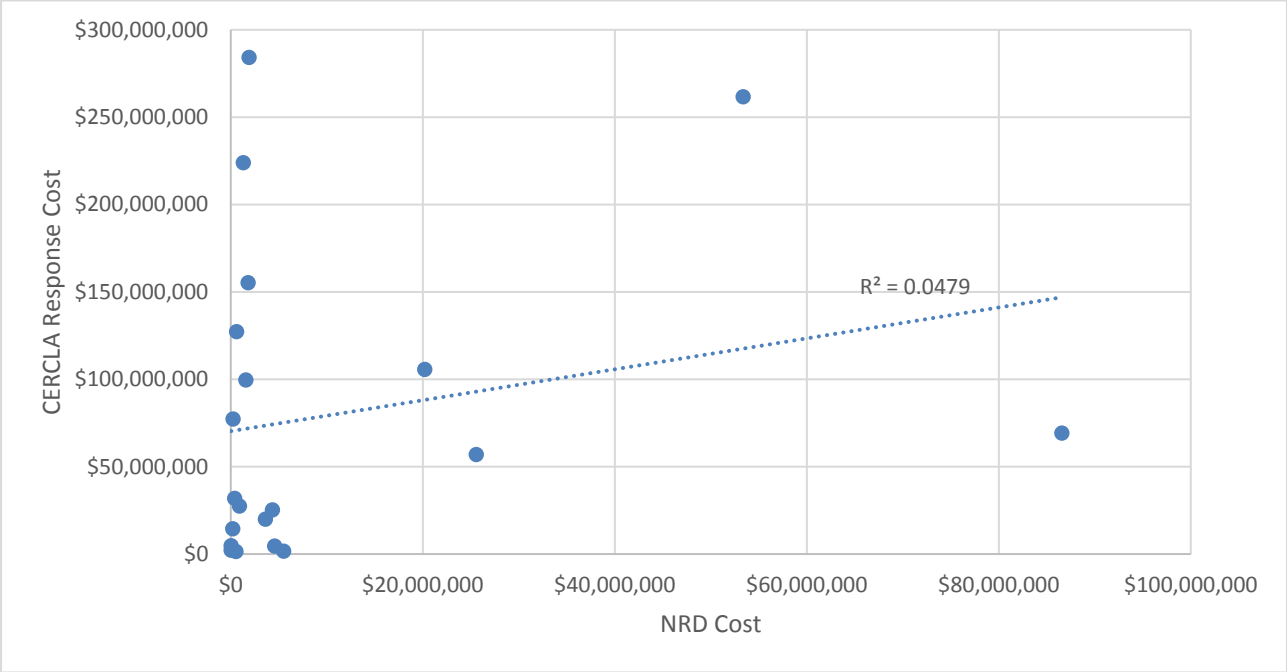


Figure 4-4: CERCLA Response Cost Versus NRD Cost – Outlier Response Costs Excluded[79]

[78] Data from Table 5-4 of U.S. EPA, CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 5-4
[79] Data from Table 5-4 of U.S. EPA, CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 5-4

4.7.2 EPA excluded data points it wrongly considers to be outliers

EPA started with a data set that included 24 HRM sites with both CERCLA and NRD related costs. However, EPA decided to eliminate four of the mining sites from the sample of 24 due to an assessment that they were outlier data points:

> *"These sites have response costs greater than two interquartile ranges above the third quartile cost, and are thus considered statistical outliers that are not likely to be representative of response costs at other sites."*[80]

This is a notable departure from EPA's handling of other aspects of formula development where it included all data, including outliers that had an even more extreme deviation from the interquartile range than those excluded for NRD (see Section 4.5.1). EPA provides no explanation of why it believes these data points are not representative of actual response costs that may be encountered in HRM facilities. These excluded response costs range between $814 million and $4.5 billion. In the RIA for the Proposed Rule[81], EPA calculates total response costs, prior to any multipliers, to range well above $500 million and when including the appropriate regional adjustment multiplier, multiple facilities have a response cost in excess of $800 million suggesting that in fact, these response costs are not outliers.

The exclusion of these sites is critical as they have NRD costs that are a relatively small percentage of response costs. Inclusion of these four data points reduces the mean of the data set from 13.4% to 2.6% and the median from 3.8% to 2.5%.

4.7.3 EPA utilizes data from legacy CERCLA sites in its analysis

In contrast to the response category cost development where EPA based its regression analysis on data from closure and reclamation from currently operating or proposed mining operations, for the NRD calculation, EPA based its analysis on CERCLA response costs from legacy sites. This data set is biased and not representative of potential future NRD costs as it reflects response costs related to practices that are no longer utilized in the industry.

Monitoring programs required by current regulatory programs substantially limit the degree and duration of releases from HRM mine sites, thereby limiting the likelihood of NRD. Furthermore, current mining regulations are specifically designed to require development of reclamation and closure plans that will protect the environment and provide site-specific FA that can be used to address any issues that develop during or after closure. Therefore, the potential for NRD at currently operating or future sites is much lower than from the HRM CERCLA sites used to develop the NRD component of the Proposed Rule.

In fact, in the CCR document that EPA references for its justification for utilizing a multiplier for NRD, EPA makes the following statement:

> *"However, some of the 137 cases described by Israel (2006; 2013) affect resources that are unlikely to be affected by impoundment releases considered for this analysis, or result from substantively different circumstances. EPA received comments on the proposed Steam Electric ELG analysis noting significant differences between NRD resulting from impoundment releases and those assessed for legacy pollution such as*

[80] U.S. EPA, CERCLA 108(b) Financial Responsibility Formula for Hardrock Mining Facilities - Background Document, pg. 5-6
[81] Exhibit B-7 of the Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule. pg B-15

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund) sites."[82]

The last sentence is an acknowledgment by EPA that there is a significant difference in NRD associated with legacy CERCLA sites and current sites for which it is trying to develop a cost estimate for CCR impoundment releases. In the instance of the calculation of the NRD multiplier for the Proposed Rule for HRM sites, EPA includes these legacy CERCLA sites in its analysis, which is inconsistent with the method EPA used for the CCR impoundments. Therefore, EPA's development of the NRD multiplier utilizing legacy sites is flawed and should be rejected.

5 Reduction criteria and methodology are fundamentally flawed

The Proposed Rule includes provisions to reduce FR amount based on *"risk-reducing practices, including controls established in compliance with Federal and state reclamation and closure programs."*[83] Furthermore, although EPA states that FR under CERCLA §108(b) is "inherently different" from FA required by other regulatory agencies,[84] EPA's approach to reductions emphasizes the significant overlap between the proposed CERCLA §108(b) rule and existing state and federal closure programs. EPA is thus making a distinction without a difference between the existing state and federal programs and the Propose Rule.

5.1 No scientific basis for reduction criteria

EPA provides no scientific rationale for its selection of reduction criteria. The agency's "Technical Support Document"[85] lists selected reduction criteria and compares the criteria to a number of what it deems to be "best management practices." These "best management practices" are excerpted from various regulatory requirements from other authorities that are responsible for mining (BLM, Forest Service, State of New Mexico, State of Alaska, etc.), industry guidelines (Global Acid Drainage Guide, conference presentations, etc.), and other government publications. EPA has not provided any rationale for its selection of individual criteria for comparison or why other criteria are ignored. It appears that EPA excerpted portions of the New Mexico regulations, in preference to other state regulations without explanation. It is particularly surprising that EPA appears to have overlooked Nevada, which is known to have an excellent regulatory program for mining and is often used as a basis for regulations cited in other jurisdictions including foreign countries.[86] Furthermore, the selection of criteria from portions of state regulations such as those from New Mexico, a semi-arid locale may result in reduction criteria that are inappropriate in other states such as Alaska, Minnesota, or Idaho where even general environmental conditions are different.

EPA does not attempt to comprehensively compile recommendations for comparison. Instead the agency appears to arbitrarily select criteria without providing any justification. In addition, even within regulations that are quoted, EPA has ignored a significant portion of the actual language and only included small excerpts. The method that EPA has used to develop the reduction criteria is illogical, poorly substantiated, and completely arbitrary.

[82] U.S. EPA, "Appendices For Regulatory Impact Analysis For EPA's 2015 RCRA Final Rule For Coal Combustion Residual (CCR) Landfills & Surface Impoundments at Electric Utility Plants", pg 313
[83] 82 Fed. Reg. at 3391
[84] 82 Fed. Reg. at 3430
[85] U.S. EPA, "Technical Support Document: CERCLA 108(b) Hardrock Mining Rule Financial Responsibility Reductions" (Nov. 30, 2016) (EPA-HQ-SFUND-2015-0781-2038) (hereinafter "Reductions Technical Support Document").
[86] NOM-155-SEMARNAT-2007, Mexican regulations on mine closure.

As an example, EPA has generally utilized 200 years for the design life for its reduction criteria as well as the period for Long Term O&M and Water Treatment. A 200-year design life is well outside of the industry norm and none of EPA's typically referenced regulatory requirements include or even recommend a 200-year design life. However, EPA appears to be relying on a conference paper as a reference for the 200-year period as a "best management practice" to justify this number while excluding all other industry regulations.[87] EPA provides no basis for the 200-year Long Term O&M and Water Treatment requirements. It arbitrarily sets the duration at 200 years without any justification as to why it was selected. In reality, the required duration should be based on a site-specific, risk-based analysis, not a one-size-fits-all time frame selected without rationale by EPA. Such a requirement could be deemed arbitrary and capricious.

EPA also uses a 200-year interval for stormwater calculations in the reductions for new mines. This interval exceeds almost all industry standards. In this case, EPA does not have a third party "best management practice" to reference and simply states it was selected based on, *"The 200-year interval storm event for new mines as a similarly conservative approach based on the consideration of climate change and other factors."*[88] Oddly, EPA has stated that for existing mines, a 100-year interval is appropriate as a conservative number based on current "best management practices".[89] It is unclear why, if the 100-year return interval is already admittedly "conservative" and meets "best management practices" at existing mines, an even more conservative 200-year return interval is necessary at new mines, all of which may be operated at the same time in the future.

As a third example, EPA cites verbatim a portion of the State of New Mexico's guidance for waste rock stability: "*Closure of all critical structures at a copper mine facility shall be designed for a long-term static factor of safety of 1.5 or greater and non-critical structures shall be designed for a long-term static factor of safety of 1.3 or greater".*[90] *The units being closed shall also be designed for a factor of safety of 1.1 or greater under pseudostatic analysis. A stability analysis shall be conducted for the unit and shall include evaluation for static and seismic induced liquefaction."*[91] EPA does not explain why it believes this requirement is most appropriate or why it has only selected this requirement from New Mexico's regulations and not others. It also does not explain why this specific quote is so critical to its reductions concept while ignoring much of the remaining New Mexico rule.

The three examples provided above are presented for discussion and are not a comprehensive listing of reductions taken from existing regulatory criteria without rationale provided.

5.2 Contradictions with state regulations

EPA's inconstant use of regulations for the reduction criteria is an exercise in selective omission in which EPA has inappropriately excluded relevant portions of other equally valid regulations, thus misrepresenting the full scope of the relevant regulations. In some instances, EPA's reduction criteria directly contradict state regulations. For example, in order to meet EPA's reduction criteria for Waste Rock, an operator must provide for "*a cover system of, at a minimum, a store and release*

[87] Mark J. Logsdon, "What Does 'Perpetual' Management and Treatment Mean? Toward a Framework for Determining an Appropriate Period-of-Performance for Management of Reactive, Sulfide-Bearing Mine Wastes," presented at the International Mine Water Association 2013 Annual Conference, Golden, Colorado, August 6-9, 2013, p. 56.
[88] Reductions Technical Support Document at 16.
[89] Ibid. / pg. 16
[90] NMAC § 20.6.7.33
[91] Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule: Financial Responsibility Reductions Technical Support Document / pg. 13

earthen cover system with a thickness of at least 12 inches".[92] However, in New Mexico, state regulation provides for an exception to this requirement: *"At existing copper mine facilities, the waste rock and leach stockpile outslopes within an open pit surface drainage area are not required to be graded and covered."*[93] Therefore, EPA is effectively imposing requirements that contradict the regulations that the State of New Mexico has determined are in the best interest of the state. This preemption of state regulations by EPA serves no rational purpose and usurps each state's authority to regulate mining activity within its borders. It also fails to take into account climatological, geological or other factors that were considered in each state's development of its mining and environmental laws. EPA's approach is arbitrary and without rational basis documented in the Administrative Record.

Another example can be seen in the reduction that appears for Open Pits requiring the following:

> *"Where ponding will occur, a plan to regrade the bottom surface during closure to a stable configuration that prevents ponding and promotes the conveyance of surface water off the unit…"*[94] *Again, New Mexico acknowledges that site-specific conditions may justify an exception: "The operator may propose for department approval of a grading plan that allows ponding as an appropriate part of closure provided additional ground water protection measures, such as synthetic liner systems, are included as part of the design."*[95]

Again, EPA is imposing an arbitrary requirement as a reduction criterion without considering the need for, or existence of exceptions under state law. An operation in compliance with the New Mexico state regulations may not meet EPA reduction criteria that do not consider state mining rules.

As a third example, EPA requires the use of a liner on a heap leach facility. While the use of a liner is not a requirement in all jurisdictions, even for jurisdictions that do specify the use of a liner, there is typically language that allows exceptions (again from New Mexico): *"At a minimum, the following requirements shall be met in designing leach stockpiles at copper mine facilities unless the applicant or permittee can demonstrate that an alternate design will provide an equal or greater level of containment".*[96]

A fourth example of only appropriating a portion of a regulation, again from New Mexico for open pits, relates to treatment of pit lake water. The New Mexico regulation specifically excludes pits from treatment requirements if they are hydraulic sinks. It also does not require mining companies to treat water for contaminants that are not originated from the mining activity: *"Open pits in which the evaporation from the surface of an open pit water body is predicted to exceed the water inflow shall be considered to be a hydrologic evaporative sink. If an open pit is determined to be a hydrologic evaporative sink, the standards of 20.6.2.3103 NMAC do not apply within the area of open pit hydrologic containment. This is limited to contaminants associated with standard copper mining practices and found to be present within the open pit, or that can be generated from the natural*

[92] Ibid. / pg. 5
[93] NMAC § 20.6.7.33
[94] [94] Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule: Financial Responsibility Reductions Technical Support Document / pg. 16
[95] NMAC § 20.6.7.33
[96] NMAC § 20.6.7.20

materials present in the open pit through degradation, oxidation, decay or other expected process."[97] However, EPA reduction criterion states:

> *"Where a pit lake will form, or where meteoric water will percolate through the pit rock into groundwater below, and the pit lake or any discharges will not meet water quality standards, a plan [is required] for the minimization, prevention, or collection and treatment of pit lakes, discharges, and/or seepage, based on site hydrology, water quality characterization information, and pit lake ecological risk assessment information".*[98]

EPA again fails to recognize these important state law exceptions and is effectively requiring treatment of any pit lake that does not meet undefined water quality standards regardless of what state regulations require. EPA's criterion also ignores the likely impacts to groundwater resources from a pit lake, which in the case of hydrologic sinks, are negligible.

5.3 EPA's reductions overlap with existing regulatory programs

As discussed in Section 2.2, there is substantial overlap between CERCLA § 108(b) and existing regulatory programs. This section focuses on the inferior nature of the Proposed Rule, when compared to the regulatory programs with which it overlaps, and provides further support that there is no reasonable justification for the addition of CERCLA § 108(b) based FR, when existing regulatory programs are better supported by science and benefit from decades of improvements through experience.

Existing mining regulatory programs can include hundreds of pages of detailed requirements and recommendations, which are then implemented through approved site-specific plans. EPA has proposed approximately 10 pages of reduction criteria, which are largely the same few recommendations repeated multiple times for each site feature. It is highly implausible to believe that these few arbitrary, generic, and often highly subjective requirements will provide any additional protection to human health and the environment not already covered by existing regulations.

EPA's repetition of the same criteria for the different site features also calls into question EPA's understanding of mining and actual closure requirements. For example, for a number of site features, there is a requirement for regrading of the surface to prevent ponding and promote surface water conveyance off the unit. While this may be reasonable under many circumstances for features such as Waste Rock, this requirement is also listed for the Open Pit category. This application to open pits is nonsensical; by nature, almost all open pits are hydraulic sinks and it is impossible for water to be conveyed out of them to prevent ponding without pumping, which is completely impractical. Additionally, for pits with pit walls that expose acid generating rocks, inundation and ponding to submerge these pit walls is necessary mitigation to minimize acid generation. Another example is the requirement to complete a stability analysis to evaluate seismically induced liquefaction for open pits. Seismically induced liquefaction is an analysis that may be appropriate for tailings, but has no applicability to open pit slopes comprised of solid rock.

Current closure and reclamation plans typically require multiple years of investigation and engineering work to be developed with the intent of mitigating risk to human health and the

[97] NMAC § 20.6.7.33
[98] Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule: Financial Responsibility Reductions Technical Support Document / pg. 25

environment. These plans are then reviewed by applicable (and experienced) regulatory authorities prior to final approval. Any identified deficiencies are addressed through the review process, which in most states includes public comment and may include a public hearing. EPA's generic, simplistic formula with no scientific basis and equally general and simplistic reductions to that formula are grossly inferior to the requirements of existing mining regulatory programs.[99]

If CERCLA §108(b) is implemented as proposed, mining companies will be incentivized to modify their reclamation and closure plans to ensure they meet these arbitrary reduction criteria to minimize the incremental and significant financial burden on the operation. This will focus closure plan development on a limited number of specific types of activities arbitrarily mandated by EPA rather than focusing on risk-based, site-specific measures developed from sound science and engineering. Mine operators will be caught between the CERCLA reduction criteria (at least some of which will make no sense at particular mines) and applicable, but potentially inconsistent state laws, mine plans, and reclamation plans. This will also create an outcome that is in opposition to EPA's proposed intent in that CERCLA § 108(b) closure plans will be less likely to ensure mitigation of the degree and duration of risk to human health and the environment compared to the closure plans developed in compliance with current state and federal requirements. EPA's arbitrary methodology will be fraught with unintended adverse consequences.

5.4 Subjective reductions

Many of the reductions in the Proposed Rule are poorly defined and therefore highly subjective and unclear. While these criteria allow for proper scientific and engineering judgment for implementation, the lack of a formal approval process will create significant uncertainty as to whether the proposed standards have been met and will leave both operators and the EPA exposed to significant potential litigation. For example, EPA has established the following criteria for Waste Rock (where the EPA provides most of its justification in its Technical Support Document):

- "*A management plan that demonstrates geochemically active materials will effectively be avoided*"[100] – this is also applicable to Heap Leach, Open Pit and Underground categories. EPA has not defined what "geochemically active materials" or "effectively avoided" mean. The issue is not the presence of the geochemically active material, but the potential risk that it might pose to the environment. Current regulatory programs require operators to identify any materials that will be mined or exposed during mining, determine the potential environmental risks associated with those materials by appropriate scientific methods, and implement measures to mitigate or eliminate those risks. For example, Nevada regulations require that all mines are designed, constructed, operated, and closed in such a way that "waters of the state" will not be degraded. Other federal and state regulatory programs have similar requirements.
- "*Requirements for concurrent or sequential reclamation of mined areas as they become available prior to final cessation of operations and closure.*"[101] Again, this is a recurring requirement on multiple features. What criteria will be used to determine areas are "available" for concurrent reclamation? What happens if an operator believes that it is not possible to concurrently reclaim portions of the operation prior to closure, but EPA or another party

[99] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.
[100] Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule: Financial Responsibility Reductions Technical Support Document / pg. 5
[101] Ibid.

disagrees? Will EPA audit individual operations and make its own assessment of whether it is possible? This is already a requirement under most regulatory programs, and determined by agreement between the operator and the regulatory agency.

- "*Requirements to provide for a stability analysis to be conducted for the unit as part of the original design and as part of mine modifications during the active life of the mine.*"[102] If a stability analysis was not completed as part of the original design (i.e., existing operation), but was added at a later date, is it still possible to meet this standard? What type of stability analysis? Geotechnical, geochemical? In quoting the various regulatory requirements and industry guidelines, it appears that EPA is mixing multiple concepts for waste rock stability, which creates significant uncertainty as to the purpose and specific requirement for this reduction.

- For Open Pits, Heap Leach and Tailings, EPA requires a stability analysis be conducted including an evaluation for static and seismic induced liquefaction. It is not clear how an analysis of the potential for seismic induced liquefaction, a phenomenon that is only possible with fine grained, unconsolidated materials, is relevant to open pits (solid rock) or heap leach facilities (large particle sizes). For a tailings dam, long-term mass stability would be an appropriate objective, but in the long-term, slope failures of some type will occur in portions of nearly every open pit. Is the purpose of the analysis simply to look at the type of potential failure and likelihood over time or is there some intent to try to prevent failures?

- For Water Treatment, in its formulaic approach to developing bonding amounts, EPA has assumed that long-term water treatment is required for all operations. However, this assumption is not defensible or reasonable based on empirical data. Because of this incorrect assumption, it is not clear from the Water Treatment reduction standard if operations that do not require long-term water treatment will be able to achieve the reduction. There are numerous examples of closure plans in semi-arid environments, such as Nevada, where water treatment is not needed and closure of most facilities can be achieved through use of engineered, zero-discharge passive management systems. These methods have been employed successfully for nearly 30 years. This is reflected in the original dataset used by EPA to create their simplistic formula, where many of the sites in Nevada and other southwestern states did not include costs for water treatment in their FA. The lack of water treatment costs for these sites was not an omission in the closure and reclamation plans, but the result of good, proven closure practice. Apparently, those collecting and analyzing the data for EPA did not understand reclamation and closure practices well enough to discern the difference between good practice and omissions.

  EPA's water treatment reduction requires *"…a conceptual engineering document that describes the processes and methods that are expected to be used for long-term management or treatment of seepage and includes an analysis of the expected operational life of each long-term water management or water treatment system, including collection/interceptor systems, until each system is no longer needed to protect water quality and applicable standards are met."*[103] Although this standard assumes that water treatment will be needed on all sites, it also provides for cessation of treatment when it is no longer needed to protect water quality and applicable standards are met. How the need for this requirement is determined and under what conditions water treatment will no longer be required is entirely unclear. Furthermore, to obtain the reduction, a facility must have a "*plan for closure, water management and water treatment*"[104]

[102] Ibid.
[103] Ibid. / pg. 79
[104] Ibid.

that includes significant detail around operating conditions and capital requirements. Obviously, this type of plan will not exist if water treatment is not required. It is ludicrous to require operators to develop a plan that covers operation of a hypothetical and unnecessary treatment plant to meet this standard. Rather, EPA's water treatment criterion should first establish whether water treatment is necessary at all.

- EPA also repeatedly refers either to meeting "applicable water quality standards" or in some instances just "water quality standards". However, it does not define which standards these may be or how applicable standards will be selected. Applicable water quality standards should be tied directly to the state operating permits.

These and similar subjective, vague reduction requirements are only some of the examples of the arbitrary FR reduction criteria EPA would incorporate into the rule. The net result will be that EPA's grossly overinflated FR requirements will likely remain in place year after year at covered sites, whether or not risks have been effectively addressed, because the FR release standards are too subjective to prove compliance.

5.5 Inflexible criteria

In contrast to the multitude of poorly defined and subjective reduction criteria, EPA has also selected highly prescriptive criteria for other conditions. Again, there is no justification as to why these specific criteria were chosen relative to other industry criteria. The prescriptive criteria are better defined (i.e. it will be clearer that an operation is in compliance); however, they also will cause significant practical problems. This is because the highly prescriptive criteria establish many instances where activities such as water treatment, liners and covers will have to be specified in a closure plan for no reason other than EPA's new regulations require them (i.e. from a risk management perspective, they are not necessary).

- For many site features, the following requirement is proposed: *"…at a minimum, a store and release earthen cover system with a thickness of at least 12 inches…"*[105] While cover systems are common in mine reclamation and closure, they are not always the most appropriate or applicable design (e.g., highly arid conditions where seepage is not a problem and vegetation cannot be established to stabilize a cover). However, EPA's proposed regulations do not provide for site-specific flexibility to select the most appropriate method of closure and dictate that a cover must be used.
- EPA also repeatedly uses the following: *"(A) implementation of an engineered cover system designed to achieve at least a 95 percent reduction in annual net-percolation based on the long-term average and reduce seepage discharges to meet applicable water quality standards; (B) a capture and treatment system designed to achieve at least a 95 percent capture efficiency and meet applicable water quality standards; or combination of an engineered cover system and a capture and treatment system to achieve at least a 95 percent reduction in discharged load and meet applicable water quality standards, or (C) a solution containment system to assure seepage flows are collected, contained, conveyed, and treated to achieve at least a 95 percent reduction to meet applicable water quality standards."* The selection of 95 percent reductions in net percolation, capture efficiency, reduction in discharged load and treatment efficiency is completely arbitrary. In many instances, this may not be possible and in other instances, there is no scientific or risk based justification to target 95% reduction is not required to achieve

[105] Ibid. / pgs. 6, 49, 63

acceptably low risk levels (e.g. a 10% reduction may be adequate to meet all standards and risk based criteria or conversely 98% reduction may be required). In Nevada, where evapotranspiration exceeds precipitation, facility water management systems must generally be zero-discharge systems – throughout operations. There, neither complex, engineered cover systems nor capture and treatment systems are typically used. These types of determinations need to be made on a site-by-site basis that takes into account actual site-specific conditions and existing, applicable state and federal laws.

5.6 Validation of the model and reductions

EPA's reduction methodology highlights how far its formula-based calculation of FR is from reality. For one operation, ID#2601916, based on the results of the RIA, EPA determined that its existing closure plan meets all reduction requirements and therefore the CERCLA §108(b) bonding requirement would be $550,000 (health assessment only).[106] EPA's formula-based calculation of FR for the site is $331 million[107], prior to the application of multipliers for NRD and Regional Adjustment. Its full EPA calculated FR amount, inclusive of the health assessment and both multipliers, but prior to reductions is $605 million. Its actual estimated closure cost, developed by the operator in support of existing FA, is $35 million, based on the document *Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)*. Therefore, an estimated $35 million in actual closure activity fully reduced the degree and duration of risk while EPA's FR formula calculates the need for almost 20 times that amount of bonding. Table 5-1 shows similar results for all sites evaluated in the RIA (the example above is Site 38). Where EPA determined a site met the proposed reduction categories, and therefore some level of reductions are appropriate, a comparison of the formulaic calculated FR amount to the actual cost estimate, supporting existing FA, consistently shows EPA's formulaic costs approaching an order of magnitude higher than actual estimates (which EPA has deemed to fully reduce to the degree and duration of risk due to the compliance with reduction criteria, per Exhibit B-8 of the RIA).

5.7 All-or-nothing approach

EPA's all-or-nothing approach to reductions also defies logic. If a mining company meets 99 percent of the reduction criteria, but fails to meet a single aspect of those criteria (which may be entirely irrelevant for that specific circumstance), the mining company cannot benefit from any actions taken or proposed to reduce the degree and duration of risk. In reality, typical reclamation and closure measures can significantly affect closure performance and, therefore, degree and duration of risk. Any measures employed to reduce risk should likewise reduce the FR obligations.

[106] Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule (the "RIA"), Exhibit B-9
[107] Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule (the "RIA"), Exhibit B-7

Table 5-1: Comparison of Estimated FR and FA Costs

EPA Site # (From RIA)	State	EPA FR Formula (no reductions)[108]	EPA Projected Reduction Amount[109]	Approved FA Amount[110]	EPA Projected Reduction / Approved FA
1	Alaska	$953,962,768	$907,528,595	$27,673,595	3,279%
2	Alaska	$144,450,064	$129,740,607	$12,533,589	1,035%
3	Alaska	$113,514,544	$108,305,429	$7,627,898	1,420%
4	Alaska	$71,202,736	$60,212,324	$1,134,719	5,306%
5	Alaska	$199,535,248	$192,259,945	$33,104,578	581%
6	Arizona	$971,413,894	$301,181,022	$9,968,962	3,021%
7	Arizona	$163,847,134	$105,641,309	$1,216,913	8,681%
8	Arizona	$820,116,748	$110,091,414	$8,065,180	1,365%
9	Arizona	$604,279,126	$245,882,225	$140,499,602	175%
10	Arizona	$476,008,984	$377,544,759	$16,309,650	2,315%
11	Arizona	$268,279,462	$190,765,810	$9,843,499	1,938%
12	Arizona	$910,927,468	$195,694,319	$3,786,966	5,168%
14	California	$103,943,584	$66,247,148	$1,058,466	6,259%
16	California	$80,660,296	$61,673,303	$1,538,756	4,008%
17	Colorado	$238,308,976	$207,701,503	$31,408,873	661%
18	Colorado	$589,558,672	$542,192,858	$113,625,314	477%
19	Idaho	$144,087,184	$125,663,729	$42,790,195	294%
20	Idaho	$55,907,344	$43,620,844	$3,582,987	1,217%
21	Idaho	$292,359,952	$252,746,225	$30,674,519	824%
22	Minnesota	$103,807,504	$49,644,979	$816,579	6,080%
23	Minnesota	$615,141,712	$409,720,362	$13,406,751	3,056%
24	Minnesota	$333,755,488	$257,035,998	$3,244,982	7,921%
25	Minnesota	$17,696,080	$9,011,733	$5,689,408	158%
28	Montana	$48,885,616	$46,314,830	$5,500,713	842%
29	Montana	$174,133,648	$158,212,442	$28,056,259	564%
30	Nevada	$796,572,640	$722,959,141	$45,971,063	1,573%
31	Nevada	$113,563,306	$100,782,999	$12,150,792	829%
32	Nevada	$693,600,904	$611,470,066	$97,479,893	627%
33	Nevada	$10,408,996	$9,109,175	$524,955	1,735%
34	Nevada	$910,681,390	$864,396,538	$20,731,752	4,169%
35	Nevada	$525,997,972	$501,022,167	$10,047,890	4,986%
36	Nevada	$379,025,902	$357,352,006	$17,989,928	1,986%
37	Nevada	$530,197,174	$498,483,293	$32,144,530	1,551%
38	Nevada	$605,052,514	$604,502,514	$34,208,230	1,767%
39	Nevada	$179,837,668	$89,848,452	$24,399,139	368%
40	Nevada	$661,467,880	$627,458,793	$37,656,153	1,666%
41	Nevada	$181,298,260	$168,048,137	$8,025,417	2,094%
43	New Mexico	$798,624,046	$761,719,351	$167,526,076	455%
44	New Mexico	$681,328,756	$653,759,482	$122,314,118	534%
45	South Carolina	$192,048,580	$149,592,031	$33,887,100	441%
46	Utah	$179,951,068	$161,664,770	$3,166,340	5,106%
47	Nebraska	$178,441,714	$6,071,945	$1,238,602	490%

[108] Includes multipliers for NRD and Regional Adjustment. Formula results from EPA 2016, "Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule", Exhibit B-7

[109] Based on EPA calculated FR formula amount (no reductions) minus EPA's estimate of FR including reductions. Data from EPA 2016, "Regulatory Impact Analysis of Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry Proposed Rule", Exhibit B-7 and Exhibit B-9.

[110] FA amount approved by relevant regulatory body supporting current FA. Data from "Expanded Appendix B - CERCLA HRM Facilities Est. Response Costs (EPA-HQ-SFUND-2015-0781-2088)"

5.8 Reductions summary

SRK agrees with EPA's basic premise, integral to its reduction strategy, namely that existing state and federal regulations and FA requirements are effective at reducing the degree and duration of risk related to mine closure to the point that additional CERCLA §108(b) FR is not required. Yet, because the EPA methodology is based on a poor understanding and misapplication of existing state and federal regulatory programs, the outcome is vague, arbitrary, inconsistent with existing laws, and will take years to implement.

6 Conclusions

EPA's approach to FR cost estimation in the proposed CERCLA §108 (b) rule is full of circular reasoning, inconsistencies, internal contradictions, unsupported assumptions vague criteria, and grossly inflated risk calculations.

The basic premise that there is a need for the Proposed Rule is countered by EPA's own methodology. EPA utilized existing mine reclamation and closure costs to provide the basis for its Proposed Rule. The stated reason that EPA selected these sources is that the actions required for mine reclamation and closure are similar to response actions implemented at HRM CERCLA sites. This directly contradicts EPA's contention that the requirements of CERCLA §108(b) are functionally different from closure and reclamation requirements covered by existing regulatory programs.

In reviewing EPA's approach, it is clear that EPA either does not understand how existing regulatory programs reduce the degree and duration of risk associated with HRM sites, or is simply second-guessing state and federal regulators, the experts at regulating risk from the HRM industry, and substituting its inferior risk calculating formula for tested and proven regulatory programs. Either way, EPA's approach is wrong. Since the actions normally required for mine operations, reclamation and closure under existing regulatory programs are the same as those implemented by EPA on HRM CERCLA sites[111], there is no justification for the EPA to implement the duplicative program EPA would create under the Proposed Rule.

EPA ignores the industry best practice of calculating site-specific FA costs in favor of overly simplistic formulas based on statistical manipulation of misunderstood and misinterpreted data simply because using site-specific, best practices "*would present a significant regulatory burden on the Agency*".[112] The fact that the site-specific approach has been used for nearly three decades in existing state and federal regulatory programs contradicts this contention, especially since the work has largely already been done as evidenced by the source data used by the EPA to create their formulas.

It appears that EPA's formula was designed to replicate the costs incurred in remediating the most expensive legacy Superfund sites. This premise is inapplicable at highly regulated modern mines where the environmental controls make remediation on the scale of a Superfund cleanup highly unlikely. During the February 3, 2017, Environmental Roundtable hosted by the Small Business Administration, EPA stated that the purpose of the formula was to produce a total site response cost similar to costs incurred at pre-regulation CERCLA HRM sites "such as Summitville." EPA's pursuit of this predetermined outcome is neither necessary nor appropriate.

[111] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.
[112] 82 Fed. Reg. at 3401.

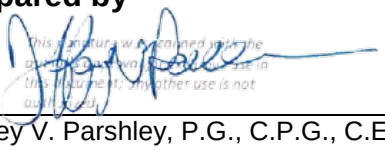
In creating an overly simplistic, one-size-fits-all formula based on a flawed interpretation of the source data and statistical manipulation of these data, EPA has created formulas that reproduce the costs associated with extreme outliers. Application of these outliers to all sites would place an unnecessary and unreasonable burden on the majority of mine sites.

EPA's Proposed Rule is premised on the idea that all currently operating and future mine sites will result in conditions experienced at historic, pre-regulation HRM CERCLA sites, which ignores all of the required environmental protection measures and monitoring, reporting, and inspection requirements in current federal and state environmental and mining laws and regulatory programs.[113] Furthermore, EPA's failure to consider the probability of occurrence in its analyses results in an unsupportable and entirely unrealistic conclusion that all sites will require remedies for every response category. This is not consistent with historic HRM CERCLA sites where not all mine features are universally present and not all remedies are required.

EPA's response to many of the concerns raised during various meetings are that reductions will allow most operators to reduce their FR through implementation of controls required under other regulatory programs and providing FA for those controls. If the controls required by and FA provided under current regulatory programs can reduce the FR amount to zero, then the current programs are the functional equivalent of the Proposed Rule and the Proposed Rule is unnecessary and duplicative.

The bottom line is that EPA used unsupportable assumptions, over simplification, misuse of source data, and statistical manipulation to develop the Proposed Rule. The Proposed Rule is not based in sound science or engineering principles and therefore does not withstand scrutiny. The Proposed Rule ignores the current state of practices in the HRM industry and the effectiveness of the existing federal and state regulatory programs. SRK believes this Proposed Rule is unnecessary and would place an unreasonable burden on an already highly regulated industry without the benefit of reducing any significant risks not already addressed by existing regulatory programs.

Prepared by



Jeffrey V. Parshley, P.G., C.P.G., C.E.M.
Group Chairman and Corporate Consultant

and

John H. Pfahl M.S.
Principal Consultant

[113] Struhsacker D. and SRK Consulting, Review of State Financial Responsibility Requirements for Hardrock Mines and the Response Categories in EPA's CERCLA § 108(b) Proposed Rule, July 2017.

Reviewed by

Project Reviewer
Mark A. Willow, MSc. C.E.M., SME-RM
Principal Environmental Scientist

Appendix A: Key Information Examined During Review

Appendix A – Key Information Examined During Review

Information Cited in Footnotes

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Appendix B: Example of some site-specific factors that are considered in risk-based management and closure of mine sites

Table A-6-1: Selected site-specific criteria used in risk-based management and closure planning

distance to nearest population
land use status
topography
drainage patterns
distance to the nearest surface water body
depth to groundwater
physical and chemical characteristics of underlying geologic materials
direction and speed of groundwater flow
existing and potential future uses of water resources
baseline surface water and groundwater quality
special biological considerations
wetlands
special habitats
characterization of native flora and fauna
annual precipitation
average amount
pattern
quantity as snow
sublimation
snowmelt (timing, duration)
evaporation
quantity
distribution through the year
wind
direction
velocity
temperature
annual temperatures
diurnal variations

number of days below freezing
number of days of sunshine
radiant energy
mining and mineral processing methodology
construction methods used in facility construction
surface area of the facility
height of the facility
total volume of the facility
detailed geochemical characterization of all mine waste
distribution and location of geochemical materials exposed in the final pit walls or underground workings
geotechnical conditions of pit walls and underground workings
physical properties of mine waste materials
grain size distribution
density
shear strength
compaction characteristics
hydraulic properties of possible cover materials
geochemical properties of possible cover materials

Appendix C: Authors' Credentials

Authors' Credentials

Jeffrey V. Parshley, PG, CPG, NV-CEM

Jeff Parshley is a Corporate Consultant with more than 35 years of environmental and closure experience in the mining industry including closure planning and closure cost estimates, environmental management planning, and environmental auditing. In addition to planning and analysis work for mines, he has also been involved in the management of several abandoned mines and implementation of actual closure works at several mines in the western United States. In 2014 Jeff was awarded the SME/AIME Environmental Conservation Distinguished Service Award for his work on the development of the Standardized Reclamation Cost Estimator (SRCE). His work on closure projects over the last 10 years has included development and use of facilitated workshop techniques as part of the stakeholder engagement process for mine closure planning.

He has worked with legal and policy aspects of mining projects since his early career, regularly works on World Bank and IFC compliance projects and is also one of SRK's most experienced mine closure strategists and regulatory specialists. Through the World Bank, he has been advising the government of the Republic of Kazakhstan on mine closure and financial assurance aspects of their new mining law. He has contributed to the development of several regulatory guidelines for mine closure and closure cost estimating and assisted a number of clients develop corporate standards and guidance documents for closure planning, implementation and cost estimating. Jeff is a regular mine closure and closure cost estimating instructor for in-house workshops conducted for a number of mining companies and several U.S. government agencies.

He developed numerous closure plans and cost models and taught related courses for clients, mining industry groups and regulatory agencies. He has worked on more than 100 international mine closure.

In the early 2000s the mining industry and regulators in the State of Nevada joined to investigate the concept of a standardized approach to reclamation cost estimating which ultimately resulted in the creation of the SRCE model. Jeff was the principal creator and driver of this public domain software. Since the original release in 2004, Jeff has continued to volunteer his time to expand the capabilities of the model. In 2009, Jeff released an international version that is now being used by the industry globally in more than 30 countries. Since developing the original version of SRCE he has developed several derivative versions that combine financial security estimates with Life-of-Mine closure cost estimates and Asset Retirement Obligation cost estimates.

John H. Pfahl

John Pfahl is a mining engineer with over 15 years of global experience in the mining industry. He is a Corporate Advisory Consultant with SRK. Mr. Pfahl has expertise in strategic planning, business improvement, investment analysis, risk analysis, capital markets and project valuation in the mining field. His background activities include project and investment management, strategic evaluations, technical and commercial due diligence, technical studies, financial modeling, structuring and negotiating terms in mergers and acquisitions, mine planning and project finance for projects ranging from exploration through production and across a broad spectrum of commodities.

Mark A. Willow, M.Sc., NV-CEM, SME-RM

Mr. Willow is a Certified Environmental Manager (CEM) in the State of Nevada, with over 20 years of environmental experience related to the mining industry. Mr. Willow has a Bachelor's degree in

Fisheries and Wildlife Management from the University of Missouri and a Master's degree in Environmental Science and Engineering from the Colorado School of Mines. As a CEM, Mr. Willow has been certified by the State of Nevada to officially handle matters concerning: the management of hazardous waste; the investigation of a release or potential release of a hazardous substance; the sampling of any media to determine the release of a hazardous substance; the response to a release or cleanup of a hazardous substance; or the of remediation soil or water contaminated with a hazardous substance.

Mark routinely provides environmental due diligence and Qualified Persons evaluations of developmental phase and operational phase mines throughout the world, including small gold and copper mining projects in Panama and Senegal (West Africa), open pit and underground coal mines in Russia, large copper mines and processing facilities in Mexico, gold mining in the Philippines, and a mining/coking operations in China. This international experience crosses over to include the participation in the development and preparation of PEA, PFS, and BFS documents for such projects as: the Elk Creek Niobium Project PEA in Nebraska; the Paul Isnard Project PEA and BFS in French Guiana; the Miraflores Open Pit/Underground, Gold Project PEA and FS in Columbia, the Trinidad Project PEA in Mexico, and the Boa Esperança Copper Project BFS in Brazil. For many of these projects, the documentation was required to be NI 43-101 compliant, as well as in line with the Equator Principles.

Mark's technical experience includes extensive site characterization and baseline data collection projects. Internationally, Mark has overseen the work scope implementation and provided senior review of local consultants performing baseline biological/ecological characterization for a number of projects, including the Reko Diq Project in Pakistan, Los Filos Project in Mexico, the Kazan Trona Project in Turkey, the Bellavista Gold Project in Costa Rica, the Pueblo Viejo Project in the Dominican Republic, and the Glamis San Martin Project in Honduras. Most of these projects involved the biodiversity impact analyses of sensitive aquatic and terrestrial wildlife habitat from both the existing and proposed mining operations. Mark draws upon this diverse background for his knowledge and experience as a human health and ecological risk assessor with respect to analyzing potential environmental impacts.

Jeff Parshley, P.G.

SRK Group Chairman and Corporate Consultant

Profession	Corporate Consultant
Education	Dartmouth College, Hanover, NH, B.A. Geology, 1980
Registrations/ Affiliations	Registered Professional Geologist: Idaho, Oregon, California, Wyoming, Washington, Utah, Texas; AIPG Certified Professional Geologist; Nevada Certified Environmental Manager; Nevada Mining Association; California Mining Association; Northwest Mining Association; Society for Mining Metallurgy and Exploration; Geological Society of Nevada; 2011 Northwest Mining Association Presidents Award; **2014 AIME/SME Environmental Conservation Distinguished Service Award**

Specialization

Mine closure and remediation, mine environmental studies, mine permitting, and environmental geochemistry

Expertise

Mr. Parshley has more than 35 years of project experience throughout the North America, Latin America, Australia, Asia, Europe and Africa, which includes mine permitting, environmental audits, feasibility and due diligence studies, mine closure design and permitting, liability assessments, reclamation and closure cost estimating, pit lake studies, mine waste studies and environmental geology. He has considerable experience in the permitting and closure of gold heap leach operations in the western U.S. and has lectured in the U.S., Latin America, Europe, Australia and Africa on mine closure planning and design. He regularly heads multi-disciplinary teams on projects ranging from environmental liability assessments to permitting to mine closure. He is currently carrying out a number of mine permitting, remediation and environmental geochemistry projects, a large underground mine expansion and several permanent mine closures.

Employment

1988 - Present	SRK Consulting (U.S.) Inc., Reno, Nevada. Group Chairman and Corporate Consultant
1985 - 1988	Ore Deposits Research Group, Chevron Oil Field Research Company. Research Geologist
1981 - 1985	Chevron Resources Company, Exploration Geologist

Publications

Numerous publications on mine environmental issues, environmental geology and mine closure

Languages

English

Jeff Parshley, P.G.
Corporate Consultant

Publications

1. “Attractive nuisances and wicked solutions”; in Mine Closure 2016 - A.B. Fourie, M. Tibbett (eds); JV Parshley and CS MacCallum; March 2016.
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34. “An Integrated Approach to Mine Design for Construction, Permitting and Closure”; J. Parshley; 1993; paper presented to members of the Chemical Lime Industry.
35. “Design and Permitting for Underground Stratigraphic Deposits - A Case Study”; J. Parshley; 1991; paper presented to Gemcom Users Group, Vancouver, B.C.

Jeff Parshley, P.G.
Corporate Consultant

Key Experience: Mine Closure and Closure Cost Estimating

Mr. Parshley has worked on numerous mine closure projects in the Americas and Europe for more than 25 years. His work varies from mine closure planning and cost estimating to directing closure design and implementation teams. He is the primary author of the Nevada Standardized Closure Cost Estimator (SRCE) model developed as a joint project of the Nevada mining industry, the U.S. Bureau of Land Management (BLM) and the Nevada Division of Environmental Protection (NDEP) to standardize closure cost estimating procedures. Continuing work on the SRCE has included and international version and a proprietary derivative version being used by SRK and a major client for the calculation of closure cost estimates for long term planning and financial reporting

He regularly lectures to industry, government agencies and international organizations on mine closure issues.

Recent project experience includes:

Kumtor Gold Mine, Kyrgyzstan

- Developed closure plan update for the second highest gold mine in the world (4300 m). Included closure planning, social closure planning, evaluation of stability of geotechnical structures, closure cover design, revision of closure design criteria, surface water management, facilitating a closure risk assessment workshop, and preparation of closure costs.

Maricunga Mine, Chile

- Developed updated closure plan for highest gold mine in the world (4500 m). Included detailed assessment of closure cover alternatives, high altitude conditions, snow accumulation, environmental impacts to sensitive wetlands, geochemistry of mine wastes, and closure costs. Included development of detailed schedule for closure of the heap leach pad.

Pontifica Universidad Catolica de Valparaiso

- International instructor on closure costs for graduate program in mine closure entitled: Postítulo Cierre de Faenas Minerari

World Bank, Kazakhstan

- Comparative analysis of financial mechanisms for environmental and social sustainability of mine sites after closure in Kazakhstan. Recommendations for revision to mining law to conform with good international practice on mine closure planning and financial assurance for social and technical closure.

Vale, Brazil

- Expert advice on the development of and integrated land use planning, stakeholder, closure strategy, closure plan system for large mining company.

Rio Tinto – Kennecott Utah Copper Corporation, Utah

- Third-party review of closure plan and supporting technical documentation for large copper mine and processing facilities.

Suralco, Suriname

- Integrated land use planning, stakeholder, closure strategy, closure risk assessment, and closure plan development for country-wide bauxite mine closure initiative including five pilot sites

Udokan Mine Closure Plan, Russia

- Closure strategy workshops, risk assessment, closure plan development, closure cost estimate for FS and ESIA for large, open pit copper mine in Far East Russia

Kettle River Mine Closure Planning, Washington

- Closure strategy workshops for open pit and underground pit copper mine in Washington, USA

Jeff Parshley, P.G.
Corporate Consultant

Tonkolili Mine Closure Cost Estimate, Sierra Leone

- Closure strategy review and ARO cost estimate for iron ore mine in Sierra Leone

Rosbery Mine Closure Cost Estimate, Australia

- Closure strategy review and cost estimate for gold mine in Tasmania, Australia

Çöpler Mine Closure Plan, Turkey

- Closure plan development, closure cost estimate for FS, open pit gold mine in Turkey

Öksüt Mine Closure Plan, Turkey

- Closure plan development, closure cost estimate for PEA, open pit gold mine in Turkey

Long Canyon Mine Closure Plan, Nevada

- Closure plan development for open pit gold mine in Nevada, USA

Hemerdon Tungsten Mine, England

- Closure plan development, closure cost estimate for permitting, open pit tungsten mine in Cornwall

Lumwana Mine Closure Plan, Zambia

- Closure strategy workshops, risk assessment, closure plan development, closure cost estimate for large, open pit copper mine

Jabal Sayed Mine Closure Plan, Saudi Arabia

- Closure plan and cost estimate development underground copper mine

Polyus Gold Operational Closure Plans (5 sites), Russia

- Closure plan audits, closure plan and cost estimate for 4 operating gold mines and one greenfield project in Siberia

ENRC, Kazakhstan

- Audited closure and post-closure liability estimates for financial reporting as part of IPO.

Santa Fe/Calvada Mine, Nevada

- Closure plan audit
- Development of new closure plan to address unresolved issues

Closure Plan and Cost Estimates (4 sites), Tanzania

- Closure plan and cost estimate development for two open pit and two underground gold mines
- Developed to meet new regulatory requirements and corporate standards

Pueblo Viejo Mine Closure Plan, Dominican Republic

- Closure plan development for large open pit gold mine redevelopment project
- Closure strategy development for historic mining disturbances associated with major redevelopment of a gold mine

Cerro Casale Mine Closure Plan, Chile

- Mine closure planning and cost estimate for prefeasibility study, feasibility study and ESIA for the greenfield copper-gold project near Copiapo Chile

Hycroft Mine Closure and Reclamation Plans, Nevada

- Mine closure and reclamation plan and cost estimate for redevelopment of existing gold mine in northwest Nevada

Fedorovo Platinum Mine Closure Plan, Russia

- Mine closure planning and cost estimate for feasibility study and ESIA for the Fedorovo greenfield project in the southern Kola Peninsula, Russia

Jeff Parshley, P.G.
Corporate Consultant

Reko Diq Copper/Gold, Pakistan

- Mine closure planning and cost estimate for feasibility study and ESIA for the greenfield copper-gold project in northwest Pakistan
- The site is located in the desert region of Baluchistan

Sedibelo Platinum Mine Closure Plan, South Africa

- Mine closure planning and cost estimate for the Sedibelo greenfield platinum project in South Africa
- The site is located in the Bushveld Complex and immediately adjacent to the Pilanesburg National Game Park

Çayeli Bakir İúletmeleri A.Û./Inmet Mining, Çayeli, Turkey

- Developed updated, comprehensive mine closure plan and cost estimate for the Çayeli and Cerattepe underground massive sulfide mines including the mines, concentrating plant, loading/unloading facilities, and marine port

Donlin Creek, Alaska

- Mine closure plan and cost estimate for the Donlin Creek gold project in Alaska for use in the Prefeasibility and Feasibility study

Barrick Australia Pacific, Australia

- Performed closure plan risk assessments for 14 mine sites in Australia and PNG
- Prepared detailed closure cost estimates for each mine site
- Developed proprietary cost estimating model for ARO calculations
- Assisted with development of corporate closure plan format guidelines

Confidential Client, Kazakhstan

- Audited clients closure cost estimates to determine compliance with international industry standards, Kazakh law and international financial reporting requirements for AROs

Confidential Client, North America

- Prepared conceptual plan for prefeasibility and feasibility studies on remote mine site
- Prepared detailed closure cost estimate suitable for prefeasibility and feasibility studies

Barrick North America, Various Sites, Western USA

- Prepared detailed ARO closure cost estimates for each mine site

Barrick North America, Puffy Lake, Manitoba, Canada

- Development of a detailed closure cost estimate for historic mining site

Pueblo Viejo, GODR, Dominican Republic

- Reviewed proposed closure approach
- Updated closure cost estimate for four separate scenarios

Standard Mine, Jipangu Inc., Nevada, USA

- Updated closure plan to incorporate mine expansion
- Prepared detailed closure cost estimate including long-term water management

Hycroft Mine, Allied Nevada, Nevada, USA

- Performed closure plan risk assessments for modern gold mine
- Assisted client in permitting closure plan and new mine expansion
- Prepared detailed closure cost estimate including long-term water management

Cortez Mine, Barrick Cortez JV, Nevada, USA

- Developed detailed closure plan including evaluation of alternative closure methods

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Corporate Consultant

- Prepared detailed closure cost estimate including long-term water management
- Prepared closure plan documents for regulatory submittal

Nevada Mining Association (in cooperation with NDEP and BLM), Nevada, USA

- Development of a standardized closure cost estimating spreadsheet model to be used by all mines in Nevada for regulatory closure cost estimates

CR Briggs Mine, Canyon Resources, California, USA

- Developed conceptual and detailed closure strategy including evaluation of alternative closure methods
- Final design and permitting

Yanacocha Mine – Minera Yanacocha SRK, Peru, SA

- Detailed closure strategy including evaluation of alternative closure methods
- Closure cost estimate based on detailed closure strategy

Quiruvilca Mine – Pan American Silver, Peru, SA

- Detailed closure strategy including evaluation of alternative closure methods
- Closure cost estimate based on detailed closure strategy

Morococha Mine – Pan American Silver, Peru, SA

- Assessment of closure liabilities and preliminary closure plan
- Closure cost estimate

Elder Creek Mine – Bureau of Land Management/U.S. Army Corps of Engineers

- Mine waste characterization and geochemistry
- Heap characterization
- Site-wide closure design and costing
- Detailed closure design and construction management

Gooseberry Mine – Bureau of Land Management

- Mine waste characterization and geochemistry
- Heap leach closure design and costing
- Detailed closure design and construction management

Yankee Mine - Placer Dome (U.S.) Inc., Nevada, USA

- Closure of heap leach pad

Silvermines District - Department of Marine and Natural Resources, Republic of Ireland

- Geochemical studies (ARD), closure liability assessment and planning of historic mining district

Bulyanhulu Mine - Kahama Mining Corporation Limited (Barrick), Tanzania

- Closure plan and cost development for new gold mine

Los Pelambres - Minera Los Pelambres, Chile

- Closure planning for three large tailings impoundment’s during original design
- Evaluation of alternatives for construction, operational and closure cost considerations

BHP Robinson - BHP-Billiton, Nevada, USA

- Closure studies, mine waste characterization, pit lake studies, closure planning and cost estimation

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Corporate Consultant

Borealis Mine - Echo Bay Mining Company, Nevada, USA

- Closure planning and implementation of three large heap leach pads, four open pits (one pit lake) and waste rock dumps

Atlanta Gold Project – Twin Mining Corporation, Idaho, USA

- Development of closure plan for heap leach pads, waste rock dump and pit lake

Brewery Creek - Viceroy Gold Corporation, Yukon Territories, Canada

- Closure planning of heap leach pad in sub arctic environment

Getchell Mine - Getchell Gold Corporation (Placer Dome), Nevada, USA

- Pit lake studies, geochemistry, closure design and cost estimation for open-pit/underground mine with waste rock dumps, pit lakes, heap leach pad and tailings impoundment

Pipeline Mine - Cortez Joint Venture (Placer Dome), Nevada, USA

- Closure planning and cost estimating for large open-pit gold mining operation

Leviathan Mine - ARCO, California, USA

- Closure site assessment and options analysis for historic mine with waste rock dumps and open pit.

Marquez Mine - Keyspan Energy Corporation, New Mexico, USA

- Closure planning, permitting and implementation for underground uranium mine and process facilities

Toiyabe Mine - Cortez Joint Venture (Placer Dome), Nevada, USA

- Closure design, cost estimating and implementation for two heap leach pads, waste rock dumps and open pits

Tonkin Springs Mine - Nevada Contact, Nevada, USA

- Closure options study, ARD geochemistry, pit lake study, permitting, cost estimating, closure plan implementation

Griffon Mine - U.S. Forest Service - Alta Gold Company Bankruptcy, Nevada, USA

- Closure design, management and implementation of heap leach pad, open pits, process facilities and waste rock dumps

Tonopah Mine - Equatorial Minerals, Inc., Equatorial Minerals, Inc.

- Waste rock dump characterization (ARD) and pit lake study for closure design and costing

Mineral Ridge - St. Paul/USF&G Insurance Company (Bankruptcy), Nevada, USA

- Closure liability audit, detailed closure design and cost estimation for heap leach pad, waste rock dumps and open pits

Pinos Altos Mine - Cyprus Metals Corporation, New Mexico, USA

- Closure design, permitting and implementation of underground copper mine and tailings impoundment

Copper Flat Mine - Alta Gold Company, New Mexico, USA

- Technical studies, closure design, closure permitting and cost estimation for pit lake, ARD waste rock and tailings impoundment

Conquista Uranium Mine, Conoco, Texas

- Strategic planning for final closure of uranium mine and mill and future transfer of site to U.S. Department of Energy

Camden Titanium Sands Project, Mineral Recovery Systems, Tennessee

- Designed mine closure for grassroots titanium sands operation in western Tennessee, including stormwater controls, wetland mitigation and closure cost estimating

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Yerington Mine, Nevada Division of Environmental Protection, USA

- Mine closure management including operational solution management, hazardous waste assessment, water balance studies, passive closure management design and closure cost estimating

Jeff Parshley, P.G.
Corporate Consultant

Key Experience: Mine Permitting and Mine Environmental Studies

Mr. Parshley has worked on mine permitting and mine environmental study projects throughout the western U.S. since the mid-1980's. This work has included preparation of Plans of Operation, Reclamation Plans, NEPA documents, Groundwater Protection Permits, NDPES permits, 404 Permits, closure plans and numerous environmental studies prepared as part of or in support of various permit applications. He regularly heads multidisciplinary teams preparing a wide variety of environmental and planning documents for mining projects in the western U.S. He is also one of SRK's most experienced environmental auditors for due diligence and environmental liability audits in North and South America. He has worked for mining companies, government agencies, financial institutions, and insurance companies.
Recent project experience includes:

Long Canyon, Nevada, USA

- SRK is preparing specialist technical studies in preparation for permitting of a greenfield gold mine
- Preparing closure plan and cost estimate for feasibility study

Lumwana Mine, Zambia

- SRK conducted specialist environmental studies in preparation for development of an ESIA
- Studies will be summarized for inclusion in the project prefeasibility study

Pueblo Viejo, PVDC (Barrick), Dominican Republic

- SRK oversaw the baseline studies, stakeholder consultation and EIA development for a new power plant and transmission line for the Pueblo Viejo gold mine in the DR. Both national and international (IFC/World Bank) standards were met on a short schedule through use of rapid assessment techniques

Yerington Mine, Singatse Peak Services, Nevada, USA

- SRK is assisting SPS in their efforts to evaluate future mineral potential of a previously abandoned mining property in western Nevada. SRK has conducted environmental studies, prepared exploration permit applications, developed engineering and water management plans, and evaluated the economic potential of the site. Complicating this project is the fact that the USEPA has ongoing CERCLA actions as the result of a previous operator. This has required coordination between the client and both state and federal regulators.

Reko Diq Copper/Gold, Tethyan Copper (Barrick/ Antofagasta JV), Pakistan

- SRK conducted specialist environmental studies, prepared the ESIA and closure plan, and assisted in the preparation of the feasibility study for Tethyan Copper's large greenfield copper gold project in northwest Pakistan

Fedorovo Platinum Mine Closure Plan, Russia

- SRK oversaw the preparation of the ESIA, OVOS (Russian requirement), specialist environmental studies, closure plan, and assisted in the preparation of the feasibility study for Barrick's greenfield platinum project in the southern Kola Peninsula, Russia

Mt. Hope, General Moly Inc., Nevada, USA

- SRK conducted geochemical and mine waste studies in support of permitting and environmental analysis documents for a very large, greenfield molybdenum mine in north-central Nevada. The work included a geological and geochemical assessment of future mine waste, geochemical characterization of tailings, pit wall geochemistry, preparation of a waste rock management plan and completion of a pit lake study to assess the future pit lake chemistry

Round Mountain Mine, Round Mountain Gold Corporation, Nevada, USA

- SRK assisted RMGC in updating various mine permitting documents including completion of several environmental studies. This work included a waste rock and heap leach charactization program, closure cover design modeling, an update to the waste rock management plan, ore stockpile characterization and completion of a new Water Pollution Control Permit application including all accompanying operating and environmental management plans

Jeff Parshley, P.G.
Corporate Consultant

Cortez Hills Plan of Operations, Cortez Joint Venture, Nevada, USA

- SRK was contracted to prepare the Plan of Operation for the Cortez Hills Modification to the Pipeline Plan of Operations. Jeff Parshley is the Project Principal for this project and responsible for quality assurance/quality control of technical deliverables, and overall successful execution of the project

Coeur Rochester Expansion EIS, BLM/Coeur d'Alene Mines Corporation, Nevada, USA

- SRK is preparing the EIS for a final mine expansion and closure of the Coeur Rochester mine in Nevada. The work has included compilation of work baseline prepared by others, preparation of project alternatives, assessment of potential environmental impacts from the various alternatives

Los Filos Gold Mine, Mexico

- SRK was contracted to prepare the ESIA in conformance with Mexican regulations and international standards. The work included baseline studies, impact analysis, public consultation, closure planning, development of environmental management plans and environmental liability cost estimation

Millennium Expansion SEIS, Glamis Gold Mining Company, Nevada, USA

- SRK was contracted to prepare the third-party Supplemental EIS for the Millennium Expansion Project at the Marigold Mine. Jeff Parshley was the Project Principal for this project and was responsible for quality assurance/quality control of technical deliverables, and overall successful execution of the project. Jeff assisted the Project Manager with the evaluation of the Project compliance with regulatory requirements and the procedural requirements of NEPA. In addition to his role as Project Principal, Mr. Parshley was also responsible for technical sections regarding Geology and Minerals, Water Quality and Quantity, and the assessment of the heap closure and reclamation

AMAX Gold Company, Hayden Hill Mine, Susanville, California.

- Jeff's primary responsibilities were review of project geology and the proposed mining operations with respect to environmental impacts and assist the project manager in coordinating Reno project personnel. A number of design alternatives for the mining operations were proposed requiring assessment of both environmental and operational impacts. The dump design, haul road placement and pit reclamation alternatives were reviewed in detail to determine the impact on geologic and economic resources and reclamation. These assessments were incorporated into the EIR/EIS and the Reclamation Plan. Jeff was also responsible for the assessment of areal disturbance to local resources by the project

Getchell Mine Plan of Operation, Reclamation Plan, EAs, Water Pollution Control Permit, Getchell Gold Inc., Nevada, USA

- Detailed permitting for expansions and closure of the historic, operating and future facilities at the Getchell Mine began in 1995. Since that time, SRK has been working on permitting efforts and related technical studies to support the permitting efforts. SRK's work has involved geochemical and geologic studies, geotechnical investigations, detailed engineering designs, ecological risk assessment, phytotoxicity studies, permitting, and NEPA analyses

Tenmile Plan of Operation, Reclamation Plan and EA, Chemical Lime Company, Idaho, USA

- Jeff was responsible for managing the mine design and permitting for a high grade limestone mine under development near Soda Springs, Idaho. Cold winter conditions at the site were a major consideration for the design, scheduling and environmental analysis of the project. Jeff's technical responsibilities on the projects were: review of existing geologic data, evaluation of the environmental impacts from various mine designs, and preparation of the reclamation plan This work led to a mine design which has minimized the environmental impacts without sacrificing the economic viability of the project. As a result, the project was permitting in six months, the reclamation plan was accepted as initially submitted, the mine opened on schedule and the design work was completed within budget. Jeff also provided liaison with the Idaho Department of Lands, Idaho Fish and Game, Department of Environmental Quality and the BLM during the NEPA process

Cricket Mountain Plan of Operation, Reclamation Plan and EA, Graymont, Utah, USA

- SRK assisted Greymont on two separate mine expansion projects or the Cricket Mountain limestone mine in central Utah. During this work SRK prepared a number of planning and state and federal permitting documents. SRK's work included reclamation design, plan modifications, NPDES stormwater permitting and EA preparation. In the role of

prime environmental contractor for the operator, SRK was responsible for subcontractor work including biological, cultural and socioeconomic studies

Toiyabe Mine, Cortez Joint Venture (Placer Dome), Nevada, USA

- SRK, under Jeff's oversight, conducted the investigation, site characterization, closure design, permitting cost estimating and construction for two heap leach pads, waste rock dumps and open pits. This also included preparing closure permit documentation and a new NEPA analysis of the closure plan

Tonkin Springs Mine, Nevada Contact, Nevada, USA

- Over a period of three years, SRK conducted a number of environmental studies, designed and implemented mitigation for a number of environmental concerns, and prepared updated permit documents for all of the major permits for the Tonkin Springs Mine. When SRK first became involved none of the project disturbance was reclaimed, the site water balance was unmanageable, stormwater plans were inadequate, and a number of permits had lapsed or expired. SRK conducted a number of critical technical studies on an accelerated schedule and provided the client and regulators with recommendations on all of the key issues ahead of the project schedule. As the client implemented the recommended actions, most of the key environmental concerns were mitigated within one year. SRK's work include, a hydrogeology study, reclamation planning, closure options study, ARD studies, water balance, geochemistry, pit lake study, closure permitting, cost estimating, exploration permitting, and NEPA analysis

Yankee Mine, Placer Dome (U.S.) Inc., Nevada, USA

- SRK prepared the detailed closure design, permit documents and the EA for the closure of Yankee heap leach pad at Bald Mountain Mine in northern Nevada. The primary concerns were the characterization of mine waste, geochemical behaviour of the heap leach pad, hydrogeology and groundwater quality, long-term ecological impacts and phytotoxicity. SRK also prepared the EA for the closure design for the BLM, Ely Field Office

Pinos Altos Mine, Cyprus Metals Corporation, New Mexico, USA

- Closure design, permitting and implementation of underground copper mine and tailings impoundment The Cyprus Pinos Altos Mine ceased operations in 1995. The underground mine and associated tailings impoundment required closure under the new regulations in New Mexico. The underground mine was sealed and the support facilities removed. The tailings impoundment, located near a leased mill facility 60 miles from the mine, will be closed once the proposed closure design has been approved by the regulatory agencies. Jeff managed the technical team responsible for developing final closure plans and post-closure environmental management plans for both sites. His specific duties included agency and client liaison, and primary authorship of the closure and environmental management plans

Copper Flat Mine, Alta Gold Company, New Mexico, USA

- Technical studies, closure design, closure permitting and cost estimation for pit lake, ARD waste rock and tailings impoundment. Jeff was responsible for assisting Alta through the Federal and State permitting process. This project will be the first major new mine permitted under New Mexico's new Mining Act. The environmental issues of concern are groundwater and surface water protection, ARD potential, post-mining pit water chemistry, tailings seepage, wildlife habitat and reclamation. SRK's technical work on the project includes hydrology, hydrogeochemistry, mine waste and tailings engineering, dump design, and reclamation and closure planning

Pipeline Project, Cortez Gold Mines, Nevada, USA

- Cortez Gold Mines expanded the Pipeline Mine to include new gold reserves discovered south of the Pipeline deposit. SRK was retained to develop the plan of operations and reclamation plan for permitting the expansion with the BLM and Mining Regulation Bureau of the NDEP. Jeff's work as project manager and primary author has included development of the operating and reclamation plan, agency liaison, senior review and coordination with the third-party EIS contractor. Since the completion of the South Pipeline permitting, several modifications to the Plan of Operation have been prepared by SRK along with several Supplemental EAs

Northumberland Mine, Western States Minerals Corporation, Nevada, USA

- The Northumberland Mine was required to revise and existing reclamation plan to comply with new Nevada regulations. The work was performed on a compressed schedule and required Jeff to review operational records and numerous previous environmental documents. The regulatory climate on the project required extensive knowledge of the project and regulations, and considerable liaison skills. Despite the demanding project schedule and

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Corporate Consultant

atmosphere, Jeff was able to lead a team which provided the client with a plan which skilfully delineated their regulatory obligations

- The reclamation plan included stability analysis of angle of repose waste rock dumps and heap leach pads, provisions for future mining potential, stabilization of a failing waste rock dump, and revegetation of waste rock dumps without topsoil. Jeff acted as primary author and managed a team of fifteen technical specialists in preparing the reclamation plan in four weeks. This plan was later used to revise the operating plan required by the Forest Service

Confidential Study, Pennsylvania, U.S.

- Jeff managed a team of technical specialists in reviewing the available data and permitting constraints for the expansion of a large silica deposit. The goal of the project of was to determine the existence of possible fatal flaws, either technical or regulatory which would preclude the development of a profitable mine expansion. The work included review of geologic data, sand quality data, slope stability studies, acid generating and metal leaching potential, preliminary wetlands evaluation, operational methods and alternatives, and applicable regulations for operation and closure

Cosgrave Project, Chemstar Lime Company, Nevada, USA

- Jeff was responsible for managing development of the mine plan and reclamation plan used during the NEPA process. The mine design was optimized to maximize the reserves utilizing economic optimization, blending strategies, and strategic sequencing while minimizing the impacts of permitting and reclamation. As co-author of the Plan of Operation and Reclamation Plan, Jeff was responsible for determining the effects of the mine design on the geologic resources and the environment. He also reviewed the proposed plan and evaluated the impacts of different alternatives on the environment. Several recommendations were made which eliminated or reduced the environmental impacts while increasing the profitability of the project. The proposed 12 mile haul road accessing the property required additional permitting through the Army Corps of Engineers, Nevada Department of Transportation, and the Nevada Division of Environmental Protection. Jeff's liaison work with the BLM and State was critical to developing an operating plan and reclamation plan which fulfilled the objectives of both the regulatory agencies and the project proponent. The reclamation plan was the first one approved for a mining operation under the Nevada NAC 519A regulations

Mule Canyon Mine, Gold Fields Mining Company, Nevada, USA

- A multi-disciplinary SRK team, under the project management of Jeff, was selected to redesign the reclamation plan for Gold Fields' Mule Canyon Mine to comply with Nevada and BLM regulations after the NEPA ID team raised issues regarding the proposed design. This work required the development and permitting of a new reclamation plan which involved: a complete redesign of the mine waste handling plan; an evaluation of operational methods and reclamation alternatives; a review of the existing data for slope stability, acid generating potential, revegetation potential; and participation in regular meetings with the NEPA ID team

Zaca Mine, Western States Minerals Corporation, California, USA

- SRK assisted Western States in evaluating the environmental impacts and permit requirements for the Zaca Mine project in Alpine County, California. Jeff was responsible for managing a diverse team of specialists in the evaluation of key issues such as acid generation, reclamation and heap leach pad closure in the context of required Federal, state and local permits. Permitting compliance and regulatory liaison work has included meetings and correspondence with the U.S.F.S., Lahontan RWQCB staff, and other state and local agencies

Jeff Parshley, P.G.
Corporate Consultant

Key Experience: Due Diligence and Environmental Liability Audits

Mr. Parshley had conducted due diligence and environmental liability audits on numerous mines in North America. He has worked for financial institutions, corporate clients, insurance companies and government agencies. Mr. Parshley has conducted liability audits on metal mines numerous industrial mineral properties. He has worked on large due diligence teams providing valuation assessments for large corporate mergers. He recently headed the team that evaluated 13 of the Alta Gold sites during bankruptcy proceedings. Recent project experience includes:

Confidential Client, Underground Copper Mine Redevelopment, Nambia

- Review of applicable environmental regulations
- Review of all technical, regulatory and monitoring documents for the site
- Risk assessment of all permitting and closure aspects for site development.

Confidential Client, Western U.S.

- Oversaw environmental liability review sof three closed mine sites in three western states
- Included review of permitting conditions, evaluation of future permitting liabilities
- Review of site closure actions and future closure costs

SUEK Coal Due Diligence, SUEK Coal Company, Siberia, Russia

- Oversaw team of six environmental specialists preparing environmental and closure portions of due diligence audit for 39 active coal mines in southwest Siberia
- Review of Russian environmental regulations and corporate environmental policies
- Review of all technical, regulatory and monitoring documents for the site

Confidential Client, Latin America

- Oversaw a team of six professionals conducting environmental and closure portions of due diligence audit for several active base metal mines and mineral processing facilities in Latin America
- Review of applicable environmental regulations and corporate environmental policies
- Review of all technical, regulatory and monitoring documents for the sites

SUEK Coal Due Diligence, SUEK Coal Company, Siberia, Russia

- Conducted environmental and closure portions of due diligence audit for five active coal mines in southwest Siberia
- Review of Russian environmental regulations and corporate environmental policies
- Review of all technical, regulatory and monitoring documents for the site

Hycroft Mine Environmental & Closure Due Diligence Audit, Canyon Resources

- Conducted environmental and closure portions of due diligence audit for northern Nevada gold mine
- Review of all technical, regulatory and monitoring documents for the site
- Conducted confirmation sampling program for ground and surface water
- Closure cost estimating was a key component of the work performed as part of a due diligence

Copper Mine Due Diligence Audit, Confidential Client, Mexico

- Oversaw the environmental portion and prepared the closure portions of due diligence audit for a small underground copper mine in northern Mexico. Work included review of site reports and key environmental documents and assessment of reasonable closure costs.

Environmental Due Diligence Audit, Confidential Client, Brazil

- Conducted environmental and closure portions of due diligence audit for two active and two planned mining operations in western Brazil. Work included two weeks of site visits and audits, review of all technical, regulatory and monitoring documents for the four sites. Two were copper-gold deposits and two were gold cyanide leach projects. Closure cost estimating was a key component of the work performed as part of a due diligence for an investment banking consortium

Jeff Parshley, P.G.
Corporate Consultant

Morococha Mine Due Diligence Audit, Pan American Silver, Peru

- Conducted environmental and closure portions of due diligence audit for portions of the Morococha mining district in Peru. Work included definition of conceptual closure options for all facilities, closure cost estimating and evaluation of long-term water treatment requirements

Standard Mine Prefeasibility Study, Apollo Gold, Inc., Nevada USA

- Prepared the environmental, permitting and closure portions of a prefeasibility study for Apollo Gold's Standard Mine in northern Nevada. The work included schedule and cost estimating for permitting, environmental studies, environmental management and closure

Closure Liability Audit, Confidential Client, USA

- Prepared assessment of closure risks and costs at mine site in northern Nevada. Reviewed closure designs, monitoring data to determine current conditions, and evaluated future permitting requirements. Final product was a closure risk assessment with associated cost analysis

Closure Liability Assessment, Various Properties, Confidential Client, USA

- Conducted assessment of closure liabilities at four gold mines in the western U.S. Reviewed compliance history, local regulations, closure plans and closure costs

Due Diligence Audit, Confidential Client, USA

- Prepared environmental portion of due diligence audit for major gold company merger. Work included review of all permitting requirements, environmental management systems, compliance, future permitting plans, closure designs and costs

Environmental Liability Audit, Confidential Client, USA

- Prepared assessment of long-term risks and financial liabilities of tailings facility at mine site in northern Nevada. Evaluated long-term risks and costs

Mineral Ridge - St. Paul/USF&G Insurance Company (Bankruptcy), Nevada, USA

- Closure liability audit, detailed closure design and cost estimation for heap leach pad, waste rock dumps and open pits

Environmental Liability Audit, Confidential Client, USA

- Prepared assessment of long-term risks and financial liabilities at mine site in northern Nevada. Evaluated current conditions, future permitting requirements, compliance history, and closure plans and costs

GoldCo Merger Due Diligence Study

- Assessed the environmental issues at two properties in Mexico. The local regulations, permits, operating plans and closure designs were reviewed in detail. Based on this review Jeff prepared a report addressing the current status, and present and future liabilities associated with permitting, environmental issues and mine closure

Environmental Liability Audit, Confidential Client, USA

- Prepared assessment environmental liabilities at mineral processing and mine waste disposal facilities in northern Nevada. Evaluated future permitting requirements, compliance history, and closure plans and costs

Anglo Gold Corporation, Due Diligence Study

- Reviewed the environmental compliance, permitting status, and environmental feasibility of the U.S. properties, Jerritt Canyon (Nevada) and Cripple Creek (Colorado). The work included a thorough review of all historical environmental records for the site, an assessment of the current status of all environmental permits, an evaluation of likely future requirements, and a review of the closure plans and cost estimates. The resulting evaluations were included in the cash flow evaluation and final Competent Persons Report for the shareholders

Alta Gold Bankruptcy, Frontier Insurance Company

- Assessed closure and environmental liabilities associated with 9 bankrupt properties. The work included review of current environmental condition of the sites, preparation of preliminary closure plans for cost estimating and

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Corporate Consultant

assessment of long-term risks

Alta Gold Bankruptcy, AIG Insurance Company

- Determined the environmental and closure liabilities for two operating properties and several exploration properties in northern Nevada following the bankruptcy of Alta Gold

Jeff Parshley, P.G.
Corporate Consultant

Key Experience: Industrial Minerals

Mr. Parshley is one of SRK's most experienced consultants to our industrial minerals clients. He has worked on permitting, mine design, environmental study and mine closure projects for industrial minerals projects throughout North America. His industrial minerals project experience includes work on silica sand, specialty clay, limestone, feldspar, aggregate, cement, titanium sands and gypsum projects. Recent project experience includes:

Crystal Pass Cement Company, Crystal Pass Project, Clark County, Nevada, U.S.

- SRK is assisting Crystal Pass Cement Company with permitting and environmental studies for a large cement quarry operation near Las Vegas, Nevada. The project will be the largest cement operation in the area and is being developed in critical habitat of the desert tortoise. The project is being developed on both public lands and Native American Tribal Lands. Jeff is the Project Principal for the project and responsible for developing the permitting strategy, closure plans, and agency negotiations

U.S. Silica Company, Berkeley Mine, Berkeley Springs, West Virginia, U.S.

- The Berkeley Mine is one of the oldest major silica mines in the United States and one of U.S. Silica's original operations. Following a review of the status of current operation, SRK prepared a new mine plan for the operation in 1995. Critical to the long term future of the operation was the development of a mine plan which incorporated a variety of environmental and production goals. Jeff managed a team of senior engineers and scientists to develop the required mine plan and ensure compliance with all environmental regulations and goals. This project was performed on a very tight schedule and budget

Chemstar Lime Company, Tenmile Mine, Soda Springs, Idaho, U.S.

- Jeff was responsible for managing the mine design and permitting for a high grade limestone mine under development near Soda Springs. Near-arctic winter conditions at the site were a major consideration for the design, scheduling and environmental analysis of the project. Jeff's technical responsibilities on the projects were: review of existing geologic data, geologic interpretation; assessment of project on geologic resources; and review of all statistical and geostatistical models. This work led to a mine design which has minimized the environmental impacts without sacrificing the economic viability of the project. As a result, the project was permitting in six months, the reclamation plan was accepted as initially submitted, the mine opened on schedule and the design work was completed within budget. Jeff also provided liaison with the Idaho Department of Lands, Idaho Fish and Game, Department of Environmental Quality and the BLM during the NEPA process and authored the Reclamation Plan

Mineral Recovery Systems, Inc., Camden, Tennessee, Pilot Plant, Benton County, Tennessee, U.S.

- This proposed heavy mineral sands mine near Camden Benton County, Tennessee will be operated by Mineral Recovery Systems, Inc.. SRK assisted MRS with the location and design of a pilot tailings impoundment, wetlands delineation, environmental studies, discharge and reclamation permitting, and wetlands restoration and mitigation. Jeff was responsible for all of the environmental and permitting work for the project

U.S. Silica Company, Confidential Study, U.S.

- Jeff managed a team of technical specialists in reviewing the available data and permitting constraints for the expansion of a large silica deposit. The goal of the project of was to determine the existence of possible fatal flaws, either technical or regulatory which would preclude the development of a profitable mine expansion. The work included review of geologic data, sand quality data, slope stability studies, acid generating and metal leaching potential, preliminary wetlands evaluation, operational methods and alternatives, and applicable regulations for operation and closure

Chemstar Lime Company, Cosgrave Project, Winnemucca, Nevada.

- Jeff was responsible for managing development of the mine plan and reclamation plan used during the NEPA process. The mine design was optimized to maximize the reserves utilizing economic optimization, blending strategies, and strategic sequencing while minimizing the impacts of permitting and reclamation. As co-author of the Plan of Operation and Reclamation Plan, Jeff was responsible for determining the effects of the mine design on the geologic resources and the environment. He also reviewed the proposed plan and evaluated the impacts of different alternatives on the environment. Several recommendations were made which eliminated or reduced the environmental impacts while increasing the profitability of the project. The proposed 12 mile haul road accessing the property required additional permitting through the Army Corps of Engineers, Nevada Department of Transportation, and the Nevada Division of Environmental Protection. Jeff's liaison work with the BLM and State was critical to

Jeff Parshley, P.G.
Corporate Consultant

developing an operating plan and reclamation plan which fulfilled the objectives of both the regulatory agencies and the project proponent. The reclamation plan was the first one approved for a mining operation under the Nevada NAC 519A regulations

Floridin Company, IMV Mine, Amargosa Valley, Nevada.

- The IMV clay mine and plant is located in the Amargosa Valley approximately 80 miles west of Las Vegas along the Nevada/California border. SRK was hired to prepare required permitting documents and complete supporting technical studies for the project. The Plan of Operations/Reclamation Plan addressed the processing facilities and four separate mining operations, three in Nevada and one in California. SRK prepared an Environmental Assessment for the Nevada Operations and a NEPA/CEQA Environmental Impact Report for the California pit. Technical support work included preparation of a water balance, an evaluation of potential impacts to ground water, recommend modifications to the waste water design and operating procedures, and a discharge permit application. Jeff managed all aspects of the project including collection of baseline data to engineering. The impacts from and to the desert climate and fauna were critical to the identification of required permits and mitigation

Graymont Western U.S., Inc (formerly Continental Lime Company), Pilot Quarry, Wendover, Nevada.

- Graymont's Pilot Quarry is located west of Wendover, Nevada. The operation has been expanding since 1993. SRK has acted as the primary consultant on mine design and permitting for the operation since that time. The work has included reclamation planning and permitting, NEPA analyses, mine facility design and regulatory liaison

Graymont Western U.S., Inc (formerly Continental Lime Company), Closure Audit of Canadian Operations, Various Locations, Canada.

- SRK reviewed the closure plan for all of Graymont's Canadian operations to provide Graymont with a technical assessment of the closure plans and projected costs for each operation. Jeff led an SRK team that compared each site closure plan with current closure technologies and industry standard closure costs. The results of the studies were used for corporate accounting and closure budget accruals

Graymont Western U.S., Inc (formerly Continental Lime Company), Cricket Mountain Quarry, Delta, Utah.

- Graymont's Cricket Mountain Quarry is located south of Delta, Utah in the Cricket Mountains. The mine is in the process of expanding production and developing new reserves for future operations. SRK was contracted to conduct environmental and engineering studies, prepare a modified Plan of Operations and Reclamation Plan, and secure necessary permits. SRK managed the multidisciplinary team assigned to the project including in-house and subcontracted baseline data experts

U.S. Silica Company, Oceanside Plant, Oceanside California, U.S.

- U.S. Silica Company was required to revise the mine plan for their silica sand operation in Oceanside operation to protect wetlands that developed in historic mining disturbance. SRK was also responsible for designing the final closure design consistent with commercial land uses in the area. This required SRK to conduct environmental and geotechnical investigations as part of the final mine plan and closure design

Graymont Western U.S., Inc (formerly Continental Lime Company), Brown's Canyon Property, Nevada, U.S.

- SRK assisted Graymont's with permitting and environmental studies on the grassroots Brown's Canyon property in northern Nevada. The proposed quarry location was the site of several important historical landmarks as well as critical habitat for a number of large game animals. SRK prepared permits for an extensive exploration drilling program as well as developing a strategy for quarry permitting

Baldwin Construction Company, Aggregate Quarry, Lassen County, California, U.S.

- SRK prepared mine plans closure plans and environmental permitting documents for a large aggregate quarry operation in the Honey Lake Valley in northern California. The environmental analysis work was prepared to comply with both CEQA and NEPA, and included mitigation measures to minimize the impacts on deer habitat and visual resources

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Profession	Corporate Advisory Consultant - Mining
Education	Master of Engineering, Engineer of Mines, Colorado School of Mines, 2008 Bachelor of Science, Engineering, Colorado School of Mines, 2003
Registrations/ Affiliations	Registered Engineer-Intern (EIT) – State of Colorado Registered Member – Society for Mining, Metallurgy, and Exploration, Inc.

Specialization	Strategic planning; project optimisation; business improvement; investment analysis; due diligence; risk analysis; commercial negotiations; stochastic modeling, risk based valuation and project finance structuring.
Expertise	John Pfahl is a mining engineer with over 15 years of global experience in the mining industry. He is a Corporate Advisory Consultant with SRK. Mr. Pfahl has expertise in strategic planning, business improvement, investment analysis, risk analysis, capital markets and project valuation in the mining field. His background activities include project and investment management, strategic evaluations, technical and commercial due diligence, technical studies, financial modeling, structuring and negotiating terms in mergers and acquisitions, mine planning and project finance for projects ranging from exploration through production and across a broad spectrum of commodities.

Employment

2015 – Present	SRK Consulting (U.S.), Inc., Corporate Advisory Consultant, Denver, CO
2008 – 2014	RCF Management LLC, Senior Associate, Denver, CO; Toronto, ON; Perth, WA
2012 – 2013	Uranium Resources, Inc., Independent Member of Board of Directors, Denver, CO
2007 – 2008	Colorado School of Mines Mining Department, Research Assistant, Golden, CO
2004 – 2007	NewFields Boulder, LLC, Consulting Engineer, Boulder, CO
2002 – 2004	MFG, Inc., Staff Engineer, Boulder, CO
2001 – 2001	Hydrometrics, Inc., Engineering Intern, Kellogg, ID
1998 – 2000	Environmental Reclamation, Inc., Construction Crew Supervisor Smelterville, ID

Publications	Pfahl, J, (2011): “Private Equity Finance”, Industrial Minerals, September, 2011, pp 40-45 Various conference and academic presentations
Languages	Native English, Limited Spanish

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Key Experience: Strategic Planning, Business Improvement and Risk Analysis

Mr. Pfahl has undertaken strategic planning and risk analysis exercises within the mining industry under a variety circumstances, but generally with a focus on long-term project development, market positioning and value creation.

Recent project experience includes:

- **Lithium Investment Strategy:** Performed multiple studies supporting confidential lithium producers. Studies focused on broad-based screening of global lithium projects to develop targeted lists for detailed project review. Strategies included in the reviews were long-term expansion of production, sourcing of near-term lithium offtake and long-term strategic partnerships for offtake.
- **Lithium Development Strategy:** Supported confidential government entity in the development of a strategy for advancing early stage strategic lithium assets. Included review of typical expenditures, timelines and required tasks for advancing lithium projects to production. Utilized to support structuring of joint venture agreements.
- **Confidential Copper Mine:** Evaluated strategic alternatives and developed revitalization plan for a large open pit copper mine in South America that was strongly cash flow negative in a depressed metal price environment. Strategic options evaluated included long term care and maintenance, short term standby (to facilitate operational improvements) and continuing operations without change. Included analysis of operational performance, labor, contracts and corporate financial obligations. The selected outcome targeted operating with a broad spectrum of business improvements to minimize near term cash consumption and maximize long-term asset value for which a detailed revitalization plan was developed. The revitalization plan for the operation focusing on improved productivity through improving utilization and availability of existing assets, cost reductions and improving metallurgical performance.
- **Official Committee of Unsecured Creditors of Allied Nevada Gold:** Provided strategic technical guidance to the committee in support of its role in the Chapter 11 bankruptcy process. Support activities included analysis of managements strategic and operational decisions during and leading up to the bankruptcy proceedings as well as evaluation of long term potential for the key assets of the company.
- **Nickel Pig Iron Evaluation:** Co-lead on an exercise undertaken to strategically guide future investment decisions in nickel projects. Work involved an in-depth review of the nickel pig iron market in China (including numerous site visits and meetings in China with nickel traders, nickel pig iron producers, stainless steel producers and information agencies) and its future outlook in Indonesia and other countries. Results included forecast operating costs for nickel pig iron producers both internal and external to China as well as forecast production volumes, which were used to position investments based on a strategy around global nickel markets.
- **Toro Gold Limited:** Oversight of an investment in Toro Gold in the position of the company's largest shareholder. Helped guide Toro's strategic planning for development of the company's flagship Mako asset as well exploration strategy and M&A opportunities. Guidance provided on a risk based approach to ensure the highest probability of success for project development and included project financing strategies, corporate and project budgeting, focusing feasibility efforts, M&A evaluation and project development team.
- **RCF Management, LLC:** Co-lead on performing a risk assessment and developing an associated risk management plan for RCF Management, LLC, an investment advisor for a series of mining-focused private equity funds with approximately US$3 billion in assets under management and callable capital. Work focused on the long-term viability of the business to survive commodity cycles and increasing competition in the mining finance and especially private equity space.
- **African Investment Strategy:** Lead efforts to develop and implement a strategy to increase focus on mining investment in Africa. Efforts included consolidating existing organizational expertise and information sources and implementing a system to open up information sharing to build a more complete organization-wide understanding of risks and opportunities in Africa. Also spearheaded efforts to break the paradigm of investment dismissal due to perceived risk and focus instead on actual risk and its investment implications.
- **Project Stage Investment Strategy:** Lead efforts to evaluate an expansion of investment strategy to encompass earlier stage opportunities than had traditionally been considered acceptable investments. Work focused on risk vs. opportunity in earlier stage investments, potential early stage investment strategies and allocation of internal resources.
- **Base Metal Development Project Analysis:** Lead efforts to strategically target investments in global base metal (copper, zinc and lead) projects at or near development ready status. Work involved a risk based analysis of project

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quality combined with environmental, political and social factors to highlight projects for detailed due diligence exercises and financing negotiations.

- **Investment in India:** Lead efforts to increase understanding and exposure to Indian opportunities and markets. Work focused on a targeted strategic investment in a small company operating in India and utilizing information gathered during the investment process and post-investment, through management of the investment, to guide future investment decisions in the country.
- **Capital Cost Overrun:** Oversaw research work to update an internal study on typical cost overruns in mining development projects. Efforts included guiding data collection to improve understanding of sources of cost overruns as well as magnitude of overruns and expanding efforts beyond existing feasibility to development analysis. Project results were then used to guide overall investment strategy regarding project risk profiles and valuation strategies.
- **Molycorp, Inc.:** Lead efforts to develop a strategic plan for a major shareholding in Molycorp, Inc. Efforts included technical and commercial due diligence to develop a range of future valuation scenarios combined with recommendations utilizing a risk based approach to future management of the shareholding.
- **Colombian Metallurgical Coal:** Guided efforts as lead manager for largest shareholder in a junior company targeting metallurgical coal in Colombia. Efforts included guiding company management's strategy on key attractive attributes for acquisition projects with a focus on infrastructure, logistics, permitting, security and project size.
- **Uranium Resources, Inc.:** Independent member of the board of directors of the company as the nominated representative by the company's largest shareholder. The company has a large and diverse portfolio of uranium assets across Texas and New Mexico and efforts focused on a risk based optimization of that portfolio to implement a development plan that would increase market confidence in the projects, the company and its management team. Also lead efforts to bring in a new CEO to take over management of the company and guidance provided on corporate budgeting, M&A activity and near-term strategic planning to best place the company for weak uranium markets.
- **Global Uranium Strategy:** Lead efforts to develop an institution-wide investment strategy in the uranium market. Efforts focused on uranium deposit type as a basis for most attractive typical operating parameters and fatal flaw type risks inherent in many development projects. Results generated investment parameters to focus on during due diligence activities and red flags to avoid that are common in many projects.
- **DRC Investment Strategy:** Participated in efforts to develop an investment strategy specific to the Democratic Republic of Congo. Efforts included in-depth technical, social, political and legal due diligence to provide investment guidelines for analysis of current and future opportunities in the country.

Key Experience: Commercial Negotiations and Structuring

Mr. Pfahl has extensive experience in commercial negotiations and transaction structuring through the lead of and participation in numerous transactions including debt, equity and hybrid financings; project acquisitions; corporate mergers; and corporate restructuring. His expertise in these areas includes term sheet development, direct negotiations, development of transaction documents and oversight of legal efforts. Project structuring and negotiations were tailored to individual investment profiles to mitigate risks identified in those opportunities while still maximizing upside leverage.

Recent project experience includes:

- **Confidential Copper Project:** Lead role on negotiations and guidance of an acquisition process through interfacing with the investment bank managing a proposed asset sale under very strict regulations. Efforts included modification of divesture process to lessen investment risk (timeline and data availability), modification of share purchase plan and feedback to the investment bank regarding bid strategy to attempt a forced process change.
- **Toro Gold Limited:** Lead role in negotiating, structuring and implementing an equity financing and a bridge debt financing with conversion into a lead position in a future equity financing.
- **India Resources Limited:** Lead role in negotiating, structuring and implementing an equity financing with associated rights appropriate for a dominant shareholding in a publicly traded junior mining company.
- **Confidential Copper Operator:** Helped guide strategy on structuring of an on-market investment in a publicly traded operating company with a most likely strategic outcome of a hostile takeover.
- **New Age Exploration:** Lead role in negotiating, structuring and implementing multiple equity financings with attached rights appropriate for a dominant shareholding in a publicly traded junior mining company.

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- **Confidential Gold Developer:** Lead role in negotiating and structuring a hybrid debt facility for pre-project development financing. With project development being delayed, revised the financing strategy to implement a lead role in an interim equity financing.
- **Confidential PGM Developer:** Lead role in negotiating and structuring a proposed equity financing to support project development with a standby hybrid debt facility for cost overruns.
- **Confidential PGM Operator:** Lead role in negotiating and structuring a proposed hybrid debt facility to provide development capital for an extension of current operations.
- **Confidential Diamond Operator:** Lead role in negotiating and structuring the financing for the proposed acquisition of an operating diamond mine by a third party junior development company from the financier side. Role involved coordinating the financing and due diligence strategy of multiple major financial partners as well as providing guidance to the junior development company on project valuation, debt strategies and acquisition structuring.
- **Noront Resources Limited:** Lead role in negotiating, structuring and implementing a bridge financing facility that automatically became a convertible debt facility if not repaid in within a fixed time period.
- **Uranium Resources Inc.:** Lead role in negotiating the merger of Uranium Resources Inc. with Neutron Energy and providing an associated third-party equity financing package. The merger was complicated by a large outstanding debt facility, effectively in default to a fourth-party lender by Neutron, which required further negotiation and structuring to remove through a combination of conversion and repayment.
- **Confidential Gold Developer:** Lead role in negotiating and structuring a proposed bridge debt facility for project feasibility work with future conversion optionality if certain mechanisms are triggered.
- **Confidential Gold Developer:** Lead role in structuring and negotiating a proposed multi-tranche hybrid debt facility to support project feasibility and development for a publicly listed company. Availability of future tranches dependent upon the company's ability to hit strategic targets in project development. Financing strategy included utilization of gold derivative instruments as a zero-cost hedging component.
- **Confidential Polymetallic Developer:** Lead role in structuring a proposed multi-tranche hybrid debt facility to support a project acquisition by a private corporation. Availability of future tranches dependent upon the company's ability to hit strategic targets in project development.
- **Confidential Copper Developer:** Lead role in structuring, negotiating and implementing a two tranche convertible debt facility to support a drilling campaign and project feasibility work. The initial tranche was significantly smaller than the second tranche, which was at the option of the lender, and targeted to provide information to support further detailed due diligence efforts as project data was sparse and of questionable quality.
- **Meliadine Resources Inc.:** Direct participation in negotiating the merger of a wholly owned private corporation with its public joint venture partner (Comaplex Minerals Corp). Negotiations had to overcome significant complexity with variable ownership percentages of individual deposits within a larger project, the presence of a significant non-recourse loan between the partners and carried capital and development cost provisions on project development. Also included the structuring of contingent payments on the back of the merger to incentivise an optimal outcome.

Key Experience: Corporate/Project Investment Analysis and Due Diligence

Mr. Pfahl has performed due diligence reviews and investment analysis on dozens of projects. Work performed typically involved technical and commercial due diligence, risk and opportunity analysis, report preparation, management of consultants (budgeting and directing work) when utilized and recommendation on whether to move forward with the investment or not.

Recent project experience includes:

- **Vale:** Technical due diligence for a confidential client on Vale's Brazilian iron ore operations. Evaluated long-term production profile (quantity of product, quality of product and type of feed ore) from each operation, current and future production costs (including impact of FX rates) and operational capital requirements.
- **Freeport-McMoRan Inc.:** Technical due diligence for a confidential client on a broad range of North American assets held by Freeport. Led one of three due diligence teams with a focus on the Bagdad and Sierrita operations. In addition, individually evaluated the El Abra, Climax and Henderson assets. Review focused on short and long-term mine planning, environmental liabilities, expansion potential and molybdenum markets.

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- **Confidential Diamond Mining Company:** Technical and commercial due diligence and associated valuation for the acquisition of a mid-tier diamond producer. Lead technical due diligence team including setting up model for valuation purposes and also provided guidance on diamond markets and strategy. Technical due diligence focused on strategic growth options, risk associated with current mine operations and future environmental risk.
- **Confidential Copper Mine, South America:** Technical and commercial due diligence for an investment in a large, operating copper mine in South America. Lead technical due diligence team including providing strategic guidance on acquisition strategy and risk. Due diligence focused on sale of complex concentrates, plant bottlenecks and reserve estimates.
- **Morne Bossa Project, Nord Department, Haiti:** Fatal flaw review of the proposed development stage Morne Bossa gold project in Haiti. Evaluated project risks and economics to support a potential investment.
- **Cobre Panama Project, Colon, Panama:** Project valuation with alternative methods applicable to long life assets and technical/commercial due diligence on a very large open pit copper/gold (porphyry) project under development. Review work included a focus on the feasibility of the proposed 200,000+ tonne per day throughput in a tropical environment, capital and operating cost risks and opportunities, project partner risk, financing risk and social risk.
- **Mineração Serra Verde, Goiás, Brazil:** Project and corporate valuation and technical evaluation of a large open pit heavy rare earth project (Serra Verde) that would utilize vat or heap leaching going through the feasibility process and thought to be similar to ionic clay deposits in China.
- **Alkane Resources Ltd, New South Wales, Australia:** Project and corporate valuation and technical evaluation of an open pit heavy rare earth deposit (Dubbo Zirconia Project) that would also produce zirconium and niobium going through project financing. The review focused on operating costs and metallurgical risks. The review also covered an associated operating open pit gold asset held within the company.
- **Tiger Resources Limited, Katanga Province, Democratic Republic of Congo:** Review of project and corporate valuation and risk factors for an operating open pit copper mine (Kipoi Mine) which targets a stratiform deposit typical of the African Copperbelt utilizing heavy media separation and heap leaching, going through an expansion phase. The review had a focus on risks specific to operating and investing in the Democratic Republic of Congo and an evaluation of availability and effectiveness of political risk insurance to mitigate certain associated risks.
- **Toro Gold Limited, Kedougou, Senegal:** Multiple rounds of technical and commercial due diligence with associated corporate valuations on a greenstone hosted open pit gold deposit (Mako) going through prefeasibility and feasibility studies. Due diligence focused on risks associated with very hard ore and social/permitting risk associated with water consumption and disposal.
- **Aquila Resources Pty Ltd., Australia:** Review of multiple project valuations with associated technical due diligence on a portfolio of both open pit and underground metallurgical coal and open pit iron ore (direct ship hematite) assets ranging from resource stage to development.
- **Yanfolila Project, Sikasso, Mali:** Technical due diligence and valuation on a greenstone hosted gold deposit at the scoping stage. The project was proposed as an open pit operation. Due diligence focused on resource to reserve conversion and haul distances.
- **India Resources Limited, Rajasthan and Jharkhand India:** Commercial due diligence (with a focus on management, political, legal and corruption risks) and technical review of an underground contractor operating in a shear hosted (sheeted lode) type copper mine (Surda) with an underground SEDEX lead and zinc development project (Aravalli) at the scoping stage.
- **Consolidated Minerals, Western Australia, Australia and Western Region, Ghana:** Commercial and technical due diligence with an associated valuation on two operating open pit manganese mines. Efforts focused on company ownership, valuation and manganese markets.
- **MMC Dalpolimetall JSC, Primorsky Krai, Russia:** Technical and commercial due diligence and associated valuation on multiple open pit and underground zinc/lead mines. Efforts focused on operating costs and corporate balance sheet.
- **Champion Iron Limited, Labrador, Canada:** Commercial and technical due diligence and corporate valuation on an open pit, low grade hematite project (Fire Lake North), requiring beneficiation, going through feasibility. Efforts focused on infrastructure risk and cost as well as risk around First Nations relations.
- **Oz Minerals Limited, South Australia, Australia:** Commercial and technical due diligence and associated corporate valuation on an operating IOCG type open pit and underground copper/gold mine (Prominent Hill). Work

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focused on the feasibility of underground expansion, mine life and commercial factors including market trading multiples and management.

- **Lydian International Ltd., Vayots Dzor, Armenia**: Commercial and technical due diligence and associated corporate valuation on a feasibility stage epithermal type gold deposit (Amulsar) proposed to be an open pit, heap leach operation. Work focused on metallurgy (optimal crush size and recoveries), political risk and management history.
- **New Age Exploration Limited, Dumfries and Galloway, Scotland and Cundinamarca Colombia:** Commercial and technical due diligence focused on the Lochinvar underground development stage metallurgical coal project. Efforts focused on coal marketability and political risk. Technical due diligence also undertaken on the Subachoque project in Colombia. Efforts focused on feasibility of mechanization of existing artisanal scale underground mine, permitting risk for reserve expansion and logistics.
- **Platinum Group Metals Ltd., Limpopo and North West Province, South Africa:** Commercial and technical due diligence and associated corporate valuation on an underground reef type PGM project under development (Western Bushveld Joint Venture) with a focus on commercial debt terms, capex and opex. Valuation and technical due diligence also incorporated the Waterburg scoping level PGM project with a focus on capex and opex.
- **Sunshine Silver Mining Corporation, Idaho, USA:** Technical due diligence on the brownfields underground Sunshine Silver Mine (high grade mesothermal vein type deposit) going through feasibility work. Efforts focused on resource estimation and reserve conversion.
- **Euromax Resources Ltd, Bosilovo, Macedonia:** Technical and commercial due diligence and associated valuation on proposed open pit porphyry copper project (Ilovitza) going through feasibility. Efforts focused on capex and opex and reserve optimization.
- **Reservoir Minerals Inc., Bor, Serbia:** Technical review and corporate valuation for the Cukaru Peki exploration stage underground high sulphidation and porphyry copper/gold project. Efforts focused on capex, opex and resource to reserve conversion.
- **Molycorp, Inc., Shandong, Jiangsu and Tianjin China, Singapore and California, USA:** Commercial and technical due diligence and associated corporate valuation on operating rare earth extraction facilities in China, rare earth magnet production facilities in China, rare earth magnet R&D facilities in Singapore and the Mountain Pass operating light rare earth mine and separation facility. Efforts focused on magnetic markets, rare earth markets and key profit drivers for the operating facilities in China. Technical work at Mountain Pass focused on reagent recycling, crack and leach processes and plant throughput.
- **Stornoway Diamond Corporation, Quebec, Canada:** Commercial and technical due diligence and associated corporate valuation on the development stage Renard underground/open pit diamond (kimberlite) project. Technical work focused on deep resource conversion, diamond distribution, geomechanical stability, operating costs and capital costs. Commercial work focused on diamond markets, project finance structuring and corporate structure.
- **North American Palladium Ltd., Ontario, Canada:** Commercial and technical due diligence and associated corporate valuation on the operating open pit and underground Lad Des Iles palladium mine. Work focused on palladium markets, resource to reserve conversion and underground opex.
- **Selwyn Resources Ltd., Yukon Territory, Canada:** Technical review and valuation on the feasibility stage open pit and underground SEDEX type lead/zinc Selwyn Project. Review focused on capex, opex, mining methods and infrastructure.
- **Minera Valle Central, Region VI, Chile:** Technical due diligence and corporate valuation on the operating copper/molybdenum tailings reprocessing facility. Efforts focused on the proposed expansion of the operations and associated capex, opex and royalty burden.
- **Pinto Valley Operation, Arizona, USA:** Technical due diligence and project valuation on the brownfields Pinto Valley porphyry copper project under redevelopment. Review focused on resource to reserve conversion, project opex and environmental liabilities.
- **Canadian Royalties Inc., Quebec, Canada:** Technical and commercial due diligence on the open pit and underground Nunavik Ni/Cu/PGM (magmatic massive sulphide) operations under development. Work focused on valuation and corporate balance sheet.
- **Noront Resources Ltd, Ontario, Canada:** Technical and commercial due diligence on the feasibility stage Eagle's Nest underground Ni/Cu/PGM (magmatic massive sulphide) project. Work focused on project optimization, including

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throughput, tailings storage, surface vs. underground infrastructure, shaft/ramp options and aggregate sources as well as infrastructure development, permitting and social risk.

- **Hummingbird Resources PLC, Sinoe, Liberia:** Technical review and corporate valuation focused on the scoping stage greenstone hosted Dugbe open pit gold project. Review focused on exploration opportunity, metallurgical recovery and milling costs.
- **Chieftain Metals Corp. British Columbia, Canada:** Technical and commercial review with corporate valuation focused on the brownfield Tulsequah Chief underground Cu/Zn/Au/Ag (volcanic massive sulphide) project that had started development and failed and was going back through feasibility. Review work focused on transportation trade-offs (barging vs. road access), capital and operating costs, metallurgical performance, concentrate marketing, First Nations relations, financial impact of a precious metals streaming arrangement and permitting.
- **Rio Algom Limited, New Mexico, USA:** Technical and commercial review of a brownfields uranium mill site and uranium resources. Work focused on social and permitting risk and quantification of legacy environmental liabilities.
- **Ekati Mine, Northwest Territories, Canada:** Technical and commercial due diligence and valuation of the operating open pit and underground Ekati diamond (kimberlite) operation. Technical review focused on pit slope stability, mud rush risks, improvement in diamond recoveries, environmental liabilities, water license renewal and feasibility of future development of the Jay pipe. Commercial review focused on acquisition financing strategy, diamond pricing assumptions, corporate working capital, environmental bonding requirements, diamond marketing strategy, diamond inventory valuation, operational improvements and future management team.
- **Uranium Resources, Inc., New Mexico and Texas, USA:** Technical and commercial due diligence and associated corporate valuation on a suite of brownfield and greenfield uranium assets (conventional and ISR) from exploration to development stage. Technical due diligence focused on uranium exploration potential in Texas, amenability of deposits to in situ recovery methods, development of reserves, operating and capital costs, permitting, environmental liability and social risks. Commercial work focused on management team and board, legal risks and corporate strategy.
- **Neutron Energy Inc., New Mexico, USA:** Technical review and valuation on portfolio of brownfield underground and open pit uranium assets plus a proposed mill site at the scoping stage. Review focused on opex, resource to reserve conversion and heap leach opportunities.
- **Avanti Mining Inc., British Columbia, Canada:** Multiple technical reviews and valuations on the Kitsault brownfield open pit primary molybdenum asset (porphyry orebody) from scoping through feasibility stage. Reviews focused on molybdenum market, capital costs, tailings storage, permitting and environmental, legal and operating costs.
- **Leviathan Minerals Group Inc., Bangka, Indonesia:** Technical and commercial due diligence on the proposed Bangka Island offshore alluvial tin project at the resource stage. Due diligence focused on resource estimation, mining and processing technology and costs, management, title and corruption risks.
- **Matamec Explorations, Inc., Quebec, Canada:** Technical due diligence with associated valuation on proposed Kipawa open pit heavy rare earth operation at the scoping stage. Due diligence focused on proposed metallurgy and associated operating costs and risks.
- **Titan Uranium Inc., Wyoming, USA:** Technical and commercial due diligence with associated valuation on the proposed Sheep Mountain open pit and underground uranium operation at the feasibility stage. Due diligence focused on resource estimation, reserve conversion, mining costs and processing options.
- **Cuprum Resources Corp., Region IV, Chile:** Technical and commercial due diligence with associated valuations on the proposed Puquios open pit heap leach (bioleaching) copper project at the feasibility stage. Due diligence focused on applicability of bio leaching to the orebody and risk profile with the technology as well as capital and operating costs.
- **Lachlan Star Limited, Region IV, Chile:** Technical due diligence on the operating CMD open pit heap leach gold mine (manto type mineralization). Due diligence focused on resource estimation, mine plan, reserve conversion, operating costs and exploration potential.
- **Deutsche Rohstoff AG, Saxony, Germany:** Technical and commercial due diligence with associated valuation on two proposed underground tin operations (Gottesberg and Geyer) at the resource stage. Due diligence focused on reserve estimation, capital costs, operating costs and tin markets.

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- **ScoZinc Project, Nova Scotia, Canada:** Technical and commercial due diligence with associated valuation on the brownfields open pit and underground ScoZinc project (Mississippi Valley Type). Work focused on resource to reserve conversion, operating costs and management team.
- **Mocoa Project, Putumayo, Colombia:** Technical due diligence with associated valuation on the proposed open pit and/or underground porphyry copper/molybdenum Mocoa project. Work focused on capital and operating costs and reserve estimation.
- **Inter-American Coal, Colombia and Venezuela:** Commercial due diligence on coal trading and logistics in Colombia and Venezuela and an interest in an operating mine in Venezuela. Review work focused on future business plans.
- **Donner Metals Ltd., Quebec, Canada:** Commercial and technical due diligence and associated valuation on the Bracemac underground lead/zinc/copper/gold/silver mine (volcanic massive sulphide) under development. Work focused on reserve estimation and impact of a metal streaming transaction.
- **Kria Resources Ltd. New Brunswick, Canada:** Commercial and technical due diligence on the proposed scoping stage Halfmile/Stratmat underground zinc/lead/copper/silver project (volcanic massive sulphide). Work focused on capital and operating costs and viability of toll milling.
- **Dominion Minerals Corp., Chiriqui, Panama:** Technical and commercial due diligence on the proposed resource stage open pit Cerro Chorcha copper (porphyry) project. Review work focused on capital and operating costs, resource estimation, social and environmental risks.
- **Canarc Resource Corp., British Columbia, Canada:** Technical and commercial due diligence with associated valuation on the proposed feasibility stage (brownfield) New Polaris underground gold (high grade, narrow vein) project. Work focused on metallurgy, logistics, operating costs and synergies with nearby deposits.
- **Coalspur Mines Ltd., Alberta, Canada:** Technical and commercial due diligence with associated valuation on the proposed feasibility stage Vista open pit thermal coal project. Work focused on corporate structure, capex, opex, environmental, social and permitting.
- **Peninsula Energy Limited, Wyoming, USA:** Technical due diligence on the proposed scoping stage Lance in situ recovery type uranium project. Work focused on project reserves, operating costs, capital costs and permitting.
- **Hathor Exploration Limited, Saskatchewan, Canada:** Technical due diligence on the proposed scoping stage Roughrider unconformity type underground uranium project. Due diligence focused on resource estimation, capital and operating costs.
- **UEX Corporation, Saskatchewan, Canada:** Technical and commercial due diligence on the proposed resource stage Shea Creek unconformity type underground uranium project. Due diligence focused on mining costs, capital costs, resource to reserve conversion and milling options.
- **Alexco Resource Corp., Yukon Territory, Canada:** Technical and commercial due diligence on the development stage Keno Hill underground silver/lead/zinc (polymetallic hydrothermal vein system) project. Efforts focused on resource to reserve conversion, exploration potential, operating costs and impacts of a metals streaming agreement.
- **Inca Pacific Resources Inc., Ancash, Peru:** Technical and commercial due diligence and associated valuation on the feasibility stage Magistral open pit copper/molybdenum (porphyry) project. Work focused on capital costs, logistics and government agreements.
- **Anvil Mining Limited, Katanga Province, Democratic Republic of Congo:** Technical and commercial due diligence on the Kinsevere open pit copper (stratiform) deposit underdevelopment. Work focused on project capital costs, mineral processing and government relations.
- **Cuco Resources Ltd., Katanga Province, Democratic Republic of Congo:** Technical and commercial due diligence on the Kinsanfu open pit copper/cobalt (stratiform) project operating on a limited scale with heavy media separation and evaluating expansion to large scale SX/EW production. Work focused on project resources, government relations, management and corruption risks.
- **Energy Fuels Inc., Colorado and Utah, USA:** Technical and commercial due diligence with an associated valuation on a portfolio of underground uranium assets ranging from resource to feasibility stage and a uranium mill development plan. Review work focused on operating costs, capital costs and permitting.

JOHN H. PFAHL
Corporate Consultant - Mining

Key Experience: Engineering Studies

Mr. Pfahl has been involved in numerous engineering studies from an oversight and guidance perspective. He also has had direct involvement in the preparation of some of these studies.

Recent project experience includes:

- **Compass Minerals International:** Lead role in an independent reserve audit for seven operating mines. Production includes salt (food, industrial and chemical grades), sulphate of potash and magnesium chloride. Production is sourced from underground mining, solution mining and solar evaporation type operations. Review included development of long-term recovery models from solution mines, audit of underground mine plans and development of a long-term brine depletion model for the Great Salt Lake.
- **Enirgi Group:** Lead role in the prefeasibility and feasibility studies for the development stage Rincon brine-type lithium project. Primary role to review and provide guidance on work product from a number of organizations contributing to the studies. Also coordinate work products and consolidate to complete the finished study materials.
- **Natural Soda LLC:** Lead role in a prefeasibility study on the expansion of an existing operation producing sodium bicarbonate through in situ solution mining in Colorado, USA. Work focused on operating cost for the in situ process, risk profile of the proposed operations, reserve estimation and guidance on resource estimation and economic modeling.
- **New Age Exploration Limited:** Primarily involved in a role of guiding the progress of a scoping study on an underground metallurgical coal project in Scotland. Direct participation in development data collection planning and budgeting to support the study as well as a project risk assessment for the study.
- **Smoky Canyon Mine:** Responsibility for the development of multiple scoping level plans for an operating phosphate mine in Idaho, USA. Efforts included conceptual design for a stream diversion and runoff infiltration basin within a drainage that had been filled with mine overburden, end of mine life closure design for all overburden disposal areas and an update of the tailing closure plan for the operation.
- **Coeur d'Alene River Basin Reclamation:** Responsibility for the development of a basin-wide reclamation plan targeting historic mine workings and fluvial tailings deposits. Efforts involved geospatial analysis of metals loading in streams to target work combined with reclamation strategies individually developed for each site. The reclamation plan was utilized for litigation and settlement purposes.

Mark A. Willow

Principal Environmental Scientist
Practice Leader / NA Director

Profession	Environmental Consultant (Permitting Specialist)
Education	Master of Science in Environmental Science and Engineering, Colorado School of Mines, Golden, Colorado (1995) Bachelor of Science in Fisheries and Wildlife Management, University of Missouri, Columbia, Missouri (1987)
Registrations/ Affiliations	Nevada Certified Environmental Manager (CEM #1832) SME Registered Member (4104492RM) MSHA 24-Hour New Miner Safety Training OSHA 40-hour Health and Safety Training Wetlands Delineator (WTI, 2001)

Specialization

Environmental Due Diligence, Environmental Permitting, Environmental Impact Analyses, Environmental Management Planning, Environmental Risk Assessment, Compliance Monitoring (incl. IFC/Equator Principle compliance), Ecological Risk Assessment.

Expertise

Mr. Willow is a Certified Environmental Manager (CEM #1832) in the State of Nevada, with over 25 years of environmental and ecological project experience, including extensive site characterization and baseline data collection experience, mine plan of operations development, closure planning, pit lake studies, and permitting. As an SRK principal and project manager, Mark oversees work scope implementation and provides senior technical review of local consultants performing environmental studies. Mark provides technical expertise and assistance in the characterization, remediation and mitigation of water and soil systems contaminated with heavy metals. Mark draws upon this diverse background for his knowledge and experience as a human health and ecological risk assessor with respect to potential environmental impacts and monitoring associated with mining operations. Using these skills and experience, Mark provides environmental due diligence/competent persons evaluations for developmental and operational mining projects throughout the world, and is a Qualified Person (QP) in accordance with Companion Policy 43-101CP to National Instrument 43-101 *Standards of Disclosure for Mineral Projects*.

Employment

1995 – Present	**SRK Consulting (U.S.), Inc**., Nevada Geo-Environmental Practice Leader (since 2010); Principal Environmental and Permitting Specialist; Served 3 years as Department Manager in Reno, NV office; Currently serving on the SRK North American Board of Directors.
1995	**Parsons Engineering Science, Inc.,** Environmental Compliance & Risk Assessment Specialist in the Denver, Colorado office.
1993 – 1995	**Colorado School of Mines**, Golden, Colorado Research Assistant – Biological Mine Drainage Treatment Teaching Assistant – Undergraduate Biology (1993-1994)
1987 – 1993	**Denver Zoo, Dallas Zoo and Frankfurt Zoologische Gardens** Animal Care Specialist/Senior Animal Keeper/Zoologist intern (respectively)

Publications

Several publications on mine waste management, water treatment (including biological treatment of Acid Rock Drainage), and reclamation/closure.

Languages

English, Conversational German

Mark A. Willow
Principal Environmental Scientist

Publications

1. Parshley, J.V., M.A. Willow, and R.J. Bowell. 2012. The evolution of cyanide heap leach closure methods. Mine Closure 2012: The Seventeenth International on Mine Closure. Brisbane, Australia. September 25-27, 2012.

2. Willow, M.A. and R.R.H. Cohen. 2003. pH, Dissolved Oxygen, and Adsorption Effects on Metal Removal in Anaerobic Bioreactors. *Journal of Environmental Quality*, 32 (4): p. 1212.

3. Willow, M. and C. tenBraak. 1999. Survey of three hard-rock acid drainage treatment facilities in Colorado. Proceedings of the Sixth International Conference on Tailings and Mine Waste '99, Fort Collins, Colorado.

4. Dorey, R., R. Duckett and M. Willow. 1999. Open pit reclamation at the Kennecott Ridgeway gold mine. Proceedings of the Sixth International Conference on Tailings and Mine Waste '99, Fort Collins, Colorado.

5. Muller, G., R. Dorey and M. Willow. 1998. Management of residual pyrite in mine tailings. Proceedings of the Fifth International Conference on Tailings and Mine Waste '98, Fort Collins, Colorado, January 26-28, 1998.

6. Willow, M.A., R.R.H. Cohen and L. Thompson. 1998. Factors affecting the efficiency of passive mine drainage treatment systems. Proceedings of the Fifth International Conference on Tailings and Mine Waste '98, Fort Collins, Colorado, January 26-28, 1998.

7. Willow, M.A. 1995. pH and dissolved oxygen as limiting factors of treatment efficiency in wet-substrate, bio-reactors dominated by sulfate-reducing bacteria. Master's Degree Thesis No. 4747, Colorado School of Mines, Golden, Colorado.

8. Lindsey, S.L., C.L. Bennett, E.A. Pyle, M.A. Willow and A. Yang. 1993. Okapi calf (*Okapia johnstoni*) management and collection of behavioural and physiological data at the Dallas Zoo. *International Zoo Yearbook*. Vol. 38.

9. Willow, M.A. and E.A. Pyle. 1991. Management of okapi calves (*Okapia johnstoni*) at the Dallas Zoo. AAZPA Regional Conference Proceedings, pp. 399-406.

Mark A. Willow
Principal Environmental Scientist

Key Experience: Scoping, Feasibility, NI 43-101 and Due Diligence Projects

Relevant project experience includes:

Underground Niobium Project PEA and FS, Elk Creek, Nebraska – NioCorp (2014 - Ongoing)

- Authored environmental section of Preliminary Economic Assessment report, including permitting requirements. Initiated coordination and consultation with NioCorp, its contractors, and regulatory agencies on the issues surrounding permitting of the project.

Pre-Feasibility Study for Segovia and Marmato Mines, Colombia – Gran Colombia Gold (2016 - Ongoing)

- Authoring environmental sections of both PFS reports, including permitting requirements, management plan reviews, and environmental liability assessments.

Due Diligence Dayton Gold project, Comstock District, Nevada – GF Capital LLC (November, 2016)

- Review of environmental, political, and social issues surrounding the permitting and development of Comstock Mining's proposed Dayton Project.

Due Diligence of UC RUSAL's Alpart Bauxite Project, Jamaica – Jiuquan Iron & Steel Co., Ltd (February, 2016)

- Review of environmental and social issues that could affect the re-start and expansion of this aluminum production facility, including issues concerning tailings management.

Lead Environmental Consultant, Twin Metals Minnesota (2015 - Ongoing)

- Selected as Administrative Manager of the SRK/Foth Infrastructure team responsible for advising TMM on permitting associated with its polymetal mine in norther Minnesota.

PEA and FS for Open Pit Gold Mine, French Guiana – NordGold (2014 - Ongoing)

- Authored environmental section of Preliminary Economic Assessment report, including permitting requirements and closure cost estimate. Currently working with SRK and Lycopodium teams on engineering and infrastructure, including environmental design criteria.

Due Diligence of Timmins Gold Ana Paula Project, Mexico – Red Kite (Bermuda) Management and Advisor Limited (December, 2015)

- Gap analysis and review of environmental and social issues (including security issues) that could affect the development of this greenfield project in southern Mexico.

Environmental Due Diligence, Kabanga Project, Tanzania – Confidential Clients (May, 2015)

- High-level review of environmental and social issues as well as estimated closure costs.

Fatal Flaw Analysis and Environmental Due Diligence Audit of Gunnison ISR Copper Project, Arizona – Confidential Clients (June – July, 2014)

- Environmental specialist on independent due diligence audit of proposed In-situ Recovery (ISR) copper project located east of Tucson, AZ.

NI 43-101 Technical Report on Resources, Morro do Pilar, Brazil – Manabi Holding S.A. (2013-2014)

- Functioned as environmental due diligence auditor and QP for technical evaluation of the proposed Morro do Pilar iron mine, concentrate pipeline and port facility project.

Environmental Due Diligence Audit of Ferrous Resources do Brasil S/A Viga Operations Brazil – Confidential Client (May 2014 – June 2014)

- Coordinated environmental team for independent due diligence audit of existing operations and proposed expansion of the VIGA iron mine near Belo Horizonte.

Mark A. Willow
Principal Environmental Scientist

Environmental Due Diligence Audit of ASARCO Silver Bell Operations – Confidential Client (March 2014)

- Environmental specialist on fatal flaw analysis of American Smelting and Refining Company LLC (ASARCO), Silver Bell operations.

Environmental Due Diligence Audit of CML Metals, Utah – Confidential Client (January 2014)

- Environmental specialist on independent due diligence audit of existing Comstock-Mountain Lion iron operations and proposed Rex expansion project near Cedar City, Utah.

December 31, 2012 Resource and Reserve Audit, Mining and Exploration Projects – Fresnillo plc

- Responsible for environmental site investigations, data collection, and summary reporting for audit report.

NI 43-101 Technical Report, Bloom Lake Mine, Quebec Province, Canada – Cliffs Natural Resources

- Environmental QP for technical report on Bloom Lake iron mine located in the Labrador Trough area which straddles the border between Quebec and Labrador.

NI 43-101 Technical Report, Wabush Mine, Labrador, Canada – Cliffs Natural Resources

- Environmental QP for technical report on Wabush iron mine located in the Labrador, Canada.

Environmental Due Diligence Audit of Compañía Minera Autlán, S.A.B.de C.V. Operations
Puebla, Mexico – Confidential Client (May 2012 – July 2012)

- Participated as Environmental Specialist in independent due diligence audit and fatal flaw analysis of two operating ferro-manganese furnaces and an underground manganese mine and manganese kiln, together with associated infrastructure including dams and dumps.

NI 43-101 Technical Report, Planalto Piauí Feasibility Study, Brazil – Bemisa Exploração Mineral S. A. (2013)

- Environmental QP for technical evaluation and pre-feasibility study of the proposed Planalto Piauí iron mine located in the state of Piauí in the Northeast Region of Brazil

Preliminary Economic Evaluation of Holy Terror Project
South Dakota, USA – Mineral Mountain Resources Ltd. (Apr. 2012 – May 2012)

- Prepared Section 20 of technical report for historic and newly proposed underground mining operation in the Black Hills of South Dakota following Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1 guidelines.

Environmental Due Diligence Audit of Runruno Gold Project
Philippines – Red Kite Management (USA) LLP (Dec. 2011 – Feb. 2012)

- Performed comprehensive review of available data and supporting documentation, as well as information obtained from site visit and personnel interviews, in order to prepare independent technical review of the project, including comment on potential project value, project risks and gap analysis of material items.

Independent Engineer's Due Diligence Review for the Almas Gold Project
Almas, State of Tocantins, Brazil – Banco WestLB do Brasil S.A. (Mar. 2012 – Apr. 2012)

- Performed comprehensive review of available data and supporting documentation, as well as information obtained from site visit and personnel interviews, in order to prepare an Independent Engineer's due diligence review of the Preliminary Economic Assessment (PEA) and Feasibility Study (FS) of the Almas Gold Project to help support Rio Novo Gold, Inc. with project debt financing.

NI 43-101 Preliminary Economic Assessment for the Miraflores Property
Risaralda, Colombia – Seafield Resources Ltd. (Aug. 2011 – Mar. 2012)

- Prepared Section 20 of Scoping Study for historic and newly proposed underground mining operation in Colombia following Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1 guidelines.

Mark A. Willow
Principal Environmental Scientist

Environmental Due Diligence Audit of Fortuna Silver Mines Caylloma & San Jose Projects
Peru and México, respectively – Confidential Client (May 2011 – July 2011)

- Third-party technical due diligence review of silver and gold operations in Peru (14,000+ feet in elevation) and México for interested buyer.

NI 43-101 Preliminary Economic Assessment (Update) for Trinidad Property
Sinaloa, México – Oro Mining Ltd. (Mar. 2012 – May 2012)

- Prepared Section 20 of PEA for proposed open pit mining operation in México following Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1 guidelines.

Environmental Due Diligence Audit of Gold Wedge Project
Manhattan, Nevada – Confidential Client (May 2011 – Jun. 2011)

- Participated as Environmental Specialist in independent due diligence audit and fatal flaw on Standard Mineral's Gold Wedge Project, located in Nye County, Nevada.

Environmental Due Diligence Audit of El Boléo Project
Baja Peninsula, México – Confidential Client (Sep. 2010 – Nov. 2011) (May 2012 – July 2012)

- Third-party technical due diligence review of Cu-Co-Zn-Mn deposit Project located in Baja California Sur, Mexico on the west coast of the Gulf of California.

Environmental Due Diligence Audit of Mina de Cobre Panamá Project
Panamá – Confidential Client (Aug. 2010 – Oct. 2010)

- Third-party review of open pit copper operation located in located in the district of Donos, Colon province, Panama.

Environmental Due Diligence Audit of Molejon Gold Project
Panama – Confidential Client (Jan. 2010 – Apr. 2010) (May 2010 – July 2010)

- Third-party review of open pit, cyanide milling operation located in located in the district of Donos, Colon province, Panama.

Environmental Due Diligence Audit of Underground and Open Pit Gold Mine
Sonora, México – Argonaut (Apr. 2009 – June 2009)

- Environmental team member reviewing permitting status, compliance and closure cost liabilities for three gold mines in various stages of development.

Environmental Due Diligence Audit of Underground Coal Mines
Russia – SUEK (Sep. 2008 – Jan. 2009) (Feb. 2010 – Jul. 2010) (Jan. 2011 – Mar. 2011)

- Environmental team member of international SRK due diligence and Mineral Economics Report (MER) team reviewing underground and open-pit coal mining operations in Siberia (2008). Follow-up visits were conducted in 2010 and 2011 to Russia's Far East Region during updates of the original audit.

Environmental Due Diligence Audit of Open Pit Gold Mine
Sabodala, Senegal – Mineral Deposits Limited (Mar. 2007 – June 2007)

- Environmental team member of international SRK due diligence team reviewing proposed gold mining and milling operation in eastern Senegal, near the Mali border. The availability and management of water resources became the limiting factor for this project. Included assessment of compliance with IFC/World Bank and Equator Principles.

Environmental Due Diligence Audit of Underground Coal Mine and Coking Plant
Shanxi Province, People's Republic of China – Regent Pacific Group (Dec. 2006 – Mar. 2007)

- Environmental team member of international SRK due diligence team reviewing the Zhaipingcun Coal Mine and associated Wash/Coke Plant, Secondary Wash Plant, Coke By-product Plant, Magnesium Smelter (under construction), and future dolomite quarry. Review focused on environmental upgrades to existing facilities.

Mark A. Willow
Principal Environmental Scientist

Environmental Due Diligence Audit on Proposed Copper Mine
Ecuador – EcuaCorriente (Jul. 2006 – Nov. 2006)

Hydrological and environmental team member of international SRK due diligence team evaluating proposed copper mining and milling operation in jungles of Ecuador. Included assessment of compliance with IFC/World Bank and Equator Principles.

Due Diligence Audits, Mexico - Confidential Client (Oct. 2005 – Jan. 2006)

- Environmental team member of international SRK due diligence team evaluating two, large-scale copper mining and smelting operations in northern Mexico, as part of potential purchase.

Due Diligence Audit, Mexico - Confidential Client (Sep. 2004 – Nov. 2004)

- Participated on a due diligence audit team as the environmental specialist for a small copper leaching operation in northern Mexico.

Los Filos/Bermejal Gold Mine Permitting, Mexico – Luismin S.A. de C.V. (2003 – 2005)

- Managed a multi-disciplinary team for comprehensive program to prepare the environmental permitting documents required to open a new gold mine in southern Mexico. The work included baseline studies, an EIS (MIA), a risk assessment, land use permits, environmental management and closure planning. Terms of reference require strict compliance with Equator Principles.

NEPA Environmental Assessments, Relief Canyon Mine
Lovelock, Nevada – Firstgold Corporation (Apr. 2008 – July 2008)

- Prepared two National Environmental Policy Act (NEPA) Environmental Assessments for continued exploration and reprocessing of the existing heap leach pads at the Relief Canyon Mine.

NEPA Environmental Assessment, Limousine Butte Exploration Project
Ely, Nevada – U.S. Gold Corporation (Dec. 2007 – Aug. 2008)

- Prepared programmatic Environmental Assessments for proposed expansion of exploration activities in the Ely District of the U.S. Bureau of Land Management.

NEPA Environmental Assessment, Tonkin Springs Mine
Eureka, Nevada – U.S. Gold Corporation (June 2008 – Nov. 2008)

- Prepared Environmental Assessments for proposed fluid management system modifications in the Battle Mountain District of the U.S. Bureau of Land Management.

Tungsten Mine Operational Permitting
Imlay, Nevada – Golden Predator Mines Inc. (May 2007 – Aug. 2008)

- Project Manager for development of Mine Plan/Reclamation Plan and Water Pollution Control Permit for recommissioning of historic underground and surface tungsten mine. Prepared Exploration plan of Operations for future activities on public land administered by the U.S. Bureau of Land Management.

Water Pollution Control Permit Applications, Nevada - Various Clients (1999 – Present)

- Managed renewal applications for several Water Pollution Control permits under review by the Nevada Division of Environmental Protection. Included a review of existing monitoring requirements and proposed modifications based on current site conditions.

Ecological Risk Assessments, Nevada – Newmont Mining Corporation (Nov. 2005 – Apr. 2006)

- Prepared screening-level ecological risk assessments for five pit lakes in northern Nevada, as input for long-term management alternatives analyses.

Atlanta Gold Project, Idaho (Oct. 2003 – Apr. 2005)

- Oversaw and conducted baseline surface water investigation for proposed gold mining operation in historic Atlanta District. Collaborated on development of Plan of Operations and associated permit documents. Administrative manager of budget and invoicing.

Mark A. Willow
Principal Environmental Scientist

Cortez Gold Mines Exploration EAs (2003)

- Participated in environmental assessment of two gold exploration Plans of Operation, including baseline surveys of springs, seeps and jurisdictional waters of the U.S. The West Pine Valley plan covered approximately 36,500 acres, while the West Side plan involved exploration on over 92,600 acres of mostly public lands.

Spanish Springs Recreation Complex EA, City of Sparks, Nevada (Apr. 2002 – Dec. 2002)

- Managed and prepared an EA for the City of Sparks Recreation Department and Carson City Bureau of Land Management for construction and operations of a recreation complex, including sports fields, golf course, and equestrian center, under an R&PP application. Proximity to ACEC of prime concern.

R&PP Applications, White Pine County Schools, Nevada (1999)

- Participated in the preparation of two Recreation and Public Purposes applications to construct two schools in remote areas of White Pine County. The application consisted of plans of development, mineral reports, and environmental assessments.

Tonkin Springs LLC Exploration Project, Eureka County, Nevada (2000)

- Prepared an environmental assessment analyzing potential impacts associated with a proposed gold exploration program. The major issues analyzed by this environmental assessment included cultural resources, Native American religious concerns, water resources, noxious weeds, and cumulative impacts.

Getchell Gold Mine NEPA Permitting, Winnemucca, Nevada (Ongoing)

- Prepared amendment to existing Plan of Operations to include backfill rock quarry and associated facilities. EA was prepared for PoO amendment, though Determination of NEPA Adequacy was granted to project before completion.

Cortez Gold Mines, Toiyabe Heap Leach Pad EA, Nevada (1999 – 2001)

- Prepared and presented Environmental Assessment to Bureau of Land Management on closure plan for heap leach pad, which included a subsurface infiltration system.

Placer Dome Yankee Mine Heap Leach Pad EA, Nevada (2001 – 2002)

- Prepared and presented Environmental Assessment to Bureau of Land Management on closure plan for heap leach pad, which included a subsurface infiltration system. Evaluated Ecological risk of closure activities on terrestrial, avian and vegetative communities.

BHP Robinson Open Pit Lake Ecological Risk Assessment, Ely, Nevada (2007 – 2011)

- During preliminary closure options evaluations, conducted a Tier 1 and modified Tier 2 ecological risk assessment on the existing open pit lake waters. Nevada law requires protection of terrestrial and avian life for impounded waters related to mining activities.

Habitat Mitigation Plan, Camden, Tennessee (Apr. 2000 – May 2000)

- The Tennessee Department of Environmental Control requested that Mineral Recovery Systems, Inc. prepare a Aquatic Habitat Mitigation Plan to offset streambed and wetland losses due to the construction of their process settling pond. A total of 3.6 acres of wetland and upland habitat was conceptually designed.

Echo Bay Mines Pit Water Lake Risk Assessment, Nevada (July 1997)

- As part of ongoing closure activities at the Borealis Mine, Echo Bay requested that a screening-level ecological risk assessment be completed for the water in the East Ridge Pit. The results are to be submitted to NDOW and the USF&WS.

Battle Mountain Gold Phoenix Project Wildlife Baseline Updates, Nevada (Nov. 1998 – Feb. 1999)

- SRK, and its merger partner WESTEC, conducted baseline vegetation and wildlife surveys of the proposed area of the Phoenix Expansion Project. Due to changes in the Plan of Operations, SRK was required to revisit the site on several occasions in 1998-99 to update the reports for submittal to the BLM as part of the Supplemental Environmental Impact Statement for the project.

Mark A. Willow
Principal Environmental Scientist

Manhattan Mine, Nevada (1997)

- In response to NDEP comments, comparison of heap solution soil concentrations to existing phytotoxicological screening benchmarks and other ecotoxicological criteria was performed which indicated that no harm to plants or future potential vegetation should result from the disposal of heap draindown effluent in the tailings impoundment.

BLM Land Exchange Habitat Assessment, Nevada (1997)

- As part of a NEPA driven land exchange between the BLM and a land development firm, conducted habitat assessment on development firm's holdings at determine current uses and potential for restoration due to cattle grazing.

Powell/Daniels Rivers, British Columbia, Canada (Sep. 1997)

- Participated in a Level 1 Fish Habitat Assessment Program of the Powell and Daniels Rivers to evaluate potential ecological effects of old forest lumber operations on fish fecundity and development.

Rocky Flats Environmental Technology Site, Colorado (1995)

- Conducted technical review and quality assurance/quality control for development of radionuclide preliminary remediation goals.

Lowry Air Force Base, Colorado (1995)

- Conducted human health and ecological risk assessments for six investigation units per EPA guidance for the purpose of base closure and property transfer. Environmental media included soil, sediment, surface water, groundwater and air.

West Pit Lake, Manhattan Mine, Nevada (1996)

- A screening-level assessment of potential ecological risks was conducted for the West Pit lake at the Manhattan Mine Project. The primary purpose of this assessment screening was to determine if ecological risks existed and identify chemical constituents contained in the water that might pose a potential, credible risk to ecological communities in and around the pit lake.

Chino Copper Mine, New Mexico (1995 – 1996)

- Principle investigator for human health risk assessment for Smelter Investigation Unit Remedial Investigation Proposal. Also acted as liaison between co-investigators for risk related issues such as receptor identification and exposure assessment.

Confidential Client, Arizona (1996)

- Principle risk assessor for groundwater investigation of potential radionuclides contamination at former mining operation. Findings presented to Arizona Department of Environmental Quality.

Illinois Creek, West-Central Alaska (1996)

As part of the comprehensive mining permit, conducted risk analysis to determine potential concentrations and aquatic toxicity effects of a cyanide release to the environment during transport to site.

Key Experience: Geotechnical/Waste Management Projects

Recent project experience includes:

Operations & Maintenance Manual Update, Nevada – Dyno Nobel, Inc. (2008)

- Updated Operations & Maintenance (O&M) Manual based on renewal permit monitoring requirements for explosives manufacturer.

Griffon Mine Closure Plan Development, Nevada (2001)

- Project Manager for development of the closure plan and associated technical specifications of the abandoned Griffon Mine. Work was conducted under contract with the USDA Forest Service.

Mark A. Willow
Principal Environmental Scientist

Kennecott Ridgeway Gold Mine, South Carolina (1996)

- Project Engineer responsible for closure plan analysis and determination of appropriate organic amendments and design for sub-aqueous deposition of backfill and waste rock from mining operations. Conducted geochemical modeling to determine appropriate treatment requirements for surface and groundwater prior to sub-aqueous disposal of backfill and waste rock; residual process solution treatability study; surface water management plan update; closure reports for open pits and tailings impoundment; a surface water geochemical mixing model for ultimate closure of the facility.

Thompson Creek Project, Idaho (1996)

- Provided technical support during preparation of Supplemental Plan of Operations; assisted in development of a modified operating plan for the tailings disposal facility for mitigation of acid rock drainage potential; participated in hydrological and geochemical modeling to evaluate the performance of proposed operating plan modifications.

Kensington Gold Project, Alaska (1996 – 1997)

- Participated as Project Environmental Engineer in development of and acquisition of solid waste disposal and surface- water/stormwater permits. Conducted preliminary design/stability risk assessment for proposed and alternative tailings disposal facilities. Spearheaded research into dry tailings and paste backfill disposal methods.

Barite Hill Gold Mine, South Carolina (1996 – 1997)

- As part of waste management team, prepared final pit closure alternative for presentations to South Carolina Department of Health and Environmental Control. Lead scientist on development, testing and design of constructed wetland (Anaerobic Contact Cell) for treatment of heap leach pad drainage/seepage.

Pueblo Viejo Project, Dominican Republic (1997)

- The Pueblo Viejo project is one of the largest gold deposits in the world with sulfide ore reserves of approximately 35 million ounces. Provided technical assistance on geochemical assessment of the existing mine waste, acid rock drainage mitigation plan and preliminary waste management and closure plan for future mining operations. Mitigation Plan included feasibility evaluation of active and passive water treatment systems.

Anchor Hill Gold Mine, South Dakota (1997 – 1998)

- Analysis of static and kinetic column and weathering cell geochemical results for use in design of waste rock removal schedules and repository construction; Examination of water treatment plant sludge treatment and disposal alternatives; Evaluation of post-closure pit phreatic surface development and off-site groundwater migration and geochemistry.

Grouse Creek Mine, Idaho (1997)

- As part of waste management team, prepared alternatives evaluation for waste rock repository closure, including evaluation and mitigation measures for potential acid-rock draining development. Developed preliminary grading plans and final surface contours for disposal facility; conducted evaluation of frost penetration on preferred and alternative waste rock cover system designs.

Thunder Mountain Project, Idaho (1997)

- Participated in the development of site waste rock management plan and subsequent waste rock disposal facility design. Also included was development of excavation and construction sequencing for waste rock dump and heap leach pad.

El Mojon Project, Nicaragua (1996)

- As part of the waste characterization and management plan, prepared preliminary waste rock disposal facility layout and design.

Mark A. Willow
Principal Environmental Scientist

ARD Seminar (1996)

- Organized and prepared presentation on acid-rock drainage treatment methodologies to visiting dignitaries from the Chinese Central Coal Mining Research Institute in Beijing.

Appendix C

EPA's Identification of Facilities (that operated in 1980 or later) that Demonstrate Mining is High Risk

Table C-1: Facilities Referenced in the Proposed CERCLA § 108(b) Proposed Rule

Table C-2: Facilities Referenced in *Releases from Hardrock Mining Facilities* (Releases Report)

Table C-3: Facilities Referenced in *Evidence of CERCLA Hazardous Substances and Potential Exposures at CERCLA §108(b) Mining and Mineral Processing Sites* (Evidence Report)

Table C-4: Facilities Referenced in *Comprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances* (Practices Report)

Table C-1 Facilities Referenced in the Proposed Rule

Agrifos, TX	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Waste Management activities at the site predated the modern waste containment criteria.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Cleanup of any of the releases has been and continues to be the responsibility of the facility operator.**

ArcelorMittal, MN	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Cleanup of the releases from the tailings piles has been handled by the operator.**

Barite Hill, SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements and provide additional enforcement tools.** • **This facility did not have a waste rock management plan to prevent formation of acid mine drainage in the main pit as compared to the most recent mine permitted where all potentially high acid rock drainage wastes are placed on a double lined waste facility.**

Table C-1 Facilities Referenced in the Proposed Rule

Barrick Goldstrike, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified releases.	• **All releases at the Goldstrike Mine have been reported and remediated in accordance with applicable NDEP permits and regulations, the BLM plan of operations and, where applicable, EPA requirements. In every release, appropriate corrective action was approved by regulatory authorities, implemented and documented. NDEP files document that the releases were fully addressed under existing regulatory and permit requirements. Releases cited by EPA reports did not and do not present any risk of a response action.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Operations at Goldstrike have been ongoing for more than thirty years. During that time, many improvements have been made to air and water quality management systems, including additional controls added to comply with updated legal, regulatory and permit requirements from BLM and NDEP. Regulations and permits require that mine facilities are monitored and that any release is reported and addressed.**
• EPA fails to acknowledge the voluntary measures undertaken by the operator to prevents releases.	• **Goldstrike has also implemented internal and corporate environmental management systems and is certified under the ISO14001:2004 standard.**
• EPA fails to appreciate the magnitude of existing financial assurance.	• **Current financial assurance for Goldstrike operations totals more than $230 million and is held jointly by NDEP and BLM.**

Table C-1 Facilities Referenced in the Proposed Rule

Beal Mountain, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **According to the Forest Service (the lead agency conducting cleanup) placer gold was discovered in the area in 1864 and placer mining reached its peak in the early 1900's. The only significant historical production was from placer deposits, which are cited as being primarily responsible for habitat degradation at the site.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Since the site operated, both the Forest Service and the State of Montana have increased their requirements on bonding to ensure that sufficient funds are available for reclamation should default occur.**
• Wrong date of operations: The Beal Mountain mine was operated by Pegasus Gold from 1984 until 1997.	• **The actual date of operations was 1988 through 1997.**

Buckhorn Mine, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine is owned by Kinross Corp.	• **The mine is owned and operated by Crown Resources Corp., a subsidiary of Kinross Gold U.S.A. Inc.**
• The site is an underground mine that includes waste rock.	• **Development rock (a.k.a. waste rock) is temporarily managed on surface and will all be utilized underground. No development rock stockpiles will remain on surface.**
• Water management during spring snow melt has been a well-documented problem.	• **Empirical data collected during operations has guided ongoing adaptive management to effectively address annual variations in quantities of snow melt. Successful water management**

	activities have included additional discharge outfalls, water treatment technology and system improvements, increased pumping capacity, additional dewatering well installation, and stormwater collection trench installation.
• In 2011 and 2012, the mine's groundwater capture zone failed to contain spring rains and snow melt resulting in contaminated water reaching a nearby creek.	• **In 2011, the operator self-reported an isolated incident that resulted from the malfunction of one dewatering well for a brief period in spring 2011. This discrete release was properly mitigated and the dewatering well has operated without capture zone failure to date. Other alleged capture zone violations were appealed and settled without an admission of fault.**
• Water generated in the underground mine can carry high concentrations of heavy metals such as copper, lead, and zinc that must be captured and processed before being discharged at approved outfalls.	• **Water from the underground mine sumps is currently collected and treated prior to discharge at approved outfalls. The most recent samples indicate concentrations of copper (year 2016), lead (year 2016) and zinc (year 2015) are below drinking water standards prior to treatment.**
• Violations in 2011 included allowing water discharges causing slope instability and erosion, and for discharging water at an unauthorized point.	• **Alleged violations were appealed and settled without an admission of fault.**
• Since operations began, the state has issued numerous penalties, notices of violation and administrative orders directing the company to control stormwater, rectify groundwater capture zone inadequacies, prevent slope failures, and comply with permit limits for nitrates, sulfates, acidity, copper, lead, zinc and solids from stormwater ponds.	• **While the state has issued certain penalties and NOVs, these have all be appealed and were either settled without any admission of fault or remain under appeal. In particular, the operator is appealing the 2014 NPDES permit issued by the state as it is unreasonable, based on flawed assumptions and fails to consider natural background quality nor previously permitted mine activities. The permit also set an arbitrary and artificial "capture zone" boundary which, among other things, does not account for facilities that fall outside this**

	"capture zone" that were designed and installed to manage this water. As a result, the permit standards are in many cases unattainable.

Florida Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• The Florida Canyon Mine has been in operation since 1986.	• **The mine began operations in 1987, pre-dating the state's mining regulations by 2 years.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The primary groundwater plume at issue was related to a heap leach pad constructed prior to the state Water Pollution Control Regulations. Current state regulations would not allow for this same type of installation. The operator has stopped using the affected portion of the old leach pad and is undertaking remedial action under the oversight of the state regulatory authority.**
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified releases.	• **State reports document that the immediate response to the release and conclude that "waters of the state were not threatened and the areas impacted by the released material were remediated quickly with oversight and approval from the site-assigned compliance inspectors."**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Table C-1 Facilities Referenced in the Proposed Rule

Formosa, OR	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The site was originally mined from approximately 1910-1937.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The state subsequently strengthened its mining regulations through passage of the consolidated permit program, which more comprehensively addresses operational design and environmental controls.**

Golden Sunlight, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining operations began in 1890.**
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified release in 1993.	• **The release from the tailings facility was discovered as the result of monitoring required by applicable permits. The facility was monitored, the release was reported, and corrective action was taken in accordance with the requirements of applicable permits and regulations. There was no risk of a response action.** • **Golden Sunlight continues to operate and to implement corrective action, reclamation and planned closure activities that will provide long-term assurance that there will be no risk of a response action at Golden Sunlight**
• EPA fails to appreciate the magnitude of existing financial assurance.	• **The current financial assurance for reclamation and closure of the Golden Sunlight mine exceeds $112 million.** • **Montana DEQ is currently reviewing the financial assurance amount and an increase is expected in 2017.**

	• **In addition, an expansion of underground mining operations has been proposed. Financial assurance will be reviewed, and, if necessary, increased before those proposed operations can proceed.**
• EPA ignores the role the owner/operator has played in reducing risks of acid rock drainage by facilitating cleanup of historic operations.	• **In addition to the on-site ore sources, the owner/operator administers a toll milling program and receives ore from various historic mine clean-up projects in the surrounding area. To date, the owner/operator has processed 690,000 tons of material from historic mine waste from 48 southwestern Montana sites. This material, processed through the mill and now is contained within a lined, state of the art tailings facility.**

Greens Creek, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine has been in operation since 1986.	• **Operations commenced in 1989.**
• Implies the water treatment facility was built in response to a release of untreated water with high levels of zinc.	• **Even prior to 1993 when the water treatment facility began operating, all water from tailings and process facilities was collected and treated through a series of ponds and sand filters. No CERCLA-like release ever occurred.**
• EPA ignores the role of monitoring in reducing risk of releases.	• **Each time that ongoing monitoring has suggested an area of concern at the site, the owner/operator has taken a proactive approach to introduce new technologies and/or operational controls and procedures to minimize and mitigate impacts.**

Table C-1 Facilities Referenced in the Proposed Rule

Jerritt Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The design and much of the construction pre-dates the state's mining regulations.**
• EPA neglects to discuss actions taken by the operator under oversight by regulatory authorities.	• **Operator has undertaken extensive corrective action to control sources and pump and contain groundwater plume under oversight by NDEP and Forest Service.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• EPA overlooks existing financial assurance.	• **The current financial assurance for Jerritt Canyon, held by NDEP and the Forest Service, totals $74.4 million with $23.5 million of that dedicated to assure management and completion of the corrective action for the releases from the tailings facility.**

Kennecott Bingham Canyon, UT	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on actions taken by state and federal regulatory agencies (even EPA itself) to prevent a similar outcome.	• **Through regulatory and voluntary efforts, controls have been put in place that have ended the historic practices and prevent further contamination from occurring.**
• Reliance on NGO reports rather than EPA's own ROD or RI/FS	• **The so-called 'factsheet' was published by Earthworks, an NGO that is unabashedly and militantly anti-mining and is widely known to play loosely with facts.**
• Failure to acknowledge EPA's past recognition of the site as an example of how releases can be properly addressed.	• **EPA has touted the site as a leading example of a cooperative federal-state-industry approach to both correct the missteps of the past and provide the right controls to prevent future contamination.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has funded all the groundwater source control and other clean-up efforts.**

Mosaic, FL and LA	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• EPA indicates that releases leading up to 2015 settlement agreement are representative of current operational problems with phosphogypsum stacks.	• **EPA's concerns regarding these stacks have been addressed through an enforcement initiative**
• Implication that the stack releases are being addressed under CERCLA.	• **These releases are being addressed under a RCRA consent decree.**
• No discussion of existing financial assurance in place to address identified issues.	• **Through an enforceable consent decree the company agree to place $650 million in a trust and issue a $50 million letter of credit to support the closure and long-term care of these stacks.**

P4/Monsanto South Rasmussen Facility, ID	
EPA Mischaracterizations/Omissions	The Real Story
• Inaccurate site identification/description	• **Proposed rule refers to P4/Monsanto South Rasmussen – Blackfoot Bridge Facility which are two separate mine but it appears the agency is discussing the South Rasmussen mine since it references a CWA settlement P4 reached with EPA on the legacy South Rasmussen mine site.** ○ **South Rasmussen is a legacy mine, permitted in the late 1990s and now in reclamation and closure.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities and the mine is covered by a BLM reclamation bond.**
• Incomplete story of owner/operator's reclamation efforts.	• **The company now collects and treats leachate related to the historic overburden disposal areas.** • **Company entered into a consent order with the state to investigate and address groundwater and is working on a remedial action plan.** • **Nearby modern mine operated by company (Blackfoot Bridge) was constructed and permitted to manage surface runoff and basically eliminate infiltration through overburden areas to address potential selenium concerns.**

Robinson Mine, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining at the Robinson site dates back to the 1860s. Current mine planning emphasizes reclaiming or moving old facilities to prevent releases.**
• No recognition of the role of the state program in reducing risk.	• **The reference releases were identified by the operator through monitoring, reported and addressed through the state regulatory and permit requirements. EPA and state reports document the response and the state concluded that all five released noted by EPA were "quickly cleaned up with the spilled material returned to containment within the process circuit or tailings impoundment." Waters of the State were not threatened and the areas impacted by the released material were remediated quickly with oversight and approval from**

	the site-assigned compliance inspectors.
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money was or has been utilized for the remediation activities.**
• No discussion of existing financial assurance	• **Current financial assurance for the Robinson Mine is $89.7 million, held jointly by BLM and NDEP.**

Smoky Canyon Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The owner/operator entered into an agreement over a decade ago with multiple agencies to investigate and prepare a feasibility study to address releases associated with historical practices. The owner/operator has paid for all investigations, feasibility studies, early actions and all agency costs (including all contractors that state and federal agencies have hired to advise them and oversee the operator's work). Agency costs have been in the millions of dollars.**
• EPA fails to acknowledge changes in practices to address the events that happened at the Pole ODA.	• **The issues that occurred were the result of historical mining practices used when the mining commenced in 1983 and before selenium had been identified as an issue. These practices have not been used since approximately 2003.**

U.S. Silver Galena, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• Failure to properly characterize the discharge	• **The issue was a controlled discharge violation that was corrected and settled with the State and EPA.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Zortman and Landusky, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Underground mining and vat leaching began in the 1880s. Open pit and heap leaching activities (including use of cyanide) began in 1977.**
• Incomplete discussion of financial assurance	• **More than $70 million in financial assurance was available for reclamation and closure of the Zortman and Landusky Mines and for water capture and treatment. BLM reported that was sufficient for some reclamation scenarios but additional funding was needed for the selected reclamation and closure plan.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **In response to the event at Zortman and Landusky, the federal and state regulatory agencies enacted substantial revisions to their regulations. These changes included much stricter data collection such as waste characterization studies to identify potentially acid-generating materials and revised closure and financial assurance requirements.**

Table _-1

Sites Referenced in the Proposed Rule

Table _-2

Sites referenced in Releases Report

Table _-3

Facilities referenced in Evidence Report

Table _-4

Facilities Referenced in the Practices Report

Table C-2 Facilities Referenced in Releases Report

Barite Hill, SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements and provide additional enforcement tools.** • **This facility did not have a waste rock management plan to prevent formation of acid mine drainage in the main pit as compared to the most recent mine permitted where all potentially high acid rock drainage wastes are placed on a double lined waste facility.**

Beal Mountain, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **According to the Forest Service (the lead agency conducting cleanup) placer gold was discovered in the area in 1864 and placer mining reached its peak in the early 1900's. The only significant historical production was from placer deposits, which are cited as being primarily responsible for habitat degradation at the site.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Since the site operated, both the Forest Service and the State of Montana have increased their requirements on bonding to ensure that sufficient funds are available for reclamation should default occur.**
• Wrong date of operations: The Beal Mountain mine was operated by Pegasus Gold from 1984 until 1997.	• **The actual date of operations was 1988 through 1997.**

Table C-2 Facilities Referenced in Releases Report

Brewer Gold, SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The mine is one of the oldest gold mines in the U.S., with the first documented gold production in 1828. The mine operated intermittently from 1828 to 1995.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements and provide additional enforcement tools.** • **Compared to the minimal monitoring requirements for this site (only at 3 locations) the most recent mine approved in state is required to conduct extensive pre-mining, during-mining and post-mining surface and groundwater monitoring obligations with quarterly reporting to EPA and the state.** • **This owner/operator posted $500,000 in financial assurance compared to $65 million for most recently approved mine in the state.** • **This facility had an unlined overburden and low-grade storage area as compared to the most recent mine permitted where all potentially high acid rock drainage wastes are placed on a double lined waste facility.**

Buckhorn Mine, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine is owned by Kinross Corp.	• **The mine is owned and operated by Crown Resources Corp., a subsidiary of Kinross Gold U.S.A. Inc.**

Table C-2 Facilities Referenced in Releases Report

• The site is an underground mine that includes waste rock.	• **Development rock (a.k.a. waste rock) is temporarily managed on surface and will all be utilized underground. No development rock stockpiles will remain on surface.**
• Water management during spring snow melt has been a well-documented problem.	• **Empirical data collected during operations has guided ongoing adaptive management to effectively address annual variations in quantities of snow melt. Successful water management activities have included additional discharge outfalls, water treatment technology and system improvements, increased pumping capacity, additional dewatering well installation, and stormwater collection trench installation.**
• In 2011 and 2012, the mine's groundwater capture zone failed to contain spring rains and snow melt resulting in contaminated water reaching a nearby creek.	• **In 2011, the operator self-reported an isolated incident that resulted from the malfunction of one dewatering well for a brief period in spring 2011. This discrete release was properly mitigated and the dewatering well has operated without capture zone failure to date. Other alleged capture zone violations were appealed and settled without an admission of fault.**
• Water generated in the underground mine can carry high concentrations of heavy metals such as copper, lead, and zinc that must be captured and processed before being discharged at approved outfalls.	• **Water from the underground mine sumps is currently collected and treated prior to discharge at approved outfalls. The most recent samples indicate concentrations of copper (year 2016), lead (year 2016) and zinc (year 2015) are below drinking water standards prior to treatment.**
• Violations in 2011 included allowing water discharges causing slope instability and erosion, and for discharging water at an unauthorized point.	• **Alleged violations were appealed and settled without an admission of fault.**
• Since operations began, the state has issued numerous penalties, notices of violation and administrative orders directing the company to control	• **While the state has issued certain penalties and NOVs, these have all be appealed and were either settled without any admission of fault or**

stormwater, rectify groundwater capture zone inadequacies, prevent slope failures, and comply with permit limits for nitrates, sulfates, acidity, copper, lead, zinc and solids from stormwater ponds.	**remain under appeal. In particular, the operator is appealing the 2014 NPDES permit issued by the state as it is unreasonable, based on flawed assumptions and fails to consider natural background quality nor previously permitted mine activities. The permit also set an arbitrary and artificial "capture zone" boundary which, among other things, does not account for facilities that fall outside this "capture zone" that were designed and installed to manage this water. As a result, the permit standards are in many cases unattainable.**

Cimarron, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The facility operated from 1960-1979.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The New Mexico Mining and Minerals Division strictly regulates metal mining and milling in New Mexico. The Division, and the mining regulations it promulgated, was authorized by the New Mexico Mining Act of 1993.**

Florida Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• The Florida Canyon Mine has been in operation since 1986.	• **The mine began operations in 1987, pre-dating the state's mining regulations by 2 years.**
• EPA neglects to provide information on changes to the state mining	• **The primary groundwater plume at issue was related to a heap leach pad constructed prior to the state**

regulations or permit requirements to prevent a similar outcome.	**Water Pollution Control Regulations. Current state regulations would not allow for this same type of installation. The operator has stopped using the affected portion of the old leach pad and is undertaking remedial action under the oversight of NDEP.**
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified releases.	• **NDEP reports document that the immediate response to the release and conclude that "waters of the state were not threatened and the areas impacted by the released material were remediated quickly with oversight and approval from the BMRR site assigned compliance inspectors."**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Formosa, OR	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The site was originally mined from approximately 1910-1937.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The state subsequently strengthened its mining regulations through passage of the consolidated permit program, which more comprehensively addresses operational design and environmental controls.**

Gilt Edge, SD	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining operations commenced in 1876. Sporadic mining by**

	numerous operators were conducted until 1941. Early gold miners developed extensive underground workings that wind through the site and engaged in some surface mining. In addition, early miners deposited mill tailings in two nearby creeks. • **The site is contaminated as a result of historic mining activities.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **South Dakota strengthened its mining regulations in 1987 and made additional changes sine to make regulations even more stringent.**

Golden Sunlight, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining operations began in 1890.**
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified release in 1993.	• **The release from the tailings facility was discovered as the result of monitoring required by applicable permits. The facility was monitored, the release was reported, and corrective action was taken in accordance with the requirements of applicable permits and regulations. There was no risk of a response action.** • **Golden Sunlight continues to operate and to implement corrective action, reclamation and planned closure activities that will provide long-term assurance that there will be no risk of a response action at Golden Sunlight**
• EPA fails to appreciate the magnitude of existing financial assurance.	• **The current financial assurance for reclamation and closure of the Golden Sunlight mine exceeds $112 million.** • **Montana DEQ is currently reviewing the financial assurance**

	amount and an increase is expected in 2017. • **In addition, an expansion of underground mining operations has been proposed. Financial assurance will be reviewed, and, if necessary, increased before those proposed operations can proceed.**
• EPA ignores the role the owner/operator has played in reducing risks of acid rock drainage by facilitating cleanup of historic operations.	• **In addition to the on-site ore sources, the owner/operator administers a toll milling program and receives ore from various historic mine clean-up projects in the surrounding area. To date, the owner/operator has processed 690,000 tons of material from historic mine waste from 48 southwestern Montana sites. This material, processed through the mill and now is contained within a lined, state of the art tailings facility.**

Greens Creek, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine has been in operation since 1986.	• **Operations commenced in 1989.**
• Implies the water treatment facility was built in response to a release of untreated water with high levels of zinc.	• **Even prior to 1993 when the water treatment facility began operating, all water from tailings and process facilities was collected and treated through a series of ponds and sand filters. No CERCLA-like release ever occurred.**
• EPA ignores the role of monitoring in reducing risk of releases.	• **Each time that ongoing monitoring has suggested an area of concern at the site, the owner/operator has taken a proactive approach to introduce new technologies and/or operational controls and procedures to minimize and mitigate impacts.**

Table C-2 Facilities Referenced in Releases Report

Grouse Creek, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Reclamation of the site was completed in 2013 with reclamation bonds released by the state in 2014 and the Forest Service in 2015.** • **The site has been reclaimed with years of documented compliance data demonstrating environmental protectiveness. Operation of a water treatment plant is ongoing and the discharge remains in compliance with the NPDES permit requirements.** • **The data from water quality sampling and in-stream biological monitoring shows no impacts to beneficial use, demonstrates environmental protectiveness and documents the successful reclamation of the mine.**
• Seepage and runoff from the waste rock dump is routed to the west ditch. The west ditch water flows to the wastewater treatment plant prior to discharge.	• **The west ditch has been eliminated with completion of the site reclamation. The subsurface water collected by waste rock storage facility keyblock drain is collected into a buried pipe which is routed to the water treatment operations pond and subsequently sent to the water treatment plant prior to discharge.** • **Extensive field testing of the waste rock storage facility's cover system has shown to the satisfaction of the Forest Service that the cover acts as an effective barrier to maintain surface water flow away from the waste rock located beneath the cover.** • **The surface runoff from the majority of the site is clean storm water which is managed by best management practices and routed off-site over reclaimed surfaces as permitted under the Multi-Sector Stormwater General Permit.**

Table C-2 Facilities Referenced in Releases Report

	• **A minimal amount of storm water is routed to the water treatment plant and consists of precipitation falling within the footprint of the operations pond, and two additional ponds, all of which are part of the water management and water treatment system.**
• The sources of wastewater in outfalls 002 and 003 discharge include runoff and seepage from the waste rock dump, mine drainage from the Sunbeam adit, storm water, and wastewater from the tailings impoundment underdrains.	• **This language appears to be taken from the 2015 fact sheet for the NPDES renewal but the 2016 renewal fact sheet should be referenced.**
• Following precipitation, coagulant and flocculant are added to aid settling and the waste water flows to a lined settling pond.	• **The water treatment does not include addition of a coagulant as it is not required.**

Illinois Creek, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **In response to the events at Illinois Creek, the state strengthened its financial assurance requirements by increasing the specific items and activities included in the cost estimate, as well as ensuring the estimate more accurately reflected actual reclamation costs.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The state entered into a "mine-to-reclaim" partnership by allowing a private company to continue operations and use money from the production to fund cleanup and reclamation.**

Jerritt Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**

Table C-2 Facilities Referenced in Releases Report

• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The design and much of the construction pre-dates the state's mining regulations.**
• EPA neglects to discuss actions taken by the operator under oversight by regulatory authorities.	• **Operator has undertaken extensive corrective action to control sources and pump and contain groundwater plume under oversight by NDEP and Forest Service.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• EPA overlooks existing financial assurance.	• **The current financial assurance for Jerritt Canyon, held by NDEP and the Forest Service, totals $74.4 million with $23.5 million of that dedicated to assure management and completion of the corrective action for the releases from the tailings facility.**

Kendall Mine, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Placer mining began in the 1880s. The advent of the improved cyanide process in 1900 brought a boom to the district as the abundance of "cyanide ores."**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Kinsley Mine, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state and BLM mining permit requirements to prevent a similar outcome.	• **Both the BLM and NDEP have changed how reclamation bonds are calculated to ensure sufficient**

	funds for reclamation in the event of a default.

Lone Tree Mine, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• Characterization of pit lake acidity as a release requiring a CERCLA-like response. • Incomplete story of owner/operator efforts to address acidic pit lake.	• **The pit lake became acidic shortly after its formation as a result of exposed, naturally occurring mineralization but there have been no releases to the environment as the pit lake is a hydraulic sink. Groundwater surrounding the pit lake naturally flows to, not out of the lake.** • **Since acidity was first identified, it has been successfully offset. The recent success of treatment and resulting lessons learned will continue to allow for more refined and more effective future reclamation practices.** • **The handling of the issue by the owner/operator demonstrates that existing regulatory programs are capable of detecting and addressing issues before major problems arise and without having to rely on any public funding.**
• No discussion of existing financial assurance in place to address identified issues.	• **The owner/operator holds in excess of $70 million in financial assurance to cover the cost of final closure. Much of this cost is attributed to pit lake management.**
• As of Jan. 2014, the lake level was approximately 4352 feet.	• **The lake level is approximately 4,230 "above mean sea level."** • **EPA's omission constitutes an exaggeration of scale and likely overstates the impacts.**

McLaughlin Mine, CA

Table C-2 Facilities Referenced in Releases Report

EPA Mischaracterizations/Omissions	**The Real Story**
• EPA selectively quotes from reports regarding the McLaughlin mine without reporting the status or conclusions by California regulatory agencies responsible for the site.	• **The McLaughlin Mine is closed and is subject to site-specific waste discharge requirements and closure and post-closure maintenance imposed by the California Regional Water Quality Control Board, Central Valley Region.** • **The closure order includes a detailed assessment of mine waste, facilities and mine waste management units and imposes specific design, maintenance and monitoring requirements based on a comprehensive hydrogeologic investigation of the area.**
• EPA fails to acknowledge the role of the operator and state regulator in addressing risk of releases.	• **The construction, operation, reclamation and closure of the McLaughlin mine has been undertaken and continues under the supervision of the California regulatory authority.**
• EPA fails to appreciate the magnitude of existing financial assurance.	• **Financial assurance for closure and post-closure maintenance for the McLaughlin mine exceeds $42 million. That financial assurance is available to respond to any release. However, the operator remains liable for implementing the closure and post-closure maintenance and monitoring plan, and the financial assurance has not been called upon nor have any other taxpayer dollars been expended to respond to a release of hazardous substances at the McLaughlin mine.**
• EPA ignores the role the owner/operator has played in reducing risks of acid rock drainage by facilitating cleanup of historic operations.	• **During operations, the owner/operator cleaned up three historic mercury mines.**

Table C-2 Facilities Referenced in Releases Report

South and Central Rasmussen Ridge, ID	
EPA Mischaracterizations/Omissions	The Real Story
• No recognition of the role of the state program in reducing risk.	• **It was through sampling pursuant to the state regulatory program that the owner/operator identified exceedances of surface water standards. The state and owner/ operator signed a Consent Order 2013 to identify potential sources of contamination to the groundwater and two creeks. A Final Preliminary Source Characterization Report has been submitted and it is anticipated that the final report will be approved in 2017 and a phased remedial action plan is anticipated to commence in mid-2017.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• Incomplete story of owner/operator's reclamation efforts.	• **Following discovery of surface water standard exceedance in a creek in 2005, the owner/operator constructed a pumpback system, which improved ponds and pumps to capture potentially impacted surface water and retain it onsite by pumping to an infiltration pond.** • **The owner/operator instituted best management practices of stormwater, involving routing runoff water into retention and infiltration ponds, with the goal of preventing surface runoff water that has been in contact with excavated material from leaving the site.** • **The owner/operator has successfully run the pumpback system and used these practices to manage stormwater for over twelve years.** • **Stormwater management features will be retained as necessary on active portions of the site, while**

Table C-2 Facilities Referenced in Releases Report

	inactive portions will be reclaimed following mining. • **In 2012 the owner/operator worked with state and federal regulations to initiate construction of a Mine Retention Pond Berm to add runoff and stormwater control capacity during high-flow events.** • **The owner/operator also constructed a geosynthetic cap and cover system of a dump as part of a study to evaluate constructability and effectiveness of a cap in reducing selenium loading and to evaluate the effectiveness of establishing a vegetative cover versus a rock armor cover.**

Rain Mine, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The dam and waste rock dump at issue were designed before the state's mining regulations for water controls and reclamation went into effect.**
• No recognition of the role of the state program in reducing risk.	• **All issues with respect to acid rock drainage and perceived problems with the tailings storage facility were detected by the owner/operator pursuant to the state-mandated monitoring plan, reported to the state regulator and corrected under the state program, all without the need for any public funding.**
• No discussion of existing financial assurance in place to address identified issues.	• **The owner/operator holds in excess of $67 million in financial assurance.**
• Incomplete story of owner/operator's reclamation efforts.	• **EPA overlooks the owner/operator's current reclamation practices and the positive results to date including, re-grading the heap leach pad,**

	closing the pregnant pond, covering one of the rock dumps, closing the fuel dock and removal of one of the crushing facilities.
• Mischaracterization of tailings.	• **EPA fails to note that the first seepage referenced consisted of uncontaminated stormwater.** • **EPA fails to mention the state's view that downstream seepage controls are effective.**

Red Dog, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• No discussion of existing financial assurance in place to address identified long-term water management issues.	• **The reclamation and closure bond provided pursuant to the state regulatory program exceeds $558 million and is sufficient to cover the reclamation and foreseeable long term water treatment costs. The funds will cover long term water treatment, repair and inspections of tailings dams and repair and monitoring of waste rock storage pile covers.**

Rochester Mine, NV	
EPA Mischaracterizations/Omissions	The Real Story
• Number of heap leach pads.	• While EPA correctly indicates five heap leach pads are authorized, only five have been constructed.
• Number of process ponds.	• Seven ponds are stated but one is not yet constructed. • The test evaporation cell is mischaracterized as a process pond but it is no longer used as such.
• Incomplete description of pit lake.	• Remediation of the pit lake has been completed through backfilling and lime amendment so that the potential

Table C-2 Facilities Referenced in Releases Report

	for a current or future pit lake no longer exists.
• Implication that certain permit requirements were included due to the need to address previous discharges at the site, including conditions for remediation of the leach pads and cover system installations.	• The term "remediation" is misrepresented, as the closure system is a function of the closure of a leach pad as a component of the overall reclamation of the site. There are "conditions" associated the cover system, but these are typical permit related conditions that apply to the site from a closure standpoint, not a corrective action "remediation" standpoint as the EPA has intended to imply. Also, there is one area where groundwater remediation is occurring and this is being addressed. No new conditions were added in the authorization related to the current remediation that is occurring. The groundwater remediation is under control, is limited, has been accounted for in state permits, was addressed in the recent NEPA EIS, and is included in the site's closure plan and associated reclamation cost estimate/financial assurance.

Silver Mountain, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The site includes the area where a mine operated sporadically from 1928 to the 1960s to extract silver, copper and gold from soil and ore.** • **Another EPA document indicates mining could have commenced as early as 1902.** • **By 1956, the sporadic development of the mine produced about 2000 feet of underground workings and several tailings piles in a mine dump consisting of waste and mineralized rock.**
• EPA neglects to provide information on changes to the state mining	• **The state Metals, Mining and Milling Operations Act was not**

Table C-2 Facilities Referenced in Releases Report

regulations or permit requirements to prevent a similar outcome.	**enacted until 1994. The act addresses the following issues that would minimize a repeat of the events that happened at Silver Mountain: inspections, financial assurance, engineering design, cyanide management and waste management.**

Smoky Canyon Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The owner/operator entered into an agreement over a decade ago with multiple agencies to investigate and prepare a feasibility study to address releases associated with historical practices. The owner/operator has paid for all investigations, feasibility studies, early actions and all agency costs (including all contractors that state and federal agencies have hired to advise them and oversee the operator's work). Agency costs have been in the millions of dollars.**
• EPA fails to acknowledge changes in practices to address the events that happened at the Pole ODA.	• **The issues that occurred were the result of historical mining practices used when the mining commenced in 1983 and before selenium had been identified as an issue. These practices have not been used since approximately 2003.**

Summitville, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Historic mining operations began as early as the 1870s or 1890s (documents conflict).**

Table C-2 Facilities Referenced in Releases Report

	• **In the Summitville Dam Impoundment, a historic tailings pond, AMD was generated by the contact of surface water collected with the waste stored in the impoundment. It was estimated that 36,000 pounds of copper per year was transported from these source areas into the Wrightman Fork.** • **The Reynolds Adit was completed in 1897. Prior to plugging in 1994, the Adit flowed continuously, varying from a low of approximately 100 gallons per minute in the winter to an average high of approximately 400 gallons per minute during spring melt. Because the Reynolds Adit drains the mineralized portion of South Mountain, historically it has evidenced relatively high metal discharges.** • **In 1934, a 100 ton-per-day flotation/cyanidation mill and gold retort was installed close to the south bank of the original Wightman Fork Creek. Records indicate that dewatering filtrate from the flotation circuit was discharged directly into the creek throughout the mid-1930's.** • **Open pit mining operations did not expose standing ground water in the mine pit. Infiltration of surface water (derived from snowmelt and rainfall) through the pit may have resulted in elevated dissolved metal concentration in the water draining from the Reynolds Adit.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The State enacted the Mined Land Reclamation Act of 1993 as a response to the perceived regulatory failure at Summitville.** • **The primary purpose of the Act is to ensure that mining operations utilizing toxic or acidic chemicals receive increased regulatory oversight.**

Table C-2 Facilities Referenced in Releases Report

	• **The act requires preparation of an Environmental Protection Plan that describes measures to be taken to prevent any unauthorized release of pollutants to the environment as well as Include adequate reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented.** • **Additionally, the provides new authorities for regulators regarding inspections and corrective actions.** • **The 1993 amendments also contained additional reporting requirements and financial safeguards intended to prevent another Summitville.**

Thompson Creek Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state and BLM mining permit requirements to prevent a similar outcome	• **Both the USFS and IDEQ changed how permit conditions are developed and how to calculate reclamation bonds to ensure proper closure and sufficient funds for reclamation.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Wharf Mine, SD	
EPA Mischaracterizations/Omissions	**The Real Story**
• Dated information on exceedances of the weak acid dissociable standard for cyanide.	• **Consistent improvement in water treatment and solution management have resulted in no**

Table C-2 Facilities Referenced in Releases Report

	exceedances to the Annie Creek since 2009.
• Dated information on arsenic levels in certain wells.	• **Of the seven wells mentioned, five of them are now consistently within the arsenic groundwater standard of 0.01 mg/l, and the other two are exhibiting consistent decline in their arsenic concentrations and are expected to also be within the groundwater standard in the near future.**

Zortman and Landusky, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Underground mining and vat leaching began in the 1880s. Open pit and heap leaching activities (including use of cyanide) began in 1977.**
• Incomplete discussion of financial assurance	• **More than $70 million in financial assurance was available for reclamation and closure of the Zortman and Landusky Mines and for water capture and treatment. BLM reported that was sufficient for some reclamation scenarios but additional funding was needed for the selected reclamation and closure plan.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **In response to the event at Zortman and Landusky, the federal and state regulatory agencies enacted substantial revisions to their regulations. These changes included much stricter data collection such as waste characterization studies to identify potentially acid-generating materials and revised closure and financial assurance requirements.**

Table C-3 Facilities Referenced in the Evidence Report

Anaconda Co. Smelter, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Large-scale copper smelting and concentrating activities outside the town of Anaconda began in 1884.** • **Hazardous release records date back to 1905.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The facility was designed long before any the state promulgated any mining or environmental regulations.**

Argenta Mine and Mill, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA failed to provide any information as to the relevance of this site to the proposed regulation.	• **The Argenta Mine and Mill facilities predate the water pollution control regulations for mining facilities established pursuant to NAC 445A.350 through 445A.447.** • **The NDEP issued permits for this facility and the facility operates within the requirements of those permits.**

ASARCO Hayden Plant	
EPA Mischaracterizations/Omissions	**The Real Story**
• The Hayden Plant is in Nevada.	• **The Hayden Plant is located in Arizona.**
• EPA attributes the releases to the Hayden Plant.	• **The releases actually occurred at the ASARCO Ray facility located 20 miles from the Hayden Plant.**

Table C-3 Facilities Referenced in the Evidence Report

• The releases from this facility are recent.	• **The releases occurred approximately 25 years ago.**
• The site has no previous significant legacy mining issues.	• **Contamination at Hayden may be related to activities potentially dating back to the beginning of operations in 1911 (not 1920).**

• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Arizona has adopted the Aquifer Protection Permit (APP) to protect groundwater:**
	  ○ **Imposes design, operation, inspection, monitoring, recordkeeping and contingency requirements on mining facilities**
	  ○ **Requires specified groundwater standards be met at points of compliance that are designated for each permitted site.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has paid for all remediation and entered into a consent decree under the CWA (not CERCLA) to ensure impacted groundwater does not impact a nearby creek**
• EPA alleges elevated air levels of copper and chromium.	• **The document cited by EPA does not discuss copper or chromium.** • **EPA Region 9 has no regional screening levels for copper and chromium in air.**
• EPA alleges elevated air levels of arsenic, cadmium and lead.	• **The levels for arsenic and cadmium are elevated only in respect to EPA Region 9's regional screening levels, which are generic and merely suggests that further evaluation of potential risks is appropriate.** • **The average measured lead level was below the NAAQS for lead** • **Any violations were resolved by a CAA (not CERCLA) consent decree in 2015, in which the company admitted no liability but agreed to a converter retrofit project to reduce these air emissions.**

• EPA exaggerates a 2002 spill.	• **The 2002 was caused by equipment failure and not design or operational flaws.** • **The amount of CERCLA chemicals was small (only 1.37 pounds) and did not leave the site.**

Bunker Hill, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations began in 1886. The beginning of mining and milling at Bunker Hill predated the Clean Air Act by 84 years, the Clean Water Act by 82 years, and the Resource Conservation and Recovery Act by 78 years.**
• EPA neglects to indicate that potentially responsible parties are funding and conducting a significant portion cleanup or reclamation activities.	• **Settlements helping to fund cleanups include $180 million from Hecla and $435 million from ASARCO.**

Captain Jack, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining at the Captain Jack Mill began in 1861.** • **The primary source of contamination of a nearby creek originated in the 19th century.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the mining law with the passage of the Mined Land Reclamation Act of 1993 to specify reclamation requirements and provide additional enforcement tools.**

Table C-3 Facilities Referenced in the Evidence Report

Cimarron, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The facility operated from 1960-1979.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The New Mexico Mining and Minerals Division strictly regulates metal mining and milling in New Mexico. The Division, and the mining regulations it promulgated, was authorized by the New Mexico Mining Act of 1993.**

Eagle Mine, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining began in the 1880s and continued until 1984.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the mining law with the passage of the Mined Land Reclamation Act of 1993 to specify reclamation requirements and provide additional enforcement tools.**

East Helena, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The zinc operation operated from 1927 to 1983, and the lead smelter operated from 1888-2001.**
• Lack of acknowledgement of other sources of contamination.	• **Other sources contributing to contamination at Operating Unit 2 of site (which includes the entire City of East Helena) include the Americas Chemet copper pigmentation processing facility**

Table C-3 Facilities Referenced in the Evidence Report

	and BNSF railroad yard. Not all costs or actions related to this OU can be attributable to the Asarco smelter.
• Lack of acknowledgement that at least some of the cleanup was done pursuant to EPA's RCRA, not CERCLA, authority.	• **Some site investigation and cleanup work done under RCRA rather than CERCLA. The site was initially designed as a CERCLA site, then re-classified as a RCRA site to address the on-going operations, only to again be re-classified as a CERCLA site. Even after designation as a CERCLA site, some site cleanup activities were conducted under RCRA authorities.**
• Failure to accurately report the results of blood lead studies.	• **The Montana Department of Environmental Quality, U.S. Department of Health and Human Services, and CDC conducted in 1983 an integrated epidemiologic study in the Helena Valley of Montana to assess children's blood lead levels and the relationship of these levels to the levels of lead in different environmental media. Despite the elevated soils metal levels, the blood lead levels of all children tested showed no cause for public health concern.**

Eastern Michaud Flats	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has funded and conducted any necessary cleanup activities.**

Table C-3 Facilities Referenced in the Evidence Report

Elkem Eramet, OH	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The facility corrected its discharge problem without using any taxpayer funds.**

Foote Mineral Co., PA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations began in 1941 and included a variety of processing operations that could not be legally constructed today (e.g., a pit used to burn solvents for purposes of disposal, and unlined lithium processing waste lagoons).**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Through an administrative order on consent and a consent decree, the PRPs performed the remedy and continue to perform operation and maintenance of the constructed remedy.**

Fort Knox, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA notes this site as one where Superfund risk assessments took place.	• **The referenced biomonitoring reports were not related to any releases at the site but were conducted by the state fish and game department to *measure progress of voluntary reclamation efforts*, including the establishment of a habitat reservoir, associated with historic placer mining.**

Table C-3 Facilities Referenced in the Evidence Report

Gilt Edge, SD	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining operations commenced in 1876. Sporadic mining by numerous operators were conducted until 1941. Early gold miners developed extensive underground workings that wind through the site and engaged in some surface mining. In addition, early miners deposited mill tailings in two nearby creeks.** • **The site is contaminated as a result of historic mining activities.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **South Dakota strengthened its mining regulations in 1987 and made additional changes sine to make regulations even more stringent.**

Greens Creek, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine has been in operation since 1986.	• **Operations commenced in 1989.**
• Implies the water treatment facility was built in response to a release of untreated water with high levels of zinc.	• **Even prior to 1993 when the water treatment facility began operating, all water from tailings and process facilities was collected and treated through a series of ponds and sand filters. No CERCLA-like release ever occurred.**
• EPA ignores the role of monitoring in reducing risk of releases.	• **Each time that ongoing monitoring has suggested an area of concern at the site, the owner/operator has taken a proactive approach to introduce new technologies and/or operational controls and procedures to minimize and mitigate impacts.**

Table C-3 Facilities Referenced in the Evidence Report

Herculaneum Lead Smelter, MO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Herculaneum Lead Smelter has operated since 1892.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **EPA fails to note that the smelter was constructed and primarily operated prior to the passage of the Clean Air Act.**

Homestake Mine, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations began in 1958.** • **Groundwater contamination was identified by the operator's monitoring in 1976.** • **Remedial activities (ground water treatment and tailings management) are the result of activities which predated the current regulatory framework.**
• EPA neglects the actions of the operator under the oversight of regulatory authorities**.**	• **The owner/operator of the facility has undertaken response and remedial actions under joint oversight governed by a memorandum of understanding between the NRC and EPA resulting in a CERCLA-equivalent process.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Most of the site facilities have been decommissioned and reclaimed by the owner/operator without any taxpayer funds.**

Table C-3 Facilities Referenced in the Evidence Report

Li Tungsten Corp., NY	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **Changes to state and federal regulations in the 1980s and 1990s limited the occurrence of the type of issues that developed at this site.**
• The site has no previous significant legacy mining issues.	• **The facility operated from 1940 to about 1984.** • **Ore feed stock was transported 1,000s to 10,000s miles for processing at the site.**

Lincoln Park, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA notes this site as one of the few 2009 Current sites where Superfund risk assessments took place.	• **This site is not representative of current sites. Operations began in 1958.**
• EPA neglects to indicate that few taxpayer funds were used to conduct cleanup or reclamation activities.	• **The operator has primarily been funding and conducting cleanup via consent decrees with EPA.**
• Failure to discuss the role of the federal government in the contamination at the site	• **The federal government licensed and oversaw the facility in connection with the government's federal nuclear program.**

Macalloy Corp., SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The smelting plant operated at the site from 1941 to 1998.**
• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements**

	and provide additional enforcement tools.
• EPA failed to acknowledge that the federal government managed parts of the site.	• **The Department of Defense has owned, operated, or otherwise used areas of the site to produce and store ferrochromium alloy, chrome ore, and slag since 1942.**

Midnite Mine, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• Incorrectly identified as post-1980 site.	• **Mining took place between 1955 and 1981**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has conducted the cleanup efforts and reimbursed the agency for all oversight costs:** ○ **spent $48 million on remedial work;** ○ **placed $42 million in a trust fund** ○ **issued $170 million letter of credit for use toward completion of remedial work.**
• Failure to discuss the role of the federal government in the contamination at the site	• **The federal government licensed and oversaw the mine in connection with the government's federal nuclear program. In fact, the government was held liable as an owner of the mine by a federal court, which even found that the United States had "the authority to prevent the very contamination" for which it brought action against the company.**

Monsanto Soda Springs, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• Failure to acknowledge contamination was a result of historic practices and	• **The Record of Decision for the NPL listing and remedial actions to**

have for the most part been addressed.	**address groundwater and dust emissions happened nearly 30 years ago.** • **Remedial actions related to an old hydroclarifier that was replaced and ponds that were evacuated and filled.** • **The company is performing a focused RI/FS to determine if a faster groundwater remedy can be achieved.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has conducted and/or paid for all remedial activities.**
• Incorrect description of final remedy.	• **EPA's "Final Remedy" section notes that adjacent "residential" property owners were given a choice to have their property cleaned up via (a) "evacuation," containment, and replacement of soils or (b) rendered protective of human health and the environment via land-use restrictions… ." Properties adjacent to facility are agricultural (not residential) and were given option being cleaned up via "*excavation," not "evacuation"* but all opted for land use restrictions on residential development rights.**
• Incorrect characterization of on-site slag piles	• **Testing has shown that slag from the plant furnaces is a glass-like, inert material.**

National Southwire Aluminum, KY	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The is a primary aluminum smelter that operated from 1969.** • **Ore feed stock was transported 1,000s miles for processing at the site.**
• EPA neglects to provide information on changes to the state and federal	• **Changes to state and federal regulations in the 1980s and 1990s**

Table C-3 Facilities Referenced in the Evidence Report

regulations or permit requirements to prevent a similar outcome.	**limited the type of issues that developed at this site.**

Omaha Lead, NE	
EPA Mischaracterizations/Omissions	**The Real Story**
• Type of facility mischaracterized	• **ASARCO's operation was a refinery as opposed to a smelter.**
• Failure to accurately portray contributions of second on-site facility.	• **To the extent offsite remediation was conducted (e.g., yard replacement, blood lead testing) some of this work was attributable to a second facility (smelter and lead battery recycling plant) operated from another entity.**

Ormet Corp., OH	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The is a primary aluminum smelter that operated from 1969.** • **Ore feed stock was transported 1,000s miles for processing at the site.**
• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **Changes to state and federal regulations in the 1980s and 1990s limited the type of issues that developed at this site.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company is conducting site remediation pursuant to a consent order.**

Palmerton Zinc Pile, PA	
EPA Mischaracterizations/Omissions	**The Real Story**

Table C-3 Facilities Referenced in the Evidence Report

• Mischaracterization of the risks to groundwater.	• **While the local drinking water utility draws water from on-site well, the wells have been operated for decade with no issues associated with the past smelting activities.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **All remedial costs and activities pursuant to CERCLA have been implemented by the relevant PRPs**

Phelps Dodge Tyrone, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• Identifies releases in 2000 but fails to discuss actions taken in response.	• **The company agreed to a cooperative assessment of potential natural resource to address such releases.** • **Entered into a settlement of claims under the Migratory Bird Treaty Act resulting in improved water management and reclamation work.** • **Closed and reclaimed all tailings impoundments.** • **Conducted a comprehensive assessment of past and present discharges affecting ground water and surface water both within and outside of the site and submitted 2 abatement plans that were approved by the state.**
• No recognition of the role of the state program in reducing risk.	• **The facility holds seven state groundwater discharge permits, including a site-wide permit that governs closure.** ○ **The closure permit specifies closure and reclamation design requirements to prevent groundwater pollution following closure, water collection and treatment requirements, closure and post-closure monitoring and reporting,**

Table C-3 Facilities Referenced in the Evidence Report

	and financial assurance for all closure costs • **Each of the permits contains provisions limiting the volume of discharges, governing design and operation of the discharging facilities, and requiring monitoring of the discharges and groundwater and reporting of unauthorized discharges.** • **The state has specific regulations governing copper mining facilities, *which apply to future renewals of the existing permits*.**

Red Dog, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• No discussion of existing financial assurance in place to address identified long-term water management issues.	• **The reclamation and closure bond provided pursuant to the state regulatory program exceeds $558 million and is sufficient to cover the reclamation and foreseeable long term water treatment costs. The funds will cover long term water treatment, repair and inspections of tailings dams and repair and monitoring of waste rock storage pile covers.**

Reynolds Metals Co., OR	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The is a primary aluminum reduction plant that operated from 1969.** • **Ore feed stock was transported 1,000s miles for processing at the site.**
• EPA neglects to provide information on changes to the state and federal	• **Changes to state and federal regulations in the 1980s and 1990s**

regulations or permit requirements to prevent a similar outcome.	**limited the type of issues that developed at this site.**
• EPA does not acknowledge in the rule that the U.S. government constructed this site.	• **The U.S. Government provided the funding for and constructed the plant in 1941.**

Silver Mountain, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The site includes the area where a mine operated sporadically from 1928 to the 1960s to extract silver, copper and gold from soil and ore.** • **Another EPA document indicates mining could have commenced as early as 1902.** • **By 1956, the sporadic development of the mine produced about 2000 feet of underground workings and several tailings piles in a mine dump consisting of waste and mineralized rock.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The state Metals, Mining and Milling Operations Act was not enacted until 1994. The act addresses the following issues that would minimize a repeat of the events that happened at Silver Mountain: inspections, financial assurance, engineering design, cyanide management and waste management.**

Smoky Canyon Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The owner/operator entered into an agreement over a decade ago with multiple agencies to investigate and prepare a feasibility study to address releases associated with**

	historical practices. The owner/operator has paid for all investigations, feasibility studies, early actions and all agency costs (including all contractors that state and federal agencies have hired to advise them and oversee the operator's work). Agency costs have been in the millions of dollars.
• EPA fails to acknowledge changes in practices to address the events that happened at the Pole ODA.	• **The issues that occurred were the result of historical mining practices used when the mining commenced in 1983 and before selenium had been identified as an issue. These practices have not been used since approximately 2003.**

Stauffer Chemical (Tarpon Springs), FL	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **This phosphorous plant operated from 1947 to 1981. Waste management activities at the site predated the modern waste containment criteria enacted by the state.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Summitville, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Historic mining operations began as early as the 1870s or 1890s (documents conflict).** • **In the Summitville Dam Impoundment, a historic tailings pond, AMD was generated by the contact of surface water collected with the waste stored in the**

	impoundment. It was estimated that 36,000 pounds of copper per year was transported from these source areas into the Wrightman Fork. • **The Reynolds Adit was completed in 1897. Prior to plugging in 1994, the Adit flowed continuously, varying from a low of approximately 100 gallons per minute in the winter to an average high of approximately 400 gallons per minute during spring melt. Because the Reynolds Adit drains the mineralized portion of South Mountain, historically it has evidenced relatively high metal discharges.** • **In 1934, a 100 ton-per-day flotation/cyanidation mill and gold retort was installed close to the south bank of the original Wightman Fork Creek. Records indicate that dewatering filtrate from the flotation circuit was discharged directly into the creek throughout the mid-1930's.** • **Open pit mining operations did not expose standing ground water in the mine pit. Infiltration of surface water (derived from snowmelt and rainfall) through the pit may have resulted in elevated dissolved metal concentration in the water draining from the Reynolds Adit.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The State enacted the Mined Land Reclamation Act of 1993 as a response to the perceived regulatory failure at Summitville.** • **The primary purpose of the Act is to ensure that mining operations utilizing toxic or acidic chemicals receive increased regulatory oversight.** • **The act requires preparation of an Environmental Protection Plan that describes measures to be taken to prevent any unauthorized release of pollutants to the environment as well as Include adequate**

Table C-3 Facilities Referenced in the Evidence Report

	reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented. • **Additionally, the provides new authorities for regulators regarding inspections and corrective actions.** • **The 1993 amendments also contained additional reporting requirements and financial safeguards intended to prevent another Summitville.**

Teledyne Wah Chang, OR	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The plant produces zirconium and other rare earth metals and alloys and began operation in 1957.** • **Ore feed stock was transported 100s to 10,000s miles for processing at the site.**
• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **Changes to state and federal regulations in the 1980s and 1990s limited the type of issues that developed at this site.**

Tex Tin Corp., TX	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The plant is a former tin and copper smelter that began operations in 1941 for wartime production and operated until 1991.** • **Ore feed stock was transported 100s to 1,000s miles for processing at the site.**

Table C-3 Facilities Referenced in the Evidence Report

• EPA neglects to provide information on changes to the state and federal regulations or permit requirements to prevent a similar outcome.	• **Changes to state and federal regulations in the 1980s and 1990s limited the type of issues that developed at this site.**

Table C-4 Facilities Referenced in the Practices Report

Anaconda Co. Smelter, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues	• **Large-scale copper smelting and concentrating activities outside the town of Anaconda began in 1884.** • **Hazardous release records date back to 1905.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The facility was designed long before any the state promulgated any mining or environmental regulations.**

ArcelorMittal, MN	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities	• **Cleanup of the releases from the tailings piles has been handled by the facility operator.**

ASARCO Hayden Plant	
EPA Mischaracterizations/Omissions	**The Real Story**
• The Hayden Plant is in Nevada	• **The Hayden Plant is located in Arizona**
• EPA attributes the releases to the Hayden Plant	• **The releases actually occurred at the ASARCO Ray facility located 20 miles from the Hayden Plant**
• The releases from this facility are recent	• **The releases occurred approximately 25 years ago**
• The site has no previous significant legacy mining issues	• **Contamination at Hayden may be related to activities potentially dating back to the beginning of operations in 1911 (not 1920)**

Table C-4 Facilities Referenced in the Practices Report

• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Arizona has adopted the Aquifer Protection Permit (APP) to protect groundwater:**
	  ○ **Imposes design, operation, inspection, monitoring, recordkeeping and contingency requirements on mining facilities**
	  ○ **Requires specified groundwater standards be met at points of compliance that are designated for each permitted site.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has paid for all remediation and entered into a consent decree under the CWA (not CERCLA) to ensure impacted groundwater does not impact a nearby creek**
• EPA alleges elevated air levels of copper and chromium	• **The document cited by EPA does not discuss copper or chromium** • **EPA Region 9 has no regional screening levels for copper and chromium in air**
• EPA alleges elevated air levels of arsenic, cadmium and lead	• **The levels for arsenic and cadmium are elevated only in respect to EPA Region 9's regional screening levels, which are generic and merely suggests that further evaluation of potential risks is appropriate** • **The average measured lead level was below the NAAQS for lead** • **Any violations were resolved by a CAA (not CERCLA) consent decree in 2015, in which the company admitted no liability but agreed to a converter retrofit project to reduce these air emissions**
• EPA exaggerates a 2002 spill	• **The 2002 was caused by equipment failure and not design or operational flaws** • **The amount of CERCLA chemicals was small (only 1.37 pounds) and did not leave the site**

Table C-4 Facilities Referenced in the Practices Report

ASARCO Silver Bell, AZ	
EPA Mischaracterizations/Omissions	**The Real Story**

• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Subsequent to the events in question, Arizona has adopted the Aquifer Protection Permit (APP) which governs this site**
	  ○ **resulted in construction of dams, catchments and pump back systems to capture any impacted surface or subsurface flow**
	  ○ **includes best available demonstrated control technology requirements as well as inspection and maintenance requirements**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has funded all remediation activities and meets the financial assurance requirements both under the APP and the Arizona Mined Land Reclamation program**

Barite Hill, SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements and provide additional enforcement tools.** • **This facility did not have a waste rock management plan to prevent formation of acid mine drainage in the main pit as compared to the most recent mine permitted where all potentially high acid rock drainage wastes are placed on a double lined waste facility.**

Barrick Goldstrike, NV

Table C-4 Facilities Referenced in the Practices Report

EPA Mischaracterizations/Omissions	The Real Story
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified releases	• **All releases at the Goldstrike Mine have been reported and remediated in accordance with applicable NDEP permits and regulations, the BLM plan of operations and, where applicable, EPA requirements. In every release, appropriate corrective action was approved by regulatory authorities, implemented and documented. NDEP files document that the releases were fully addressed under existing regulatory and permit requirements. Releases cited by EPA reports did not and do not present any risk of a response action.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Operations at Goldstrike have been ongoing for more than thirty years. During that time, many improvements have been made to air and water quality management systems, including additional controls added to comply with updated legal, regulatory and permit requirements from BLM and NDEP. Regulations and permits require that mine facilities are monitored and that any release is reported and addressed.**
• EPA fails to acknowledge the voluntary measures undertaken by the operator to prevents releases.	• **Goldstrike has also implemented internal and corporate environmental management systems and is certified under the ISO14001:2004 standard.**
• EPA fails to appreciate the magnitude of existing financial assurance.	• **Current financial assurance for Goldstrike operations totals more than $230 million and is held jointly by NDEP and BLM.**

Beal Mountain, MT

Table C-4 Facilities Referenced in the Practices Report

EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues	• **According to the Forest Service (the lead agency conducting cleanup) placer gold was discovered in the area in 1864 and placer mining reached its peak in the early 1900's. The only significant historical production was from placer deposits, which are cited as being primarily responsible for habitat degradation at the site.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Since the site operated, both the Forest Service and the State of Montana have increased their requirements on bonding to ensure that sufficient funds are available for reclamation should default occur.**
• Wrong date of operations: The Beal Mountain mine was operated by Pegasus Gold from 1984 until 1997.	• **The actual date of operations was 1988 through 1997.**

Blackbird Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The Blackbird Mine operated from the 1880 to 1982.**
• EPA neglects to indicate that almost no taxpayer funds were used to conduct cleanup or reclamation activities	• **Almost all the cleanup of the releases has been and continues to be the responsibility of the facility operator.**

Table C-4 Facilities Referenced in the Practices Report

Brewer Gold, SC	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The mine is one of the oldest gold mines in the U.S., with the first documented gold production in 1828. The mine operated intermittently from 1828 to 1995.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the state Mining Act in 1990 to specify reclamation requirements and provide additional enforcement tools.** • **Compared to the minimal monitoring requirements for this site (only at 3 locations) the most recent mine approved in state is required to conduct extensive pre-mining, during-mining and post-mining surface and groundwater monitoring obligations with quarterly reporting to EPA and the state.** • **This owner/operator posted $500,000 in financial assurance compared to $65 million for most recently approved mine in the state.** • **This facility had an unlined overburden and low grade storage area as compared to the most recent mine permitted where all potentially high acid rock drainage wastes are placed on a double lined waste facility.**

Buckhorn Mine, WA	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine is owned by Kinross Corp.	• **The mine is owned and operated by Crown Resources Corp., a subsidiary of Kinross Gold U.S.A. Inc.**

Table C-4 Facilities Referenced in the Practices Report

• The site is an underground mine that includes waste rock	• **Development rock (a.k.a. waste rock) is temporarily managed on surface and will all be utilized underground. No development rock stockpiles will remain on surface.**
• Water management during spring snow melt has been a well-documented problem	• **Empirical data collected during operations has guided ongoing adaptive management to effectively address annual variations in quantities of snow melt. Successful water management activities have included additional discharge outfalls, water treatment technology and system improvements, increased pumping capacity, additional dewatering well installation, and stormwater collection trench installation.**
• In 2011 and 2012, the mine's groundwater capture zone failed to contain spring rains and snow melt resulting in contaminated water reaching a nearby creek	• **In 2011, the operator self-reported an isolated incident that resulted from the malfunction of one dewatering well for a brief period in spring 2011. This discrete release was properly mitigated and the dewatering well has operated without capture zone failure to date. Other alleged capture zone violations were appealed and settled without an admission of fault.**
• Water generated in the underground mine can carry high concentrations of heavy metals such as copper, lead, and zinc that must be captured and processed before being discharged at approved outfalls.	• **Water from the underground mine sumps is currently collected and treated prior to discharge at approved outfalls. The most recent samples indicate concentrations of copper (year 2016), lead (year 2016) and zinc (year 2015) are below drinking water standards prior to treatment.**
• Violations in 2011 included allowing water discharges causing slope instability and erosion, and for discharging water at an unauthorized point.	• **Alleged violations were appealed and settled without an admission of fault.**
• Since operations began, the state has issued numerous penalties, notices of violation and administrative orders directing the company to control	• **While the state has issued certain penalties and NOVs, these have all be appealed and were either settled without any admission of fault or**

stormwater, rectify groundwater capture zone inadequacies, prevent slope failures, and comply with permit limits for nitrates, sulfates, acidity, copper, lead, zinc and solids from stormwater ponds.	**remain under appeal. In particular, the operator is appealing the 2014 NPDES permit issued by the state as it is unreasonable, based on flawed assumptions and fails to consider natural background quality nor previously permitted mine activities. The permit also set an arbitrary and artificial "capture zone" boundary which, among other things, does not account for facilities that fall outside this "capture zone" that were designed and installed to manage this water. As a result, the permit standards are in many cases unattainable.**

Captain Jack, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues	• **Mining at the Captain Jack Mill began in 1861.** • **The primary source of contamination of a nearby creek originated in the 19th century.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Significant changes were made to the mining law with the passage of the Mined Land Reclamation Act of 1993 to specify reclamation requirements and provide additional enforcement tools.**

Cimarron, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The facility operated from 1960-1979.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The New Mexico Mining and Minerals Division strictly regulates metal mining and**

Table C-4 Facilities Referenced in the Practices Report

	milling in New Mexico. The Division, and the mining regulations it promulgated, was authorized by the New Mexico Mining Act of 1993.

Climax Molybdenum, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations began in 1917 and the identified wind-blown tailing issue is historical in nature.**
• Reference to a state notice of violation and fine for a 1986 wind-blown tailing event that were later dropped.	• **Although state regulators initially proposed a penalty, following its inspection and findings but this matter was settled with Colorado regulators, and that the fine was dropped.** ○ **The settlement included incorporating a dust control plan into the Mine's permits.** ○ **By 1989, the mine had regraded, stabilized, and capped its No. 1 Dam with clean cover, consistent with its negotiations with State regulators.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Today, the mine has a dust control plan that is part of its current permits.** ○ **Implementation of that plan adequately protects the surface of the tailing dams from atmospheric events, and the mine mobilizes its personnel and equipment to apply additional dust palliative where necessary.**
•	•

Table C-4 Facilities Referenced in the Practices Report

East Helena, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The zinc operation operated from 1927 to 1983, and the lead smelter operated from 1888-2001.**
• Lack of acknowledgement of other sources of contamination	• **Other sources contributing to contamination at Operating Unit 2 of site (which includes the entire City of East Helena) include the Americas Chemet copper pigmentation processing facility and BNSF railroad yard. Not all costs or actions related to this OU can be attributable to the Asarco smelter.**
• Lack of acknowledgement that at least some of the cleanup was done pursuant to EPA's RCRA, not CERCLA, authority.	• **Some site investigation and cleanup work done under RCRA rather than CERCLA. The site was initially designed as a CERCLA site, then re-classified as a RCRA site to address the on-going operations, only to again be re-classified as a CERCLA site. Even after designation as a CERCLA site, some site cleanup activities were conducted under RCRA authorities.**
• Failure to accurately report the results of blood lead studies.	• **The Montana Department of Environmental Quality, U.S. Department of Health and Human Services, and CDC conducted in 1983 an integrated epidemiologic study in the Helena Valley of Montana to assess children's blood lead levels and the relationship of these levels to the levels of lead in different environmental media. Despite the elevated soils metal levels, the blood lead levels of all children tested showed no cause for public health concern.**

Table C-4 Facilities Referenced in the Practices Report

Energy Fuels White Mesa Mill, UT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The incorrect allegations of CAA exceedances that came from an NGO were attributed to the state regulator: "In 2015, the Utah Department of Environmental Quality discovered that radon emissions from the tailings cells exceeded by up to 80 times the limits established in the CAA…"	• **The incorrect allegations of CAA exceedances came from an NGO presentation that misapplied a model.** ○ **The results of an analysis, which included proper application of the model, showed that radon emissions were approximately seven times *less* than the limits.**
• EPA implies that an investigation into the exceedances by state regulators was "ongoing."	• **The state never conducted an investigation, only requested additional information and analysis. Once the company responded, the issue was considered closed by the state, which EPA should have discerned from its review of the exceedances allegation.**
• EPA referenced one-sided "evidence" and ignored exculpatory "evidence.	• **EPA did not take into account several other relevant documents, including the Ute Mountain Ute's "Calculation Brief" documents, and Energy Fuels response to those documents, all of which were submitted directly to the EPA prior to publication of the Practices Document on November 30, 2016**

Florida Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• The Florida Canyon Mine has been in operation since 1986.	• **The mine began operations in 1987, pre-dating the state's mining regulations by 2 years.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The primary groundwater plume at issue was related to a heap leach pad constructed prior to the state Water Pollution Control Regulations. Current state**

	regulations would not allow for this same type of installation. The operator has stopped using the affected portion of the old leach pad and is undertaking remedial action under the oversight of NDEP.
• EPA fails to acknowledge the role of the operator and state regulator in addressing the identified releases.	• **NDEP reports document that the immediate response to the release and conclude that "waters of the state were not threatened and the areas impacted by the released material were remediated quickly with oversight and approval from the BMRR site assigned compliance inspectors."**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Gilt Edge, SD	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining operations commenced in 1876. Sporadic mining by numerous operators were conducted until 1941. Early gold miners developed extensive underground workings that wind through the site and engaged in some surface mining. In addition, early miners deposited mill tailings in two nearby creeks.** • **The site is contaminated as a result of historic mining activities.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **South Dakota strengthened its mining regulations in 1987 and made additional changes sine to make regulations even more stringent.**

Table C-4 Facilities Referenced in the Practices Report

Greens Creek, AK	
EPA Mischaracterizations/Omissions	**The Real Story**
• The mine has been in operation since 1986.	• **Operations commenced in 1989.**
• Implies the water treatment facility was built in response to a release of untreated water with high levels of zinc.	• **Even prior to 1993 when the water treatment facility began operating, all water from tailings and process facilities was collected and treated through a series of ponds and sand filters. No CERCLA-like release ever occurred.**
• EPA ignores the role of monitoring in reducing risk of releases.	• **Each time that ongoing monitoring has suggested an area of concern at the site, the owner/operator has taken a proactive approach to introduce new technologies and/or operational controls and procedures to minimize and mitigate impacts.**

Homestake Mine, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations began in 1958.** • **Groundwater contamination was identified by the operator's monitoring in 1976.** • **Remedial activities (ground water treatment and tailings management) are the result of activities which predated the current regulatory framework.**
• EPA neglects the actions of the operator under the oversight of regulatory authorities**.**	• **The owner/operator of the facility has undertaken response and remedial actions under joint oversight governed by a memorandum of understanding between the NRC and EPA resulting in a CERCLA-equivalent process.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **Most of the site facilities have been decommissioned and reclaimed by**

Table C-4 Facilities Referenced in the Practices Report

	the owner/operator without any taxpayer funds.

Jerritt Canyon, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The design and much of the construction pre-dates the state's mining regulations.**
• EPA neglects to discuss actions taken by the operator under oversight by regulatory authorities.	• **Operator has undertaken extensive corrective action to control sources and pump and contain groundwater plume under oversight by NDEP and Forest Service.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• EPA overlooks existing financial assurance.	• **The current financial assurance for Jerritt Canyon, held by NDEP and the Forest Service, totals $74.4 million with $23.5 million of that dedicated to assure management and completion of the corrective action for the releases from the tailings facility.**

Kennecott Bingham Canyon, UT	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to provide information on actions taken by state and federal regulatory agencies (even EPA itself) to prevent a similar outcome.	• **Through regulatory and voluntary efforts, controls have been put in place that have ended the historic practices and prevent further contamination from occurring.**
• Reliance on NGO reports rather than EPA's own ROD or RI/FS	• **The so-called 'factsheet' was published by Earthworks, an NGO that is unabashedly and militantly anti-mining and is widely known to play loosely with facts.**

Table C-4 Facilities Referenced in the Practices Report

• Failure to acknowledge EPA's past recognition of the site as an example of how releases can be properly addressed.	• **EPA has touted the site as a leading example of a cooperative federal-state-industry approach to both correct the missteps of the past and provide the right controls to prevent future contamination.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company has funded all the groundwater source control and other clean-up efforts.**

Lost Creek, WY	
EPA Mischaracterizations/Omissions	**The Real Story**
• Mischaracterization of severity of spills on-site.	• **Only one of the 22 spills referenced required cleanup pursuant to federal or state established criteria since the mining solutions generated at in situ mines typically contain only very low concentrations of radionuclides or other constituents of environmental concern. The total soil cleanup required the removal of only a few drums of soil.**
• Mischaracterization on the failure to maintain bleed in a manner that could allow for the possibility of groundwater to escape:	• Mining solutions were controlled and none of the monitor wells were triggered which would have happened if contaminated fluids had begun to migrate and corrective action would have been required. This issue was resolved with the agencies and production continued uninterrupted.
• Mischaracterization of worker exposure to yellow cake dust and related violation.	• Further, the dose to the employees was well within limits established by the NRC. The single violation issued resulted not because of the worker exposure or exposure levels, it was related to the absence of a specialized work permit having been prepared to implement the cleanup in the plant.

Table C-4 Facilities Referenced in the Practices Report

Molycorp Mountain Pass, CA	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• Mischaracterization of severity of the 1989 spill	• **EPA's technical background documents for the Phase IV LDR rule acknowledges that for this site: "no remedial measures have been proposed to correct any contamination caused by [the 1989 spill] as the spill was contained on-site and not believed to pose a significant threat to human health or the environment."**

Mosaic, FL and LA	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• EPA indicates that releases leading up to 2015 settlement agreement are representative of current operational problems with phosphogypsum stacks.	• **EPA's concerns regarding these stacks have been addressed through an enforcement initiative**
• Implication that the stack releases are being addressed under CERCLA.	• **These releases are being addressed under a RCRA consent decree.**
• No discussion of existing financial assurance in place to address identified issues.	• **Through an enforceable consent decree the company agree to place $650 million in a trust and issue a $50 million letter of credit to support the closure and long-term care of these stacks.**

Table C-4 Facilities Referenced in the Practices Report

Morenci, AZ	
EPA Mischaracterizations/Omissions	**The Real Story**
• Identifies releases in 2000 and 2001 but fails to discuss actions taken in response.	• **The company agreed to a cooperative assessment of potential natural resource damages that resulted in a $6.8 million award to address such releases.** • **Entered into a settlement of claims under the Migratory Bird Treaty Act resulting in improved water management and reclamation work.**
• Identifies a 2008 release but fails to discuss actions taken in response	• **Under the oversight of the state, the company appropriately responded by removing all impacted sediment and soils and confirming complete removal.**

• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **Arizona has adopted the Aquifer Protection Permit (APP) to protect groundwater:**
	  ○ **Imposes design, operation, inspection, monitoring, recordkeeping and contingency requirements on mining facilities**
	  ○ **Requires specified groundwater standards be met at points of compliance that are designated for each permitted site.**

National Zinc Corp., OK	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Operations were conducted from 1907-1976.** • **The predominant amount of time the facility conducted operations was prior to the advent of modern environmental law.**

Table C-4 Facilities Referenced in the Practices Report

• Lack of acknowledgement that the cleanup was done pursuant to EPA's RCRA, not CERCLA, authority.	• **The facility underwent a RCRA corrective action to complete closure of the facility.** ○ **This comprehensive action occurred in the late 1990s and is now in the post-closure phase with financial assurance in place pursuant to RCRA.**

Nelson Tunnel/Commodore Waste Rock, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• Failure to acknowledge the 2005 waste rock pile failure is likely the result of legacy mining issues.	• **This site was active from 1876-1989.** • **The mining and dewatering activities at the site predated any environmental laws and regulations.**

Nyrstar Clarksville, TN	
EPA Mischaracterizations/Omissions	**The Real Story**
• Indicates that available documentation does not provide direct evidence that smelting or other processes caused certain air emissions and if the emissions were permitted	• **A cursory review of public records would have revealed that the emissions were permitted under a Title V CAA permit.**
• Misuse of TRI data to allege risk from releases	• **Over 90% of the TRI releases were solids stored in permitted impoundments with engineered impervious liners.**

Table C-4 Facilities Referenced in the Practices Report

Omaha Lead, NE	
EPA Mischaracterizations/Omissions	**The Real Story**
• Type of facility mischaracterized	• **ASARCO's operation was a refinery as opposed to a smelter.**
• Failure to accurately portray contributions of second on-site facility.	• **To the extent offsite remediation was conducted (e.g., yard replacement, blood lead testing) some of this work was attributable to a second facility (smelter and lead battery recycling plant) operated from another entity.**

P4/Monsanto South Rasmussen-Blackfoot Bridge, ID	
EPA Mischaracterizations/Omissions	The Real Story

• Inaccurate site identification/description	• **The Practices document refers to Proposed rule refers to P4/Monsanto South Rasmussen-Blackfoot Bridge site but fails to acknowledge that South Rasmussen and Blackfoot Bridge are two separate mines.**
	• **EPA likely is referring to South Rasmussen because it discusses a CWA settlement P4 reached with EPA on the legacy South Rasmussen mine site.**
	  ○ **South Rasmussen is a legacy mine, permitted in the late 1990s and now in reclamation and closure.**
	  ○ **Blackfoot Bridge is a currently operating modern mine.**

• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**
• Incomplete story of owner/operator's reclamation efforts.	• **For South Rasmussen, the company now collects and treats leachate related to historic overburden disposal practices.**

Table C-4 Facilities Referenced in the Practices Report

	• **Company entered into a consent order with the state to investigate and address groundwater and is working on a remedial action plan.** • **Nearby Blackfoot Bridge mine was constructed and permitted to manage surface runoff and basically eliminate infiltration through overburden areas to address potential selenium concerns.**

Phelps Dodge Tyrone, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• Identifies releases in 2000 but fails to discuss actions taken in response.	• **The company agreed to a cooperative assessment of potential natural resource to address such releases.** • **Entered into a settlement of claims under the Migratory Bird Treaty Act resulting in improved water management and reclamation work.** • **Closed and reclaimed all tailings impoundments.** • **Conducted a comprehensive assessment of past and present discharges affecting ground water and surface water both within and outside of the site and submitted 2 abatement plans that were approved by the state.**
• No recognition of the role of the state program in reducing risk.	• **The facility holds seven state groundwater discharge permits, including a site-wide permit that governs closure.** ○ **The closure permit specifies closure and reclamation design requirements to prevent groundwater pollution following closure, water collection and treatment requirements, closure and post-closure**

Table C-4 Facilities Referenced in the Practices Report

		monitoring and reporting, and financial assurance for all closure costs • **Each of the permits contains provisions limiting the volume of discharges, governing design and operation of the discharging facilities, and requiring monitoring of the discharges and groundwater and reporting of unauthorized discharges.** • **The state has specific regulations governing copper mining facilities, *which apply to future renewals of the existing permits*.**

Table C-4 Facilities Referenced in the Practices Report

Robinson Mine, NV	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Mining dates back to the 1860s.** • **Current mine planning emphasizes reclaiming or moving old facilities to prevent releases.**
• No recognition of the role of the state program in reducing risk.	• **The reference releases were identified by the operator through monitoring, reported and addressed through the state regulatory and permit requirements. EPA and state reports document the response and the state concluded that all five released noted by EPA were "quickly cleaned up with the spilled material returned to containment within the process circuit or tailings impoundment." Waters of the State were not threatened and the areas impacted by the released material were remediated quickly with oversight and approval from the site-assigned compliance inspectors.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money was or has been utilized for the remediation activities.**
• No discussion of existing financial assurance	• **Current financial assurance for the Robinson Mine is $89.7 million, held jointly by BLM and NDEP.**

Smoky Canyon Mine, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The owner/operator entered into an agreement over a decade ago with multiple agencies to investigate and prepare a feasibility study to address releases associated with historical practices. The owner/operator has paid for all investigations, feasibility studies,**

	early actions and all agency costs (including all contractors that state and federal agencies have hired to advise them and oversee the operator's work). Agency costs have been in the millions of dollars.
• EPA fails to acknowledge changes in practices to address the events that happened at the Pole ODA.	• **The issues that occurred were the result of historical mining practices used when the mining commenced in 1983 and before selenium had been identified as an issue. These practices have not been used since approximately 2003.**

Summitville, CO	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Historic mining operations began as early as the 1870s or 1890s (documents conflict).** • **In the Summitville Dam Impoundment, a historic tailings pond, AMD was generated by the contact of surface water collected with the waste stored in the impoundment. It was estimated that 36,000 pounds of copper per year was transported from these source areas into the Wrightman Fork.** • **The Reynolds Adit was completed in 1897. Prior to plugging in 1994, the Adit flowed continuously, varying from a low of approximately 100 gallons per minute in the winter to an average high of approximately 400 gallons per minute during spring melt. Because the Reynolds Adit drains the mineralized portion of South Mountain, historically it has evidenced relatively high metal discharges.** • **In 1934, a 100 ton-per-day flotation/cyanidation mill and gold retort was installed close to the**

Table C-4 Facilities Referenced in the Practices Report

	south bank of the original Wightman Fork Creek. Records indicate that dewatering filtrate from the flotation circuit was discharged directly into the creek throughout the mid-1930's. • **Open pit mining operations did not expose standing ground water in the mine pit. Infiltration of surface water (derived from snowmelt and rainfall) through the pit may have resulted in elevated dissolved metal concentration in the water draining from the Reynolds Adit.**
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **The State enacted the Mined Land Reclamation Act of 1993 as a response to the perceived regulatory failure at Summitville.** • **The primary purpose of the Act is to ensure that mining operations utilizing toxic or acidic chemicals receive increased regulatory oversight.** • **The act requires preparation of an Environmental Protection Plan that describes measures to be taken to prevent any unauthorized release of pollutants to the environment as well as Include adequate reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented.** • **Additionally, the provides new authorities for regulators regarding inspections and corrective actions.** • **The 1993 amendments also contained additional reporting requirements and financial safeguards intended to prevent another Summitville.**

Table C-4 Facilities Referenced in the Practices Report

Tohono (Cyprus), AZ	
EPA Mischaracterizations/Omissions	**The Real Story**
• Little recognition that the identified issues at the site are related to legacy mining issues.	• **Operations at the site began in the 1880s. Environmental issues at the site mainly were the result of historic mining practices.**
• No mention of activities to ensure future groundwater protection.	• **Under a CERCLA order, groundwater is being protected by an ongoing CERCLA remedial investigation/feasibility study and an extensive monitoring well system.** • **The company's new mining restart plan is modern and protective, and is contingent government approvals.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company is conducting all required actions without any taxpayer funding.**
• EPA fails to mention the existing financial assurance requirements.	• **Financial assurance is already required by the company's lease with the Tohono O'odham Nation and the Bureau of Indian Affairs.**

United Nuclear, NM	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **The mining operation began in 1967 and the milling operation began in 1977. All operations ceased in 1982.**
• EPA neglects to provide information on changes to the state and federal mining regulations or permit requirements to prevent a similar outcome.	• **The New Mexico Mining and Minerals Division, and the mining regulations it promulgated, was authorized by the New Mexico Mining Act of 1993, three decades after the operation began.**

Table C-4 Facilities Referenced in the Practices Report

U.S. Silver Galena, ID	
EPA Mischaracterizations/Omissions	**The Real Story**
• Failure to properly characterize the discharge.	• **The issue was a controlled discharge violation that was corrected and settled with the state and EPA.**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **No public money is being utilized for the remediation activities.**

Uranium One Willow Creek, WY	
EPA Mischaracterizations/Omissions	**The Real Story**
• EPA neglects to indicate that no taxpayer funds were used to conduct cleanup or reclamation activities.	• **The company conducted and paid for any necessary cleanup activities.**
• Overstatement of severity of spills or releases	• **2001 spill -- EPA failed to note that the spill:** ○ **involved no radionuclides or hazardous materials;** ○ **impacted approximately 0.04 acres** ○ **State agency recommended no cleanup of the spill was needed.** • **Jan. 2014 spill – EPA failed to note that:** ○ **None of the release fluids entered active water** ○ **State inspection found no visibly discernable impact along the spill flow path to soil or vegetation** ○ **Upon a showing that cleanup of uranium and radium were complete, the state signed off on a completion report.** • **Aug. 2015 spill – EPA failed to note that:**

Table C-4 Facilities Referenced in the Practices Report

	○ **The correct spill date was Aug. 2014;** ○ **The leak involved only 492 gallons of fluid, impacting only 0.04 acres of soil.** • **Sept. 2014 drum pressurization incident – EPA failed to note that:** ○ **The company voluntarily notified NRC of this incident and implemented prompt and effective corrective actions;** ○ **No violations were identified by the Nuclear Regulatory Commission or Department of Transportation.**
• EPA neglects to discuss actions taken by the operator to address future spills or releases	• **Company has voluntarily added into its operational procedures:** ○ **Leak detection systems at all wellhead locations;** ○ **Redesigned module buildings to include a lined catchment sump and leak detection;** ○ **Additional inspection of wellfields;** ○ **Upgraded leak detection alarm systems; and** ○ **Investigated each spill to determine cause and prevent future occurrences.**

Zortman and Landusky, MT	
EPA Mischaracterizations/Omissions	**The Real Story**
• The site has no previous significant legacy mining issues.	• **Underground mining and vat leaching began in the 1880s. Open pit and heap leaching activities (including use of cyanide) began in 1977.**
• Incomplete discussion of financial assurance	• **More than $70 million in financial assurance was available for reclamation and closure of the Zortman and Landusky Mines and for water capture and treatment. BLM reported that was sufficient**

Table C-4 Facilities Referenced in the Practices Report

	for some reclamation scenarios but additional funding was needed for the selected reclamation and closure plan.
• EPA neglects to provide information on changes to the state mining regulations or permit requirements to prevent a similar outcome.	• **In response to the event at Zortman and Landusky, the federal and state regulatory agencies enacted substantial revisions to their regulations. These changes included much stricter data collection such as waste characterization studies to identify potentially acid-generating materials and revised closure and financial assurance requirements.**

Appendix D

REVIEW OF ENVIRONMENTAL PROTECTION AGENCY REPORTS

FINANCIAL RESPONSIBILITY RULES

REVIEW OF ENVIRONMENTAL PROTECTION AGENCY REPORTS

FINANCIAL RESPONSIBILITY RULES

By The

SOCIETY FOR MINING METALLURGY & EXPLORATION, INC.

INTRODUCTION

The National Mining Association (NMA) has requested that the Society for Mining, Metallurgy & Exploration, Inc. (SME) respond to certain statements and studies underlying the Environmental Protection Agency's (EPA) newly proposed rule to set "Financial Responsibility Requirements under CERCLA 108(b) for Classes of Facilities in the Hardrock Mining Industry," See, 40 CFR Part 320, 44 Fed. Reg. 3338 (January 11, 2017). SME is a professional society (nonprofit 501(c) (3) corporation) whose more than 15,000 members represent all professionals serving the minerals industry in more than 100 countries. SME members include engineers, geologists, metallurgists, educators, students and researchers. SME advances the worldwide mining and underground construction community through information exchange, education and professional development.

A panel of experts within SME has reviewed the EPA proposed regulation and submits the following response to the EPA proposal and two of the studies on which the agency has relied to support the imposition of regulations on the mining industry. SME's focus is on the technical validity of statements by the EPA about the technologies employed in mining and the degree and duration of risk associated with the use of those technologies.

Background – Section 1A - EPA Assumptions, Conclusions and Methodology are flawed

Commonly known as "Superfund," the Comprehensive Environmental Response, Compensation, & Liability Act of 1980 (CERCLA) directs EPA to "promulgate requirements that classes of facilities…establish and maintain evidence of financial responsibility *consistent with the degree and duration of risk* associated with the production, transportation, treatment, storage or disposal *of hazardous substances*." 42 U.S.C. 9608(b). (Emphasis supplied). Mining is the first industrial sector EPA has chosen to regulate and the agency, to date, has not sought to impose financial responsibility requirements on any other industrial class.

In proposing this new rule, the EPA relies on two reports to establish what the agency considers the degree and duration of risks involved with hard rock mines and associated facilities. The first is a 1992 paper, *"Mining Sites on Superfund's National Priorities List – Past and Current Mining Practices"* by the EPA's Van E. Housman and Stephen Hoffman. The second is a November 30, 2016 EPA report, titled C*omprehensive Report: An Overview of Practices at Hardrock Mining and Mineral Processing Facilities and Related Releases of CERCLA Hazardous Substances*. Both reports argue that current mining and processing practices do not

differ significantly from the historical practices that produced the contaminated sites listed on the Superfund's National Priorities List (NPL).

For example, the 25 year old Housman/Hoffman report concludes and EPA endorses the following statement: "While some mining waste management practices have changed over time, the basic technologies for extracting and processing of mineral ores have remained fairly constant over approximately the last 50 years. Mining technology has become more efficient over time in recovering mineral values – allowing lower grade ores to be mined which produce more waste. At the same time, combinations of economic and technological factors have increased the scale of surface disturbance and waste generation." *See proposed rule at 3475.*

SME has analyzed the EPA's technical conclusions and the reports on which they are based. In short, the EPA's findings are overly simplistic and ignore the weight of scientific evidence demonstrating the evolution and improvement of mining practices, mineral and ore processing technologies since the enactment of CERCLA more than thirty years ago. The fact that EPA relies upon a report published more than 25 years ago (Housman/Hoffman) is itself troubling, given the agency's stated intent to assess contemporaneous mining practices. The EPA reports also improperly equate the risks associated with current mining practices with those at "Superfund" sites, which predate the era of modern mining regulation.

EPA's Methodology and the 2016 Report

In the Methodology section (*See 2016 Report at 1-5),* EPA acknowledges that it conducted a less than thorough analysis, excluding from its review "individual site permits, environmental impact statements, and other [unspecified] documentation." 2016 Report at 4. EPA also said that the Report "does *not* endeavor to develop a formal risk assessment of the non-operating and currently operating sites and facilities."

In light of the fact that "systematic and comprehensive information about facility characteristics, waste management, releases, and regulatory oversight was not available for either non-operating sites or currently operating facilities," EPA conceded that its profile "is based on information that may be incomplete or anecdotal." Id. at 5. The analysis was also subject to numerous data limitations. Thus, the agency admits that "documentation about operations and releases at currently operating facilities was inherently more difficult to find," in the absence of major enforcement actions. Thus, "no comparison of magnitude and severity was drawn between releases at non-operating sites and currently operating facilities."

The following analysis will demonstrate the improvements in modern mining and ore processing technologies that greatly reduce the both the degree and duration of risk of a release of hazardous substances to zero or *de minimus* levels.

Section 1B. Non-Entry Solution Mining and Ion Exchange Processing

EPA's overstates the risks of potential releases of hazardous materials associated with solution recovery of hardrock minerals. In general, EPA draws inappropriate conclusions from reports or studies or, alternatively, relies upon reports that have been found incorrect. Our reasons follow:

- In the introduction, EPA states that solution mining can release hazardous contaminants to the environment, citing as primary threats the potential for releases to adjacent groundwater and to surface soils and water from spills. Although from a permit/license perspective, these releases are contemplated, existing EPA, Nuclear Regulatory Commission (NRC) and state regulations already require corrective action. There has never been a documented release – based on regulatory records - from solution mines, including uranium recovery that has contaminated adjacent aquifers or adjacent surface properties. Existing regulations remain robust and protective.

- Contrary to the statements in the referenced section, in a public roundtable meeting with the Small Business Administration in February 2016, an EPA representative (Tom Peak, Office of Radiation and Indoor Air) stated that there are no documented impacts to an Underground Source of Drinking Water (USDW) by solution mining of uranium.

- EPA cites as a source in several locations, *Draft Report: Economic Analysis: Proposed Revisions to the Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings Rule (40 CFR Part 192) (November 2014)*. In comments filed with the agency, NMA, other trade groups, mining companies, and several states, including Texas, Nebraska, and Wyoming, disputed the accuracy of this report and claimed it overstated the environmental risks and costs of solution mining for uranium recovery. In subsequent public meetings, EPA was unable to support the conclusions of this report and significantly revised it. EPA ultimately withdrew the rule prior to publication.

- Under the technical portion of the section, EPA cites the use of "new technologies in non-entry mining [that] also use fracturing or drilling to enhance contact with the ore." This statement could cause the reader to infer – incorrectly - that hydraulic fracturing is used for the in-situ recovery of uranium, a false charge levied on multiple occasions by non-governmental organizations that intervene in licensing and permitting process for uranium recovery operations. This statement further implies a new risk to the extraction process using a highly-charged term "fracturing", that is not used and is restricted by existing EPA regulations, namely 40 CFR Part 146.33.

- Under the section titled, "Potential Sources of Hazardous Substances", EPA states; "As of 2009, no remediation of an In-Situ Leaching {ISL) operation in the United States for which data are available had successfully returned the aquifer to baseline conditions." This argument is misleading and misreads a report by the United States Geological Survey (USGS) entitled "*Groundwater Restoration at Uranium In-Situ Recovery Mines, South Texas Coastal Plain*", authored by Susan Hall. Based on Ms. Hall's own statements at public hearings regarding the proposed revisions to 40 CFR Part 192, her report concluded that most but not all individual ionic constituents were returned to

baseline or below, but she did not make any conclusions on whether groundwater restoration was successful or not. The Uranium Producers of America, commented on the proposed revisions to 40 CFR Part 192, providing the results of restoration related to the same results discussed in the USGS report. Those comments demonstrated that in every case where an ionic constituent was not restored to its exact baseline condition, it was within 1 to 2 standard deviations of the baseline mean. In the case of those constituents having a Maximum Contaminant Limit (MCL), the baseline concentrations were above the MCL prior to mining. EPA is alleging that there are significant CERCLA hazards remaining following restoration, which in fact is untrue. Further, EPA implies that the release of the restored groundwater is automatic and not subject to further regulatory action, whether by NRC or Agreement States.

- Further, in the same paragraph (2nd), EPA states, "Depending on geologic and hydrologic conditions, however, metals and leach solutions may seep into surrounding aquifers post closure." This statement cites a hypothetical risk that in over 40 years of operating and post closure experience has not been observed or documented by an operator or regulatory agency. Thus, EPA alleges a potential CERCLA risk that does not exist, and it fails to account for the NRC regulatory process under the Uranium Mill Tailings Recovery Act (UMTRCA).

- In the third paragraph, EPA attempts to link subsidence to the potential list of CERCLA risks. With respect to in-situ recovery of uranium, the risk of subsidence is non-existent since operationally the process, whether during mining or groundwater restoration, cannot sustain significant dewatering, a condition that can cause subsidence. In fact, 40 CFR Part 146 discusses subsidence in the case of Class III injection wells in the context of a pre-existing geologic condition and not as the result of injection operations.

- In the third paragraph, EPA invents a new operational condition called, "self-cleaning" as a gross simplification of the groundwater restoration process. With in-situ uranium mining, groundwater restoration is an integral part of the development and operating plan.

- The risk assessment casually makes broad and general statements that have little basis in fact. For example, EPA states, "Even with the application of the above mitigation strategies, the majority of ISL mines experience higher levels of selenium and uranium in the groundwater after restoration than before mining started." That is an observation that belies the characterization of risk. These operations are heavily regulated and the baseline and restoration groundwater standards are subjected to licensing review by the NRC and its Agreement States. These risks are appropriately characterized in the UMTRCA Statute, NRC rules and regulation, Commission decisions, NRC guidance, and specific licensing actions. Under the current regulatory process, no in-situ uranium recovery facility will be released for unrestricted use unless it can meet the current release criteria under 40 CFR Part 192 and 10 CFR Part 40. And appropriate financial assurances is maintained until all post closure risks are mitigated through corrective actions and/or institutional controls.

- Under the section titled "Non-Operating Sites and Currently Operating Facilities", EPA provides detailed commentary on events and operations that have absolutely no bearing on the potential CERCLA related hazards, and they seem to be presented for dramatic effect.
    - Under non-operating sites, EPA focuses all of its attention on two CERCLA sites in New Mexico that were placed on the NPL solely at the discretion of the state. These are conventional milling sites that have significant off-site impacts that pre-date UMTRCA, and are completely different from in-situ recovery operations. EPA did not consider any of the fully released in-situ recovery operations in Texas, Wyoming and New Mexico that are success stories, instead they spent the entire portion of the reports to unrelated operations.
    - Under currently operating facilities, EPA focuses a significant portion of the section on operation spills and on-site releases that have been reported and mitigated under the existing licenses. None of these were discussed in the main portion of the risk assessment and are unrelated to the report's thesis of the alleged hazards of groundwater contamination.

The section of this report related to "non-entry (solution) mining" attempts to incorporate all forms of solution mineral recovery (i.e. Class III mineral recovery injection wells) as a risk class, but focuses entirely on uranium recovery. The report also cites impacts from activities conducted outside the United States under presumably different regulatory standards. The report should only cite risks associated with those mining activities conducted in the United States.

The section of the report fails to discuss any real CERCLA hazard risks related to financial assurance gaps, and "cherry picks" conclusions from reports that are not risk assessments at all. The public record is awash with real risk assessments performed by the NRC and Agreement States.

Section 1C – Physical Processing and Gravity and Magnetic Separation

Section 1C states that "Physical processing and gravity and magnetic separation generally require few chemical additives and thus have a relatively small potential for adverse environmental impacts from process chemicals." 2016 Report at 43. Notwithstanding this acknowledgement, EPA cites the potential for the release of hazardous substances associated with physical, gravity and magnetic separation from the following:

1. Dust generated from size reduction prior to using any one of these processes and
2. Tailings disposal following the use of any one of these processes.

Dust management in the physical, gravity and magnetic separation plant is a well-known practice in which emissions are contained, captured and recycled back to the process. Many modern day plants are designed to standards that allow workers to perform their jobs without a physical means or device for protection from dust in the air. The dust is captured at the source, contained and recycled. Moreover, minimizing dust exposure is an occupational health issue and is not the

type of risk that CERCLA Section 108b was meant to address. In any event, those "risks" are minimal and subject to appropriate process controls.

The report states that "dust from crushed and ground rock is a primary source of adverse effects during physical processing, posing concerns for human health as well as air and water quality." Id. at 43. The refusal to acknowledge that dust emissions are controllable is erroneous. The crushing process, in which run-of-mine ore is reduced from approximately 1 meter in size to less than 6 inches in size, controls dust using wind curtains, dust covers, water spray, water mist or dust collectors. These technologies control and capture dust and are well known and widely used in the industry.

EPA also claims adverse effects from the grinding process, claiming in a footnote that "the size range of particles undergoing grinding is often in the respirable category. Any particles smaller than 60 micrometers can be suspended in the air and subsequently be inhaled or deposited in nearby ecosystems." 2016 Report at 43, fn. 176. Today grinding process plants are generally done in a liquid/solid unit operation. Water is added to the ore and the ore is tumbled and ground to size using steel balls, which eliminates dust in the process area.

There are several grinding process plants that still utilize dry grinding. Known dust collection technologies are employed to reduce or eliminate emissions.

Critique on Section 1D – Flotation Processing

The 2016 Report at Section 1D states that "The primary environmental concerns stem from the tailings produced by flotation processes and their geochemical contents." Report at 51, Paragraph 1, Sentence 2. The report acknowledges, however, that there is no indication that flotation processing has increased the risk of a potential release of hazardous substances, or increased the risks of environmental harm. In fact, only "eight of the 29 non-operating and processing CERCLA sites reviewed used flotation processing techniques." Although "the causes of releases were identified for six of the eight CERCLA sites that used flotation," EPA admits "*there is no indication that the releases at these sites were directly caused by flotation processing*" Id. at [5]6 & 57, Paragraph 7, Sentence 1 & 2. (Emphasis supplied).

Regarding operating sites, EPA further declares: "At least 13 of 15 facilities experienced hazardous substance releases, but *little evidence* was available concerning the causes and types of releases, *including whether the release was associated with the flotation process."* Report at 57, Paragraph 3, Sentence 3 *(*Emphasis supplied).

The report clearly speculates that any discharge to the environment would mostly likely result from the uncontrolled discharge of tailings slurry, yet further acknowledges that those reagents," including CERCLA listed substances," (id. at Page 54, Paragraph 1, Sentence 2) are consumed during flotation, with only small residual quantities making it into tailings."
Id. at 54, Paragraph 2, Sentence 1.

Thus, as the Report correctly concludes, most reagents are consumed during the flotation process. Once added, these reagents chemically attach themselves to the mineral, which is then

recovered and the majority of the reagent is removed from the tailing stream. Thus, this process does not directly contribute to any level of risk that would warrant CERCLA financial responsibility requirements. Moreover, SME again opposes any reliance on non-operating CERCLA sites as the basis of a risk determination, even when EPA acknowledges the limitations of using those sites.

Section 1E. Cyanidation

The 2016 report acknowledges the evolution of "regulatory requirements, mitigation and best management practices" to control the risks and better mitigate the impact of releases, but then states, without citing any studies or examples, that "substantial releases of cyanide have been observed both historically and as a result of contemporary mining practices." *2016 Report at 58.*

In addition to confusing the requirements and practices at modern mining operations with historic, legacy sites, EPA's description of the processes and risks associated with the use of cyanide at hardrock mine site processing facilities is inaccurate and incomplete. In fact, these processes are well known and well managed in both their design and operation.

EPA describes the cyanidation process as follows:

> "In cyanidation, cyanide is used to separate gold or silver from its ore. This beneficiation process dissolves gold and silver from ore, separating it from waste material (tailings or spent heap). The cyanide solution containing gold and silver is then processed on site by carbon adsorption or by zinc precipitation (Merrill-Crowe) process) to produce doré metal, a semi-pure mixture of gold and silver. Cyanidation is typically performed using either agitated tank or heap leaching processes."

This description is too simplistic and implies that cyanide is simply added to the solution without also mentioning the process controls used to prevent releases to the environment. In contemporary cyanidation processing, proper control of the cyanide and lime reagent additions are critical in the management of metallurgical performance as well as environmental risk.

The processing of silver also differs from that of gold. Silver dissolution requires finer grinding of ore and different concentrations of reagents.

A summary of the major flaws in EPA's analysis follows:

- The process description is too simplistic to demonstrate how process reagent controls are used in contemporary gold ore processing to manage toxicity risks while achieving metallurgical performance;
- The process description does not adequately explain leaching of silver with gold and tailings losses for silver; and
- The process description does not identify other metal and metalloid species (As, Cu, Hg, Pb, Sb, Se and Zn) that are properly managed to control environmental risks on an ore specific basis.

EPA also erroneously confuses releases to the environment from active and abandoned mine sites, confusing cyanide leaching, a metallurgical process, with mining, which is the extraction of ore, as follows:

> "Leaching tanks, leach pads, piping, and storage facilities (e.g., process solution ponds, tailings facilities) can release cyanide and other mobilized contaminants into the environment, however, at both active and abandoned mines." 2016 Report at 58.

Without separately addressing active from abandoned mine sites, EPA wrongly implies that the risks associated with each are the same, when in the fact they are vastly different, both in terms of the natural cyanide degradation, technologies employed and the regulatory standards that apply.

EPA also fails to account for or discuss the "**International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold**" developed by a multi-stakeholder Steering Committee under the guidance of the United Nations Environmental Program (UNEP). The Code imposes state of the art requirements for not only the use of cyanide in metallurgical processing, but also its detoxification to minimize or eliminate environmental, health and safety risks. It also covers the entire life cycle of use including manufacture and transportation.

The Cyanide Code is a voluntary industry program for gold and silver mining companies. It focuses exclusively on the safe management of cyanide and cyanidation mill tailings and leach solutions. Companies that adopt the Cyanide Code must have their mining and processing operations that use cyanide to recover gold and/or silver audited by an independent third party to determine the status of Cyanide Code implementation. Those operations that meet the Cyanide Code requirements can be certified. A unique trademark symbol can then be utilized by the certified operation. Audit results are made public to inform stakeholders of the status of cyanide management practices at the certified operation.

The objective of the Cyanide Code is to improve the management of cyanide used in gold and silver mining and processing and assist in the protection of human health and the reduction of environmental impacts. The 1992 Housman/Hoffman report predated the development and the adoption of this Code and the 2016 EPA report does not address its adoption on the risks associated with mining by operators that are signatories to the agreement.

The code requires that contemporary cyanidation ore processing be carried out in a contained processing facility separate from the mine. The mine delivers ore directly to the process or to ore stockpiles where the process takes control of the ore for cyanidation. For operating cyanidation ore processing operations cyanide reagent and solutions are contained within process limits[1] as follows:

[1] http://www.cyanidecode.org/become-signatory/implementation-guidance

"Cyanide storage and mixing tanks should be located on a concrete surface to prevent seepage to the subsurface. Secondary containment should be employed to contain any releases from the tanks, and for any precipitation that may come in contact with the cyanide. Allowances must also be made for the recovery and return to the cyanidation process or proper disposal of any contaminated water or cyanide leakages."

“Secondary containments used for this purpose should be constructed of concrete, asphalt, plastic or other materials that are demonstrated to provide a competent barrier. Containments, which may include multiple containments connected by piping, should be sized to hold a volume of leakage greater than that of the largest tank, any piping that drains back into the containment, and should have additional capacity for the design storm event. Procedures should be implemented to prevent discharge to the environment of any process solution or precipitation contaminated with cyanide that is collected in a secondary containment area."

"For leach pads and leach solution ponds, this typically requires lining with a minimum of one synthetic membrane, such as high- or low-density polyethylene, HDPE or LDPE, placed on a prepared and compacted earthen liner. These and other liner systems, such as two synthetic membranes, can be designed and constructed with leak detection and recovery systems between the liners where significant hydraulic head exists (i.e., a solution pond or the internal solution collection trenches of a heap leach pad) to allow for periodic monitoring for leakage."

"Tanks holding process solutions such as leaching vessels, CIL and CIP tanks and cyanide tanks associated with cyanide regeneration activities should be located on concrete or material impermeable to seepage of spilled solution. Secondary containment should be provided for potential failure of cyanide process solution tanks, with provisions for recovery of released solution or remediation of any contaminated soil as necessary to protect surface and ground water. Containments should be sized to hold a volume greater than that of the largest tank within the containment, any piping that drains back into the containment, and have additional capacity for the design storm event.

“Spill prevention or containment measures should also be provided for process solution pipelines. Examples include secondary containment ditches, differential pressure sensing with alarms and/or automatic shutoff systems, and preventive maintenance programs with pipe thickness measurements. While a program of regular visual inspections should also be conducted, visual inspections alone are not typically sufficient unless the inspections are conducted at a frequency that can identify and prevent significant releases. If a risk exists for a release of process solution from a pipeline to adversely affect surface water, such as where pipes cross streams, operations should evaluate the need for special protection such as double-walled piping."

> The cyanide code also limits the concentration of any discharge from the process to 0.5 mg/L weak and dissociable (WAD) cyanide and 0.022 mg/L free cyanide at the environment mixing zone. Flow injection analytical methods have been developed to provide reliable analysis at these critical concentrations for the use of process, regulatory and environmental laboratories (ASTM D7728).

Summary

- Cyanidation is limited to processing ore for gold and silver recovery, it is not used in the mine;
- Contemporary ore processing using cyanidation following cyanide code guidance manages the risk of contaminant release as do state regulations;
- The cyanide code addresses suitable cyanide concentrations for containment and discharge and is supported by reliable ASTM measurement methods.
- Free cyanide breaks down fairly rapidly under oxidizing condition;
- Abandoned mines are outside of the scope of the technical review since they are not subject to the proposed financial assurance for the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances.

Exhibit 1.E.1. Gold and Silver Recovery from Cyanidation

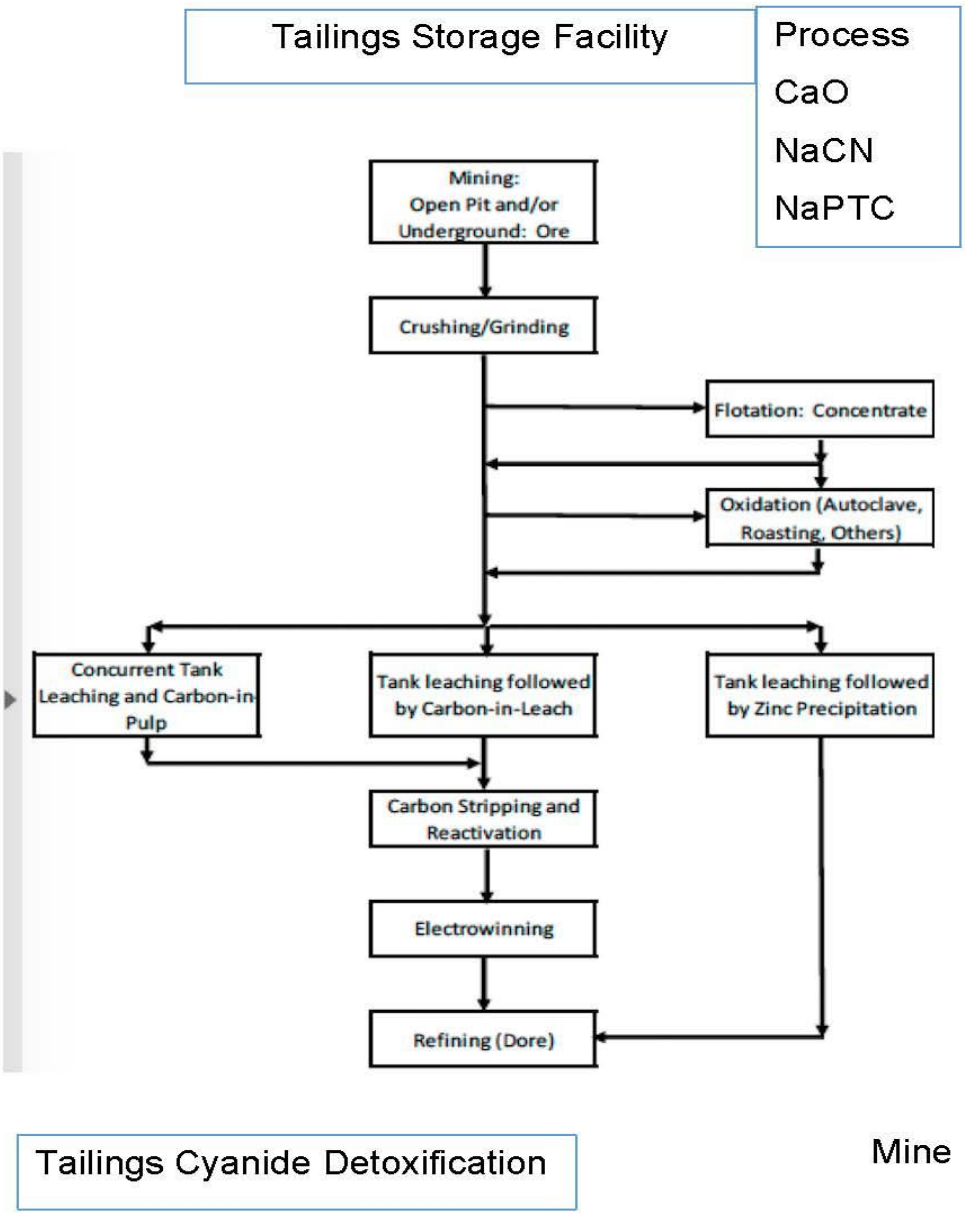
EPA states:

> "Dissolved gold and silver are collected with activated carbon (carbon-in-pulp adsorption or carbon-in-leach processing), thickener tanks, vacuum filters, or zinc precipitation. Electrowinning, which uses electric currents to further separate metals, and smelting then produce doré metal, a semi-pure mixture of gold and silver. Mercury, which is commonly present in gold ores, is removed as a byproduct."

Thickener tanks are not used to collect gold and silver, but are used to concentrate these minerals in solution and separate tailings solids. Dissolved gold and silver is adsorbed in contact with cyanidation slurry (carbon-in-pulp adsorption or carbon-in-leach processing), the residence time can vary from 8-96 hours, depending on processing requirements for the ore. Alternatively, pregnant solutions are separated from solids using a thickener and gold and silver recovered from the pregnant solutions by carbon in column adsorption or Merrill Crowe zinc cementation and collection of precipitates on vacuum filters. Loaded carbon is removed from the leach slurry by screening and chemically stripped, with the pregnant solution being processed by electrowinning or Merrill-Crowe cementation to produce a gold-silver metal concentrate. A vacuum filter can be used to prepare gold-silver concentrate for retorting, if mercury-bearing, and fire refining. Not all gold-silver ores contain mercury, however, where it is recovered it is typically placed in flasks for storage or transportation to a site for processing using a detoxification process. Process residue slurries, after gold is recovered, are normally sent to cyanide detoxification and tailings storage facilities where barren solution is reclaimed and reused in the process where needed.

EPA's Flow Chart below does not accurately describe the process of metal recovery.

Figure 1 Updated Mill Cyanidation Gold and Silver Recovery Flow Sheet



In fact, key items were omitted. In updated in Figure 1, the reclaim stream comes to the grinding circuit as make-up water. Make up lime and cyanide are added in milling, and cyanide is sometimes added to the mill to control particulate gold losses. If mercury emissions are problematic from the mill, organic sulfide reagents (sodium polythiocarbonate (NaPTC) can be added to the mill. Cyanide detoxification is critical for wildlife protection in open tailings storage facilities.

Summary:

- EPA's description of the contemporary cyanide milling metal recovery process is inadequate.
- Reuse of tailings decant water is not shown in flow sheet.
- Lime (CaO), cyanide and NaPTC reagent use is not shown to manage metal and metalloid dissolution.
- Management of tailings detoxification for wildlife protection is not depicted.
- Sources of tailings are not included in the figure, tailings slurries are the major process flows.

Section 1F – Acid Leach, Solvent Extraction and Electrowinninng

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Section 1F states as follows:

> "Based on the available documentation, primary concerns for acid leach and solvent extraction and electrowinning (SX/EW) are proper reclamation of spent dump or heap leach piles, maintenance of equipment, and ensuring that systems are prepared for rainfall events. The most common cause of releases was pipe failure, with chronic seepage from disposal areas, other equipment failures and weather-related discharges also causing contamination." Report at 87, Paragraph 6.

Section 1F also cites the potential for hazardous substances associated with acid leach and SX/EW as sulfuric acid and organic solvents. "These process reagents can have serious human health consequences as well as ecological effects." Id. at 77, Paragraph 3, Sentence 3. Yet the report cites *no* evidence of any such release of organic solvents to the environment at either non-operating or operating plants. Thus, the report fails to identify negative environmental impacts from solvent extraction or electrowinning technologies.

The report cites several different releases of solution containing sulfuric acid and dissolved metals such as selenium, cadmium and copper from non-operating and operating mines. Hence, this critique will focus on the three primary concerns mentioned:

1. Proper reclamation of spent dump or heap leach piles
2. Maintenance of equipment
3. Weather-related discharges

Proper reclamation of spent dump or heap leach piles

Historically dump leaching started when supplies of sulfuric acid became readily available and operators recognized that the oxide copper resources contained in the dumps were amenable to leaching. The surface that dumps were placed on was oftentimes not considered. Material was placed at the most convenient location for storage so as to minimize mine haul costs. When sulfuric acid leaching was considered the underlying surface characteristics were often unknown. The operator used consulting geotechnical services to determine if a majority of the leach solution could be recovered since leaching without solution recovery would be fruitless. Trenching and wells were used to recover errant solutions. A certain amount of solution loss was expected.

As the price of copper increased over the decades starting in the 1970's and the amount of material available for sulfuric acid leaching increased there was impetus to place dumps on prepared surfaces so as to recover as much value as possible from the dump leach.

Liner technology advanced in the 1980's with high density polyurethane (HDPE) such that dump and leach heights in excess of 300 feet could be accommodated, thereby containing the leach solutions and ensuring minimal transfer of leach solutions to the surrounding environment. Since no liner is 100 percent effective, drainage layers were constructed under the leach area to collect errant and channel them to a collection point for recovery. Additionally, pump back wells were installed so that even minimal amounts of errant solution could be captured and returned to the process.

The report cites only one example of a pipeline break for a currently operating facility. In 1997 65,000 gallons leaked from a ruptured weld in the liner at Freeport McMoRan's Tyrone mine. The report fails to mention that the 65,000 gallons were contained on property.

Given the many leach operations and the extent of the leaching that occurs in the United States, the frequency of spills due to liner failure is insignificant. Moreover, state regulations provide stringent exist to address spills and to require immediate action to address, control and minimize environmental risks.

Maintenance of equipment

Mechanical equipment failures may be resolved by a mix of known and developing technologies. As an example in years past it was difficult and expensive to run a double pipe with the inner piper serving as the transport pipe and the outer pipe serving as spill containment and protection for the inner transport pipe. Advances in engineering and construction practices have shown that a double pipeline is very practical to construct and install.

Given the ease at which engineering solutions can be implemented to overcome pipeline leaks and equipment failures, dump or heap leaching for sulfuric acid solutions should not be considered for CERCLA listing.

Weather-related discharges

The report states that weather-related discharges occur on a frequent basis and give a number of different instances when this has occurred. Weather-related discharges are the result of precipitation, which overfills the storage capacity of the collection ponds downstream of the dump or heap leach.

Modern dump and leach facility design takes into account the storage required to hold a complete drain down of the leach pad as well as the collection of precipitation from the facility for a 100-year event. A complete drain down of the dump or leach pad system would occur when the pumps would completely fail and would not return solution to the leach circuit. A 100-year event is a storm that statistically has a 1-percent chance of occurring in any given year. It should be noted that a 100-year event may occur more frequently than once every 100-years.

A double failure of pumps and a 100-year precipitation event is unlikely to occur. Pumps are designed with back-up power generation to ensure the removal of solution from the collection ponds and recirculate the solution back up to the leach area. Nevertheless, there is a plausible scenario and risk that the 100-year precipitation event could cause an unforeseen power failure.

Should a double failure occur it is unlikely that the resulting solution overflow from the ponds would result in any environmental damage that would not have occurred as a result of the flooding occurring in the surrounding area. Any contained metal values would be diluted, minimizing any downstream impact. The means of calculating the dilution and the resulting harm caused by an overflow is available through modern computer modeling.

Section 1G - Pyrometallurgical Processes

This section addresses the risks associated with pyrometallurgical processing of hardrock minerals. It contains many errors and overstates the risks associated with these activities, as discussed below. In general, EPA draws conclusions of risks from documents and studies without supporting facts, or relies upon studies since discredited or which underwent substantial revision.

EPA's report reflects a basic misunderstanding of metallurgical processing. Mineral processing is that part of mining engineering that uses processes without any change of phase. Physical process such as gravity or flotation are used to concentrate minerals. Extractive metallurgy is a branch of Mineral Engineering that relies on a change of phase. This is normally done by the use of heat, electrical energy and chemicals. Pyrometallurgy is focused on changes in phase which defines it as part of Extractive Metallurgy.

Contrary to EPA's statements, aluminum is not generally concentrated with pyrometallurgy. It relies upon the Bayer hydrometallurgical process for the recovery and concentration of alumina. This pure alumina is then reduced in the electrometallurgical Hall Heroult process.

The EPA report draws the sweeping conclusion that all pyrometallurgical process are associated with environmental and health effects. Modern pyrometallurgical processing is conducted without health effects. The Stillwater zero emission smelter is a prime example of modern pyrometallurgy practices. The Umicore Hoboken smelter is another. Both rely upon modern pyrometallurgical technology along with advanced emission controls to produce high quality primary and recycled metals.

Contrary to EPA's statements, the domestic pyrometallurgical industry is not in decline. The American steel industry has grown with the use of regulated mini-mills for production. Modern pyrometallurgical technology such as plasma is used in the recycling of automobile catalysts.

There are many more advances in pyrometallurgy that EPA does not recognize in its report. For example, Ausmelt, Outotec and Mitsubishi have developed clean, efficient smelting and converting technologies. Modern efficient electric arc and plasma furnaces, which minimize gas flows and airborne emissions, are also in use. Scrubbers, acid plants, baghouses, electrostatic precipitator technologies are mature technologies employed globally to minimize emissions.

The EPA errs in discussing aluminum. Aluminum metal is produced by the Hall Heroult process which is a fused salt electrochemical process. This is not actually a smelting process but rather an electrometallurgical one.

Pyrometallurgical technology cannot always be replaced by hydrometallurgical technology, as EPA recommends. Pyrometallurgy is efficient in the treatment of high volumes of clean ores and concentrates.

Section 1H Bayer Process

EPA's discussion of the Bayer Process also contains errors. For example, EPA does not demonstrate knowledge of chemistry or corrosion. Sodium hydroxide is not highly corrosive, but may be readily be stored long term in mild steel containers with no adverse effects.

Figure 1.H.1 is an oversimplification that minimizes key unit operations. It does not show the creation deportment of Red Mud. It also does not include the all-important recycle of Bayer process solutions that minimizes costs, energy and effluents. The EPA also fails to mention that Bayer process Red Mud is a potential source of Rare Earths supply. Pilot plants in Jamaica are currently in operation.

Sources: Taylor, P., *Brief Overview of Some Innovations in Pyrometallurgy (2013)*
Anjier, J. and Anderson, C., *The Bayer Hydrometallurgical Alumina Process Evolution and Innovations*

Section 2 Waste Management Practices
Section 2A. Mine or Mining Influenced Water (MIW)

Mining Influenced Water is defined to include any water which has been in contact with mined or processed solids, so it may be acidic and metal-bearing, neutral, inert, basic, acid neutralizing or reactive with non-metals. Since all mined or processed materials are not toxic, MIW is not necessarily toxic, in fact, alkalinity in some carbonate-bearing gold ores is beneficial to cyanidation, resulting in reduced lime consumption. Likewise, limestone can be used to line water diversion channels, adding alkalinity which can prevent formation of acid rock drainage (ARD)[2].

EPA's report errs in its description of MIW or fails to provide adequate explanations, as outlined herein.

Lag Time - EPA states that "AMD has a considerable lag time from the first deposition of waste material to the observation of acidic discharge, making it an ongoing and potentially perpetual source of hazardous contamination at a mine site." Acid generation reactions, not AMD, can have a considerable lag time if there is sufficient neutralization potential present. Where there is no neutralization potential and high acid generation potential, acid can be generated without much lag time in the presence of oxygen, water and bacteria. MIW is not always the source of negative effects, environmental and health risks Operations before contemporary mining and processing manage their MIW through dewatering operations

EPA suggests, nonetheless, that all MIW is hazardous, claiming that "since the very beginning of mining history, MIW has been a source of both environmental and human health concerns." 2016 Report at 113. Studies contradict this blanket assertion.

Geologists inventoried impacts of natural ARD and historic and inactive mines in the National Forests of Colorado[3], the distribution is shown in Figure 2. No significant impacts were identified at 86% of the locations sampled (1,200 out of 19,000 sites had environmental issues). Contemporary mining and processing recognizes the potential impacts of MIW on human health and the environment, through the development of characterization programs to identify materials for special handling during mining and processing, in engineered stockpiles, waste rock storage facilities and tailings storage facilities. Reactive sulfidic or alkaline material can be encapsulated using non-reactive material to reduce ingress of water and oxygen to the iron sulfide minerals, slowing the reactions until the facility can be reclaimed.

[2] Gusek, J. and Figueroa, L., Mitigation of Metal Mining Influenced Water, Volume 2 of Management Technologies for Metal Mining Influenced Water, SME, 2009, pp 110.

[3] Sares, M. A,,Gusey, D.L. and Neubert, J.T. " Abandoned Mines and Naturally Occurring Acid Rock Drainage on National Forest System Lands in Colorado" http://coloradogeologicalsurvey.org/wp-content/uploads/2013/08/USFS-ICARD2000-paper-Final1.pdf

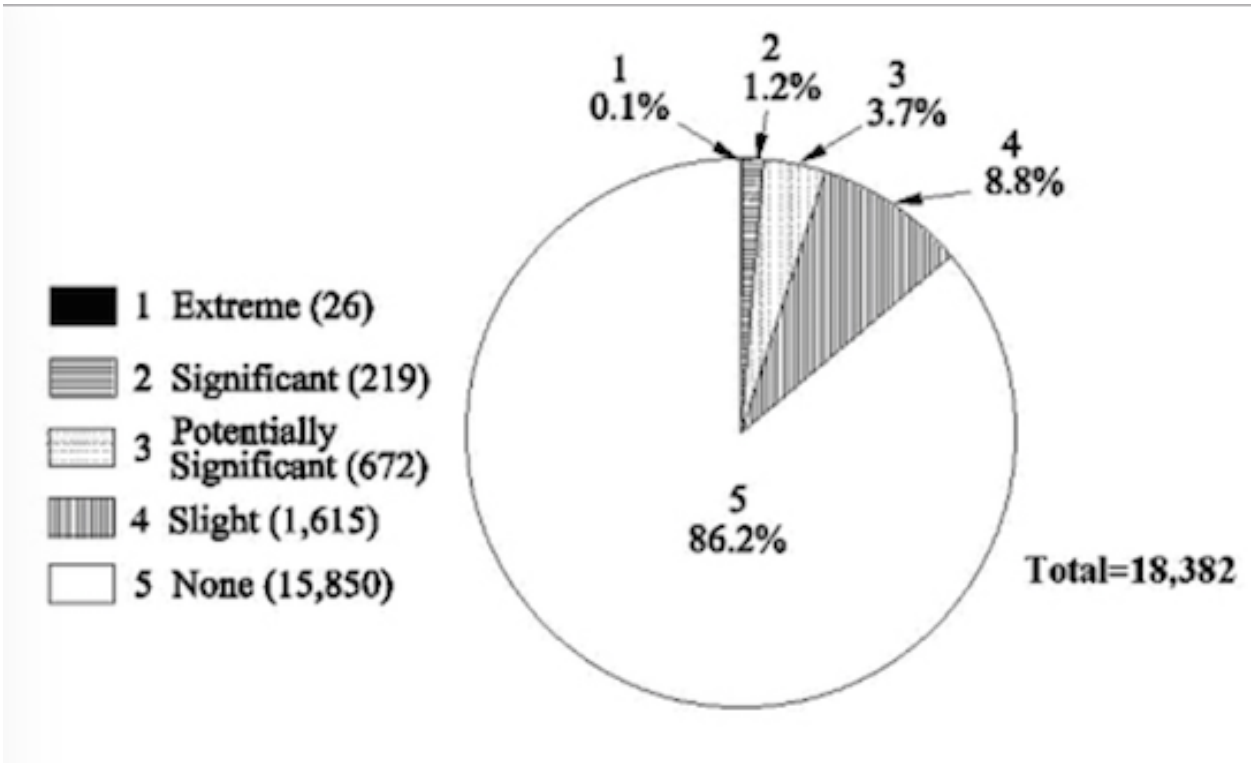

Figure 2. Distribution of Environmental Issues for Colorado National Forest natural, historic and inactive Mine Sites

Summary:

- MIW has a range of acid-base water qualities from acidic to neutral to alkaline
- Contemporary mining and processing utilizes characterization methods to implement proper storage practices
- A majority of historic and non-operating mines and natural ARD sites in the Colorado National Forest that were inventoried contain MIW which is not hazardous.

EPA states: " A key characteristic for most MIW (whether acidic, neutral, or alkaline drainage) is an elevated concentration of trace elements that have leached from surrounding solids such as waste rock, tailings, or mine surfaces." 2016 Report at 113. While EPA recognizes many variables that can affect the risk of environmental releases, the primary driver for acidity and metals production is the mineralogy of the waste rock, stockpiles pit surfaces and tailings.

EPA claims the MIW generally may contain high acidity and residual process chemicals mobilizing hazardous trace elements. Most occurrences of waste rock are not highly acidic, but cover a spectrum of acid-base characteristics. Where sulfides, primarily pyrite, marcasite and pyrrhotite are absent, highly acidic MIW is unlikely. The process of acidic MIW formation is dependent primarily on the presence and content of iron sulfide minerals pyrite, marcasite and pyrrhotite, neutralizing calcium and magnesium carbonates, oxygen, water and iron oxidizing bacteria.

Mining Influenced Water is the proper term to use with water that has been in contact with mined and/or processed materials. Acid Mine Drainage (AMD) is not as appropriate to describe process drainage. AMD is best used to describe an acid and metal laden water exiting a mine portal. The generic term should be acidic MIW or acidic and metal-bearing MIW. Whereas use of AMD should be restricted to mines, acidic MIW or alkaline MIW should be useful in this context, discussing hard rock mines and metallurgical processing. Much of cyanidation MIW is affected by gypsum saturation, resulting in periodic cleaning of scale off of equipment.

EPA states:

"MIW encompasses any water whose chemical composition has been affected by mining or mineral processing. The most prevalent type of MIW is AMD, but MIW also includes drainage that is neutral or alkaline. In addition to environmental concerns posed by acidity or alkalinity, MIW often contains elevated concentrations of mobilized contaminants, suspended solids, or sulfate or arsenate content." 2016 Report at ix. "MIW remains one of the most significant issues across the mining industry."2016 Report at 113

Not all MIW is adversely impacted by mining or process, although he EPA claims AMD is the most prevalent form of MIW, it is not true in many deposits, as shown above in the Figure 2.

Acidic, metal-bearing MIW is a relatively small proportion of the overall MIW, particularly in limestone hosted ore deposits Prospective ore deposits in the US are now routinely characterized for acid generation potential, acid neutralization potential, soluble minerals and soluble minerals before and after weathering (ASTM E1915, E2242 and D5744). This is important data that can be used to identify hazards in MIW, if any, and further testing of the MIW can be used to estimate mitigation costs, where needed, to determine the viability of a new project.

Summary:

- Acid Mine Drainage (AMD) is a term that should be limited to the mine and should not be applied to ore processing.
- AMD is not the most prevalent type of MIW.
- Ore deposit characterization programs are in use for determining the distribution of acid-base characteristics in contemporary mining and processing to manage ores and waste

EPA states: "Media rock with high concentrations of zinc, copper, lead, cobalt, nickel, and iron are more likely to generate AMD." EPA appears to be confused with metals vs. acid generation. It is not clear what contaminants are being discussed. Potentially acid generating minerals (pyrite, marcasite or pyrrhotite), under weathering conditions, can produce acidity, if present in the waste rock and tailings beach due to oxidation, not zinc, copper, lead, cobalt, and nickel Acidity can release these detrimental trace elements, if present, by the acid generated, if any. Readily soluble minerals and salts can be solubilized in un-weathered state. CERCLA priority

contaminants in acidic MIW from iron sulfide minerals include arsenic, mercury, cadmium, cobalt, nickel and zinc. Copper and iron are greater than 100 on the CERCLA hazard priority list.

Summary:

- Iron sulfide minerals pyrite, marcasite or pyrrhotite are mostly responsible for acidification of MIW not zinc, copper, lead, cobalt, and nickel.
- Iron sulfide minerals are mostly associated with the solids, not the drainage.
- CERCLA priority contaminants are not discussed (arsenic, mercury, cadmium, cobalt, nickel and zinc)

EPA also states that "MIW generally may contain residual process chemicals or mobilized contaminants, with high acidity further mobilizing potentially hazardous trace elements." 2016 Report at 121.

The statement that MIW generally has high acidity is not correct, per the example in Figure 2. Process chemicals are not normally present in the waste rock other than spend blasting residues. Highly acidic materials should be segregated in the center of a waste rock storage facility

Summary

- MIW does not generally have high acidity, but when it does it can be segregated in the middle of an engineered waste rock storage facility.

Section 2B -Waste Rock

`The EPA states:

> "Ore and waste are extracted separately, and the waste rock is transported to the disposal site, which may be in a previously mined pit or at a dedicated dump or pile."2016 Report Page 117,

The mining of ore and waste requires sampling in order to extract them separately. Ore can be transported directly to processing or simply stockpiled. In contemporary mining waste rock storage facilities are engineered to manage MIW. The use of the terms dump or pile are inappropriate where waste rock storage is engineered. The waste rock can be selectively placed by end-dumping or plug-dumping to segregate the potentially acid generation waste rock in the interior of the storage facility, to limit exposure to oxygen and water for the long term and allow for MIW collection, if necessary, in draining structures.

Summary

- Waste rock is generally placed in an engineered waste rock storage facility separate from piles or dumps if they are suitable materials for potentially acid generating waste rock encapsulation in inert to basic waste rock.

- Sampling in the mine for waste rock acid-base characteristics is practiced in contemporary mining and processing,

EPA states that “Operators can segregate and selectively deposit solid waste – tailings or waste rock – with high concentrations of sulfidic material"

Segregation in mine waste rock storage facilities differs from processes tailings storage facilities and for co-disposal. A waste rock storage facility is engineered to handle coarse run of mine rock, while tailings storage facilities are designed to store finely ground materials and to separate and reclaim the process solution. Although a co-disposal facility is rare, such facilities have been successfully used and are an option for contemporary mining and processing, given the proper strip ratio and competency of the waste rock.

Summary

- Mine waste rock storage facilities are engineered to manage run-of-mine waste.
- Ore processing tailings storage facilities are engineered to manage slurries, and separation of solids and liquids.
- Although co-disposal facilities are still rare, they have become a viable option for contemporary mining and processing under the right circumstances.

EPA states: “Waste rock is uneconomic material that abuts or surrounds commodity-bearing ore and is currently deemed not fit for processing. The commodity is separated from waste rock at the mine site, at which point the operator disposes of the waste rock." Report at 116.

This statement is inaccurate. It is not the commodity that is separated from the waste rock, it is the commodity bearing ore that is mined separately from the waste rock. Also, the waste rock is placed in engineered waste storage facilities, not disposal dumps. Ore is either fed directly to the process or is placed on a stockpile for blending or later processing.

Summary

- Waste Rock is mined separately from ore and is placed in a waste rock storage facility.
- Ore is fed directly to the process or placed in stockpiles.

The description of the sub-ore stockpiles is not correct. . These are normally segregated ore type piles with metal content slightly below an ore grade cut off, such that an increase in metal prices, in addition to technology improvement can make the processing as ore, economic.

EPA states:

> "Waste rock containing residual quantities of a commodity may later become economical because more efficient processes have been developed, allowing operators to treat the waste as ore using low-cost methods such as acid leaching or, depending on the mineralogy of the rock, milling." 2016 Report at 116.

The description of the sub-ore stockpiles[4] is not accurate. . These are normally segregated ore type piles with metal content slightly below an ore grade cut off, such that an increase in metal prices, in addition to technology improvement can make the processing as ore, economic.

Summary

- Sub ore stockpiles are typically just below ore grade cut off sub-ore, not waste mixed with ore
- Improvement of technology or metal prices allow the stockpile to be processed at a later date.

The glossary says:

"Overburden: non-mineralized material on top of ore deposits that must be removed in order to reach ore deposits. Typically stored on site and can be used for backfill and revegetation after mining operations are complete. The term may also be used to refer to waste rock, although overburden typically has a lower potential for environmental contamination. It is distinct from tailings, which remain after economically valuable components have been removed." 2016 Report at ix.

That definition is not clear. Overburden is a subset of waste rock excluding waste that is internal to an open-pit ore deposit, it is typically not removed for an underground mine. The overburden should undergo the preoperational analysis to determine it is not potentially acid generating. Overburden stored on site for reclamation use may need to be classified as non-acid generating or amended. The operation feasibility determination for the ore deposit for contemporary mining and processing for a sulfidic ore deposit will likely include a block model of acid generation potential as well as acid neutralization potential and acid-base classification of the ore and waste blocks.

The EPA states:

> "...In most mining sectors, the ore mined consists largely of waste material, which creates tailings" 2016 Report at 135

Ore, by definition is not waste, it is rock that can be mined and processed to make a profit. EPA's view is biased, it assumes all ore will be milled to make tailings, which is not the objective, ore is mined to make metal and tailings are merely a waste product from high grade ore. It would be more correct to state a small fraction of the ore contains valuable minerals, which, when mostly removed, leaves tailings or processing residue.

2C. Tailings Management

EPA states:

> "Tailings Storage Facilities are the ultimate repositories for both slurry and paste tailings, unless the operator uses the tailings as mine backfill" 2016 Report at 135

Mine backfill is one of the few instances where wastes from the mill return to the mine. Use of cyanidation tailings require detoxification to meet MSHA workplace limits and groundwater standards to comply with the Cyanide Code[5]:

> "Where mill tailings are used as underground backfill, the operation should determine the cyanide concentrations in the liquid phase and evaluate the risks to worker safety and ground water quality. Where potential exists for worker exposure to hydrogen cyanide gas, or for the release of cyanide to ground water, treatments to chemically convert, remove available cyanide, or to complex it in forms that do not present risks to worker health or the beneficial uses of the ground water or other appropriate actions should be implemented."

EPA states:

> "Dewatered paste and filtered tailings are often deposited in a lined or unlined surface impoundment with a drain and an embankment." 2016 Report at 135.

High solution recovery can be implemented with filtered or paste tailings processing. MIW is normally recovered from the slurry for reuse in the process. The use of lining in the tailing storage facility is normally implemented in gold process plants for cyanide code compliance.

EPA states:

> "At processing facilities that do not reclaim water from tailings ponds, wastewater is sometimes treated and released into local waterways. If treatment fails, tailings water with constituent hazardous substances can be released." 2016 Report at 140

It is not common practice to treat all reclaim water from tailings for discharge. However, treatment of excess reclaim water is often practiced when there is a positive water balance. Treatment failure is normally contained in lined storage ponds as soon as possible. MIW is normally recovered from the slurry for reuse in the process. There are economies in reagent effectiveness by treating the tailings decant water rather than a slurry if excess solution need to be discharged.

[5] http://www.cyanidecode.org/become-signatory/implementation-guidance

Summary

- Cyanidation detoxified tailings may be used for underground backfill provided they meet human health and groundwater protection standards.
- Water reuse is practiced at most tailings facilities
- Treatment costs for discharge of excess water may be reduced by treating tailings decant water vs. tailings slurries.

EPA states:

"Tailings storage facility: is a general term that includes “ponds,” “impoundments,” and “dams.” Many different types of facilities are used to contain and manage the tailings (waste ore) resulting from hardrock mining. Depending on the type of tailing (e.g., slurry, filtered, or paste), facilities may include liners, tailings ponds, and retention dams. ." 2016 Report at x

The Cyanide Code Implementation Guidance[6]states as follows:

> "There are a number of techniques for limiting and controlling seepage from tailings storage facilities; these are identified for informational purposes only, and are not intended as verifiable elements of the Cyanide Code:

Limiting the hydraulic head by maintaining a small pond area will reduce the force driving solution into the subsurface. The earthen floor of an impoundment can be compacted in its natural condition, or by adding clay materials to form a liner. Deposition methods can be used to promote tailings compaction and reduce their permeability.

Dam designs are available to promote drainage to a collection system rather than to the subsurface, and cut-off trenches can be used to intercept and collect shallow seepage before it can impact ground water.

Remedial actions such as pump-back systems also can be used to manage subsurface flows and prevent existing ground water plumes from reaching potential receptors and interfering with the beneficial uses of ground water.

The need for and nature of seepage control measures is highly dependent on site-specific hydrogeological conditions. Such systems should therefore be factored into the initial design of a tailings storage facility and be incorporated into the facility's operating plan to protect the designated beneficial uses of ground water. Any measures to restrict or control seepage from tailings storage facilities must be integrated into overall facility design, as they are directly related to the overall stability of the engineered structures."

The EPA definition of tailings storage facility in the glossary uses the term "waste ore" to describe tailings. A better description would be “finely ground waste residue from mill processing after metal removal."

[6] http://www.cyanidecode.org/become-signatory/implementation-guidance

There are several instances where tailings storage facility should be used instead for describing contemporary processing in place of its components;

- impoundments or ponds[7,8]
- impoundment facility[9]
- tailings pond[10]

EPA states that the residual chemicals are usually recycled with the water and trace elements from the ore liberated from the sold portion of the tailings can present health and environmental issues[11] after acid or alkaline leaching in the tailings storage facilities. Those risks of potential impacts are prevented by the containment design of the facility.

Mercury occurs in gold ore primarily as the sulfide mineral cinnabar (HgS), which is soluble in cyanide ion solutions. Mercury is volatile as the neutral cyanide complex [Hg (CN) $_2$] and metallic liquid form [Hg^0] and can be stabilized in solution by maintaining an excess of free cyanide or by complexing the mercury with sulfide reagents. Use of inorganic sulfides for mercury precipitation is limited due to reaction with cyanide to form thiocyanate and dissolution of the mercury sulfide formed by cyanide ion. Organic sulfide reagents are more selective, such as sodium polythiocarbonate (thio-red). Use of hypochlorite[12] is not recommended in a cyanide circuit unless cyanide destruction is desired, due to generation of toxic cyanogen chloride gas.

[7]"The surface management regulations also specify engineering requirements and require liners, containment systems, and inspections for process areas, including cyanide leach operations and tailings impoundments or ponds." Page 69, Paragraph 3, Sentence 1.

[8]"Nevada water control regulations establish minimum design criteria for tailings impoundments and ponds. Process areas must obtain a permit to ensure compliance with these engineering standards." Page 71, Paragraph 1, Sentence 1.

[9]"When the desired mineral or metal has been removed through extraction and beneficiation, wet tailings are discharged in a dilute slurry at a 20-45 percent solids ratio, or can be physically treated to slurry at a solids ratio of 55 to 60 percent and conveyed through a pipeline to an impoundment facility." Page 134, Paragraph 2, Sentence 1.

[10] "must monitor for potential contaminant releases from tailings ponds." Page 143, Paragraph, Sentence 1.

[11] "These naturally co-occurring substances (e.g., arsenic and mercury from gold ore) are liberated from rock and can present health and environmental concerns. Page 137, Paragraph 1, Sentence 2.

[12] "Releases can be reduced using a hypochlorite injection system and by improving process and control equipment efficiency." Page 67, Paragraph 4, Sentence 1.

EPA states that the liquid state of tailings lends itself to use of ponds[13] as a repository. Contemporary tailings processing uses tailings storage facilities to process slurries by separating solids for storage and liquid fraction for reuse in the mill. Components identified by EPA are residual processing chemicals[14], water, waste solids, low content of valued minerals and trace elements of potential environmental concern[15]. It should be noted that trace elements are not present in all tailings. The example is milling for flotation or leaching[16] cyanide, the potential reagents should be identified, such as cyanide detoxification byproducts such as residual cyanides, sulfates, ammonia-nitrogen, cyanate, thiocyanate, nitrite-nitrogen, nitrate-nitrogen, metal cyanide complexes, and oxyanions. .

Spills

The EPA is referring to the acidic MIW in tailings impoundments, which are engineered waste storage facilities in contemporary processing, not mining, so the solutions should be called MIW not mine[17] drainage and tailings storage facilities is more accurate term than tailing impoundments.

The definition of milling[18] is also too broad, since it includes transportation to metallurgical processing from the mine to the stockpile, which should be part of the mine.

The EPA discusses MIW as including tailings, which are not part of the mine, but in the metallurgical processes[19], so the liquid portion should not be referred to as mine drainage, but

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[13] "Because of the liquid state of the tailings, ponds are the most commonly used repository." Page 134, Paragraph 2, Sentence 4.

[14] "While residual chemicals are usually recycled with tailings water, trace elements from the ore are housed in the tailings and represent longer-term sources of possible contamination," Page 135, Paragraph 1, Sentence 3.

[15] "The tailings slurry contains water, waste particles, and uneconomic portions of the commodity and other trace elements of potential environmental concern." Page 135, Paragraph 1, Sentence 1.

[16] "For example, milling operations that practice flotation or leaching may produce tailings containing reagents such as lime or glycol ether and lixiviants including acids and cyanide." Page 135, Paragraph 1, Sentence 3.

[17] "In the event the mine drainage requires treatment prior to discharge, Page 66, Paragraph 4, Sentence 2.

[18] "**Milling**: the facility at which beneficiation, or processing, takes place. It usually includes equipment used for processing itself, and is connected to supplementary features that support processing: process ponds that house process liquid before use or reuse, tailings facilities that store processing waste, and transportation facilities to receive unprocessed ore and ship out processed concentrates." Page viii, Paragraph 8.

process MIW[20,21]. The discussion of tailings drainage reacting with sulfide minerals, should specify potential acid generating sulfide minerals need to be present in the tailings for acid generation to occur, along with oxygen and water[22], those conditions are not always present in tailings. EPA calls for ongoing monitoring to measure effectiveness of failed prevention methods[23], prevention methods should be monitored if they are successful or fail as part of a mining or metallurgical quality control program.

EPA's definition of seepage, uses a tailings storage facility as an example[24] with continuous release of fluid into soil, bedrock or groundwater. This is a limited definition since seepage can be intermittent, seasonal and can be captured and pumped back to the process, if necessary.

EPA discusses spills from embankment failure resulting in tailings dispersal[25]. Technically it is a failure of the embankment component of the tailings storage facility. Dispersal will result if the tailings breach containment and reach an active stream. Conventional processing clean-up for cyanidation tails requires excavation of the tailings until a wall sample is below the maximum contaminant limit before backfilling (ASTM D7572).

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[19] "MIW (e.g., acid, alkaline, or neutral mine drainage), runoff originating from exposed tailings, is also a distinct risk." , Page 148, Paragraph 4, Sentence 1.

[20] "Further, impoundment failure via mine drainage or seepage and ..." Page 139, Paragraph 2, Sentence 7

[21] "During operations special handling techniques such the addition of alkaline materials or amendments can be used to reduce potential for AMD from leach tailings." Page 139, Paragraph 2, Sentence 3.

[22] "Further, drainage may react with sulfide minerals, creating acid drainage." Page 139, Paragraph 2, Sentence 3.

[23] "... ongoing monitoring must be conducted to assess the efficacy of any prevention methods at a given mine site if they fail or prove insufficient' Page 139, Paragraph 2, Sentence 3.

[24] "**Seepage**: the continuous release of fluid (e.g., from a tailings storage facility) into local soil, bedrock, or groundwater." Page ix, Paragraph 9.

[25] "Embankment failure results in the release of tailings into local environment and, if located near a watershed, dispersal of tailings downstream" Page 138, Paragraph 1, Sentence 1.

Reclamation and Closure

According to EPA, reclamation and closure's objective is to return the site to public use[26]. Contemporary mining and processing require the land to be returned to a state which supports a beneficial use, not necessarily a public use.

CONCLUSION

EPA's authority to issue financial responsibility requirements under Section 108(b) is contingent upon prioritizing the development of any financial responsibility requirements for "those classes of facilities, owners, and operators which the President (and EPA) determines ***presents the highest level of risk of injury***." 42 U.S.C. § 9608(b) (1) (emphasis added). Once this threshold determination has been made, EPA may then promulgate regulations to ensure that those "classes of facilities establish and maintain evidence of financial responsibility ***consistent with the degree and duration of risk*** associated with the production, transportation, treatment, storage, or disposal of hazardous substances." *Id*. (emphasis added).

Based upon the SME's review of the two EPA reports in question, it is clear that EPA has not properly calculated the degree and duration of risk associated with mining and ore processing of hardrock minerals, and has indeed overstated those risks. Mining is subject to extensive and comprehensive regulation at the state and national levels. Those requirements and the evolution of mining technologies and practices refute EPA's blanket conclusion that mining technologies have undergone little change over the past 50 years.

[26] "**Reclamation and closure**: refers to tasks conducted after mining operations have concluded to return the facility site to public use, and to ensure there are no post-operational releases. Tasks include monitoring the site, conducting water treatment if necessary, and covering and revegetating features that had created a surface disturbance, among others. Reclamation and closure is regulated under both federal surface management regulations (on federal land) and state regulations." Page ix, Paragraph 8.