Consideration of RCRA Requirements in Performing CERCLA Responses at Mining Waste Sites

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
SOLID WASTE AND EMERGENCY RESPO

MEMORANDUM

SUBJECT: Consideration of RCRA Requirements in Performing CERCLA Responses at Mining Waste Sites

FROM: Henry L. Longest II, Director
Office of Emergency and Remedial Response
Walter W. Kovalick, Jr. for

TO: Waste Management Division Directors
Regions I - X

As you know, on July 3, 1986, the Agency issued a final determination on whether mining waste would be regulated under Subtitle C of RCRA (copy attached). This determination was based on a report to Congress mandated by RCRA Section 3001(b)(3)(C) and subsequent public comments. The determination is that mining wastes will not be regulated under Subtitle C at this time. This conclusion is based on the belief that several aspects of EPA's current hazardous waste management standards if applied universally to mining sites, are likely to be environmentally unnecessary, technically infeasible, or economically impractical.

However, given the concern about actual and potential mining waste problems, the Agency intends to develop a program for regulating mining waste under Subtitle D. The current Subtitle D program establishes criteria principally aimed at municipal and industrial solid waste which focus on standards related to surface water discharges, groundwater contamination and endangered species. Modifications to this program will focus on identifying environmental problems, setting priorities for applying controls at sites with a high potential for risk, and employing a risk management approach in the development of appropriate standards to protect human health and the environment, as necessary, including closure options, tailored controls, pretreatment of wastes prior to disposal, and cleanup options. Revisions to Subtitle D criteria are expected to be proposed in mid-1988; however, EPA has reserved the option to reexamine a modified Subtitle C in the future if this approach is unworkable or insufficient.

In the interim, Superfund will continue to address mining waste problems through the RI/FS and ROD/EDD processes taking into account current Subtitle D requirements as well as options for addressing risks not addressed by Subtitle D requirements. To address such remaining risks, you may wish to consider the technical requirements of Subtitle C regulations during the initial review of remedial alternatives. If these requirements seem to be technically infeasible, they may be rejected early in the screening process. If Subtitle C approaches appear to satisfy the criteria found in Section 300.68 (g), Initial Screening of Alternatives, of the NCP, they should be considered in the detailed analysis. Other remedial alternatives should be evaluated in a risk management analysis. In some cases, a combination of Subtitle C and risk analysis approaches may be used to address a discrete phase of response. All data generated during remedial planning, including the basis for selection of specific remedies, should be forwarded to my office as it becomes available so that the information can be transmitted to OSW to assist that office in its development of standards for mining wastes.

Attachment

cc: Marcia Williams, OSW
Gene Lucero, OWPE
Dan Berry, OGC

Environmental Protection Agency

40 CFR Part 261

Regulatory Determination For Wastes From the Extraction and Beneficiation of Ores and Minerals

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[FRL 3033-7]

Regulatory Determination for Wastes from the Extraction and Beneficiation of Ores and Minerals

AGENCY: Environmental Protection Agency.

ACTION: Regulatory determination.

SUMMARY: This is the regulatory determination for solid waste from the extraction and beneficiation of ores and minerals required by section 3001(b)(3)(C) of the Resource Conservation and Recovery Act (RCRA). This section of RCRA requires the Administrator to determine whether to promulgate regulations under Subtitle C of the Act for these wastes or determine that such regulations are unwarranted; the Administrator must make this determination no later than six months after completing a Report to Congress on these wastes and after public hearings and the opportunity to comment on the report. After completing these activities and reviewing the information available, the Agency has determined that regulation of the wastes studied in the Report to Congress, i.e., wastes from the extraction and beneficiation of ores and minerals, under Subtitle C is not warranted at this time.

ADDRESS: The address for the Headquarters docket is: United States Environmental Protection Agency, EPA RCRA docket (Sub-basement), 401 M street, SW., Washington DC, 20460, (202) 475-9327. For further details on what the EPA RCRA docket contains, see Section VII. of this preamble, titled "EPA RCRA Docket" under "SUPPLEMENTARY INFORMATION.".

FOR FURTHER INFORMATION CONTACT: RCRA/Superfund Hotline at (800) 424-9346 or (202) 382-3000 or Dan Derkics at (202) 382-2791.

SUPPLEMENTARY INFORMATION:

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VI. Application of Subtitle D to Mining Waste

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I. Summary

Based on the Report to Congress, comments on the report, and other available information, EPA has determined that regulation of mining waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA) is not warranted at this time.

This conclusion is based on EPA's belief that several aspects of EPA's current hazardous waste management standards are likely to be environmentally unnecessary, technically infeasible, or economically impractical when applied to mining waste. While under existing law EPA would have some flexiblity to modify its standards for hazardous waste management as applied to these wastes, there are substantial questions about whether the flexibility inherent in the statute coupled with the Agency's current data on these wastes provide a sufficient basis for EPA to develop a mining waste program under Subtitle C that addresses the risks presented by mining waste while remaining sensitive to the unique practical demands of mining operations. Given these uncertainties, EPA does not intend to impose Subtitle C controls on mining waste at this time.

The Agency, however, is concerned about certain actual and potential mining waste problems, and therefore plans to develop a program for mining waste under Subtitle D of RCRA. The long-term effectiveness of this program depends on available State resources for designing and implementing a program tailored to the needs of each State, and on EPA's ability to oversee and enforce the program. As noted below in section VI, EPA will be working with the States to determine the specific nature of their current mining waste activities and

their future plans to administer such programs. The Administration will work with Congress to develop expanded Subtitle D authority (i.e., Federal oversight and enforcement) to support an effective State-implemented program for mining waste. EPA has already made preliminary contacts with Congress and intends to hold detailed discussions on the specifics of the Subtitle D program in the coming year. In the interim, EPA will use RCRA section 7003 and CERCLA sections 104 and 106 to protect against substantial threats and imminent hazards. If EPA is unable to develop an effective mining waste program under Subtitle D, the Agency may find it necessary to use Subtitle C authority in the future.

II. Background

Section 8002(f) of the Resource Conservation and Recovery Act of 1976 directed EPA to conduct:

A detailed and comprehensive study on the adverse effects of solid wastes from active and abandoned surface and underground mines on the environment, including, but not limited to, the effects of such wastes on humans, water, air, health, welfare, and natural resources, and on the adequacy of means and measures currently employed by the mining industry, Government agencies, and others to dispose of and utilize such solid wastes to prevent or substantially mitigate such adverse effects.

The study was to include an analysis of:

1. The Sources and volume of discarded material generated per year from mining;

2. Present disposal practices;

3. Potential danger to human health and the environment from surface runoff of leachate and air pollution by dust;

4. Alternatives to current disposal methods;

5. The cost of those alternatives in terms of the impact on mine product costs; and

6. Potential for use of discarded material as a secondary source of the mine product.

On May 19, 1980, EPA promulgated regulations under Subtitle C of RCRA which covered, among other things, "solid waste from the extraction, beneficiation, and processing of ores and minerals," i.e., mining waste. On October 21, 1980, just before these Subtitle C regulations became effective, Congress enacted the Solid Waste Disposal Act of 1980 (Pub. L. 96-482) which added

section 3001(b)(3)(A)(ii) to RCRA. This section prohibits EPA from regulating "solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore" as hazardous waste under Subtitle C of RCRA until at least six months after the Agency completes and submits to Congress the studies required by section 8002(f), and by section 8002(p) (which was also added to RCRA by the 1980 amendments).

Section 8002(p) required EPA to perform a comprehensive study on the disposal and utilization of the waste excluded from regulation, i.e., solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore. This new study, to be conducted in conjunction with the section 8002(f) study, mandated an analysis of:

1. The source and volumes of such materials 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 costs of such alternatives;

7. The impact of these alternatives on the use of phosphate rock and uranium ore, and other natural resources; and

8. The current and potential utilization of such materials.

The 1980 amendments also added section 3001(b)(3)(C), which requires the Administrator to make a "regulatory determination" regarding the waste excluded from Subtitle C regulation. Specifically within six months after submitting the Report to Congress, and after holding public hearings and taking public comment on the report, the Administrator must "determine to promulgate regulations" under Subtitle C of RCRA for mining waste or "determine that such regulations are unwarranted."

EPA was required to complete the study and submit it to Congress by October 16, 1983. In 1984, the Concerned Citizens of Adamstown and the Environmental Defense Fund sued EPA for failing to complete the section 8002 studies and the regulatory determination by the statutory deadlines. The District Court for the District of Columbia ordered EPA to complete the studies by December 31, 1985, and to publish the regulatory determination by June 30, 1986.

EPA submitted its Report to Congress on mining waste on December 31, 1985. A notice announcing the availabilityof the report, and the dates and locations of public hearings, was published January 8, 1986 (51 FR 777). EPA held public hearings on the report in Tucson, Arizona on March 6, 1986; Washington, DC on March 11, 1986; and Denver, Colorado on March 13, 1986. The comment period on the report closed March 31, 1986. This notice constitutes the Agency's regulatory determination for the wastes covered by the Report to Congress, i.e., wastes from the extraction and beneficiation of ores and minerals.

On October 2, 1986, EPA proposed to narrow the scope of the mining waste exclusion in RCRA section 3001(b)(3)(A)(ii), as it applies to processing wastes (50 FR 40292). Under this proposal, wastes that would no longer be covered by the mining waste exclusion would be subject to Subtitle C if they are hazardous. These "reinterpreted" wastes where not studied in the mining waste Report to Congress and therefore, are not covered by this regulatory determination.

III. Legal Authority

EPA has concluded that its decision whether to regulate mining waste under Subtitle C should be based not just on whether mining waste is hazardous (as currently defined by EPA regulations) but also should consider the other factors that section 8002 required EPA to study. The basis of this conclusion is the language of section 3001(b)(3)(A) which states that the regulatory determination must be "based on information developed or accumulated pursuant to [the section 8002 studies], public hearings, and comment. . . ." Clearly, Congress envisioned that the determination would be based on all the factors enumerated in sections 8002 (f) and (p). Congress already knew that some mining waste was hazardous, since the RCRA Subtitle C regulations which were promulgated on May 19, 1980 were to apply to hazardous (both characteristic and listed) mining waste. Congress apparently believed, however, that EPA should obtain and consider additional information, not just data on which types of mining waste are hazardous, before imposing Subtitle C regulation on these wastes. Accordingly, this regulatory determination is based on consideration of the factors listed in sections 8002 (f) and (p).

In reviewing the factors to be studied which are listed in sections 8002 (f) and (p), and the legislative history of these and other mining waste provisions, EPA has concluded that Congress believed that certain factors are particularly important to consider in making the Subtitle C regulatory determination. First, Congress instructed EPA to study the potential dangers to human health and the environment from mining waste, indicating that the decision to regulate under Subtitle C must be based on a finding of such a danger. Second, section 8002(p) required EPA to review the actions of other Federal and State agencies which deal with mining waste "with a view toward avoiding duplication of effort." From this provision, EPA concludes that Congress believed Subtitle C regulation might not be necessary if other

Federal or State programs control any risks associated with mining waste. Third, Congress expected EPA to analyze fully the disposal practices of the mining industry which, when read in conjunction with the legislative history of this provision, indicates concern about the feasibility of Subtitle C controls for mining waste. Finally, Congress instructed EPA to look at the costs of various alternative methods for mining waste management, as well as the impact of those alternatives on the use of natural resources. Therefore, EPA must consider both the cost and impact of any Subtitle C regulations in deciding whether they are warranted. Clearly, Congress believed that it was important to maintain a viable mining industry. Therefore, any Subtitle C regulations which would cause widespread closures in the industry would be unwarranted.

IV. Report to Congress

EPA's Report to Congress provides information on sources and volumes of waste, disposal and utilization practices, potential danger to human health and the environment from mining practices, and evidence of damages. EPA received more than 60 written comments on the report and heard testimony at the hearings from more than 30 individuals. A complete summary of all the comments presented at the hearings and submitted in writing is available (ICF, 1986a see VII No. 6); (see "EPA RCRA Docket"). This section summarizes the information contained in the Report to Congress, public comments received on the report, and EPA's response to the comments.

A. Summary of Report to Congress

1. Structure and Location of Mines

EPA focused on segments producing and concentrating metallic ores, phosphate rock, and asbestos, totalling fewer than 500 active sites during 1985. These sites, which are predominantly located in sparsely populated areas west of the Mississippi River, vary widely in terms of size, product value, and volumes of material handled. Several segments are concentrated primarily in one state: The iron segment is mainly concentrated in Minnesota, lead in Missouri, copper in Arizona, asbestos in California, and phosphate in Florida.

2. Waste Quantities

The Report to Congress estimated that 1.3 and 2 billion metric tons per year of nonfuel mining waste were generated in 1982 and 1980, respectively. The accumulated waste volume since 1910 from nonfuel mining is estimated to be approximately 50 billion metric tons. The large volume of annual and accumulated nonfuel mining waste results from the high waste-to-product ratios associated with mining. The fact that most of the material handled in mining is waste and not marketable product distinguishes mining from many other process industries where waste materials make up a relatively small portion of the materials used to produce a final product. Consequently, some of the

larger mining operations handle more material and generate more waste than many entire industries.

3. Waste Management Practices

The report indicated that site selection for mines, as well as associated beneficiation and waste disposal facilities, is the single most important factor affecting environmental quality in the mining industry. Most mine waste is disposed of in piles, and most tailings in impoundments. Mine water is often recycled through the mill and used for other purposes onsite. Off-site utilization of mine waste and mill tailings is limited (i.e., 2 to 4 percent of all mining waste generated). Some waste management measures (e.g., source separation, treatment of acids or cyanides, and waste stabilization) now used at some facilities within a narrow segment of the mining industry could be more widely used. Other measures applied to hazardous waste in nonmining industries may not be appropriate. For example, soil cover from surrounding terrain may create additional reclamation problems in arid regions.

4. Potential Hazard Characteristics

Of the 1.3 billion metric tons of nonfuel mining waste generated by extraction and beneficiation in 1985, about 61 million metric tons (5 percent) exhibit the characteristics of corrosivity and/or EP (Extraction Procedure) toxicity, as defined by 40 CFR 261.22 and 261.24, respectively. Another 23 million metric tons (2 percent) are contaminated with cyanide (greater than 10 mg/1). Further, there are 182 million metric tons (14 percent) of copper leach dump material and 95 million metric tons (7 percent) of copper mill tailings with the potential for release of acidic and toxic liquid, i.e., acid formation. There are 443 million metric tons (34 percent) of waste from the phosphate and uranium segments with radioactivity content greater than 5 picocuries per gram; a total of 93 million metric tons (7 percent) has radioactivity content greater than 20 picocuries per gram. Finally, asbestos mines generated about 5 million metric tons (less than 1 percent) of waste with a chrysotile content greater than 5 percent.

5. Evidence of Damages

To determine what damage might be caused by mining waste, EPA conducted ground-water monitoring and examined documented damage cases. During short-term monitoring studies at eight sites, EPA detected seepage from tailings impoundments, a copper leach dump, and a uranium mine water pond. The

EP toxic metals of concern, however, did not appear to have migrated during the 6- to 9-month monitoring period. Other ground-water monitoring studies, however, detected sulfates, cyanides, and other contaminants from mine runoff, tailings pond seepage, and leaching operations. The actual human health and environmental threat posed by any of these releases is largely dependent upon site-specific factors, including a site's proximity to human populations or

sensitive ecosystems. Sites well removed from population centers, drinking water supplies, and surface waters are not likely to pose high risks.

Incidents of damage (e.g., contamination of drinking water aquifers, degradation of aquatic ecosystems, fish kills, and related degradation of environmental quality) have also been documented in the phosphate, gold, silver, copper, lead, and uranium segments. As of September 1985, there were 39 extraction, beneficiation, and processing sites included or proposed for inclusion on the National Priorities List under CERCLA (Superfund), including five gold/siver, three copper, three asbestos, and two lead/zinc mines. The asbestos Superfund sites differ from other sites in that these wastes pose a hazard via airborne exposure.

6. Potential Costs of Regulation

The Report to Congress presented for five metal mining segments, total annualized costs ranging from $7 million per year (for a scenario that emphasizes primarily basic maintenance and monitoring for wastes that are hazardous under the current RCRA criteria) to over $800 million per year (for an unlikely scenario that approximates a full RCRA Subtitle C regulatory approach, emphasizing cap and liner containment for all wastes considered hazardous under the current criteria, plus cyanide and acid formation wastes). About 60 percent of the total projected annualized cost at active facilities can be attributed to the management of waste accumulated from past production. Those segments with no hazardous waste (e.g., iron) would incur no costs. Within a segment, incremental costs would vary greatly from facility to facility, depending on current requirements of state laws, ore grade, geography, past waste accumulation, percentage of waste which is hazardous, and other factors.

B. Comments Received on the Report to Congress and EPA's Response

1. Potential Hazard Characteristics

EPA received several comments addressing the magnitude of the wastes generated by the mining industry, and the amount that is hazardous. Many agreed with the report's conclusion that there are substantial volumes of waste, but questioned EPA's estimates of the amount of "hazardous" waste.

Many commenters noted that they believed the EP (Extraction Procedure) test is inappropriate for mining waste because the municipal landfill mismangement scenario on which the test is based is not relevant to mining waste. They further noted that the corrosivity characteristic is not appropriate because it does not address the buffering capacity of the environment at certain mining sites. Finally, several commenters noted that leaching operations are processes, rather than wastes and are thus outside the purview of RCRA.

The Agency agrees that dump and heap leach piles are not wastes; rather they are raw materials used in the production process. Similarly, the leach liquor that is captured and processed to recover metal values is a product, and not a waste. Only the leach liquor which escapes from the production process and abandoned heap and dump leach piles are wastes. Since the report identified 50 million metric tons of heap and dump leach materials as RCRA corrosive wastes, EPA has accordingly reduced its estimate of mining waste volumes which meet the current definition of hazardous waste. The Agency currently estimates that out of the 61 million metric tons per year of mining waste identified as hazardous in the Report to Congress, only 11 million metric tons of mining waste generated annually are hazardous because they exhibit EP toxicity, and an unknown amount of escaped leach liquor is corrosive. EPA has also concluded that potential problems from substantial quantities of mining waste which have other properties, i.e., radioactivity, asbestos, cyanide, or acid generation potential will not be identified by the current RCRA characteristics. EPA, therefore, believes that entirely different criteria may more appropriately identify the mining wastes most likely to be of concern.

2. Evidence of Damages

EPA received many comments on whether the Report to Congress demonstrates that mining waste pose a threat to human health and the environment. Many commenters alleged that the report does not demonstrate conclusively that such wastes do pose a threat. They claimed that EPA did not adequately consider the site-specific nature of mining waste management problems. They pointed out that the environmental settings of sites vary widely, as do management practices, and that all these factors influence risk. Also, several commenters noted that the report fails to distinguish between the threat from past practices and the threat, if any, from current practices. Based on these observations, many of these commenters urged EPA to postpone regulations pending additional analysis. However, other commenters noted that they believed there is sufficient evidence that mining waste poses a threat to human health and the environment and asked for immediate regulatory action, noting that the time for study was over.

The Agency agrees that adverse effects to the public and the environment from the disposal of mining waste is not likely at sites well-removed from population centers, drinking water supplies, surface water, or other receptors. However, for other sites, analyses of contaminant plumes released by leaching operations and releases of other contaminants (e.g., acids, metals, dusts, radioactivity) demonstrate adverse effects. Moreover, the Agency recognizes, as evidenced by the mining waste sites on the National Priorities List, the potential for problems from mining sites. It is apparent that some of the problems at Superfund or other abandoned sites are attributable to waste disposal practices not currently used by the mining industry. However, it is not clear from the analysis of damage cases and Superfund sites, whether current waste management practices can prevent damage from seepage or sudden releases. EPA is concerned that a large exposure

potential exists at some sites generating mining waste, particularly the sites that are close to population centers or in locations conducive to high exposure and risk to human health and the environment.

3. Potential Costs of Regulation

EPA received a large number of comments pertaining to the cost of complying with regulations for mining waste, and the effects these compliance costs would have on the mining industry. Many commenters claimed that regulating the mining industry would impose costs much greater than those EPA estimated in its Report to Congress. They also noted that the mining industry was depressed, and that for many mines, increased compliance costs would be greater than the profits, leading to forced closures.

Many commenters also pointed out that there are current Federal and State regulations which already apply to mining, which impose costs. They noted that EPA needs to review the existing Federal and State regulatory structure before adding to it, thereby imposing additional costs. Others did not agree, commenting that existing Federal and State regulations are inadequate, and that additional EPA regulation is necessary.

EPA is sensitive to the potential costs to the industry associated with mining waste regulations under Subtitle C. The Agency is also cognizant that many EPA programs already affect the mining industry such as the Clean Water Act which, among other things, control surface water discharge via national Pollutant Discharge Elimination system (NPDES) permits. Other Federal agencies, including the Bureau of Land Management, the Forest Service, and the National Park Service, also exercise oversight and impose regulatory controls (CRA, 1986b see VII no. 3). The Federal waste disposal requirements generally call for practices that will prevent unnecessary and undue degradation. Federal reclamation guidelines are somewhat more detailed, requiring approval of a land management operating plan and an environmental assessment. Also these agencies generally require compliance with all applicable state and local laws and ordinances.

A number of states have their own statutes and implementing regulations for mining waste. Some states have comprehensive and well-integrated programs; other States have newer, partially developed programs (CRA, 1986c see VII no. 4). Although there is great variation in programs, many states have siting and permitting requirements, and require financial assurance, ground-water and surface water protection, and closure standards. EPA agrees that any requirements necessary to protect human health and the environment should consider the existing Federal and State mining waste programs with a view toward avoiding duplication of effort.

C. Mining Waste Conclusions

Based on the available information and public comments, the Agency draws the following conclusions about mining wastes. (BAI, 1986 see VII No. 1)

Source and Volume

- The waste volume generated by mining and beneficiation is considerably larger than the volume of waste generated by other industries currently subject to hazardous waste controls. The mining industry alone generates over one billion metric tons of waste per year compared to 260 million metric tons generated annually by all other hazardous waste industries. The average mining waste facility manages about three million metric tons of waste annually while the typical facility subject to Subtitle C controls manages about 50 thousand metric tons of waste per year.

- In general, mining waste disposal facilities are considerably larger than industrial hazardous waste disposal facilities; most of the largest industrial hazardous waste land disposal facilities are (tens of acres) in size, while typical mining waste disposal facilities are (hundreds of acres) in size. Agency studies indicate that mining waste tailings impoundments average about 500 acres; the largest is over 5000 acres. Mining waste piles average 126 acres; the largest exceeds 500 acres. Hazardous waste impoundments, however, average only about 6 acres and hazardous waste landfills average only about 10 acres. Consequently, EPA believes that many traditional hazardous waste controls may be technically infeasible or economically impractical to implement at mining waste sites because of their size.

Waste Management Practices

- EPA estimates indicate that most hazardous waste generators (about 70 percent) ship all of their waste off-site, however, no mines ship all of their waste off-site. In addition, nearly all mining waste is land disposed, while less than half of all industrial hazardous waste is land disposed.

Evidence of Damage

- In general, environmental conditions and exposure potential associated with mining waste are different than those associated with industrial hazardous waste streams. Agency studies suggest that mining waste streams generally have lower exposure and risk potential for several reasons.

- First, mining waste management facilities are generally in drier climates than hazardous waste management facilities, thereby reducing the leaching potential. Over 80 percent of the mining sites are located west of the Mississippi River, which generally has drier climates, whereas industrial hazardous waste landfills are more evenly distributed nationally. In addition, the Agency estimates that more than sixty percent of all mines have annual net

recharge between 0-2 inches, and only ten percent have net recharge greater than ten inches. However, about 80 percent of the hazardous waste land disposal facilities have net recharge greater than five inches, and over one-third exceed 15 inches.

- Second, EPA studies indicate that hazardous waste land disposal facilities are closer to ground water than mining waste sites. Over 70 percent of hazardous waste sites have a depth to ground water of 30 feet or less, while about 70 percent of mining sites have ground water depths greater than 30 feet.

- Third, Subtitle C facilities tend to be located in more densely populated areas. EPA estimates that mining waste sites have average populations of less than 200 within one mile of the site, while hazardous waste sites average over 2,000 people at the same distance. Within five miles of the mining waste sites, the average population is almost 3,000, while hazardous waste sites average nearly 60,000 people.

- Fourth, Agency studies suggest that, compared to mining waste sites, hazardous waste sites tend to be located closer to drinking water receptors and serve larger populations. Almost 70 percent of the hazardous waste sites are located within five miles of a drinking water receptor serving an average population of over 18,000 and as many as 400,000 people. Almost half as many mining sites are located within this same distance, and they serve considerably smaller populations (averaging 3,000 but ranging as high as 20,000.)

- Although the Agency believes that the human exposure and risk potential appears to be lower for mining waste sites than for industrial hazardous waste sites, many mines are located in sensitive environmental settings. EPA estimates that about 50 percent of the mines are located in areas that have resident populations of threatened or endangered species or species of other special concern, (often the case for industrial sites). In addition, mining sites are typically located in relatively remote and otherwise undisturbed natural environments.

Cost and Economic Impacts

- EPA believes that many traditional waste management controls designed principally for industrial hazardous waste management facilities may be economically impractical to implement at mining sites and could impose substantial costs to the industry resulting in potential mine closures. Full Subtitle C controls for mining sites could impose as much as $850 million per year in compliance costs. Such costs could be greater than profits resulting in mine closures.

- Many Federal and State agencies already have regulatory programs for managing mining waste. New hazardous waste controls for mining waste could be difficult to integrate with existing Federal and State programs.

V. Application of Subtitle C to Mining Waste

EPA believes that it needs maximum flexibility to develop an appropriate program for mining waste which addresses the technical feasibility, the environmental necessity, and the economic practicality of mining waste controls. The program should consist of a tailored risk-based approach which addresses the diversity and unique characteristics of mining waste problems.

The current Subtitle C program is designed principally for controlling problems created by industrial wastes. Based on information available, the Agency believes that many controls required under the current Subtitle C program, if applied universally to mining sites, would be either unnecessary to protect human health and the environment, technically infeasible, or economically impractical to implement. For instance, certain Subtitle C requirements such as single and double liner system requirements which provide liquid management, and closure and capping standards to minimize infiltration, may be technically infeasible or economically impractical to implement for mining wastes because of the quantity and nature of waste involved. In addition, for many mining sites located in remote areas, such controls may be necessary to protect human health and the environment. For example, liquid releases to the ground water can be minimized and controlled using cutoff walls or interceptor wells (i.e., controlled release) as well as through liner systems, and alternate capping requirements designed to address site-specific concerns such as direct human contact or wind erosion, are likely to be feasible and practical, thus providing better long-term protection of human health and the environment.

Section 3004(x) of RCRA does provide flexibility for regulating mining waste. This section gives EPA the authority to modify certain Subtitle C requirements for mining waste which were imposed by the Hazardous and Solid Waste Amendments of 1984 (HSWA) which relate to liquids in landfills, prohibitions on land disposal, minimum technological requirements, continuing releases at permitted facilities, and retrofitting interim status surface impoundments with liners. In modifying these requirements, EPA may consider site-specific characteristics as well as the practical difficulties associated with implementing such requirements. In addition, EPA has general authority under RCRA section 3004(a) to modify remaining Subtitle C requirements, such as administrative standards, financial requirements, and closure and capping requirements, if a waste poses different risks or the existing standards are technically infeasible. However, in modifying such requirements, section 3004(a) does not provide EPA the same degree of flexibility to consider the economic impact of regulation that is found in section 3004(x).

As described earlier in this notice, EPA believes that the decision whether to regulate mining waste under Subtitle C must consider the factors listed in RCRA sections 8002 (f) and (p), including the risks associated with mining waste, the cost of such regulation, and the effect regulation might have on the use of natural resources. EPA has concluded that in order to meet that objective, it would want to develop a program that has maximum flexibility to develop an effective control strategy for individual facilities based on site-specific conditions. The existing Subtitle C regulatory program would probably have to be changed substantially for mining waste to provide that type of flexibility.

Given these general conclusions about what would be needed to make the Subtitle C system appropriate for mining waste, there are substantial uncertainties about whether that program is the right mechanism to address mining waste. First, it is unclear whether the legal authorities under which EPA would be acting (i.e., sections 3004(a) and 3004(x)) give EPA sufficient flexibility to craft a program for "hazardous" mining waste given the statutory and regulatory approach established for other hazardous wastes. Second, and closely related, there are substantial questions about whether the Agency's current data on mining waste management provide a basis for substantial modifications to the existing Subtitle C regulatory program. With the mining waste study and the supplementary information collection efforts associated with today's notice, EPA has greatly expanded its understanding of mining waste management practices. At the same time, additional data collection and analysis would probably be necessary to support specific modifications of multiple provisions in the existing hazardous waste regulations before those regulations would provide the type of flexibility we currently believe might be necessary. These uncertainties have led us to the conclusion that Subtitle C does not provide an appropriate template for a mining waste management program.

VI. Application of Subtitle D to Mining Waste

Solid waste that is not hazardous waste is subject to regulation under Subtitle D. Therefore, mining waste, which is included in the RCRA definition of solid waste, is currently covered by Subtitle D. EPA believes that it can design and implement a program specific to mining waste under Subtitle D that addresses the risks associated with such waste. The current Subtitle D program establishes criteria which are, for the most part, environmental performance standards that are used by States to identify unacceptable solid waste disposal practices or facilities. (See 40 CFR Part 257.) These criteria include, among other things, standards related to surface water discharges, ground-water contamination, and endangered species. Because the program's criteria are aimed principally at municipal and industrial solid waste, EPA believes they do not now fully address mining waste concerns. In addition, many of these criteria, such as control of disease vectors and bird hazards, are not appropriate for mining waste.

The Agency is currently revising these criteria for facilities that may receive hazardous household waste and small quantity generator hazardous waste; these revisions will not apply to mining waste which are generally not codisposed with such wastes. However, the Agency intends to further augment the Subtitle D program by developing appropriate standards and taking other actions appropriate for mining waste problems. EPA will focus on identifying environmental problems and setting priorities for applying controls at mining sites with such potential problems as high acid-generation potential, radioactivity, asbestos and cyanide wastes. EPA will also develop a risk-management framework to develop appropriate standards as necessary to protect human health and the environment. EPA will consider requirements such as: (1) A range of closure options to accommodate variable problems such as infiltration to ground water and exposure from fugitive dust; (2) options to define tailored controls, including those established by the Clean Water Act, to address problems from runoff to surface water; (3) options for liquid management controls such as pretreatment of wastes prior to disposal, controlled release, or liner systems; (4) ground-water monitoring options that accommodate site-specific variability; and (5) a range of clean-up options.

In developing such a program, EPA will use its RCRA Section 3007 authority to collect additional information on the nature of mining waste, mining waste management practices, and mining waste exposure potential. EPA believes this authority does not limit information collection to "hazardous" waste identified under Subtitle C but also authorizes the collection of information on any solid waste that the Agency reasonably believes may pose a hazard when improperly managed. (EPA may also use this authority in preparing enforcement actions.) Initially, EPA will use this information to develop a program under Subtitle D. The information, however, may indicate the need to reconsider Subtitle C for certain mining wastes.

In specifying the appropriate standards, EPA also will further analyze existing Federal and State authorities and programs and determine future plans for administering their mining waste programs. Additionally, EPA will perform analyses of costs, impacts, and benefits and will comply fully with Executive Orders 12291 and 12498, the Regulatory Flexibility Act, and the Paperwork Reduction Act.

EPA is concerned that the lack of Federal oversight and enforcement authority over mining waste controls under Subtitle D of RCRA and inadequate State resources to develop and implement mining waste programs may jeopardize the effectiveness of the program. The Administration therefore will work with Congress to develop the necessary authority. In the interim, EPA will use section 7003 of RCRA and sections 104 and 106 of CERCLA to seek relief in those cases where wastes from mining sites pose substantial threats or imminent hazards to human health and the environment. Mining waste problems can also be addressed under RCRA Section 7002 which authorizes citizen lawsuits for violations of Subtitle D requirements in 40 CFR Part 257.

As EPA develops this program for regulating human health and environmental risks associated with mining waste, the Agency may find that the Subtitle D approach is unworkable, perhaps because there is insufficient authority to implement an effective program (i.e., the Agency does not obtain oversight and enforcement authority under Subtitle D), or that States lack adequate resources to develop and implement the program. In such an event, EPA may find it necessary to reexamine use of Subtitle C authority with modified mining waste standards in the future.

EPA has already made preliminary contacts with Congress to discuss the best approach for an effective mining waste program. The Agency intends to immediately begin collecting additional technical, economic, and other relevant information needed for program development, and to complete its data analysis by late 1987. EPA hopes to propose revisions to the Subtitle D criteria that are specific to mining waste by mid-1988.

VII. EPA RCRA Docket

The EPA RCRA docket is located at:

United States Environmental Protection Agency,
EPA RCRA Docket (Sub-basement),
401 M Street, SW.,
Washington, DC 20460.

The docket is open from 9:30 to 3:30 Monday through Friday, except for Federal holidays. The public must make an appointment to review docket materials. Call Mia Zmud at (202) 475-9327 or Kate Blow at (202) 382-4675 for appointments.

Copies of the following documents are available for viewing only in the EPA docket room:

1. Buc & Associates Inc., 1986. Location of Mines and Factors Affecting Exposure.

2. Charles River Associates, 1986a. Estimated Costs to the U.S. Uranium and Phosphate Mining Industry for Management of Radioactive Solid Wastes.

3. Charles River Associates, 1986b. Federal Non-EPA Regulations Addressing Mining Waste Practices.

4. Charles River Associates, 1986c. State Regulations of the U.S. Mining Industry.

5. Frontier Technical Associates, 1986a. Groundwater Monitoring Data on Ore Mining and Milling Solid Waste Disposal.

6. ICF, 1986a. Summary of Comments on the Report to Congress.

7. ICF, 1986b. Overview of Superfund Mine Sites.

8. Meridian 1986. Statistical Analysis of Mining Waste Data.

9. Versar, 1986a. Quantities of Cyanide-bearing and Acid-Generating Wastes.

10. Versar, 1986b. Technical Studies Supporting the Mining Waste Regulatory Determination.

The public may copy a maximum of 50 pages of material from any one regulatory docket at no cost. Additional copies cost $.20/page.

Dated: June 30, 1986.

Lee M. Thomas,

Administrator.

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