ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[SWH-FRL-3546-4]

Mining Waste Exclusion

AGENCY: Environmental Protection Agency.

ACTION: Notice of proposed rulemaking.

SUMMARY: Section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery Act (RCRA) excludes "solid waste from the extraction, beneficiation, and processing of ores and minerals" from regulation as hazardous waste under Subtitle C of RCRA, pending completion of certain studies by EPA. In 1980, EPA interpreted this exclusion (on a temporary basis) to encompass "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals" (45 FR 76619, November 19, 1980).

In today's notice, which supercedes and substantially revises the NPRM published on October 20, 1988, EPA is proposing to further define the scope of the Bevill exclusion with respect to mineral processing wastes. Specifically, the Agency is proposing to remove from the exclusion all mineral processing wastes except for six wastes proposed to be retained within the temporary exclusion and 33 other wastes proposed to be conditionally retained pending collection of data necessary to evaluate hazard. Thus, a two-stage rulemaking process is necessary in order for the Agency to complete determinations of Bevill exemption status for mineral processing wastes: one stage for wastes that the Agency already has adequate data to make such determinations, and a second stage for those for which insufficient data are available.

All mineral processing wastes, other than the 39 wastes referred to above, that exhibit one or more of the characteristics of hazardous waste would become subject to the requirements of Subtitle C of RCRA if today's rule is promulgated as proposed. All wastes retained within the Bevill exclusion when the two stages of this rule are promulgated will be studied in a Report to Congress pursuant to section 8002(p) of RCRA prior to a determination of their final regulatory status.

DATES: EPA will accept public comments on this proposal until May 31, 1989. The Agency will hold a public hearing on May 23, 1989 from 9:00 a.m. to 5:00, unless concluded earlier; see the section titled "Public Participation" for details.

ADDRESS: Those wishing to submit public comments for the record must send an original and two copies of their comments to the following address: RCRA Docket Information Center (OS-305), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. Place the docket #F-89-MWRP-FFFFF on your comments.

The OSW docket is located in room M2427 at EPA headquarters. The docket is open from 9:00 to 4:00 Monday through Friday, except for Federal holidays. Members of the public must make an appointment to review docket materials. Call (202) 475-9327 for appointments. Copies cost $0.15/page.

FOR FURTHER INFORMATION CONTACT: RCRA/Superfund Hotline at (800) 424-9346 or (202) 382-3000 or Dan Derkics, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-3608.

SUPPLEMENTARY INFORMATION:

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I. Overview

Section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery Act (RCRA) excludes "solid waste from the extraction, beneficiation and processing of ores and minerals" from regulation as hazardous waste under Subtitle C of RCRA, pending completion of certain studies by EPA. In 1980, the Agency interpreted this exclusion (on a temporary basis) to encompass all "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals" (45 FR 76619, November 19, 1980). In July, 1988, a Federal Court of Appeals (*Environmental Defense Fund* v. *EPA*, 852 F.2d 1316 (D. C. Cir. 1988), *cert. denied*, 109 S. Ct. 1120 (1989) (*EDF* v. *EPA*)) *found that this exclusion is based upon the "special waste" concept first proposed by EPA in 1978 (43 FR 58946) and that*

> Congress intended the term "processing" in the Bevill Amendment to include only those wastes from processing ores or minerals that meet the "special waste" concept, that is "high volume, low hazard" wastes. 852 F.2d at 1328-29.

In compliance with this Court decision, on October 20, 1988 EPA published a proposal to further define the scope of the section 3001(b)(3)(A)(ii) of RCRA. (See 53 FR 41288) In the October 20, 1988 proposal, EPA presented a criterion for defining mineral processing wastes and a two-part criterion for identifying which mineral processing wastes are high volume, but proposed to defer judgment on the hazard posed by high volume mineral processing wastes until preparation of a required report to Congress. The Agency also applied the processing and volume criteria to its available data on mineral processing wastes, and identified 15 which it believed met the criteria, and which the Agency therefore proposed to retain within the exclusion and study for the report to Congress:

1. Slag from primary copper smelting
2. Process wastewater from primary copper smelting/refining
3. Blowdown from acid plants at primary copper smelters
4. Bleed electrolyte from primary copper refining
5. Slag from primary lead smelting
6. Blowdown from acid plants at primary zinc smelters
7. Process wastewater from primary zinc smelting/refining
8. Red and brown muds from bauxite refining
9. Phosphogypsum from phosphoric acid production
10. Slag from elemental phosphorus production
11. Iron blast furnace slag
12. Air pollution control dust/sludge from iron blast furnaces
13. Waste acids from titanium dioxide production
14. Air pollution control dust from lime kilns
15. Slag from roasting/leaching of chromite ore.

Today's proposal substantially revises and supplements the NPRM published on October 20, 1988. Based on comments received on the October 20, 1988 NPRM, EPA believes that, in spite of the technical difficulties associated with

developing, and the very limited data available for applying, a criterion for evaluating the hazard of mineral processing wastes prior to the preparation of a report to Congress, such a criterion is required in order to identify those mineral processing wastes that are "special wastes". As a result, today's proposal includes a criterion for identifying mineral processing wastes that are clearly not low hazard and, therefore, not "special wastes" even if they are high volume. This criterion evaluates the corrosivity of the waste and the mobility and toxicity of constituents in the waste. Today's proposal also provides some clarification of the criterion used to define mineral processing wastes and modifies the volume criterion by deleting the total national volume test.

Based on these changes to the "special waste" criteria and the information provided in public comments, EPA is today proposing to remove from the Bevill exclusion all but 39 mineral processing wastes. Of the 39 mineral processing wastes being proposed today to be retained within the exclusion, the Agency believes that the following six wastes satisfy all of the "special waste" criteria described in today's proposal:

1. Slag from primary copper smelting
2. Slag from primary lead smelting
3. Red and brown muds from bauxite refining
4. Phosphogypsum from phosphoric acid production
5. Slag from elemental phosphorus production
6. Furnace scrubber blowdown from elemental phosphorus production.

In compliance with a Court ordered deadline, EPA intends to take final action on the Bevill status of these six wastes as well as the criteria used to determine which mineral processing wastes are "special wastes" by August 18, 1989. This final rule will complete the first stage of rulemaking regarding the Bevill status of mineral processing wastes.

The other 33 wastes are being proposed to be *conditionally* retained within the exclusion because they are mineral processing wastes that the Agency believes satisfy the volume criterion but for which the Agency does not currently have adequate data to evaluate compliance with the hazard criterion. The wastes that the Agency is today proposing to conditionally retain within the exclusion are:

1. Barren filtrate from primary beryllium processing
2. Raffinate from primary beryllium processing
3. Bertrandite thickener sludge from primary beryllium processing
4. Process wastewater from primary cerium processing
5. Ammonium nitrate process solution from primary lanthanide processing
6. Roast/leach ore residue from primary chrome ore processing
7. Gasifier ash from coal gasification
8. Cooling tower blowdown from coal gasification
9. Process wastewater from coal gasification
10. Bleed electrolyte from primary copper refining
11. Process wastewater from primary copper smelting/refining
12. Slag tailings from primary copper smelting
13. Calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining
14. Furnace off-gas solids from elemental phosphorus production
15. Process wastewater from elemental phosphorus production
16. Fluorogypsum from hydrofluoric acid production
17. Air pollution control dust/sludge from iron blast furnaces
18. Iron blast furnace slag
19. Process wastewater from primary lead smelting/refining
20. Air pollution control scrubber wastewater from light weight aggregate production
21. Wastewater treatment sludge/solids from light weight aggregate production
22. Process wastewater from primary magnesium processing by the anhydrous process
23. Process wastewater from primary selenium processing
24. Process wastewater from phosphoric acid production
25. Wastes from trona ore processing
26. Basic oxygen furnace slag from carbon steel production
27. Leach liquor from primary titanium processing
28. Sulfate processing waste acids from titanium dioxide production
29. Sulfate processing waste solids from titanium dioxide production
30. Chloride processing waste acids from titanium and titanium dioxide production
31. Chloride processing waste solids from titanium and titanium dioxide production
32. Blowdown from acid plants at primary zinc smelters
33. Process wastewater from primary zinc smelting/refining.

In compliance with a Court ordered deadline, EPA plans to complete a second stage of rulemaking regarding the Bevill exemption status of mineral processing wastes. This will consist of a proposal by September 15, 1989 that identifies the proposed status of these 33 wastes with respect to the hazard criterion, as well as publication of a final rule by January 15, 1990 that identifies which of these 33 wastes will be retained within and which will be removed from the regulatory exclusion provided by the Bevill Amendment.

Those mineral processing wastes that remain temporarily excluded as of January 15, 1990 will be studied for a report to Congress that EPA is required by a Court order to prepare by July 31, 1990. Six months after submission of the report to Congress, EPA will make a determination as to whether Subtitle C regulation of these wastes is warranted.

If today's proposal is promulgated, all mineral processing wastes other than the 39 wastes listed above will be *permanently* removed from the Bevill exclusion. That is, the exclusion from Subtitle C regulation currently provided by section 3001(b)(3)(A)(ii) of RCRA would apply only to these 39 wastes after the effective date of the August 18, 1989 rulemaking. After the second stage of this rulemaking is completed, some or all of the 33 conditionally retained mineral processing wastes may be found to not be low hazard and may, accordingly, be removed from the exclusion.

Any commenters on today's proposal who believe that the Agency should add to or delete from the group of 39 wastes that are today proposed to either be retained within the temporary exclusion from Subtitle C requirements or conditionally retained pending collection of additional data must provide information that at least demonstrates the status of the waste (to be added or deleted) with respect to the mineral processing operation and high volume criteria. In the absence of compelling additional information that indicates that there are other high volume mineral processing wastes, the Agency plans to retain, at most, only the 39 mineral processing wastes identified above within the Bevill exclusion for "solid wastes from . . . processing ores and minerals".

The Agency is interested in receiving data and comments on all aspects of today's proposal. Of particular interest, however, are the following areas:

(1) Analytical data on the physical, chemical and radiological nature of the 33 proposed conditionally excluded wastes;

(2) The appropriateness of the toxicity and pH tests for identifying "low hazard" mineral processing wastes; and

(3) Whether the definition of "mineral processing" should be further narrowed beyond that contained in today's proposal. For example, should "mineral processing" be considered confined to only those mineral processing operations that are co-located with extraction and beneficiation operations?

II. Background

A. History of the Mining Waste Exclusion for Mineral Processing Wastes

1. Introduction

Since the proposal of the first regulations under the Resource Conservation and Recovery Act (RCRA) in 1978, mineral processing wastes have been subject to a different regulatory framework than most other categories of potentially hazardous wastes. In the 1978 proposed rule implementing Subtitle C of RCRA, EPA introduced the "special waste" concept, which was based on the belief that these "special wastes" should, on a provisional basis, be regulated less stringently than other wastes because they were produced in very large volumes, were thought to pose less of a hazard than other wastes, and were generally not amenable to the management practices required by the technical standards being proposed for other hazardous wastes.

In 1980, Congress made this "special waste" concept a statutory requirement when it enacted the Bevill Amendment as part of the 1980 amendments to RCRA. The Bevill Amendment temporarily exempted fossil fuel combustion wastes, oil and gas field production wastes, mining and mineral processing wastes, and cement kiln dust waste from potential regulation as hazardous wastes under Subtitle C of RCRA. Most of the continuing controversy over the regulation of mineral processing wastes results from different interpretations of the legislative intent with regard to the Bevill Amendment, and of the subsequent Court decisions.

This section provides a summary and analysis of the history of the Bevill exclusion, from the initial enactment of RCRA through the present.

2. The Resource Conservation and Recovery Act and Proposed Subtitle C Regulations (1976–1980)

On October 21, 1976, Congress enacted the Resource Conservation and Recovery Act (Pub. L. 94–580). Section 3001 of RCRA mandated that the EPA Administrator "promulgate regulations identifying characteristics of hazardous waste, and listing particular hazardous wastes which shall be subject to the provisions of this subtitle." Section 3004 required the Administrator to promulgate standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities. Congress did not explicitly address the regulation of mining and mineral processing wastes, but Section 8002(f) instructed the EPA Administrator 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 * * *"

This study requirement was based upon the Congressional recognition that mining wastes were generated in larger quantities than any other type of solid waste, and that historical and, perhaps, contemporary mining wastes management practices, could pose danger to human health and the environment. Mandated study factors included sources and volumes of wastes generated, present and alternative disposal practices, potential danger posed by surface runoff and fugitive dust emissions, the cost of waste management alternatives, and the potential for use of discarded materials as secondary sources having mineral value. The House report (No. 94–1491) accompanying the RCRA bill indicates that the focus of EPA's inquiry was to be the environmental and technical adequacy of current waste management practices, with economic practicality being a secondary consideration.

On December 18, 1978, EPA proposed its regulations for managing hazardous wastes under Subtitle C of RCRA (43 FR 58946). These proposed regulations introduced the "special wastes" concept, upon which most of the debate concerning the regulatory status of mineral processing wastes has been focused. "Special waste" referred to wastes that were generated in large volumes, were thought to pose less risk to human health and the environment than other hazardous wastes, and for which the proposed technical requirements implementing Subtitle C might not be appropriate. EPA identified waste materials from the "extraction, beneficiation, and processing of ores and minerals" as one of six such "special wastes" under the proposed regulations.[1] EPA proposed to defer most of the RCRA Subtitle C requirements for these special wastes until information could be gathered and assessed that would enable EPA to determine the most appropriate regulatory approach.

In the fall of 1979, EPA completed a draft background document that outlined the development of EPA's methodology for determining which materials qualified as "special wastes" (Introduction and Criteria for Special Waste, November 2, 1979, EPA Docket #A–Dl–SS0062). The background document presents the eight criteria that were used to develop the original list of "special wastes" for the December 18, 1978 proposed Subtitle C regulations:

1. Limited information on waste characteristics;
2. Limited information on the degree of human health and environmental hazard posed by disposal;
3. Limited information on waste disposal practices and alternatives;
4. Very large volumes and/or large number of facilities;
5. Limited movement of wastes from the point of generation;
6. Few, if any, documented damage cases;
7. Apparent technological difficulty in applying current Subpart D[2] regulations to the waste because of volumes involved at typical facilities; and
8. Potential high economic impact if current Subpart D regulations are imposed.

The background document states further that criteria 1, 2, 3, 4, and 7 were the driving forces in the decision-making process for the 1978 proposed Subtitle C regulations, while the other criteria were met to some degree for individual wastes.

EPA received many public comments on the proposed Subtitle C regulations. The background document indicates that the Agency incorporated many of these comments, as well as its own continuing analysis, when it revised the criteria used to designate "special wastes." The concluding section discussed the four criteria that EPA, at that point, intended to use to evaluate petitions to designate a waste as a "special waste:"

1. The waste is or is anticipated to be generated and disposed in large volumes. This determination would be based on the national volume generated per year; the projected volume of waste generated over the next decade; the volume of waste disposed at a typical disposal facility; and extraneous siting restrictions on the generator.
2. The waste should be uniform, i.e., the waste exhibits the same characteristics whenever disposed, and is amenable to being predominantly managed without being mixed with other wastes.
3. The waste must pose only a low potential hazard to human health and the environment. This determination would be based on the class of hazard of the waste; the chemical composition and physical characteristics of the waste; results of the application of 40 CFR 250 Subpart A [now 40

[1] The other five "special wastes" were cement kiln dust waste; utility waste; phosphate rock mining, beneficiation, and processing waste; uranium mining waste; and gas and oil drilling muds and oil production brines.

[2] 40 CFR Part 250, Subpart D contained the proposed RCRA Section 3004 management standards (43 FR 59008). These requirements are now found in final form at 40 CFR Parts 264–266).

CFR Part 261] procedures for determining hazardous characteristics and other available testing information (although ignitable, corrosive, or reactive wastes would be acceptable as special wastes at the discretion of the Administrator); and information on documented past damage cases.

4. Due to lack of information on current treatment, storage, and disposal practices and alternatives, the Agency would be unable to propose standards for control of the waste.[3]

Using the revised list of four criteria, the Agency considered expanding the list of six "special wastes" in the 1978 proposed Subtitle C regulations to a total of eleven:

1. Cement kiln dust waste;
2. Utility waste;
3. Phosphate mining, beneficiation, and processing waste;
4. Uranium mining waste;
5. Wastes from the extraction, beneficiation, and processing of ores and minerals other than phosphate rock and uranium ore;
6. Gas, oil, and geothermal drilling and production wastes;
7. Shale oil industry wastes;
8. Red muds [from bauxite refining];
9. Black muds [from bauxite refining];
10. Coal mining waste; and
11. Dredge spoils.

Though the special waste category was never promulgated, it is clear that EPA was responsible for amplifying the original study requirement under section 8002(f) into a regulatory concept, that the Agency had several specific criteria (principally low hazard, high volume, and infeasibility of Subtitle C technical requirements) that it employed to evaluate potential special wastes, and that the group of wastes that might have received the temporary exemption from full Subtitle C regulation was to be both finite and relatively small. The concept of and means of identifying special wastes continue to be relevant to and serve as the basis for the present rulemaking.

3. Final Subtitle C Regulations and the Solid Waste Disposal Act Amendments of 1980, Including the Bevill Amendment (1980)

Throughout 1980, Congress was conducting hearings to substantially amend RCRA. On February 20, 1980, Rep. Thomas Bevill (AL) offered an amendment which, among other things, amended section 3001 to temporarily exempt three categories of waste from Subtitle C regulation:

- Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels;
- Solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and uranium ore; and
- Cement kiln dust waste.

These wastes were to remain exempt from Subtitle C regulation until completion of the studies required under sections 8002(f) and 8002(p), the latter of which was to be added to RCRA (these sections are discussed below).

From his statements before the Committee on Interstate and Foreign Commerce, it is apparent that Rep. Bevill offered his amendment primarily to prevent regulatory disincentives for the development of the nation's coal resources. Rep. Bevill stated that "the House [would] not allow EPA to take steps that will discourage the use of coal." Rep. Bevill noted that EPA "has very little information on the composition, characteristics, and degree of hazard posed by these [i.e., coal] wastes" and that the Agency believed that any potential hazards presented by the materials are relatively low.

Rep. Bevill also claimed that existing Federal and State regulation would sufficiently regulate wastes from the combustion of coal and other fossil fuels while EPA was undertaking the required studies. During the hearing, several other representatives spoke in favor of the Bevill amendment, specifically concerning refuse-derived fuel (Rep. Horton-NY), fly ash and slag from coal (Rep. Findley-IL), oil and gas muds and brines (Rep. Moffett-CT), and large volume coal wastes (Rep. Rahall-WV; Rep. Staggers-WV). Rep. Florio (NJ) submitted for the record results of EPA studies that documented the known health risks associated with radioactive uranium and phosphate wastes.

The discussion of mining wastes as a part of the Bevill Amendment was limited to brief comments by Rep. Williams (MT), who stated that wastes from mineral production should not be subject to Subtitle C regulation at that time. As an example of the limited potential hazard of these wastes, Rep. Williams paraphrased a National Academy of Sciences study, stating that slag waste generated by the smelting of copper

> . . . is basically inert and weathers slowly. The slag produced 2,500 years ago at King Solomon's mines north of Eliat, Israel, has not changed perceptibly over time.

Rep. Williams then continued

> Should wastes such as smelting slag be subject to stringent regulations at this time? I think not—not until a thorough study is conducted by the responsible agency which clearly proves the need for additional regulation. (Emphasis added.)

Based on Rep. Bevill's comments, it is apparent that the fundamental purpose of the amendment was to limit the impact of Subtitle C regulation on the coal industry (the Senate version of this bill, however, emphasized oil and gas field production wastes), at a time when the nation and the Congress were extremely concerned about energy self-sufficiency. Although the Bevill Amendment, as read into the record during the hearing, explicitly refers to mineral processing wastes, Rep. Bevill did not mention these wastes or respond to Rep. Williams' statements.

Almost all of the major components of the Bevill amendment were originally conceived by EPA. The Bevill amendment made the Agency's planned activities, as expressed in the 1978 proposed Subtitle C regulations and the 1979 "Special Waste" background document, statutory requirements. In fact, with very few exceptions, all of the specific provisions of the Bevill Amendment were lifted (often verbatim) from EPA rulemakings and related documents.

Furthermore, it is clear from the legislative history that the Bevill Amendment was designed to defer regulation of those wastes which EPA had defined as special wastes. Congressman Bevill referred specifically to EPA's 1978 special waste proposal in his explanation of the amendment, noting that EPA had asserted

> it did not have data on the effectiveness of current or potential waste management technologies or the technical or economic practicability of imposing its proposed regulations. In the same [12/18/78] announcement, EPA also stated that it believed that any potential hazards presented by the materials are relatively low.

26 *Cong. Rec.* 3361 (1980). Other Congressmen also referred to the Bevill wastes in terms of the EPA "special waste" concept. Congressmen Santini, Staggers, and Findley all supported the amendment on the basis that it would defer regulation of "special wastes" until EPA had completed the required study. *Id.* at 3348, 3349, 3363, 3365. Congressman Williams of Montana, in explaining why smelting slag should be studied (see above), noted that the Bevill Amendment "would direct [EPA] to evaluate *certain high volume, low toxicity* wastes so as to assure a reasoned set of regulations by which to manage these wastes." *Id.* at 3364. Clearly, the discussions on the floor of the House imply Congressional intent to incorporate the "special waste" concept into the Bevill Amendment definitions of

[3] EPA also considered and rejected a number of criteria not included in the original list, including: adequacy of current waste management practices and resource recovery potential.

excluded wastes. (See also 852 F.2d at 1327).

On May 19, 1980, EPA promulgated final regulations under Subtitle C of RCRA which addressed, among other things, "solid waste from the extraction, beneficiation, and processing of ores and minerals" (45 FR 33066). In promulgating these regulations, EPA decided to withdraw rather than finalize the "special waste" category. The Agency's stated basis for this decision was twofold:

(1) The thresholds for the (EP) extraction procedure toxicity and corrosivity characteristics tests (which are used to identify hazardous wastes subject to Subtitle C regulation) had been significantly relaxed. As a result, the number of wastes in general, and "special wastes" in particular, that would be potentially subject to Subtitle C regulation was greatly reduced.

(2) The Agency had incorporated more flexibility, through phasing and standard-setting, in Parts 264 and 265 (which contain the regulations for permitted and interim status owners/operators of hazardous waste facilities). Thus, a RCRA permit writer had the ability to take into account site-specific environmental characteristics and management practices (i.e., "special waste" study factors) in establishing permit requirements.

As a result, the Agency concluded that these changes "accomplish the objectives of, and eliminate the need for, a special solid waste category." When EPA eliminated the "special waste" concept, it was aware of Congress' intention to exempt mining and mineral processing and other proposed "special" wastes from Subtitle C regulation because passage of the Solid Waste Disposal Act Amendments of 1980 (including the Bevill Amendment) was expected (Senate and House versions had been passed on June 4, 1979 and February 20, 1980, respectively).

On October 12, 1980, Congress enacted the Solid Waste Disposal Act Amendments of 1980 (Pub. L. 96-482), which added section 3001(b)(3)(A)(ii) (the Bevill Amendment) to RCRA. This section temporarily prohibits EPA from regulating, among other wastes, "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 EPA 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 the Administrator to study the adverse effects on human health and the environment, if any, of the waste from the disposal and utilization of "solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ores," and submit a Report to Congress on its findings by October 1983. The 1980 amendments also added section 3001(b)(3)(C), which requires the Administrator to make a regulatory determination, within six months of the completion of the section 8002 studies, whether to regulate mining wastes under Subtitle C of RCRA.

On November 19, 1980, EPA published an interim final amendment to its hazardous waste regulations to reflect this mining waste exclusion (45 FR 76618). The regulatory language incorporating the exclusion was identical to the statutory language, except EPA added the phrase "including coal." In the preamble to the amended regulation, however, EPA tentatively interpreted the exclusion to include "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals." The preamble made it clear that the Agency was interpreting the scope of the exclusions very broadly and that, over the next 90 days, EPA intended to review the legislative history of the Bevill amendment and the public comments received in response to the interpretation. The preamble indicated that based on this review, EPA would probably narrow the scope of the exclusion.

4. Litigation, the Hazardous and Solid Waste Amendments of 1984, and Bevill Exclusion Reinterpretations (1981–1988)

As noted above, the Solid Waste Disposal Act Amendments of 1980 amended section 3001 to require the EPA Administrator to make a regulatory determination regarding the wastes temporarily excluded from Subtitle C regulation within six months of submitting the required Report to Congress. EPA was required to submit the Report to Congress by October 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 (*Concerned Citizens of Adamstown* v. *EPA* No. 84-3041, D.D.C., August 21, 1985). EPA explained to the District Court for the District of Columbia that the Agency planned to propose to "reinterpret" the scope of the mining waste exclusion so that it would encompass fewer wastes. Therefore, EPA suggested two schedules to the court: one for completing the section 8002 studies and submitting the Report to Congress, and one for proposing and taking final action on the reinterpretation. On August 21, 1985, the court ordered EPA to meet these two schedules; first, the Agency was to complete the section 8002 studies and Report to Congress by December 31, 1985, and to publish the regulatory determination by June 30, 1986; and second, EPA was to propose to reinterpret the Bevill exclusion and subsequently, to take final action on the proposed reinterpretation by September 30, 1986.

EPA submitted the Report to Congress on December 31, 1985. The Report to Congress provided 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 focused on the mining industry segments that produced and/or concentrated metallic ores, phosphate rock, or asbestos.

On July 3, 1986, EPA issued its regulatory determination for the universe of mining wastes covered by the Report to Congress (51 FR 24496). The regulatory determination concluded that Subtitle C regulation of the wastes studied in the Report to Congress (i.e., extraction and beneficiation wastes) was not warranted at that time. This conclusion was based on EPA's belief that aspects of the Subtitle C standards were likely to be environmentally unnecessary, technically infeasible, or economically impractical when applied to mining waste. EPA announced its intention to develop a program for mining waste under Subtitle D of RCRA.

The July 3, 1986 regulatory determination was subsequently challenged in court (*Environmental Defense Fund* v. *EPA*, 852 F.2d 1309 (D.C.Cir. 1988)). The Court of Appeals upheld EPA's regulatory determination for extraction and beneficiation wastes.

In the interim, Congress enacted the Hazardous and Solid Waste Amendments to RCRA in 1984. These amendments added new requirements applicable to owners and operators of facilities that treat, store, or dispose hazardous waste, and included minimum technical standards for the design, construction, and operation of waste management units, land disposal restrictions, and corrective action requirements for continuing releases. In developing these new requirements, Congress considered their feasibility with respect to and potential impact on the management of certain categories of wastes. This concern was embodied in what was to become section 3004(x) of RCRA, the so-called "Simpson Amendment," which allowed the EPA Administrator to modify the Subtitle C

technical standards for managing mining wastes, utility waste, and cement kiln dust waste, as long as protection of human health and the environment was assured.

In the floor debate on the Simpson Amendment, the Senate considered remarks concerning the types of wastes that would be eligible for the special status conferred by the amendment. Sen. Jennings Randolph (WV) read into the record the description of mining wastes that was contained in the committee report on the HSWA amendments. In this report, "solid wastes from mining and mineral beneficiation and processing" are described as "primarily waste rock from the extraction process, and crushed rock, commonly called tailings" The report continues by stating

> [t]he 1980 amendments covered wastes from the *initial* stages of mineral processing, where concentrations of minerals of value are greatly increased through physical means, before applying *secondary* processes such as *pyrometallurgical or* electrolytic *methods. Smelter slag might also be included. . .* These wastes were considered "*special wastes*" under the 1978 proposed regulations as being of large volume and relatively low hazard. (Emphasis added.)

The remaining discussion in the excerpt from the committee report focuses on the potential difficulties of managing the huge volumes of waste rock and tailings associated with mineral exploitation under the new minimum technology standards under debate.

Thus, although the Congress explicitly considered the special study wastes in crafting the provisions of HSWA, there is nothing in either the amendments themselves or in the legislative record supporting them to suggest that Congress construed the term "mineral processing" broadly, i.e., to include wastes that are not "special wastes."

In keeping with its agreement in the *Adamstown* case, on October 2, 1985, EPA also proposed to narrow the scope of the Bevill exclusion (50 FR 40292). In preparing the proposed mining waste exclusion, EPA implicitly applied the "high volume, low hazard, special waste" concept from EPA's 1978 proposed hazardous waste regulations. The proposed rulemaking would have eliminated from the mining waste exclusion most wastes from the processing of ores and minerals; EPA proposed to retain bauxite refining muds, phosphogypsum from phosphoric acid plants, and slag from primary metal smelters and phosphorus reduction facilities within the Bevill exclusion. In the preamble, EPA stated that Congressional intent supported the Agency's special waste concept. The proposed rule did not, however, outline the criteria that EPA used to determine high volume or low hazard.

In response to the proposed reinterpretation, many commenters "nominated" additional wastes that they believed fit the "special waste" criteria, and therefore should also be excluded from Subtitle C regulation as "processing wastes." Because EPA had not explicitly defined the terms "high volume" or "low hazard" in the October 2, 1985 proposal, the Agency was unable to determine the regulatory status of these nominated wastes. EPA could not infer definitions for these terms based upon the four wastes listed in the proposal as meeting the "special waste" criteria. The public comments on the proposal and the Agency's analysis indicated that the proposed reinterpretation could not be finalized because it did not set out "practically applicable" criteria for distinguishing "processing" (i.e., high volume, low hazard ore and mineral processing residuals) from non-processing wastes (i.e., non-excluded) wastes. Moreover, the Agency was unsure whether such criteria could be developed. Therefore, faced with the court-ordered deadline for final Agency action in Adamstown, EPA withdrew the proposal on October 9, 1986 (51 FR 36233). As a consequence, the interpretation of the mining waste exclusion established in the November 19, 1980 rulemaking notice remained in effect.

The Agency's decision to withdraw its proposed reinterpretation of the mining waste exclusion was subsequently challenged in court (*Environmental Defense Fund* v. *EPA*, 852 F.2d 1316 (D.C. Cir. 1988), *cert. denied* 109 S. Ct. 1120 (1989) (*EDF* v. *EPA*)). In this case, the petitioners contended, and the Court of Appeals agreed, that EPA's withdrawal of its proposed reinterpretation of the Bevill Amendment was arbitrary and capricious because it reaffirmed an "impermissibly over-broad interpretation" of the Bevill Amendment. *EDF* v. *EPA*, 852 F.2d at 1326.

In reaching this decision, the Court found that the words "waste from * * * processing of ores and minerals" do not convey a self-evident, accepted meaning. *Id.* at 1327. Therefore, the Court reviewed the structure and the legislative history of the Bevill Amendment to ascertain the intent of Congress. The Court found that "[t]he structure of the Bevill Amendment suggests that the term "solid waste from the * * * processing of ores and minerals" should be interpreted in a manner consistent with the concept of large volume wastes. *Id.* The Court also decided that "[t]he legislative history of the Bevill Amendment establishes that the key to understanding Congress' intent is the concept of "special waste" articulated in the regulations proposed by EPA on December 18, 1978 following the enactment of RCRA." *Id.* See 43 FR 58911 (1978) and 50 FR 40293 (1985).

In explaining this decision, the Court cited statements made by members of Congress during the legislative consideration of the exclusion and the description of the provision in the Conference Report accompanying the legislation. Based on these indications of Congressional intent, the court concluded that

> it is clear that Congress did not intend the mining waste exclusion to encompass all wastes from primary smelting and refining. On the contrary, Congress intended the term "processing" in the Bevill Amendment to include only those wastes from processing ores or minerals that meet the "special waste" criteria, that is, "high volume, low hazard" wastes. 852 F.2d at 1328–29.

Thus, when the Agency withdrew its October 2, 1985, proposed reinterpretation of the mining waste exclusion, which was based on implicit "special waste" criteria, EPA by default reverted to its November 19, 1980, interpretation of the exclusion, which did not distinguish between high volume, low hazard processing wastes and other processing wastes. As a consequence, the number of temporarily excluded processing wastes remained very large. The Court ruled that this result was inconsistent with Congressional intent. Therefore, the Court ordered EPA to propose, by October 15, 1988, a specific list of mineral processing wastes that meet the criteria of high volume and low hazard, and thus remain temporarily excluded from Subtitle C regulation. 852 F.2d at 1331.

5. Analysis and Implications

From the foregoing, it is clear that EPA has considerable latitude in defining the scope of the Bevill exclusion for mineral processing wastes, within the boundaries of Congressional intent. The legislative history of the Bevill Amendment indicates that the Congress was relying very heavily upon EPA's "special waste" concept when it created the exclusion, and that it therefore implicitly accepted the Agency's ideas regarding the definition of special wastes, as well as the importance of the study factors that were ultimately written into the RCRA statute. This central fact has several

important implications for how EPA can and should respond to the Appeals Court directive to modify the scope of the Bevill exclusion for mineral processing wastes.

The first is that, contrary to the assertions of several commenters, there is no basis for concluding that the Congress intended the scope of the Bevill exclusion for mineral processing wastes to be broad. As noted above, EPA had identified a small number of special wastes as worthy of special study in 1978, and clearly had no intention of studying more than a few other materials when it prepared the background document for the special wastes concept. For its part, the Congress did little to indicate that it wanted EPA to expand the intended scope of the study requirement when it considered the issue in 1980. The only suggested departure from EPA's original short list of wastes is that metal smelting slags also be included, based upon the remarks of Rep. Williams, which were never challenged on the House floor or subsequently. Therefore, and in keeping with the Appeals Court directive, EPA can and should significantly narrow the scope of the Bevill exclusion for mineral processing wastes.

Moreover, as discussed at length in the Appeals Court decision that precipitated the current rulemaking, EPA is obliged to consider whether candidate wastes are high volume and low hazard in making Bevill mineral processing waste exclusion decisions. These two factors are, and have always been, the key elements in identifying special wastes. High volume is the principal indicator of whether a particular waste is amenable to management under Subtitle C of RCRA. A consideration of hazard is necessary to identify and remove from the exclusion wastes that may pose risk or hazard to such a great extent or magnitude that they cannot be considered "special wastes," irrespective of volume. There is, however, no statutory directive or legislative or regulatory guidance addressing the specific components of the necessary high volume and low hazard criteria. Therefore, EPA is free to use its discretion in developing and applying these criteria.

EPA requests comment on its approach for defining the scope of the Bevill mineral processing waste exemption, in light of the legislative history discussed above. In particular, the Agency has considered, and solicits comments on, whether the scope of the exemption should be narrowed to those wastes that are both generated at mineral processing operations that are co-located with extraction and beneficiation operations and meet the "special waste" criteria.

B. Summary of the October 20, 1988 NPRM

In compliance with the Court order in *EDF* v. *EPA*, on October 20, 1988, EPA published a new proposed reinterpretation of the Bevill exclusion and listed 15 specific high volume processing wastes that the Agency designated as "special wastes" based on criteria discussed in the proposal. (See 53 FR 41288.) Under the proposal, these wastes would remain within the Bevill exclusion and hence be studied in a Report to Congress and be subject to a subsequent regulatory determination pursuant to section 3001 of RCRA.

In the proposal, EPA outlined the criteria it used to determine whether a mineral processing waste was a "special waste." The Agency examined three types of criteria in selecting the specific wastes to be retained within the Bevill exclusion: (1) a criterion for identifying wastes from ore and mineral "processing"; (2) a criterion for identifying "high volume" wastes from ore and mineral processing; and (3) a criterion for identifying "low hazard" wastes from ore and mineral processing.

EPA interpreted the term "solid waste from the . . . processing of ores and minerals" to refer to solid wastes, including pollution control residuals, that are uniquely associated with mineral industry operations and that possess the following attributes:

(1) Follow beneficiation of an ore or mineral (if applicable);

(2) Serve to remove the desired product from an ore or mineral, or beneficiated ore or mineral;

(3) Use feedstock that is comprised of less than 50 percent scrap materials;

(4) Produce either a final mineral product or an intermediate to the final product; and

(5) Do not include operations that combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying); fabrication (any sort of shaping that does not cause a change in chemical composition), except for casting of metal anodes and cathodes.

In developing the high volume criterion, EPA decided that any waste generated from the processing of ores or minerals, as defined above, that met either of the following tests would be designated a "high volume" processing waste:

(1) For a specific waste stream arising from mineral processing in any given mineral commodity sector (e.g., primary copper processing), the total quantity of the specific waste generated by all facilities in the United States in any one calendar year from 1982 through 1987 equals more than two million metric tons; or

(2) For a specific waste stream arising from mineral processing in any given mineral commodity sector, the specific waste stream is generated at an average rate (i.e., total quantity of the specific waste generated by all facilities in any one calendar year from 1982 through 1987 divided by the number of facilities generating the waste) of more than 50,000 metric tons per facilities per year

EPA decided not to include a low hazard criterion for three reasons: (1) The existing data on mineral processing waste characteristics were insufficient to apply a low hazard criterion to these wastes; (2) the existing hazardous waste characteristics tests were inappropriate for mineral processing wastes; and (3) there was no appropriate substitute test for determining low hazard.

As a result, EPA adopted a two-step process for determining the wastes to be retained within the Bevill exclusion. Using the two criteria, EPA determined that the following 15 wastes would remain temporarily exempt from Subtitle C regulation and all other mineral processing wastes would be subject to regulation as hazardous wastes under Subtitle C if they exhibit one or more hazardous characteristics as defined by 40 CFR Part 261:

1. Slag from primary copper smelting
2. Process wastewater from primary copper smelting/refining
3. Blowdown from acid plants at primary copper smelters
4. Bleed electrolyte from primary copper refining
5. Slag from primary lead smelting
6. Blowdown from acid plants at primary zinc smelters
7. Process wastewater from primary zinc smelting/refining
8. Red and brown muds from bauxite refining
9. Phosphogypsum from phosphoric acid production
10. Slag from elemental phosphorous production
11. Iron blast furnace slag
12. Air pollution control dust/sludge from iron blast furnaces
13. Waste acids from titanium dioxide production
14. Air pollution control dust from lime kilns
15. Slag from roasting/leaching of chromite ore

III. Analysis of Public Comments on the 10/20/88 NPRM

In response to the October 20, 1988 NPRM, EPA received many written comments addressing a number of rule-related issues. This section summarizes public comments on the major issues pertaining to the October proposal, and provides, where appropriate, the Agency's tentative reactions to the issues raised. Final EPA responses to the issues discussed herein will be

presented when the Agency promulgates the Bevill special waste criteria (by August 18, 1989).

A. The Definition of "Mineral Processing"

In the preamble to the October 20, 1988 proposed rule, EPA provided criteria for defining and identifying wastes from ore and mineral processing operations. These criteria made it clear that all solid wastes qualifying for exclusion under the Bevill Amendment must originate from a mineral processing operation as defined by the following elements:

(1) Excluded Bevill wastes must be solid wastes as defined by EPA.

(2) Excluded solid wastes must be uniquely associated with mineral industry operations.

(3) Excluded solid wastes must originate from mineral processing operations that:

(a) Follow beneficiation of an ore or mineral (if applicable);

(b) Serve to remove the desired product from an ore or mineral, or from a beneficiated ore or mineral;

(c) Use feedstocks that are comprised of less than 50 percent scrap materials;

(d) Produce either a final mineral product or an intermediate to the final product; and

(e) Do not combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying), and do not involve fabrication or other manufacturing activities.

(4) Residuals from treatment of excluded mineral processing wastes must meet the high volume and low hazard criteria in order to retain excluded status.

1. Excluded Bevill Wastes Must Be Solid Wastes as Defined by EPA

The proposed rule requires that any excluded Bevill wastes be solid wastes as defined by EPA. The principal comment regarding this requirement was that the regulatory status of recycled residuals from mineral processing is unclear. Many commenters objected to EPA's characterization of materials that are reused, further processed, and/or recycled as solid wastes. These commenters claimed that materials that are not discarded (e.g., copper slag and wastewater treatment sludge that are resmelted) are not solid wastes, and therefore, should not be considered processing wastes; rather, they should be considered intermediate products. They contended that any other interpretation would disrupt the present recycling and reuse of processing residuals, and dramatically increase disposal costs.

Because of these concerns, commenters recommended that EPA develop regulatory language that removes materials destined for reprocessing or recycling from the definition, and requested, furthermore, that this clarification be in the rule itself rather than in the preamble. Moreover, in keeping with the status of residuals from the treatment of Bevill wastes, some commenters argued that residuals from the recycling of such non-waste material should be afforded excluded status if the residuals meet the high volume and low hazard criteria.

EPA believes that there is nothing in the regulatory history of the Bevill Amendment that indicates that the Agency is expected to or should apply a definition of solid waste that is different than that applied throughout the RCRA program. Therefore, the Agency will continue to use the definition of solid waste in 40 CFR 261.2 to identify materials that are eligible for consideration as special wastes. This definition subdivides secondary materials by material type and recycling activity in order to ascertain whether they are solid wastes. EPA does not accept the commenters' oversimplified premise that materials that are recycled are not "discarded" and therefore are never solid wastes. Recycling activities characterized by elements of discard, such as use constituting disposal or burning of hazardous wastes for energy recovery, are activities that Congress expressly ordered the Agency to either prohibit or regulate. See, e.g., section 3004(q) and (1) of RCRA. At the same time, the Agency has always limited the scope of its definition to avoid asserting authority over in-house recycling operations that are essentially continuations of a manufacturing process. See 50 FR 637–41 (Jan. 4, 1985). EPA has proposed to further limit the definition's scope over these types of activities in response to the opinion of the U.S. Court of Appeals in *American Mining Congress* v. *EPA*, 824 F.2d 1177 (D.C. Cir. 1987). See 53 FR 526–28 (Jan. 8, 1988). Pending further consideration of these issues in the January 8, 1988, rulemaking, the existing definition found at 40 CFR 261.2 (1988) will remain applicable here.

The Agency notes, however, that under certain circumstances, products containing recyclable materials that are produced for use by the general public and that are used in a manner constituting disposal may not be considered solid wastes (see 40 CFR 266.20). Based upon its evaluation of waste management practices for the Report to Congress, EPA will consider whether particular materials that have been retained within the Bevill exclusion might qualify for this exemption from RCRA.

2. Excluded Solid Wastes Must Be Uniquely Associated With Mineral Industry Operations

To be excluded, solid wastes must be uniquely associated with the mineral processing industry. EPA received no significant comments either in support of or in opposition to this criterion.

3. Excluded Solid Wastes Must Originate From Mineral Processing Operations as Defined by the Five Criteria

In general, commenters believed that the attributes used in the proposed rule to define mineral processing were acceptable, although at least one commenter declared that a broader interpretation is supported by the legislative history and prior EPA rulemaking activity.

As discussed at length in the Appeals Court decision that precipitated the current rulemaking, EPA is obliged to consider whether candidate wastes are high volume and low hazard in making Bevill mineral processing waste exclusion decisions. These factors are, and have always been, the key elements in identifying special wastes. Nonetheless, the distinction between mineral processing and non-mineral processing wastes is important. EPA believes that it is abundantly clear that the Congress intended to exclude only wastes generated as a consequence of exploiting a natural resource, not wastes from other industrial activities, even if both occur at the same facility.

a. Operation must follow beneficiation of an ore or mineral (if applicable). The proposed rule defined processing as following beneficiation and provided both a general definition and some examples of beneficiation. Several commenters stated that this definition and discussion of beneficiation do not adequately delineate the boundary between beneficiation and processing. Some commenters requested that EPA utilize the definition of beneficiation used in the Report to Congress on extraction and beneficiation wastes.

The U.S. Bureau of Mines (BOM) commented extensively on the delineation between beneficiation and processing. BOM was primarily concerned with the status of leaching operations, claiming that the definition in the preamble to the proposal did not adequately express EPA's apparent

intent that leaching be considered a beneficiation operation. BOM pointed out that EPA has clearly considered leaching to be a beneficiation operation, as suggested by both the Report to Congress and the development document for effluent limitations for the ore mining and dressing point source category.

As defined in the October 20, 1988 proposal, beneficiation operations, which often precede ore or mineral processing operations, include primarily, but not exclusively, physical operations (e.g., crushing, grinding, sorting, sizing, washing, flotation) that concentrate the valuable constituents from an ore or mineral in preparation for further refinement (e.g., smelting). The solid wastes generated by these beneficiation operations are normally crushed or pulverized rock, or other earthen materials, such as clays or sands. In contrast, processing operations use other means, such as chemical reactions, electrolytic techniques, or pyrometallurgical/thermal processes (e.g., roasting, smelting, calcining) to concentrate or enhance the characteristics of valuable constituents and, thus, differ from beneficiation operations.

A specific exception to this relatively simple distinction between beneficiation and processing is heap, dump, and in-situ leaching, as well as tank and vat leaching. EPA's policy toward leaching, as stated in a previous regulatory determination,[4] is that active leach piles and leach solutions are not wastes, but rather are raw materials used in the production process and intermediate products, respectively. Only leach solutions that escape from the production process are considered wastes while the leaching operation is active.

In light of the regulatory determination, EPA concurs with BOM in its comments about leaching. Accordingly, EPA has modified the proposed definitions of processing and beneficiation, such that heap, dump, *in-situ*, tank, and vat leaching are explicitly defined as beneficiation operations, unless they follow one or more processing operations in the production sequence, in which case they are considered processing operations. To further clarify the distinction between beneficiation and processing for regulatory purposes, today's proposed rule contains language explicitly defining ore and mineral beneficiation operations.

b. Operation must serve to remove the desired product from an ore or mineral, or from a beneficiated ore or mineral. The October 20, 1988 proposal identified the purpose of mineral processing as being to remove the desired product from an ore or mineral or beneficiated ore or mineral. Several commenters indicated that this language obscures the regulatory status of certain processing operations (e.g., lightweight aggregate production) whose purpose is to change the characteristics of valuable constituents in ores or minerals without removing or concentrating them. These commenters suggested that EPA modify the processing definition by altering the second attribute to include operations that serve to enhance the desirable properties of, as well as those that remove the desired product from, an ore or mineral.

EPA agrees, and has modified the second attribute of mineral processing accordingly. EPA wishes to clarify the meaning of this attribute by stating that production steps that use heat to alter the chemical composition (as opposed to simply removing waters of hydration) of ores or minerals (or beneficiated ores or minerals) are considered to be mineral processing operations rather than beneficiation operations. Examples include activities such as roasting, smelting, calcining, and other pyrometallurgical techniques, but do not include activities such as drying, which are considered beneficiation operations.

c. Operation uses feedstock that is comprised of less than 50 percent scrap materials. The October 20, 1988 proposal required that at least 50 percent of the feedstock to an operation be ore or mineral, or beneficiated ore or mineral, for the operation to be considered a primary mineral processing operation. This requirement allows mineral processing operations to use recycled materials in their feedstocks while ensuring that non-mineral processing wastes do not receive an unintended regulatory exclusion.

One commenter was opposed to this attribute of the definition, stating that the nature of copper smelting and refining are unrelated to the source of material that is processed, that primary copper smelters and refineries really use a combination of primary and secondary processes, and, therefore, that this attribute should be modified or deleted.

Other commenters sought clarification of this attribute. Most were concerned with what materials are to be included as part of the "primary" feedstock. Commenters claimed that while many feedstocks are not technically classified as ores or minerals or beneficiated ores or minerals, they are "in-process" materials that are derived from ores and minerals, or beneficiated ores or minerals. Consequently, the commenters contended that these materials are not "scrap" materials, but rather are "indigenous" materials that, when used as feedstocks, should be treated identically to ores or minerals or beneficiated ores or minerals. Accordingly, commenters recommended that EPA modify this "50 percent rule" to include, as "primary" feedstocks, these in-process or intermediate materials that are derived from ores and minerals, or beneficiated ores or minerals. Commenters also requested clarification regarding accounting policies (i.e., what operations to include and over what time period to measure when analyzing feedstock percentages). Commenters recommended that the 50 percent rule be applied to an entire plant's operations or to integrated operations within a company; they also argued that the accounting for the 50 percent rule should be on an annual basis.

EPA proposed the 50 percent rule in order to establish an upper bound on the amount of non-ore or mineral (or beneficiated ore or mineral) material that may be present in an operation's feedstock for it to qualify as a mineral processing operation. The Agency recognizes that a large number of feedstocks are used in mineral processing operations, including a broad variety of "in-process" or "intermediate" materials that are derived from ores and minerals, or beneficiated ores or minerals. In the absence of additional data about these materials, however, EPA believes that an upper bound on the amount of non-ore or mineral (or beneficiated ore or mineral) that may be present in a feedstock is essential in order to ensure that wastes from operations that primarily process materials other than ores and minerals are not provided with an exclusion that Congress did not intend. This attribute of the definition affords considerable flexibility to mineral processing operations, in that they are able to accept scrap and intermediate materials in their feedstocks, and still be eligible for Bevill status. At the same time, operations other than primary mineral processing, such as materials recovery or waste treatment, will not be eligible for the Bevill exclusion.[5]

[4] See Regulatory Determination for Wastes From the Extraction and Beneficiation of Ores and Minerals, 51 Fed. Reg. 24496 (July 3, 1986).

[5] An exception is wastes that satisfy the special waste criteria and result from the treatment of a waste that also satisfies the special waste criteria.

In addition, EPA wishes to clarify this attribute by stating that the 50 percent rule applies to all materials containing the mineral value that enter a process operation, rather than to the total of all materials entering the operation. For example, the 50 percent rule would apply to crushed copper ore (or beneficiated copper ore) and scrap copper used in the feedstock for a copper smelting operation, but coal or natural gas used to fire the furnace would not be included in the calculation. Materials not containing the mineral value (e.g., reducing agents, fluxing agents) are also not included in determining whether a processing operation or waste complies with the 50 percent rule.

With regard to accounting policies, EPA agrees with the comment that the accounting period over which to analyze feedstock percentages should be one year. However, in contrast to the preference of some commenters, the Agency believes that the rule must be applied to individual processing operations rather than to an entire plant's operations. Applying the 50 percent rule to an entire plant's operations would ignore the significant differences in volume and potential hazard that exist between the diverse groups of wastes produced at mineral processing facilities. The Agency wishes to emphasize that it is establishing a one year accounting period to allow for normal fluctuations in the composition of mineral processing operation feedstocks. Wastes generated by operations that utilize ores, minerals, or beneficiated ores or minerals as secondary feedstocks or use them only intermittently are not eligible for Bevill status.

d. Operation produces either a final mineral product or an intermediate to the final product. The definition of processing in the proposed rule requires that, to be eligible for consideration for the Bevill exclusion, the process operation must produce either a final mineral product or an intermediate to the final mineral product. One commenter stated that EPA should follow Congress' intended broad view of the term "processing" and inclnde all stages after beneficiation through production of final products, including all parts of multi-circuit processes.

As indicated earlier, EPA believes that products that are not directly related to mineral processing operations or that are produced after mineral processing is complete do not fall within the scope of the definition intended by Congress. For example, manufacturing ammoniated phosphate fertilizer products, which involves mixing ammonia, a non-mineral material, with mineral processing products, is not considered a mineral processing operation. Manufacturing of finished products, such as copper wire, silver jewelry, and lead weights, is also outside the definition of mineral processing operations. Additional information about the point at which mineral processing ceases and alloying or fabrication begins is provided below.

e. Operation does not combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying); and do not involve fabrication or other manufacturing activities. The proposed rule defined the end of mineral processing as the point at which the processed ore or mineral is combined with another material that is not an ore or mineral, or beneficiated ore or mineral, undergoes fabrication, or is subjected to other manufacturing operations. EPA believes that the end point is reached when recovery or enhancement of mineral value(s) ends and manufacturing begins. Some commenters expressed general dissatisfaction with this definition and argued that it significantly narrows the definition of mineral processing wastes eligible for the Bevill exclusion. They contended that Congress intended the exclusion to encompass all wastes generated by mineral processing operations, from the removal of minerals from the ground through creation of a final saleable product. Many comments centered around a particular processing operation and associated wastes that would potentially be removed from the Bevill exclusion if this attribute is included in the final rule.

The purpose of this portion of the definition is to identify the end point of mineral processing operations. The Agency believes that Congress, in adopting the Bevill Amendment, intended to include only those processes that remove, concentrate, and/or enhance values contained in ores and minerals or beneficiated ores and minerals. EPA's view is that manufacturing and alloying operations clearly do not fit into this category.

Instead, EPA, in articulating the special wastes concept, and the Congress, in implicitly basing the Bevill Amendment on this concept, wished to distinguish between operations that: (1) By their nature produce large volumes of waste in retrieving valuable commodities from native materials in which concentrations of the values are relatively low; and (2) conventional manufacturing operations. It is clear from the legislative history that both EPA and Congress intended the "special waste" concept to have a finite scope that did not encompass wastes from operations that produce wastes in volumes similar to other manufacturing operations. Accordingly, EPA has not made any changes to this attribute for today's proposal.

4. Residuals From Treatment of Excluded Mineral Processing Wastes Must Meet the High Volume and Low Hazard Criteria

The October 20, 1988 proposal included, as processing wastes, residuals from the treatment of excluded mineral processing wastes if these residuals also meet the high volume criteria. Apparently, some confusion exists regarding the status of these residuals, as commenters requested both rule language that was already present in the preamble to the proposed rule and additional clarification of rule provisions. Several commenters, for example, stated that the regulatory status of wastewater treatment effluent is unclear and requested that EPA clarify in the final rule that wastes which arise from the treatment of a Bevill Amendment waste fall within the Bevill exclusion.

Commenters also expressed concern regarding the status of wastes that are generated by pollution control equipment; they expressed concern that a strict reading of the five attributes, and the second and fourth attributes in particular, might prevent any pollution control residual from being classified as a processing waste. Several commenters specifically suggested that EPA simply list for study, in the regulation itself, the category "residues from the treatment of all mineral-processing wastes on the preceding list which are generated at a rate greater than the high volume criteria established by EPA." This action, they contended, would make the list more flexible and allow it to address the different types of treatment which may be utilized at different mineral processing operations.

Other commenters suggested that high volume criteria should not be applied to treatment residuals, because, they contended, this action would frustrate the objectives of RCRA and the Bevill Amendment by discouraging waste reduction and the treatment of excluded wastes. They argued that because excluded wastes are the highest volume mining wastes, the most environmental good would come from volume reduction innovations for these waste streams. Therefore, these commenters suggested including on the list for study, in the

regulation itself, "residues from the treatment of all mineral processing wastes on the preceding list regardless of the rate of generation."

EPA believes that the most appropriate interpretation of the term "solid waste from the processing of ores and minerals" should include pollution control residuals as long as the residuals meet the high volume and low hazard criteria required for all excluded wastes.

The Agency believes that by including qualifying mineral processing wastes and pollution control residuals on the list of wastes excluded under the Bevill Amendment, the intent of Congress will be achieved by allowing further study of these high-volume, low-hazard wastes. Pollution control residues would still have to meet both the high-volume and the low-hazard criteria being established by today's proposed rule in order to qualify as excluded special wastes. The ultimate regulatory approach imposed upon the wastes that would be retained within the Bevill exclusion under today's proposed rule will be addressed in EPA's Report to Congress and subsequent regulatory determination.

Moreover, as discussed in more detail below, the Agency is not proposing to apply the high volume and low hazard criteria prospectively, i.e., EPA will define the final scope of the Bevill mineral processing waste exclusion by January 15, 1990. Therefore, application of these criteria will not discourage future waste reduction and the treatment of excluded wastes.

B. The "High Volume" Criterion

The preamble of the October 20, 1988 NPRM articulated an explicit high volume criterion to be used to identify high volume mineral processing wastes. This criterion consisted of two tests, one of which would have to be met for a waste to be considered high volume. The first test was based on the average annual per facility generation rate of a waste, and the second on total annual quantity of a waste generated nationwide. Both tests applied only to individual waste streams produced in any single year between 1982 and 1987. For a complete description of the basis for this criterion, see the original notice published at 53 FR 41288, October 20, 1988.

While several commenters expressed concern with the high volume criterion, most commenters supported the concept of using an explicit quantitative high volume criterion to help define special mineral processing wastes.

Several commenters argued that nothing in the Appeals Court decision indicated that Bevill wastes must meet both the high volume and low hazard criterion, arguing that, in fact, wastes that do not satisfy either of the criteria could be retained within the exclusion.

The Agency rejects this conclusion, and believes that to do otherwise would be inconsistent with the Court's reading of legislative intent as well as ignore the essence of the special waste concept, which EPA first articulated in 1978.

Several commenters recommended that EPA not rely solely upon volumetric data when making Bevill exclusion decisions. Instead, they suggested that EPA use the criterion only as a guideline and fully consider the unique or unusual nature of mineral processing operations rather than removing a waste from the exclusion based solely upon volume. In addition, one commenter stated that EPA's use of the waste volume criterion without reference to other mineral processing considerations ignores Congressional intent in requiring specific studies of each special waste category.

EPA disagrees. The issue in this rulemaking is which mineral processing wastes will be considered special wastes and hence, subject to further study, and what criteria will be used to identify these special wastes. Volume is the most relevant and objective measure of the degree to which a waste is amenable to management under the provisions of Subtitle C. Other factors, such as the special or unique characteristics of a particular operation or industry sector, are not relevant to defining high volume, and therefore, the feasibility of Subtitle C controls. These factors will, however, be evaluated for the wastes that are retained within the exclusion and be discussed in the Report to Congress.

Other commenters also noted that Congress did not intend to create a disincentive for voluntary waste reduction efforts when it passed the Bevill Amendment, and contended that imposing a volume cut-off for defining special wastes would create such a disincentive. One commenter stated that because one of the primary goals of RCRA is reduction of waste, EPA should not "reward" successful waste reduction efforts by removing wastes from the mining waste exclusion.

EPA agrees that neither the Congress nor the Agency intended to discourage waste reduction efforts on the part of industry. The issue at hand, however, is establishing the boundaries of a temporary exclusion which provides for study of the unique aspects of managing some of the unavoidable high volume residues of mineral processing. Presumably, if mineral processing waste volumes could be significantly reduced through process modifications, facility operators would already have implemented such modifications, because waste management (of either hazardous or non-hazardous waste) is costly, particularly for large volumes of wastes. Therefore, EPA believes that wastes that can be greatly reduced in volume through process modifications are not truly special wastes in the first instance. Moreover, the Bevill Amendment was clearly intended to provide a bridge between historical and future waste management requirements based upon current waste streams and waste generation rates. Therefore, prospective behavior on the part of industry or individual facilities has no effect on a waste stream's Bevill status, since this status will be determined on the basis of historical waste generation rates. Nonetheless, EPA has made allowances for recent waste reduction efforts by accepting the highest annual waste generation volume during any of the five years from 1982 to 1987 (1983 to 1988 in today's proposal).

In developing the high volume criterion the Agency evaluated four methodological issues, including: (1) The appropriate degree of aggregation of waste streams; (2) the basis for quantitative analysis (facility-specific vs. industry-wide); (3) the units of measure; and (4) the types of other wastes to be used as the basis for comparison.

1. Degree of Aggregation of Waste Streams

For the 10/20/88 NPRM, the Agency weighed three options concerning the degree of aggregation: (1) Consider individual waste streams generated by specific industry sectors separately (the option adopted); (2) aggregate all waste streams within a given facility; and (3) combine similar waste streams across mineral commodity sectors. Commenters in general requested more aggregation, with several commenters recommending specifically either the second or third options or modification of the first option (i.e., more aggregation of similar individual waste streams). These commenters identified several precedents for aggregating waste streams, citing EPA's effluent guidelines and supporting documents, the 1985 proposed reinterpretation, and the Agency's approach in addressing extraction and beneficiation wastes. They also maintained that aggregation is consistent with Congressional intent and with the 1985 proposed reinterpretation which designated "primary smelting slag" as a generic

Bevill Amendment processing waste category.

Several commenters claimed that EPA has artificially segregated processing wastes into specific waste streams (e.g., separating non-contact cooling water from process wastewater). Several suggested that within a facility, all wastes should be grouped together for the purpose of developing a per-facility high volume criterion. Several commenters also indicated that EPA should not treat lower volume waste streams differently than higher volume waste streams if all the streams are part of the same process and if operations are uniquely related to ore and mineral processing operations. They argued that for purposes of the Bevill study, EPA should aggregate, especially within but also across sectors, waste streams that arise from the same types of feedstocks and production processes and that are similar in their generation rates, physical or chemical waste characteristics, management practices, and/or other characteristics.

Several commenters discussed specific waste streams within their particular commodity sector(s) that they felt were exemplary of waste streams that should be aggregated. For example, commenters representing the phosphate sector contended that EPA should aggregate process waters associated with phosphate rock processing along with the entrained solids. Similarly, commenters from the copper sector argued that EPA should not segregate wastes such as process wastewater and contact cooling water, various blowdown effluents, and wastewater treatment plant sludges. These commenters also argued that all slags from the various operations of copper smelting and refining should be aggregated into one waste stream (as they were in the proposed rule). They claimed that presently, EPA treats smelting and refining wastes inconsistently because the Agency disaggregates smelting and refining slags while concurrently aggregating smelting and refining process wastewaters.

EPA largely disagrees with these comments. EPA believes, and the Court has agreed, that mineral processing wastes must meet all special waste criteria to be entitled to the temporary exclusion from Subtitle C requirements. In order to complete the study requirements listed at section 8002(p) of RCRA, EPA must define current and alternative practices that are and could be employed to manage special mineral processing wastes. In practical terms, this requires that the Agency examine *individual* waste streams in order to determine whether current practices (e.g., co-management) are adequately protective of human health and the environment, and whether individual Bevill wastes are amenable to Subtitle C controls. Moreover, because the Agency believes that it is neither appropriate nor practical to screen an assemblage of dissimilar wastes with a criterion addressing hazard to identify the wastes that are clearly not low hazard, it is similarly inappropriate to evaluate the volumes of wastes on an aggregated basis.

In determining the waste streams to be included in the Bevill exclusion, EPA did, however, employ some aggregation within mineral commodity sectors, specifically for copper slags and certain process wastewaters. For purposes of the rule, EPA continues to propose to treat process wastewater as a generic category comprising waters that are uniquely associated with processing operations that have accumulated contaminants to the point that they must be removed from the mineral production system; the category includes contact cooling water but does not include aqueous waste streams from pollution control devices (e.g., acid plant blowdown, wastewater treatment sludge).

Some commenters also suggested that similar wastes should be aggregated across mineral commodity sectors. They claimed that EPA has created the illusion of separate waste streams by segregating processing wastes by mineral commodity sectors. These commenters contended that waste streams should be considered on an industry-wide, aggregate basis rather than on a sector-specific basis, again determining which waste streams to aggregate based on similarities in process, waste, and waste management characteristics.

In particular, some commenters that operate pyrometallurgical processes maintained that all slags should be aggregated across mineral commodity sectors because the slags have similar characteristics. They maintained that Congress' intent was that all slags should be considered as a single waste, pointing out that the generic waste category "smelting slag" was explicitly mentioned in the legislative history of the Bevill Amendment and in the 1985 reinterpretation proposal (see 50 FR 40292, October 2, 1985).

Although the Agency believes that combining very similar wastes (e.g., copper reactor and converter slags) within a commodity sector for purposes of evaluating volume is appropriate, it does not believe that aggregating wastes across sectors is appropriate. Despite the fact that metallic ore processing facilities having pyrometallurgical operations, for example, share many attributes, the Agency believes that differences in feedstock composition may render processing wastes (e.g., slag) at some facilities in some sectors potentially more hazardous than similar wastes at other facilities in other sectors. Moreover, waste generation rates (and hence, amenability to management under Subtitle C) may vary dramatically between industry sectors for the same type of waste. Accordingly, EPA continues to propose that a high volume waste generated by one commodity sector may be a special waste while another waste that is generated by the same type of process in another sector and is physically similar but is generated in low volumes is not a special waste.

2. The Basis for Quantitative Analysis (Industry-Wide vs. Per-Plant Waste Generation)

In the October 20, 1988, NPRM, EPA discussed three options for conducting its quantitative analysis of candidate Bevill mineral processing waste streams: (1) Develop and analyze a plant-specific measure of waste generation; (2) examine waste stream generation on an industry-wide basis; or (3) develop and utilize a combination of the first two alternatives by developing both a plant and industry-specific criterion (the option adopted).

Some commenters supported the use of the facility level test, because it would not penalize sectors comprised of a small number of individual facilities (i.e., the zinc, lead, beryllium, chromium, tungsten, and other sectors). Many objected, however, to the use of a facility *average*, pointing out that the use of an average may remove wastes from the exclusion that are generated in large volumes at one or more facilities in commodity sectors comprised primarily of small facilities.

The Agency believes that using a sector-wide average is the most equitable way to define high volume mineral processing wastes. Allowing any individual facility to qualify for the exclusion if it exceeds the volume criterion would discriminate against smaller producers in a sector, while excluding a waste on a sector-wide basis if any one facility fulfilled the criterion might result in wastes that are not truly high volume (i.e., are amenable to Subtitle C controls at most facilities) being retained within the exclusion.

Some commenters also felt that individual facility operators would find it difficult to determine whether their particular wastes or residuals exceed the volumetric threshold; different facilities which generate the same waste streams in different quantities could arrive at opposite conclusions about whether their wastes meet the high volume criterion. Therefore, instead of a threshold based on a facility-level average, several commenters recommended that EPA establish a high volume criterion on an individual facility basis. This would, they maintained, incorporate the benefits of the facility level analysis while countering the statistical and administrative disadvantages of the facility average.

The Bevill exclusion applies to wastes, not individual facilities. In this proposal, EPA has already applied the criteria outlined in this preamble to derive the list of waste streams (including treatment residuals) proposed for continued exclusion from regulation under Subtitle C. Facility operators will not have to apply the criterion themselves but merely determine if the facility generates the proposed Bevill waste. Facility owner/operators who believe that EPA has overlooked a waste stream which meets the stated criteria should submit public comments, including supporting documentation, regarding the physical, chemical, and radiological characteristics and generation rate of any potential candidate waste stream(s) managed at their facilities. EPA will then utilize the information submitted by all commenters representing a particular commodity sector to determine whether the candidate special waste satisfies the high volume criterion (and the other special waste criteria).

Some commenters objected to the use of the facility level test as part of the high volume criterion. They argued that the most important and undesirable effect of the current facility level average test would be to retain wastes that should be withdrawn from the exclusion. They noted, furthermore, that all but one of the wastes meeting the total nationwide volume test, the measure that they contended is the true indicator of large volume, also meet the facility-level test, rendering this facility-level test ineffectual.

EPA believes that the Bevill exclusion is intended to apply only to those waste streams that are produced in such large quantities that they may not be amenable to management under Subtitle C. The burden of waste management (and, therefore, the feasibility of Subtitle C controls) depends more on the quantity of waste generated by a typical facility than on the total amount produced by a commodity sector. This is particularly true in industries that generate large quantities of waste that, for technical and economic reasons, are managed on-site.

Few comments directly addressed the nationwide volume criterion. Several commenters requested that EPA require that wastes pass both the sector-wide and the facility-level test. Other commenters, however, were concerned about any approach in which all excluded wastes would be required to meet the nationwide volume criterion, because they felt this test would unfairly remove from the exclusion any sectors with small numbers of waste generators. One commenter suggested that the total volume test be dropped altogether.

In response to these comments, the Agency has decided to eliminate the nationwide volume criterion and rely solely upon a facility-level analysis of waste generation. While the industry-wide volume criterion is consistent with past Agency proposals to resolve the special mineral processing wastes issue, the Agency believes that average per-facility volumes provide a better measure of amenability to management under Subtitle C controls, in large part because large volume mineral processing wastes typically are managed on-site. Based upon EPA data and information submitted in public comment on the 10/20/88 NPRM, eliminating the industry-wide test results in the removal of only one waste stream from the Bevill exclusion (lime kiln APC dust).

3. Units of Measure

EPA weighed two options in determining the appropriate units of measure to apply to mineral processing wastes in order to serve as a basis of evaluation and comparison with other high volume wastes. These options included (1) using the quantity of waste generated annually in metric tons (the option adopted), or (2) using ratios of waste volume generated to quantity of final product (or other appropriate comparisons, e.g., to quantity of ore/mineral feedstock). While EPA noted several advantages to using a ratio in the preamble to the proposed rule, the Agency noted that existing data were not adequate to compile ratios for certain prominent large volume waste streams.

The only comment regarding the evaluation of waste generation in absolute terms was directed at the use of metric tons which, the commenter indicated, is a unit of mass and not of volume. This commenter points out that the court decision specifically references "large volume wastes" and requests that EPA clarify this apparent contradiction.

As discussed above, the term "high volume" has always been an integral part of the definition of special wastes. For purposes of analysis, however, EPA believes that it is convenient to utilize data expressed on a common mass basis, because candidate special wastes having different physical forms are often quantified in different units (e.g., cubic yards vs. gallons). Because the wastes of concern are typically either solids, sludges, or liquids, conversion between waste quantities expressed in terms of mass/weight and volume is simple and straightforward, requiring only the density of the material in question. EPA has, accordingly, decided to utilize metric tons as the common analytical unit for this rulemaking. The Agency notes that it has consistently discussed high volume wastes in terms of metric tons since 1978. Furthermore, EPA believes that amenability to Subtitle C controls may be addressed most accurately through the use of units of mass.

While EPA did not utilize a ratio in support of the October 20, 1988 proposal, the Agency did solicit public comment on the use of a ratio of waste volume generated to one or more measures of material handled to further define the term "high volume." EPA also requested suggestions for the numerical value of the appropriate ratio. Several commenters strongly supported the adoption of a waste-to-product ratio as an additional or alternative test in determining whether a waste should be Bevill-excluded. For example, one commenter suggested that EPA consider a waste-to-ore or mineral ratio. Other commenters objected to the use of a ratio approach, contending that it is irrelevant to the process of identifying high volume mineral processing wastes, and could result in low volume wastes being retained within the Bevill exclusion.

Several commenters appealed to EPA to not reject the ratio approach solely because of the limitations of the Agency's existing data base. They argued that a ratio helps to ensure that the high volume criterion does not discriminate against small industry sectors or against large volume waste generators in sectors with predominantly low volume waste generators. Additionally, commenters agreed that ratios remain relatively constant whereas the total volume of waste generated (both nationally and at the facility level) varies with economic

market fluctuations. They also contended that, administratively, the use of a ratio would be more accurate in distinguishing between mineral processing wastes and other industrial wastes and be more easily used by facility operators in determining which of a facility's wastes might meet volumetric criteria.

While recommending the ratio approach, some commenters did suggest several conditions. They requested that the ratio be employed as an alternative, rather than additional, test that must be met for a waste to be retained within the exclusion. Several commenters recommended that in administering this criterion EPA retain any waste stream that has met the ratio test for any calendar year between 1982 and 1987, in order to avoid penalizing firms and industries that have reduced their waste generation rates in recent years.

As mentioned above, several commenters recommended that EPA not employ a ratio approach. These commenters maintained that the ratio concept does not take into account the efficiency of the processing operation and that the use of ratios creates incentives for poor processing or increasing waste generation rates, which would be contrary to EPA's goal of waste minimization.

Comments on potential ratio values were varied. In the October 20, 1988 NPRM, EPA suggested that if a waste-to-product ratio were used, a value of 0.5 might be appropriate. In criticizing the use of any ratio approach, some commenters argued that this value is miniscule in comparison to the ratios for other mining wastes. Other commenters, on the contrary, argued that the value was not low enough to effectively distinguish high volume from low volume processing wastes, pointing out that EPA's own data indicate that two of the wastes proposed for exclusion, copper process wastewater and copper bleed electrolyte, have ratios lower than 0.5. They also noted that although many other special wastes (e.g., fly ash, cement kiln dust) have ratios that are less than 0.5, these materials are clearly within the Bevill exclusion. Generally, commenters supporting the use of a ratio criterion suggested a waste-to-product ratio in the range of 0.1 to 0.2.

Based upon an analysis of the comments received, the Agency has concluded that the use of a waste-to-product or other ratio would not enhance EPA's understanding of the amenability of mineral processing wastes to management under Subtitle C controls (the purpose of the volume criterion) and has, accordingly, decided to not include a ratio of any kind in the high volume criterion. Ratios provide a measure of the degree of concentration and/or relative quantity of material handled in the production process. Hence, they would be useful in prediction the quantity of wastes that might be generated assuming a given quantity of mineral product or ore feedstock. This information, however, is not relevant to determining whether a particular mineral processing waste is amenable to Subtitle C control. In fact, data submitted to EPA in public comment indicate that many low volume wastes (i.e., those generated in the 200–500 mt/yr/facility range) have relatively high ratios of waste-to-product (greater than 0.5). Therefore, EPA believes that this concept is not suitable for identifying high volume mineral processing wastes.

4. Types of Wastes Used as the Basis for Comparison

In the 10/20/88 NPRM, the Agency discussed four options concerning the basis for comparison that should be utilized in developing values for waste volume thresholds: (1) Extraction and beneficiation wastes; (2) other special wastes such as oil and gas wastes; (3) RCRA Subtitle C wastes; and (4) some combination of all three (the option selected).

Several commenters objected to some degree to each of the approaches. For example, a commenter claimed that EPA, regardless of which approach was taken, compared disaggregated mineral processing wastes to aggregated Subtitle C, oil and gas, and mining wastes.

This statement is only partially true. EPA compared aggregated wastes managed under Subtitle C with quantities of proposed Bevill mineral processing wastes, because waste- and facility-level data on Subtitle C waste management were unavailable, making comparisons with disaggregated Subtitle C data infeasible. Other comparisons developed in support of the volume criteria, however, used disaggregated data (e.g., mineral extraction and beneficiation wastes on an individual and commodity sector-specific basis, distinct high volume oil and gas wastes).

Another commenter argued that the only permissible basis of comparison with processing wastes is the universe of industrial wastes because comparison with Bevill or Subtitle C wastes is improper and contrary to Congressional directive.

This comment reflects an incomplete understanding of the special wastes concept and of Congressional intent in enacting the Bevill exclusion. The purpose of the high volume criterion is to identify mineral processing wastes for which the provisions of Subtitle C might be potentially infeasible. Therefore, comparisons with Subtitle C wastes are not only reasonable and appropriate, but necessary. Comparisons with other Bevill wastes, on the other hand, do not provide conclusive evidence, but do suggest boundaries on what might be considered a high volume special waste.

Finally, one commenter asserted that the Court directive in *EDF* v. *EPA* to establish the Bevill exclusion's boundaries on the basis of "high volume" does not require EPA to set a volume threshold for special mineral processing wastes that relates in any way to waste volumes in other industries. They argued that EPA could in fact establish a distinct volume criterion for each industry or sector.

EPA agrees that the Court directive does not require the Agency to establish a volume threshold on the basis of comparisons with other wastes. In fact, the Court directive leaves the reasoning behind any volume threshold to EPA's discretion. The Agency believes, however, that the methodology it has used to derive the specific volume criterion levels is reasonable and equitable.

With regard to the volume comparisons using RCRA Subtitle C wastes, a commenter correctly observed that the specific volumetric criteria used exceed the quantities of most wastes that are managed under Subtitle C. Another commenter argued that basing the high volume criterion on the waste volumes generated in the top ten percent of Subtitle C facilities has no legal or logical basis. This commenter recommended that rather than choosing the highest volume listed hazardous wastes to compare with mineral processing wastes, EPA should have utilized the average, or typical, Subtitle C waste volume.

The Agency disagrees with the argument that a relevant comparative analysis should reflect "typical" quantities of hazardous waste generated. Because the Bevill exclusion is intended to exempt only wastes generated in volumes which may be too large to be managed under Subtitle C of RCRA, it would not be appropriate to base the high volume criterion on comparisons with the hazardous wastes that are generated and managed in "typical" volumes.

Several commenters addressed the use of other mineral processing wastes, arguing that in setting the high volume criterion, EPA should not concern itself with the generation rates of the six recently relisted smelting wastes. EPA disagrees. Because the Court explicitly

determined that the six smelting wastes are not high volume, low hazard wastes, the generation rates of these wastes can and should serve as a lower bound below which wastes should not be afforded Bevill status.

5. Definition of High Volume Mineral Processing Wastes

In the October 20, 1988 NPRM, EPA proposed to designate a waste as a "high volume" processing waste if it met either of the following criteria: (1) Produced annually by all U.S. facilities in a processing sector in quantities greater than two million metric tons in any year from 1982 to 1987, or (2) produced at an average per facility rate, in a given sector, in excess of 50,000 metric tons during any of the years 1982 to 1987.

Several commenters maintained that the thresholds were set higher than necessary and suggested values in the range of 100,000 to 400,000 metric tons per year for the sector-wide total and 25,000 to 35,000 metric tons per year for the facility-level total. Specifically, some commenters also argued that the proposed sector-wide and facility thresholds are not supported by EPA's own data on extraction and beneficiation wastes. They contended that EPA's data indicate that lowering the criterion would allow EPA to effectively distinguish between high and low volume processing wastes. They also noted that an evaluation of generation rates of other special wastes (e.g., utility wastes) indicates that the thresholds are significantly higher than they should be.

Some commenters also contended that EPA's approach contradicts its earlier statements (e.g., 51 FR 36233) that using the lowest of the traditionally considered high volume wastes as the threshold is inappropriate. They argued that the fact that increasing or decreasing the 50,000 metric tons per year average facility threshold point by 25 percent would affect the designation of only one mineral processing waste (see 53 FR 41294) does not support EPA's thresholds; this is an arbitrary fact that could easily be stated about a variety of other thresholds and demonstrates that the threshold is too high.

Unlike the definition of extraction and beneficiation wastes (materials that are, in almost all cases, clearly high volume, low hazard wastes), there has always been some ambiguity regarding the definition of mineral processing wastes as it relates to regulatory status under the Bevill exclusion. For this reason, EPA believes that it must explicitly define the criteria used to define special mineral processing wastes, including those used to define high volume.

In order to avoid the confusion caused by the earlier proposed rulemaking, EPA has attempted to define "high volume" by making explicit comparisons with several different types of wastes. The Agency has not used the lowest of the other Bevill waste generation rates to establish the threshold but has instead used this information as a "reality check" for the criteria that it developed based on data concerning Subtitle C waste generation and management. Finally, the fact that one extraction or beneficiation waste is generated at quantities less than the threshold for Bevill mineral processing wastes does not, in the Agency's view, invalidate the adopted threshold.

Some commenters were concerned that the criterion might discriminate unfairly against smaller producers and industry sectors. Utilizing the existing volume criterion to formulate the final rule would, they claimed, result in the effective removal of all of the processing wastes generated by 21 minor metals industries from the mining waste exclusion. In addition, these commenters argued that fixed high volume standards unfairly discriminate against smaller producers and industries that have recently experienced poor market conditions.

The Court has ruled that the Bevill exclusion has always been intended to cover only high volume, low hazard wastes. The fact that some industry sectors would no longer enjoy the temporary exclusion from Subtitle C if the proposed rule were promulgated is not a relevant factor in defining either the scope of the Bevill exclusion generally or the provisions of the high volume criterion specifically. In addition, EPA believes that the proposed high volume standard avoids discriminating against smaller producers because it is based on average per-facility waste generation rate. Similarly, EPA believes that the proposed approach accounts for variations in market conditions by using the highest average annual per-facility waste volume for the most recent five year period.

Other commenters argued that the proposed thresholds are too low. Specifically, they argued that the thresholds are not supported by comparisons with extraction and beneficiation wastes, pointing out that because extraction and beneficiation wastes are clearly within the scope of the Bevill exclusion, their generation rates should serve as the lower bound for evaluating processing wastes.

This line of argument ignores the nature of the mineral production process. In minerals processing, values are progressively concentrated from native materials in stages; generally, each successive step produces waste volumes which are orders of magnitude lower than those generated by the previous step. Accordingly, one would not expect waste generation rates from mineral processing to parallel those from extraction and beneficiation operations. Extraction and beneficiation waste volumes, therefore, are not appropriate for establishing a lower bound for a processing waste volume threshold.

Some commenters argued that EPA's comparisons with Subtitle C data are faulty. They contended that EPA has not demonstrated that there is something unique about the wastes identified by the thresholds or the management practices employed for these wastes that would render Subtitle C regulatory controls technically infeasible or inappropriate. They claimed that the fact that ten percent of Subtitle C facilities manage waste quantities in excess of the thresholds demonstrates that it is indeed technically feasible to manage these large waste volumes; special wastes are not "special," they contended, if the category applies to such a substantial percentage of the regulated community.

With regard to the actual comparisons with Subtitle C wastes, these commenters argued that EPA has distorted the facts in its attempt to dismiss the overlap by using the unsupported claim that the Subtitle C data refer to combined wastes streams dominated by aqueous waste streams. In fact, the commenters argued that proposed BDAT background documents report that generators producing at least two of the nine top listed hazardous waste streams referred to in the 10/20/88 NPRM averaged in excess of 50,000 metric tons per facility per year in 1985. Four plants produced 801,000 metric tons of K104 wastes (combined wastewater streams generated from nitrobenzene/aniline production), averaging over 200,000 metric tons per plant. Similarly, seven plants produced 414,000 metric tons of K016 wastes (heavy ends or distillation residues from the production of carbon tetrachloride), averaging 59,143 metric tons per plant.

As noted by another commenter and as discussed above, there is no reason to require that the ranges of volumes at which excluded mineral processing and Subtitle C wastes are generated and managed be mutually exclusive. In addition, EPA believes that some

overlap between the available aggregated Subtitle C data and the volumes of excluded mineral processing wastes is indeed unavoidable, in part because available Subtitle C data include commercial facilities. Many of the largest Subtitle C facilities are commercial hazardous waste management operations, which are in the business of managing aggregated wastes generated by other entities, for which they receive compensation. Facilities that manage only their own wastes (such as most mineral processing operations), on the other hand, incur waste management expenses as an operating cost. Because the incentives for and costs/benefits of managing large volumes of waste within these two groups of facilities are quite different, EPA believes that allowances must be made in evaluating the aggregated Subtitle C data. For example, the proportion of non-commercial Subtitle C facilities (i.e., those that may appropriately be compared with mineral processors) that generate waste volumes above the specified high volume threshold is actually less than ten percent. Moreover, mineral processing facilities often manage multiple high volume waste streams. For these reasons, the Agency feels that an overlap with ten percent of the total Subtitle C universe is an appropriately stringent approach and supports the average facility criterion of 50,000 metric tons per year.

Several commenters suggested that separate tests be established for solid and aqueous liquid waste streams, as the typical waste generation rates of these waste types vary dramatically. Furthermore, these commenters noted that managing solid waste streams differs from managing aqueous liquid waste streams with respect to technologies employed, cost, and technical feasibility. Conceptually, the Agency believes that the idea of separate tests for solid and aqueous liquid waste streams may have merit. Industry routinely manages wastewater volumes in the millions of gallons per day per facility (i.e., well over one million metric tons per year); thus, it may be appropriate to set a much higher criterion threshold for aqueous liquid mineral processing wastes. Because of time and data constraints, however, EPA could not undertake the analysis necessary to develop separate criteria for this NPRM. EPA hereby solicits comment on the idea of a different volumetric criterion for aqueous liquid wastes, as well as suggestions of possible values for an aqueous liquid waste volume cut-off for possible incorporation into the final rule. EPA is considering an aqueous liquid waste volume criterion on the order of 1.5 million metric tons per year.

C. The "Low Hazard" Criterion

As discussed in the preamble to the October 20, 1988 NPRM, EPA evaluated two options for characterizing a mineral processing waste as low hazard: Defining low hazard wastes as those mineral processing wastes that exhibit none of the characteristics of hazardous waste (i.e., EP-toxicity, corrosivity, reactivity, or ignitability—see 40 CFR 261.21 through 261.24), and deferring judgment of hazard until study for the Report to Congress. Because of reservations regarding the appropriateness of applying the four hazardous waste "characteristics", EPA decided to defer judgment of hazard in the proposed rule.

1. Deferring Judgment of Hazard Is Appropriate

Several commenters supported EPA's decision to not use the Subtitle C characteristics of hazardous waste to determine which mineral processing wastes are covered by the Bevill Amendment or to assess hazard within the context of this rulemaking. They argued that (a) EPA cannot and should not require a low hazard criterion; (b) in addition to insufficient data, EPA's tests for hazardous "characteristics", especially the EP-toxicity test, are not appropriate or accurate for mining and mineral processing wastes; and (c) a mineral processing waste that exhibits a characteristic of a hazardous waste should not automatically be subject to Subtitle C regulations, as actual risk from mineral processing facilities is low.

a. *The Need for a Low Hazard Criterion.* Several commenters maintained that EPA should retain a waste within the exclusion if the waste is either high volume or low hazard. This would, they argued, address both the need for and feasibility of Subtitle C regulations for mineral processing wastes. Some commenters also argued that the low hazard criterion is unnecessary and that requiring that wastes meet any such criterion may actually be contrary to Congressional intent. These commenters noted that in the lawsuit over the regulatory determination for mineral extraction and beneficiation wastes (*EDF* v. *EPA*, 852 F.2d 1309 D.C. Cir. 1988), the Court found that Congress designed the Bevill Amendment to break with the previous approach to regulation of hazardous industrial waste, revealing a Congressional understanding that some "hazardous wastes" might require management and control techniques different than those of Subtitle C.

Some commenters also contended that precedent exists for bypassing the low hazard criterion, noting that in the 1986 regulatory determination for mining wastes, EPA asserted that Subtitle C regulation might not be necessary if other Federal or State programs control any risks associated with mining wastes. In fact, commenters argued, the Appeals Court decision on the mining wastes regulatory determination demonstrates that EPA must consider factors other than hazard in determining whether a high volume mining or processing waste should be permanently excluded from Subtitle C regulation.

In addition, a commenter argued that the proper time to apply a hazard criterion would be when making a regulatory determination as to which processing wastes should be subject to Subtitle C, and not when deciding which wastes are to be retained within the Bevill exclusion. This position was supported further by another commenter who, reiterating EPA's proposed position, stated that the determination of whether a waste is "low hazard" can only be finally determined by the studies that will support the next Report to Congress (i.e., after the reinterpretation of the Bevill exclusion is finalized).

As discussed in more detail below, EPA believes that the criteria used to identify which mineral processing wastes are properly within the scope of the Bevill Amendment should include a component that addresses hazard. This conclusion is based upon review of public comments, and more detailed analysis of the Appeals Court decision prompting this rulemaking and of the regulatory and legislative history of the Bevill Amendment and the special wastes concept. The Agency recognizes that a full assessment of hazard can be appropriately considered in a Report to Congress. Nevertheless, a test designed to identify any wastes that are clearly not low hazard wastes is a necessary and appropriate component of the criteria for identifying mineral processing wastes that remain temporarily excluded from Subtitle C regulation by the Bevill Amendment. Any wastes that are clearly not low hazard wastes are not special wastes and would not, under this proposal, remain within the Bevill exclusion.

b. Existing Test and Data Limitations. Several commenters also suggested that existing data are insufficient to assess the potential hazard posed by most, if not all, mineral processing wastes. These commenters maintained, in

addition, that existing EPA toxicity tests (e.g., EP, TCLP) are inappropriate for judging the hazard posed by mineral processing wastes, primarily because these tests are based on the leaching of constituents under conditions similar to those found at municipal landfills while mining and mineral processing wastes are usually disposed in on-site monofills. Several commenters contended that there are no available valid substitute testing procedures.

Other commenters also maintained that the EP-toxicity test is insufficient as a means of assessing hazard. These commenters suggested, however, that the test is not strict enough and would allow wastes that are actually toxic to remain within the exclusion. They noted, for example, that the test only evaluates the effects of acidification on wastes (e.g., copper slags) and does not assess mobilization of metals under other conditions. A commenter specifically argued that testing of recycled slag with the EP-toxicity test produced concentrations of arsenic that are significantly higher than concentrations produced using deionized water to perform the extraction, but were lower than results obtained using other extraction media containing complexing agents such as ethylenediamine tetra-acetic acid (EDTA).

EPA believes that there are two principal questions regarding the use of toxicity tests for determining the hazard posed by mineral processing wastes: (1) Are any measures of inherent toxicity sufficient for defining the universe of relevant wastes, and (2) if so, what sort of test(s) can and should be used? As discussed in more detail below, EPA believes that the use of inherent toxicity and pH tests as a low hazard criterion is, in fact, feasible and represents the only currently available approach for identifying those mineral processing wastes that are clearly not low hazard wastes. With regard to the appropriate test, EPA concurs with those commenters who suggest that there may be better approaches than the EP-toxicity test for screening mineral processing wastes to identify those wastes that are clearly not low hazard. The Agency has concluded, however, that it disagrees with the contention of some commenters that there are no available valid substitute testing procedures and, today, is proposing the use of a different testing procedure for determining which mineral processing wastes are clearly not low hazard wastes.

c. Consideration of Risks. Some commenters contended that contaminants released from mining sites have a lower potential for human exposure than do those from typical industrial or hazardous waste management facilities and, therefore, any risk to health is minimal, if not non-existent. One commenter suggested that the nature of the processes that generate high volume wastes also ensures that the wastes are of low toxicity due to the effects of dilution. Commenters indicated, furthermore, that the location of many mineral processing facilities is such that they pose a uniquely low degree of hazard in comparison with other industries. The reasons for this, argued some commenters, are that (1) because mineral processing facilities are primarily located in dry climates, leaching of wastes is unlikely; (2) these facilities are usually in less densely populated areas than those of other industries; and (3) waste disposal areas in mineral processing facilities are farther from ground-water and drinking water supplies than are facilities in other industries.

For example, one commenter indicated that the probability of significant impact on the use of ground water located beneath its large copper facility is quite low because the underlying shallow aquifer has always been highly saline and unusable while the deep aquifer is both historically undrinkable and protected from contamination by an impervious clay layer. Another commenter reported that its wastewater from magnesium production exhibits only low pH and is managed in an area that is "a virtual desert" in a calcium carbonate sand-based pond that provides a neutralization medium for the acidic wastewater.

EPA recognizes that factors such as distance to population centers and hydrogeologic setting are important for determining the risks posed by mineral processing wastes to human health and the environment. The Agency also recognizes that some mineral processing facilities may pose negligible risks due to their locations or settings. Nonetheless, EPA believes that a significant portion of the operations that generate high volume processing wastes may not be sufficiently isolated to pose negligible risk and that, in any event, available data are not sufficient to substantiate claims to this effect. After appropriately narrowing the scope of the Bevill exclusion (i.e., removing wastes that are clearly not low hazard), EPA intends to collect the necessary data to assess the risk posed by the special mineral processing wastes, as required for the Report to Congress.

2. Deferring Judgment of Hazard Is Improper

Some commenters disagreed with EPA's decision to defer the judgment of hazard and argued that it was contrary to both Congressional intent and the two recent decisions of the U.S. Court of Appeals (i.e., *EDF* v. *EPA*. 852 F.2d 1309, and *EDF* v. *EPA*, 852 F.2d 1316). Moreover, these commenters argued, EPA's proposal is inconsistent with previous Agency rulemakings because it ignores the hazard component of the criteria that the Agency used to describe special wastes in 1978, which the Court has reaffirmed as denoting the limitations of the RCRA mining wastes exemption.

In reviewing its October 1988 proposal to defer judgment of waste hazard until preparing the Report to Congress, as well as the resulting public comments, EPA has concluded that it should change the approach it proposed by developing and applying a hazard criterion in determining the proper scope of the Bevill exclusion. Specifically, EPA believes that, in spite of the technical difficulties associated with developing and applying a low hazard criterion, such a criterion was part of the original special waste concept (see 43 FR 58946, 58991–2, December 18, 1978) and is required by the Court's reading of Congressional intent. Although additional analysis of the hazard associated with wastes that would remain excluded under this proposed rulemaking will be performed during preparation of the Report to Congress, EPA will now be complying more directly with Congressional intent by removing from the exclusion those wastes that are clearly not low hazard wastes.

Another commenter objected to EPA's failure to propose a low hazard criterion, claiming that because mineral processing wastes must pass either a high volume or a low hazard criterion to remain excluded and only the volume criterion exists, many low volume mineral processing wastes would be removed from the Bevill exclusion under the proposed rule. Therefore, they contended, by deferring a judgment of hazard EPA may cause low hazard wastes to be included in the RCRA Subtitle C program. Alternatively, another commenter stated that EPA should consider waste-related hazard rather than volume in order to comport with Congressional intent.

EPA has considered and rejected these suggestions that the Agency rely solely upon either volume or hazard to make Bevill exclusion decisions because

this approach would be inconsistent with Congressional intent and the special wastes concept.

Several commenters recommended that the final rule include explicit toxicity criteria that would eliminate from the exclusion any processing wastes not qualifying as low hazard wastes. These commenters generally contended that adequate data exist to make some waste-specific determinations of hazard for at least some large volume mineral processing wastes. These commenters claimed that toxicity data on the copper, zinc, lead, bauxite, and aluminum sectors indicate that several of these wastes are not low hazard. They stated, for example, that in a previous EPA waste sampling effort, wastes from copper production showed elevated leachable levels of arsenic, cadmium, and mercury in process wastewater and acid plant blowdown; and arsenic, cadmium, and lead in slag. They also noted that large quantities of these wastes are stored in unlined surface impoundments, wastes piles, and landfills.

EPA acknowledges that it previously has collected and analyzed some data on some mineral processing wastes. The Agency does not believe, however, that those data provide an adequate means for evaluating compliance with a low hazard criterion on a waste-by-waste basis, except in a few limited cases, as discussed below. Therefore, EPA plans to collect and analyze the data required to determine which of the other high volume mineral processing wastes also pose low hazard, based on the pH and toxicity and mobility tests presented below.

Several commenters indicated that EPA should use information on the risks to human health and the environment, either in addition to or in the absence of data on waste characteristics, to determine which mineral processing wastes are low hazard wastes. Several commenters stressed that risks from mineral processing facilities are well known and that water contamination risks for mining facilities as a group are similar or even higher than for the group of hazardous waste-producing facilities. Some commenters argued that there are several well-established cases of environmental damage resulting from waste disposal activities at mineral processing facilities. For example, these commenters claimed that two of the five active lead smelters have legal actions for damage pending against them.

Another commenter, who reported having used copper smelting slag purchased from a mineral processing facility for road base, indicated that heavy metal contamination of soils and run-off has resulted from the sale of this material without a proper indication of its risks. Other commenters contended that phosphogypsum stacks pollute groundwater, surface water, and air, and that residual radioactivity that they contain may produce harmful effects such as lung cancer.

EPA recognizes that there is limited information indicating that some past and current mineral processing waste management practices may pose unacceptable risks to human health or the environment. However, EPA believes that it is infeasible to systematically consider this information within a low hazard criterion for this rulemaking, and then apply this information uniformly to all of the various mineral commodity sectors distributed throughout the country. Therefore, EPA intends to utilize a hazard criterion based upon inherent toxicity, and to collect and analyze various kinds of additional data (such as damage cases) for the Report to Congress, once the scope of the Bevill exclusion has been appropriately defined.

D. Comments on Candidate "Special" Mineral Processing Wastes

This section discusses comments received on specific wastes from mineral processing operations. The discussion is organized around the fifteen wastes proposed for exclusion in the October, 1988 NPRM. In contrast to other sections within Part III of this preamble, EPA has not, in general, provided responses to waste nomination-related comments within this section. Instead, the proposed status of candidate Bevill mineral processing wastes is addressed in Part IV, which discusses the nature and implications of the changes to the Bevill criteria used to prepare today's proposed rule. In this way, EPA can provide responses to the issues raised in public comment, as well as articulate the effects of the new Bevill criteria, on a waste-specific basis.

EPA proposed fifteen waste streams for continued exclusion from Subtitle C under the Bevill Amendment in its October 20, 1988, proposal:

(1) Copper smelting slag;
(2) Copper process wastewater;
(3) Copper acid plant blowdown;
(4) Copper bleed electrolyte;
(5) Lead smelting slag;
(6) Zinc process wastewater;
(7) Zinc acid plant blowdown;
(8) Bauxite red and brown muds;
(9) Phosphogypsum;
(10) Elemental Phosphorus Slag;
(11) Iron Blast Furnace Slag;
(12) Iron Blast Furnace APC Dust/Sludge;
(13) Lime Kiln APC Dust;
(14) Waste Acids From Titanium Dioxide Production; and
(15) Chromite Ore Roasting/Leaching Slag.

Although each of the wastes proposed for exclusion met the mineral processing definition and, tentatively, the high volume criterion articulated in the preamble to the proposed rule, none had, at that point, been evaluated with regard to hazard. As explained in detail elsewhere, however, the basis of today's proposed rule includes a low hazard criterion. Therefore, because of the hazard criterion, new waste nominations, and data limitations, the group of wastes proposed for exclusion today is different than the group of fifteen proposed in October.

In addition to reflecting the new hazard criterion, the list of wastes provisionally proposed for exclusion in today's rule includes wastes nominated in public comment on the previous NPRM. After considering the available data, the Agency has decided that it has sufficient data to propose the exclusionary status of nine high volume mineral processing waste streams, some of which were previously proposed and some of which were nominated in public comment. Of those waste streams, six meet both the high volume and low hazard criteria and thus are proposed for exclusion, while three waste streams fail the low hazard criterion and thus would be removed from the Bevill exclusion and regulated under Subtitle C if they exhibit hazardous characteristics. Of the many wastes nominated for exclusion by commenters, approximately thirty-three appear to meet the revised high volume criterion. Because, however, the Agency does not have sufficient data at this time to determine whether these wastes meet the low hazard criterion, EPA proposes to conditionally retain them within the Bevill exclusion until January 15, 1990. The regulatory status of these wastes will be addressed in a subsequent rulemaking scheduled to be proposed on or before September 15, 1989.

In response to the 10/20/88 proposed rule, commenters nominated many additional waste streams that they believed should be retained within the Bevill exclusion. EPA has reviewed these nominations and, in most instances, has concluded that these additional wastes should not be afforded special waste status. The reasons for these waste-specific decisions are varied; some wastes did not meet the definition of mineral processing wastes (e.g., are beneficiation or alloying wastes), while others are generated by processes that are outside the scope of this rulemaking

(e.g., secondary metal production). The most common reason, however, for rejecting claims of Bevill status was that the nominated materials are not high volume wastes.

Comments on the proposed Bevill status of the 15 original wastes are presented below. Responses to most of these comments may be found in Part IV, below.

Wastes Identified in the October 20, 1988 Proposed Rule as Special Mineral Processing Wastes

(1) *Slag from Primary Copper Production.* Several commenters supported the proposal to retain this waste under the Bevill exclusion and requested clarifications of the waste definition. One commenter suggested that because slag, acid plant blowdown, process wastewater, and wastewater treatment sludges from the processing of primary copper are comprised of groups of wastes that possess similar characteristics and are managed in similar ways, each waste should be considered a single waste stream. Moreover, this and another commenter stated, EPA should include in the definition of slag from primary copper smelting both slag from converter operations and slag from anode furnace operations. In addition to asking for clarifications, several commenters provided detailed process descriptions in an attempt to demonstrate that the slag and effluent resulting from primary copper processing are not hazardous.

In contrast to these statements, several commenters argued that this waste should not be retained within the Bevill exclusion. One commenter noted that EPA data indicate that one sample of slag exceeded EP-toxicity limits for arsenic, cadmium, and lead. A second commenter indicated that it had purchased primary copper slag from a mineral processor for use in road construction. This commenter contended that the generator of the slag failed to assess the suitability of the copper smelting slag for reuse or to warn users of its potential hazards. The commenter also stated that copper smelting slag can release large amounts of hazardous metals when disposed of in an ordinary manner or when reused as a substitute for rock or gravel. Moreover, the commenter argued, because copper slag is responsible for documented, significant environmental damage, EPA should remove this waste from the Bevill exclusion.

As indicated earlier in this preamble, EPA has elected to continue to consider reactor slag, converter slag, and anode furnace slag to be one waste stream, and has evaluated its eligibility for continued exclusion under Bevill on that basis.

(2) *Process Wastewater From Primary Copper Production.* Several commenters expressed support for retaining this waste within the Bevill exclusion and suggested that the definition of the waste be expanded. One commenter suggested that EPA consider all residuals from the treatment of process wastewater as one aggregate waste stream, while another commenter noted that a representative of EPA had assured the American Mining Congress that wastewater streams separated from copper smelter acid plant blowdown could constitute "process wastewater." Finally, several commenters stated that process wastewater from primary copper processing should also include contact cooling water from primary copper production. One of these commenters argued that EPA should apply the 50,000 metric tons per year test to the aggregate quantity of both process wastewater and contact cooling water because there is no logical reason to distinguish between the two waste streams. Another contended that EPA, not industry, made the first distinction between "process wastewater" and "contact cooling water."

In contrast to these arguments, one commenter argued against retaining this waste within the Bevill exclusion. This commenter contended that wastewater from primary copper processing is frequently managed in unlined surface impoundments and that, according to EPA data, this wastewater regularly fails the EP-toxicity test for arsenic, cadmium, and mercury. Therefore, the commenter argued, this waste should be removed from the Bevill exclusion.

(3) *Acid Plant Blowdown From Primary Copper Production.* Several commenters expressed support for retaining this waste in the Bevill exclusion. One commenter indicated that it generated a new waste stream that is very similar to acid plant blowdown, and contended that this waste stream, called Lurgi scrubber effluent, should be combined with acid plant blowdown for analytical and exclusionary purposes because, in addition to physical and functional similarities, the two waste streams are co-managed at the commenter's facility. The commenter indicated that the acid plant blowdown and Lurgi scrubber effluent are mixed with alkaline tailings, which generates a neutral waste (Lurgi effluent has a pH of 1.7 before being mixed with tailings, after which it has a pH of 7.0 to 8.0). A second commenter simply stated that the definition of hazardous waste K064 should specify that this listed hazardous waste is limited to thickened acid plant blowdown that is disposed in surface impoundments.

In contrast to these arguments, a commenter contended that this waste is frequently managed in unlined surface impoundments and that according to EPA data, acid plant blowdown from primary copper processing routinely fails the EP-toxicity test for arsenic, cadmium, and mercury. Therefore, this commenter argued, this waste should be removed from the Bevill exclusion.

EPA agrees that, because Lurgi scrubber effluent is generated by a pollution control process similar to that used in typical metallurgical acid plants, this waste stream should be afforded status similar to acid plant blowdown from primary copper production. Accordingly, the Agency has broadened the definition of this latter waste stream to include Lurgi scrubber effluent.

(4) *Bleed Electrolyte From Primary Copper Production.* One commenter described the recycling process it uses to manage its bleed electrolyte from primary copper processing, in order to demonstrate that this waste does not pose a threat to human health and the environment. Nonetheless, this commenter admitted that due to impurities in anode copper, bleed electrolyte may exhibit the hazardous waste characteristics of EP-toxicity and corrosivity. A second commenter noted that this waste is frequently managed in unlined surface impoundments. This commenter argued that, according to EPA data, bleed electrolyte from primary copper processing routinely fails the EP-toxicity test for arsenic, cadmium, and mercury and that this material, therefore, should be removed from the Bevill exclusion.

(5) *Slag From Primary Lead Production.* The only comments that EPA received concerning this waste stated that the waste should not be retained within the Bevill exclusion. These commenters noted that EPA data indicate that 28 percent of slag from primary lead processing is placed in unlined storage facilities while 24 percent is placed in unlined disposal facilities. These commenters also noted that in EPA sampling efforts, 13 of 17 samples of slag from lead processing facilities showed evidence of EP-toxicity. Moreover, except for "de-zinced" slag, all samples of hot-dumped or granulated slag were EP-toxic. Finally, water extract samples of slag displayed lead and cadmium leachability in excess of the toxicity characteristic regulatory levels. Therefore, these commenters concluded, based upon its own data, EPA should

withdraw slag from primary lead processing from the Bevill exclusion.

(6) *Process Wastewater From Primary Zinc Production.* The only comments received concerning this waste were in opposition to retaining it within the exclusion. Commenters noted that all EPA samples of process wastewater from the zinc industry showed evidence of EP-toxicity from cadmium. These commenters also noted that some facilities in this sector already manage this waste as a hazardous waste. Therefore, these commenters concluded, EPA should withdraw process wastewater from primary zinc processing from the Bevill exclusion.

(7) *Acid Plant Blowdown From Primary Zinc Production.* The only comments received concerning this waste were in opposition to retaining it within the exclusion. Commenters noted that one of two samples of acid plant blowdown exhibited EP toxicity and failed the test for corrosivity. These commenters also noted that some facilities in this sector already manage this waste as a hazardous waste. Therefore, these commenters concluded, EPA should withdraw acid plant blowdown from primary zinc processing from the Bevill exclusion.

(8) *Red and Brown Muds From Alumina Production.* Commenters representing diverse interests agreed that red and brown muds are low hazard wastes. One commenter, however, contended that red and brown muds have already been studied and should properly be considered extraction and beneficiation wastes. The only other comment received regarding this waste stated that red scale produced at a plant is composed of the same material as red mud and that both this red scale and pisolites should be included with red and brown muds under the Bevill exclusion.

For purposes of analysis and regulatory action, EPA considers pisolites to be a component of red muds, but considers red scale to be a cleaning waste that is not a mineral processing waste, and therefore, is outside the scope of the Bevill exclusion.

(9) *Phosphogypsum From Phosphoric Acid Production.* Several commenters expressed support for the exclusion of phosphogypsum under the Bevill Amendment and suggested expanding the materials included under the definition of this waste. These commenters argued that EPA should modify the definition of phosphogypsum to include the associated solids and liquids from the processing of phosphate rock. One commenter also suggested that EPA expand the scope of the Bevill exclusion to include waters used for flash coolers, barometric condensers, evaporators, air pollution control equipment, phosphogypsum filters, and other related equipment.

In contrast, one commenter objected to the continued exclusion of phosphogypsum under Bevill. This commenter contended that some Florida residents are concerned that phosphogypsum stacks may be exempted under Bevill even though the wastes are not actually "low hazard." The commenter argued that phosphogypsum is hazardous because the concentrations of the radionuclide Radium 226 in EPA samples were consistently in the 25 to 35 pCi/g range. The commenter argued further that phosphogypsum stacks pollute ground water, rivers, bays, and the air. Noting that in Florida, phosphogypsum is being stockpiled increasingly close to heavily populated areas, and that by the year 2000 there will be over one billion tons disposed in Florida, the commenter concluded that phosphogypsum should be withdrawn from the Bevill exclusion and subjected to special management standards due to the hazardous nature (e.g., residual radioactivity) of the waste.

EPA rejects the suggestion that the definition of phosphogypsum be broadened to include any of the various water streams that may be mixed with and used to transport the waste gypsum to its disposal area (generally a gypsum stack). Although facilities may operate their waste management operations in an integrated fashion, the actual generation of waste gypsum and process wastewater in the phosphoric acid production process derive from different steps in the process and have very different characteristics, and hence, will be considered separately for analytical and regulatory purposes.

(10) *Slag From Elemental Phosphorus Production.* The only comment received regarding this waste stated that EPA's proposal to include phosphorus slag among the wastes to be studied further is appropriate. The commenter argued further that the slag has been used in the construction industry and has not imposed any adverse effects on human health.

(11) *Iron Blast Furnace Slag.* A number of commenters argued that iron blast furnace slag is not a waste but a valuable material. These commenters noted that such slag has been defined as a product by the American Society of Testing and Materials, that at present 75 to 100 percent of all the slag produced is recovered as useful product and is often used as a replacement for scrap in steel mills, and that the U.S. is currently importing this material for industrial use. Moreover, several commenters argued, iron blast furnace slag is not a hazardous waste, has no history of displaying hazardous characteristics, and has even been used to stabilize hazardous and radioactive wastes prior to disposal. Therefore, at least one commenter concluded, iron blast furnace slag should be permanently excluded from regulation under EPA's hazardous waste rules.

EPA included iron blast furnace slag on the original list of 15 wastes proposed for exclusion because preliminary information indicated that this material is either disposed or used in a manner constituting disposal (i.e., directly on the land) at some facilities. Therefore, iron blast furnace slag may be a solid waste at some facilities and is, for purposes of this proposal, considered a solid waste. If retained within the Bevill exclusion in the final rule, the disposition of this slag would be addressed in the Report to Congress.

(12) *APC Dust From Iron Blast Furnaces.* No comments were received regarding the proposed exclusion of APC dust from iron blast furnaces under the Bevill Amendment.

(13) *Lime Kiln APC Dust/Sludge.* One commenter stated that there are no hazardous wastes produced from air pollution control operations at lime kilns. This commenter also stated that studying the lime industry is unnecessary. The only other comments regarding this waste argued that lime kiln APC dust should be withdrawn from the Bevill exclusion because this waste does not pass nationwide waste generation test of the high volume criterion.

(14) *Waste Acids From Titanium Dioxide Production.* Several industry commenters suggested revisions to the definition of this waste. One commenter suggested that EPA's definition be modified in order to avoid discriminating against producers of titanium metal, requesting that the definition read "waste acids from the processing of titanium bearing ore." This commenter noted that such an action would treat equally all processors of titanium bearing ore which produce the same acid wastewaters. Several other commenters suggested that in order to clarify that chloride process wastes result from the production of titanium tetrachloride, which is an intermediate in the production of titanium dioxide, the waste stream should be defined as "waste acids and contained solids from titanium tetrachloride and titanium dioxide production and related air pollution control devices."

Several commenters expressed opposition to the continued exclusion of this waste. They argued that certain facilities already manage titanium dioxide acids as hazardous wastes, thus demonstrating that the management of these wastes under Subtitle C is technically and economically feasible.

EPA agrees that it should recognize differences in processes as well as the dissimilar components of waste streams that are generated from titanium ore processing. Accordingly, EPA will make separate Bevill exclusion decisions for sulfate process waste acids, sulfate process waste solids, chloride process waste acids, chloride process waste solids, and leach liquors, and will consider all facilities that are primary producers of either titanium metal or titanium dioxide.

(15) *Chromite Ore Roasting/Leaching Slag.* One commenter contended that chromite ore roasting/leaching slag is a low hazard waste. This commenter argued further that the exclusion of such slag under the Bevill Amendment should include all slags disposed in the past. Another commenter suggested that for clarity, "chrome ore tailings and chromium-contaminated waste" should be substituted for "slag" in the text of the proposed rules. Finally, the operator of one chromite ore processing facility indicated that its roasting/leaching slag is generated at a rate high enough to surpass EPA's proposed cut-off rate of 50,000 metric tons per year, but did not provide a quantity.

EPA rejects the suggestion that the definition of this waste should be broadened in any way. For clarity, however, this candidate special waste is, in today's proposal, referred to as "roast/leach ore residue from primary chrome ore processing."

E. Related RCRA Issues

1. Applicability of the Mixture Rule

The October 20, 1988 proposal to reinterpret the scope of the Bevill exclusion as it applies to wastes from mineral processing operations contained specific language indicating that mixed waste streams would be removed from the Bevill exclusion if they are mixtures of (1) characteristic hazardous waste(s) and a Bevill-excluded waste that continues to exhibit one or more hazardous characteristics, or (2) any listed hazardous waste and a Bevill-excluded waste. Several commenters opposed the application of the mixture rule to Bevill wastes, contending that EPA cannot legally apply the mixture rule to any mixtures containing Bevill wastes, because Bevill wastes are temporarily exempt from all Subtitle C requirements, including the mixture rule.

Several commenters also maintained that applying the mixture rule and not excluding Bevill wastes that are mixed with hazardous waste is unrealistic; many mineral processing facilities combine their waste streams with those generated by beneficiation and other processing operations in common tailings or evaporation ponds. Furthermore, while much of the justification for co-management is economic or technical in nature, commenters indicated that often the practice is employed for environmental and regulatory reasons, i.e., Bevill wastes may be co-managed in order to comply with non-RCRA regulatory requirements such as NPDES permit limitations.

Some commenters specifically argued that the interpretation of the mixture rule with regard to co-management with a characteristic hazardous waste is overly restrictive. Mixing low volume characteristic hazardous wastes with high volume Bevill wastes that also exhibit a characteristic of hazardous waste often does not appreciably change the characteristics of the waste mixture and hence, its environmental impact. In cases where waste mixtures display none of the characteristics of a hazardous waste other than those exhibited by the Bevill waste alone, the commenters contended that environmental protection is not improved by depriving the mixture of its Bevill exclusion.

Therefore, several commenters recommended that EPA suspend or modify the mixture rule as applied to mineral processing wastes, thus permitting the co-mingling of wastes and avoiding imposition of a less effective and environmentally protective waste management system. One commenter specifically recommended that EPA determine that when a Bevill waste is intentionally mixed with another waste stream in order to treat that waste, and thereby achieve compliance with other regulatory requirements (e.g., NPDES permit limitations), the resulting treated waste would retain its exempt status. Another commenter requested specifically that EPA modify its interpretation of the mixture rule so that the rule would be inapplicable to mixtures of Bevill waste and recently listed hazardous wastes from mineral processing. Finally, several commenters requested that the final rule be altered so that mixtures of Bevill wastes and relatively small quantities of non-Bevill hazardous wastes retain their Bevill status so long as the only hazardous characteristics displayed are those displayed by the Bevill waste alone.

Some commenters contended that precedent exists for EPA to modify the regulations regarding mixtures. They argued that EPA has authority from various sections of RCRA, in particular the Simpson Amendment (section 3004(x)) and section 3004(a), to modify regulation of certain wastes to allow for special circumstances. They also maintained that in the past EPA has indicated that *de minimis* quantities of hazardous wastes that are mixed with Bevill wastes would retain their excluded status (e.g., in a letter from EPA to the Utility Solid Waste Activities Group dated January 13, 1981), establishing a precedent for exempting certain co-mingling practices from the mixture rule. Finally, some commenters contended that EPA has previously articulated a modified mixture rule position regarding the injection of methanol into extraction wellheads by the oil and gas industry in its Report to Congress on oil and gas wastes.[6] In light of these precedents and in keeping with Congressional intent, these commenters indicated that EPA can and should exempt and study large volume, co-mingled, exempt/nonexempt waste streams before making any final determinations.

After review of these comments and further analysis, EPA has resolved to continue to apply the mixture rule to Bevill and non-Bevill mixed waste streams under almost all circumstances, because to do otherwise would allow many small volume mineral processing wastes to remain effectively excluded from potential Subtitle C regulation, which would be inconsistent with both Congressional intent and the decision of the Court in *EDF* v. *EPA*, and might not be adequately protective of human health and the environment. Therefore, mixtures of one or more listed hazardous wastes and a large volume, low hazard mineral processing waste will be considered a hazardous waste unless and until the mixture is delisted.[7]

EPA has decided, however, that it is appropriate to revise the proposed regulatory status of some mixtures of non-excluded "characteristic" wastes and Bevill wastes. In these instances,

[6] U.S. EPA. *Report to Congress: Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural gas, and Geothermal Energy.* December 1987, p. II–17.

[7] Unless the hazardous waste is listed only because it exhibits a hazardous characteristic; in that instance, the waste is not considered hazardous when and if it no longer exhibits any of the four characteristics of a hazardous waste (40 CFR 261.3(a)(2)(iii)).

the *mixture* will be considered a hazardous waste if it exhibits one or more of the same hazardous characteristics that are exhibited by the non-excluded waste. If the mixture exhibits one or more hazardous characteristics that are exhibited by the Bevill waste but *not* by the non-excluded characteristic waste, then the mixture is *not* a hazardous waste.

EPA wishes to make clear, however, that in any case, mixing a characteristic hazardous waste with a Bevill waste would constitute treatment of a hazardous waste, which would require a RCRA treatment, storage, or disposal permit (Section 3005 "Part A" permit) for interim status, and, subsequently, a final RCRA Part B permit.

EPA will consider modifying the regulatory language addressing the mixture rule found at 40 CFR 261.3(d) to reflect its final position on the applicability of the mixture rule to Bevill mineral processing wastes, and hereby solicits public comment on this issue.

2. Applicability of the Derived-From Rule

The proposed rule contained no explicit discussion of the interaction of the derived-from rule with the mineral processing waste exclusion. Several commenters, however, raised this issue by requesting clarification of the status of wastes generated from co-combustion of hazardous wastes with minerals or ores in mineral processing furnaces.

Several commenters indicated that hazardous waste is regularly burned as fuel in the kilns of lightweight aggregate producers. These commenters contended that this activity is an environmentally sound hazardous waste management practice that advances the objectives of RCRA and, moreover, has been considered within the Bevill exclusion as a matter of Agency policy. These commenters were concerned that a restrictive application of the derived-from rule might prevent or discourage this type of practice within the industry. They suggested that EPA disregard the Subtitle C derived-from rule where mineral processing is involved, effectively allowing wastes generated from processes that burn hazardous waste in mineral processing furnaces to be eligible for retention within the Bevill exclusion.

In contrast, some commenters believed that the application of the derived-from rule prohibits EPA from excluding wastes from mineral processing operations that burn hazardous waste as fuel. They argued that the language of the Bevill Amendment applies only to the extraction, beneficiation, and processing of ores and minerals and does not include or even mention hazardous wastes. Therefore, noted one commenter, any attempt to expand the statutory exemption to encompass residues from the co-burning of hazardous and mineral processing wastes would be counter to Congressional intent and, in fact, unlawful. Furthermore, argued commenters, processes generating these co-combustion wastes fail to satisfy the fifth attribute of the definition of mineral processing listed in the proposed rule (i.e., they represent operations that combine ores or minerals with materials that are not ores or minerals). Therefore, they requested that EPA state explicitly in the final rule that the mining waste exclusion does not encompass residues generated from the co-burning of hazardous wastes with ores and minerals in mineral processing furnaces.

As a potential precedent for excluding these derived-from wastes, several commenters addressed the exclusion of wastes generated from the combustion of hazardous wastes and fossil fuels in coal-fired utility boilers, another group of special wastes excluded from regulation under the Bevill Amendment. These commenters pointed out, however, that the language of the Bevill Amendment acknowledges co-combustion as a common and accepted practice in the utility industry, but not in the mining industry. Therefore, these commenters contended, residuals from the burning of hazardous waste in mineral processing furnaces should not be excluded under the Bevill Amendment even though this practice is allowed under regulations applied to the utility industry. In a similar request, other commenters, concerned that a new interpretation could affect special wastes from coal combustion, requested that EPA apply any interpretations concerning wastes from co-combustion of hazardous wastes with mineral feedstocks only to Bevill exclusion decisions concerning mineral processing wastes (i.e., not to coal combustion wastes).

The Agency has reviewed these comments and evaluated several options regarding the derived-from rule. EPA will clarify the application of the derived-from rule in a supplemental notice (expected in mid-1989) to the May 6, 1987, proposed rules for boilers and industrial furnaces burning hazardous waste. In the interim, the Agency adheres to its prior statements on this issue, i.e., that wastes from co-managing hazardous wastes and Bevill materials remain within the scope of the Bevill exclusion so long as the character of the residues is not significantly affected by the hazardous waste management activity. See 50 FR 49190 1189 (Nov. 29, 11985); 52 FR 17012–13 (May 6, 1987) for further information.

3. The Status of Future Mineral Processing Wastes

Several commenters disagreed with EPA's proposed approach wherein wastes not presently existing or currently meeting the high volume criteria could not be considered for special waste status in the future. They contended that permanently removing mineral processing wastes from the Bevill exclusion in the future is contrary to Congressional intent in that the Bevill Amendment includes no time limits. These commenters argued that limiting this reinterpretation to a specific list of wastes currently meeting the criteria would stifle and frustrate future industry innovations, at a time when the minerals industry is striving to develop new concentration technologies that would produce substantial and varied waste streams. As an example, they noted that the steel industry is currently working on process development for direct steel-making, based on in-bath smelting and continuous refining. If successful, this could lead to the development of totally new processes with environmental and process advantages over current technology, but which would also create new types of waste streams.

Some commenters argued, therefore, that EPA is obligated to study and issue a regulatory determination for any waste that may meet EPA's criteria in the future. They also argued that it is more appropriate to define the scope of the Bevill exclusion for mineral processing wastes directly by the criteria instead of creating a list of wastes that EPA data indicate meet the specified criteria. Using criteria instead of creating a list would allow for the effects of changing market conditions and new mineral processing technologies. These commenters recommended, therefore, that EPA amend the proposed rule to include a provision whereby if a waste qualifies as a high volume waste in the future, it would become subject to the provisions of the Bevill Amendment.

After reviewing these comments and examining the history of the Bevill exclusion in depth, EPA has decided to maintain its proposed approach and make a one-time reinterpretation of the scope of the Bevill exclusion for mineral processing wastes. EPA recognizes that technological advances and changing market conditions may lead to the genesis of new waste streams and/or the generation of existing waste streams

in larger quantities. This is, however, irrelevant to a determination of the proper scope of the Bevill exclusion. Moreover, EPA believes that a one-time decision will serve to encourage rather than discourage environmentally sound mineral production and waste treatment process innovations.

Both the administrative record and Congressional intent clearly indicate that the Bevill Amendment was intended to provide a temporary exclusion, pending further study, over a fixed time period. Congress directed EPA to conduct a single study of wastes generated by mineral mining and processing facilities, because of concern that existing wastes might not be readily amenable to Subtitle C controls and might pose relatively low hazard to human health and the environment. Moreover, contrary to some commenter's assertions, the statutory language includes explicit time limits on the Bevill exclusion, which apply to the submission of the required Report to Congress and subsequent regulatory determination.

In addition, EPA believes that making a one-time reinterpretation is not contrary to the interests of either industry or the environment. With regard to the concern raised by several commenters that the development of new technologies would be stifled, EPA notes that any new wastes generated in the future will be regulated under an established regulatory scheme (i.e., either the Subtitle C or D program). Therefore, rather than facing regulatory uncertainty and incentives to generate large volumes of any new mineral processing wastes, industry will instead have substantial knowledge of the regulatory regime that it will face. Moreover, in keeping with recent EPA policy initiatives, industry will have a clear incentive to ensure that process changes or waste treatment technologies that it develops will generate non-hazardous wastes and waste treatment residuals.

EPA also believes that basing Bevill exclusion determinations on historical waste generation rates will not provide any disincentives for continuing existing waste reduction initiatives. Because the criteria would be applied to wastes and volumes of wastes that were generated between 1983 and 1988, no incentive exists for a facility to increase (or decide not to treat and/or decrease) its generation of a particular mineral processing waste in the future in order to meet the criteria.

4. The Status of Historical Accumulations of Mineral Processing Wastes

As EPA stated in the preamble to the proposed rule, a number of mineral processing wastes that have been provisionally excluded from regulation as hazardous wastes by EPA's 1980 interpretation of the Bevill Amendment would become subject to RCRA Subtitle C regulations if they exhibit hazardous characteristics. Several commenters indicated concern that the implications of the proposed rule have not been completely articulated, stating that the proposed rule is not clear about whether existing waste management units at active or potentially active facilities would be subject to Subtitle C requirements if the wastes they contain exhibit hazardous characteristics.

These commenters contended that if wastes removed from the Bevill exclusion under the final rule are retroactively subjected to Subtitle C requirements, large cost impacts associated with closure and post-closure care of existing storage and disposal units would occur. Therefore, they argued that in resolving this issue, EPA must consider costs, technical feasibility, Subtitle C landfill capacity, and other practical problems. One commenter added that retroactive application of Subtitle C to wastes withdrawn from Bevill by this proposal is not only unwarranted but potentially unlawful. Other commenters expressed concern that the retroactive application of the mixture rule, particularly in cases in which the vast majority of the waste is exempt, was never anticipated by Congress and would entirely eviscerate the Bevill Amendment exclusion.

Many commenters argued that EPA must clarify its position on this issue in the final rule. Some commenters recommended that existing wastes be "grandfathered" and any new Subtitle C regulation of processing wastes should only occur prospectively. Some suggested that this could be accomplished by explaining in the preamble that wastes disposed of prior to the effective date of the rule would continue to be considered excluded if either (1) they would be excluded under the new rule or (2) they would reasonably have been considered excluded under interpretations existing at the time of disposal.

In keeping with EPA's long-standing policy, the Agency intends to treat non-excluded mineral processing wastes that are disposed prior to the effective date of the rule that makes them subject to Subtitle C requirements (in this case, as a result of this proposed reinterpretation of the Bevill exclusion) as not being subject to direct Subtitle C controls such as closure and post-closure care requirements. Therefore, existing accumulations of waste that were tentatively considered to be excluded from Subtitle C requirements by the Bevill amendment prior to the effective data of this proposed reinterpretation would not be subject to direct Subtitle C controls unless and until the accumulated wastes are actively managed (i.e., accumulations left undisturbed will not be subject to Subtitle C regulation). The waste management units that contain these wastes might, however, be subject to the requirements for solid waste management units promulgated pursuant to section 3004(u) of RCRA, if the facility were otherwise subject to RCRA Subtitle C permitting requirements.

5. RCRA Section 3004(x)

As part of the 1984 HSWA Amendments, Congress incorporated a provision that allows the EPA Administrator to relax certain of the Subtitle C standards contained in the new amendments as they relate to the management of mining wastes, utility wastes, and cement kiln dust waste. This provision, found at section 3004(x), is commonly called the Simpson Amendment. The Simpson Amendment allows EPA to modify the minimum technical standards for the design, construction, and operation of waste management units, land disposal restrictions, and corrective action requirements for continuing releases, as long as protection of human health and the environment is assured.

One commenter contended that EPA should exercise the authority provided by the Simpson Amendment to modify the Subtitle C technical standards for the wastes that would be removed from the Bevill Amendment exclusion. This commenter argued further that modified requirements should follow the Subtitle D program being developed for extraction and beneficiation wastes.

EPA believes that the provisions of section 3004(x), and hence, the opportunity for flexible application of Subtitle C requirements, apply only to the special wastes identified in the statute. Accordingly, section 3004(x) would not apply to wastes that are not special wastes and that would therefore be removed from the Bevill exclusion by this proposed rule. Although the Agency might, under other circumstances, be willing to consider modifying the technical standards of Subtitle C to account for unique or unusual

characteristics of mineral processing operations (as long as the revised standards would ensure protection of human health and the environment), EPA does not have the authority to apply the flexibility afforded by section 3004(x) to materials that are not special wastes.

IV. Changes to the October 1988 NPRM

Today's proposed rulemaking contains several substantial changes from the October 20, 1988 NPRM. The primary changes are to the criteria used for selecting the specific wastes proposed for retention within the Bevill exclusion. In particular, today's rule modifies the "high volume" criterion and adds, for the first time, an explicit criterion for identifying "high hazard" mineral processing wastes. Although basically unchanged from the October 20, NPRM, the criteria used to define "mineral processing waste" are further clarified in this NPRM.

Following analysis of public comments received on today's proposal, EPA will, by August 18, 1989, finalize this rulemaking. Although the status of the wastes that are today proposed to be conditionally retained within the Bevill exclusion will be considered in a subsequent rulemaking, no changes to the mineral processing "special waste" criteria will be entertained after August 18, 1989. The subsequent proposal (by September 15, 1989) will simply apply the final Bevill mineral processing waste criteria to the conditionally excluded wastes, in light of additional data that EPA will collect during the next several months.

A. Addition of a Low Hazard Criterion

As discussed above, in light of public comments and further internal analysis, EPA has decided to include in this proposal a criterion by which to address the "low hazard" aspect of the "special wastes" concept. The purpose of this new hazard criterion is to identify candidate Bevill mineral processing wastes that pose an unambiguously high level of hazard to human health and/or the environment. EPA believes that any waste failing such a criterion is sufficiently hazardous to justify immediate Subtitle C regulation, rather than postponement pending completion of the 8002(p) study and subsequent regulatory determination. Moreover, such wastes should not, in the Agency's view, be eligible for any permanent exclusion from Subtitle C regulation, irrespective of volume, costs of controls, or any of the other section 8002(p) study factors. Hence, these wastes should not qualify as "special wastes." EPA wishes to emphasize that the use of the criterion would be restricted to this and the subsequent rulemakings regarding which mineral processing wastes are temporarily exempted from Subtitle C requirements by the Bevill Amendment (i.e., those addressing the proposed and final status of candidate Bevill mineral processing wastes), because it is a screening criterion specifically intended for identifying mineral processing wastes that are also special wastes. The Agency does not contemplate, for example, using the Bevill hazard criterion in making hazard determinations under RCRA Section 3001(a), or as an ARAR in assessing potential remedies at CERCLA mining sites or, necessarily, as the basis for subsequent determinations as to which temporarily excluded wastes should be regulated under Subtitle C. With respect to CERCLA sites, any processing waste which does not pass the Bevill hazard criterion will be treated identically to any other hazardous waste in establishing ARARs. If a processing waste does pass the Bevill hazard criterion, RCRA Subtitle C requirements will not be applicable, but may be relevant and appropriate.

In today's proposal, all high volume mineral processing wastes that are low hazard based on currently available data and the hazard criterion described in the proposal are proposed for continued temporary exclusion from RCRA Subtitle C requirements under the Bevill Amendment. Large volume mineral processing wastes that are not low hazard based on currently available data and the hazard criterion, and which the Agency today is proposing to remove from the Bevill exclusion, are identified below. EPA believes that these materials pose a sufficiently high hazard to demonstrate that they are not special wastes. The data used to make these proposed decisions are presented in Appendix I.

A number of additional wastes do, according to available data (including data submitted in public comment on the October 20, 1988 NPRM), meet EPA's criteria for high volume mineral processing wastes. The Agency does not, however, possess sufficient data at this time to apply the hazard criterion to these wastes. Hence, EPA is today proposing to retain these wastes within the exclusion on a conditional basis. Upon development of the necessary data, EPA plans to propose, by September 15, 1989, which of the wastes in this group qualify as special wastes. A final rulemaking on the status of this group of wastes is planned to occur by January 15, 1990. All wastes that are found to meet the final processing, volume, and hazard criteria will be subjected to further study according to the provisions of RCRA section 8002(p) and a subsequent regulatory determination pursuant to section 3001(b)(3)(c).

The criteria EPA has developed for this rulemaking are intended to identify those mineral processing wastes that are clearly not "special wastes". Because the "low hazard" criterion is a screening criterion for determining which high volume wastes will be subject to special study and regulatory consideration, rather than a criterion that will determine the final regulatory status of a waste, EPA believes that it is appropriate to use a measure of hazard that identifies highly hazardous wastes. This measure need not be identical to the characteristics tests that EPA has promulgated under section 3001(a) of RCRA to identify hazardous wastes. As discussed above, some wastes that fail these tests may still be appropriate for further study and possible permanent exclusion from Subtitle C, as EPA determined for mineral extraction and beneficiation wastes (see 51 FR 24496). The U.S. Court of Appeals for the D.C. Circuit has already agreed that the hazardous characteristic tests need not, by themselves, be determinative of the ultimate regulatory status of special wastes (852 F.2d at 1314).

To develop a hazard criterion, EPA looked at the four types of waste characteristics that are generally used to identify wastes that are hazardous (i.e., ignitability, corrosivity, reactivity, EP toxicity). The ignitability and reactivity tests used to identify wastes that exhibit hazardous characteristics, however, are such that they can not be readily "relaxed" for use as part of a screening criterion. In addition, the Agency currently has virtually no information on the potential reactivity or ignitability of any mineral processing wastes. Therefore, the hazard criterion described in today's proposal is based on the other two types of tests, which have been or will be applied to those mineral processing waste streams meeting the high volume criterion: (1) A pH test and (2) a mobility and toxicity test. Candidate Bevill wastes must pass both of these tests to be eligible to remain within the exclusion.

The pH test that EPA is using requires that a mineral processing waste have a pH between 1 and 13.5 to be considered a "special waste". This criterion represents a one order of magnitude "relaxation" of the pH levels used to identify corrosive hazardous wastes.

The proposed mobility and toxicity test parallels the EP toxicity test used to

identify solid wastes that exhibit hazardous characteristics, but utilizes a different leaching procedure and leaching medium to predict the mobility of contaminants. Mineral processing waste samples prepared for analysis according to this procedure will provide the basis for determining mobility and toxicity. Concentrations of constituents in the resulting extracts will then be compared with 100 times Maximum Contaminant Levels (MCLs) as promulgated under authority of the Safe Drinking Water Act for each of the standard EP toxicity test contaminants. The dilution factor of 100 is consistent with that used in the EP and TCLP procedures.

The Agency is proposing to use a recently developed synthetic precipitation leaching procedure (Method 1312) to predict the mobility of contaminants in candidate low hazard wastes. In addition, the proposed (54 FR 3212, January 23, 1989) mandatory quality assurance/quality control procedures described in Chapter One of SW–846 would also apply to this method. Method 1312 simulates the leaching process created by acidified precipitation percolating through a waste. The Agency believes that this leaching procedure is the appropriate method to use in screening the mobility and toxicity of these particular large volume wastes to determine whether they are clearly not low hazard wastes.

Using Method 1312, which is fully described in the docket for today's proposal and is available through the RCRA Hotline, the waste is mixed with a mildly acidic aqueous leaching medium, and the mixture is agitated to extract any mobile toxicants present in the waste. The acidity and composition of the leaching fluid are designed to simulate the acidity of rainfall that occurs in the general region of the country where the waste is managed (i.e., east or west of the Mississippi River). The resulting extract is then analyzed via established SW–846 analytical methods to determine the degree to which contaminants might leach out of the waste and migrate away from the disposal area.

While the Agency has not yet completed its evaluation of Method 1312, work conducted to date indicates that the procedure is of acceptable precision. A recent study (EMSL, 1989) [8] indicates that Method 1312 produces a reasonably precise measurement of the mobilization of organic compounds and certain metals from soil. The method was also found to be fairly robust with respect to the effects of small variations in extraction fluid pH, waste-extraction fluid contact time, and the ratio of extraction fluid to waste. Based on the results of this study and the similarity of Method 1312 to the more completely evaluated Method 1311 (the Toxicity Characteristic Leaching Procedure) on which it is based, the Agency feels confident in using Method 1312 for this application.

Because Method 1312 is a new procedure, the Agency has not yet completed its evaluation of the testing procedure and does not currently possess data from its application to mineral processing wastes. The Agency does, however, have data from neutral water testing of several candidate special mineral processing wastes upon which to base today's proposal. These water extract data serve as the primary basis for making the limited number of proposed Bevill exclusion decisions that are listed below. Because neutral water is only slightly less aggressive than the Method 1312 leaching medium, the Agency believes that any wastes excluded based on neutral water extract data would also be excluded using Method 1312. In cases where the Agency did not have neutral water data, EPA made limited use of Method 1310 (the EP-Toxicity Test Procedure) extract data. If Method 1310 indicated that a waste had low leaching potential, the Agency assumed that Method 1312 data would yield a similar result, because the Method 1310 extraction medium is generally a more aggressive extraction medium than that used in Method 1312. That is, if a waste passes the Extraction Procedure Toxicity Test procedure, it would almost certainly not exceed the inherent toxicity test being used as part of the Bevill low hazard criterion for today's proposed rule.

Evaluation of candidate Bevill mineral processing waste streams with respect to both hazard criterion tests is a two step process:

(1) Determine if the waste stream fails the hazard criterion at each facility for which data are available; and

(2) Determine if the waste stream fails the hazard criterion for the commodity sector.

For step 1, different procedures are required depending on the number of samples taken from a facility, as follows:

- If only one sample was or is taken at a facility, then analysis of that sample determines whether the waste stream fails or passes at that facility;
- If two samples were or are taken at a facility, then the lower value is analyzed in the pH test,[9] and the mean of the two samples is used for the toxicity and mobility test; and
- If more than two samples were or are taken from a facility, then the median value is used for the pH test, while the mean value is used to assess toxicity and mobility.[10]

In step 2, a waste stream will fail the proposed hazard criterion for the commodity sector if it fails either of the hazard tests at two or more facilities, regardless of the number of facilities generating the candidate Bevill waste. For each high volume mineral processing waste generated by two or more facilities that previously have not been sampled adequately to apply the hazard criterion, EPA plans to sample two facilities selected at random. In those instances in which a waste is generated at only one operating facility, then that facility will be sampled and the waste stream will be removed from the Bevill exclusion if it fails the hazard criterion. EPA recognizes that this method is not rigorously valid in a statistical sense, but believes that it is a reasonable way to make decisions based upon extremely limited data.

Under today's proposed rule, a waste stream would be removed from the Bevill exclusion if it failed either of the proposed hazard criterion tests. The procedure for evaluating a waste stream for purposes of developing today's NPRM was based in part on the availability of data. In cases where EP extract data were available for a mineral processing waste and these data indicated that the waste does not exhibit the hazardous characteristic of EP-toxicity, EPA has assumed that the waste would pass the toxicity portion of the proposed low hazard criterion (which uses Method 1312) and is today proposing that it be retained within the Bevill exclusion. In cases where no data were available or the data indicated that a waste stream failed the EP toxicity test, but no water extraction data were available, further sampling is required and EPA is proposing to conditionally retain the waste within the Bevill exclusion if it is high volume.

EPA recognizes that the concept of explicitly addressing hazard in making

[8] "Performance Testing of Method 1312—QA Support for RCRA Testing." T.C. Chiang, C.A. Valkenburg, and P.A. Miller, Lockheed Engineering and Science Co., and S. Wayne Sovocool, EMSL—LV, March 21, 1989.

[9] The lower pH value is used because pH is measured on a logarithmic scale and the average of the anti-logs of multiple values will be dominated by the lowest value.

[10] The median value is used for pH because pH is measured on a logarithmic scale and an average pH is a meaningless number. Mean values of constituent concentrations are used due to the limited data available.

waste-specific Bevill exclusion decisions is a departure from previous Agency rulemaking proposals related to the proper scope of the Bevill exclusion. Accordingly, EPA solicits public comment on a number of issues pertaining to the new hazard criterion:

(1) The appropriateness of using pH and mobility and toxicity tests to evaluate waste-specific hazard;

(2) The appropriateness of EPA's decision not to employ a consideration of ignitability and reactivity in the hazard criterion.

(3) Whether additional constituents or measurements, particularly residual radioactivity, should be incorporated into the inherent toxicity test, and what measure is appropriate;

(4) The appropriateness of using Method 1312 and the EP-toxicity characteristic regulatory levels contained in 40 CFR 261.24(b);

(5) The appropriateness of using neutral water extracts as surrogates for data obtained using Method 1312;

(6) The appropriateness of the assumption that leachate concentrations obtained using Method 1312 will not be greater than those obtained by Method 1310;

(7) Whether EPA should incorporate selected indices of environmental hazard (e.g., Ambient Water Quality Criteria) for contaminants that are more toxic to non-human organisms than to humans (e.g., copper, zinc); and

(8) The appropriateness of the two-facility test to determine whether a candidate waste fails the hazard criterion.

B. Revision of the High Volume Criterion

In the October 20, 1988 NPRM, a waste stream was classified as a high volume waste and proposed for continued temporary exclusion from Subtitle C regulation if one of the following two conditions were fulfilled:

(1) The annual total quantity of the specific waste generated by all of the facilities in the United States in any one calendar year equals more than 2 million metric tons; or

(2) The specific waste stream is generated at an average rate of more than 50,000 metric tons per facility per year.

As discussed above, for today's proposal EPA has used only the average facility generation rate to determine whether a candidate mineral processing waste is a high volume, special waste. That is, for any waste stream arising from mineral processing in any given mineral commodity sector, the high volume criterion is satisfied if the average annual per-facility generation rate for all facilities generating that waste exceeds 50,000 metric tons. Based on currently available information, the Agency's proposal to use only the average annual facility generation rate to identify high volume mineral processing wastes affects the status of only one mineral processing waste: air pollution control dust from lime kilns. Industry comments indicate that the lime industry does not object to this proposed change in the status of this waste with respect to the Bevill exclusion.

Because EPA wishes to obtain the most recent available data, the Agency will now entertain data pertaining to waste generation during the period from 1983 through 1988, inclusive, rather than the period from 1982 through 1987, as indicated in the October 20, 1988, NPRM. Wastes that exceed the volume threshold for any single year during this five year period satisfy the high volume criterion. According to the information available to EPA, changing the dates of eligibility in this way will not remove any wastes from Bevill that would otherwise qualify as high volume wastes.

C. Clarificatfon of the Definition of Mineral Processing

EPA is continuing to use the definition of mineral processing that it articulated in the October 20, 1988, NPRM, but offers the following clarifications.

- Pollution control residuals may be considered solid wastes from the processing of ores and minerals. The residuals, however, must independently meet the high volume and low hazard criteria to qualify for continued exclusion under the Bevill Amendment. Wastewater can qualify as a mineral processing waste if the influent is derived wholly from mineral processing operations and also meets the high volume and low hazard criteria.
- Heap, dump, and in-situ leaching, as well as tank and vat leaching, are specifically defined as beneficiation operations. EPA currently considers active leach piles to be raw materials used in the production process, and leach solutions to be intermediate products. As long as the leaching operations are active, only leach solutions that escape from the production process are considered wastes.
- Processes that use heat to change the chemical composition of ores and minerals (or beneficiated ores or minerals) are, in general, considered mineral processing operations. These processes include activities such as roasting, smelting, calcining, and other pyrometallurgical techniques, which may not act to concentrate the ore or mineral value, but do enhance its characteristics. Operations that use heat only for purposes of drying, such as heating of diatomaceous earth to drive off waters of hydration, do not change the chemical composition of the materials involved in the process and hence, are considered beneficiation rather than processing operations.
- The 50 percent rule applies to all materials entering a process operation that contain the mineral value rather than all materials entering the operation irrespective of function. The requirement that at least 50 percent of the feedstock be ores or minerals (or beneficiated ores and minerals) allows mineral processing operations to use recycled materials, while ensuring that secondary processing wastes do not receive an unintended regulatory exclusion. Materials not containing the mineral value (e.g., reducing or fluxing agents) are not included when determining whether a waste complies with the 50 percent rule.
- Activities, such as manufacturing and alloying, that use concentrated ores or minerals (or beneficiated ores or minerals) without further removing or enhancing the desired mineral product(s) do not fall within the scope of mineral processing operations. Similarly, operations that involve mixing products of mineral processing with other non-mineral materials (e.g., ammonia, refined metals) are also not considered mineral processing.

D. Resulting Revisions to the Proposed Regulation

This section describes the waste-specific implications of applying the revised special mineral processing wastes criteria included in today's proposal, given the Agency's current state of knowledge. For some candidate wastes, EPA believes that it has sufficient data to make a decision to either propose to retain or propose to withdraw the waste from the Bevill exclusion. These decisions, and the data and analysis that support them, are discussed below.

Today's proposed rule also contains an explicit definition of ore and mineral beneficiation, so as to eliminate confusion and provide clear guidance as to whether a particular material is a beneficiation or a processing waste.

For a number of candidate wastes, particularly those nominated in public comment on the October 20, 1988 NPRM, however, the Agency is presently unable to apply the hazard criterion, and hence, cannot propose to either retain or withdraw the wastes. In these instances, EPA is proposing to conditionally retain the wastes within the exclusion until January 15, 1990, at which time EPA plans to make a final decision as to their Bevill status. If EPA obtains information that enables it to make a determination of hazard on a sufficiently timely basis, then the Agency will formally propose to either retain or withdraw any such waste(s) by September 15, 1989. The wastes that EPA believes meet the processing definition and high volume criterion constraints, but for which the data necessary to apply the hazard criterion are not currently available, are listed below.

Finally, as discussed above, the Agency received nominations for a large number of additional wastes, that, after review of the available information, the Agency believes do not qualify for

temporary exclusion under Bevill. These wastes are, in EPA's judgment, outside the scope of the Bevill mineral processing wastes exclusion, for a number of reasons. Some are clearly beneficiation wastes; others are wastes that are generated downstream of mineral processing, or in some instances, have a very tenuous link with mineral processing of any kind. Still others are wastes from mineral processing, but are generated in quantities too small to be considered "special wastes." Finally, some waste nominations were accompanied by statements or data that were too vague and incomplete to fully evaluate. In the absence of complete and compelling evidence to the contrary, EPA is proposing that these materials are outside the scope of the Bevill exclusion.

1. Wastes for Which Current Data Support a Proposed Exclusion Decision

a. Wastes Meeting the Processing and High Volume Criteria for Which Hazard Data are Available. Because of the addition of the hazard criterion and data limitations, the group of wastes proposed for exclusion today is different than the group of fifteen proposed in October, 1988. After consideration of the available information, the Agency has decided that it has sufficient data to determine the exclusionary status of nine mineral processing waste streams, some of which were previously proposed to be retained within the exclusion and some of which were nominated in public comment. Of those waste streams, six meet both the high volume and low hazard criteria and thus are proposed for continued exclusion, while three waste streams fail the low hazard criterion and thus would be removed from the Bevill exclusion and regulated under Subtitle C if they exhibit one or more hazardous characteristics. The data supporting these proposed exclusion decisions (i.e., against which the special wastes criteria were applied) are presented in Appendix I to this preamble.

Wastes Proposed for Retention Within the Bevill Exclusion

1. Slag from primary copper processing;
2. Slag from primary lead processing;
3. Red and brown muds from bauxite processing;
4. Phosphogypsum from phosphoric acid production;
5. Slag from elemental phosphorus production; and
6. Furnace scrubber blowdown from elemental phosphorus production.

Wastes Proposed for Withdrawal from the Bevill Exclusion

1. Acid plant and scrubber blowdown from primary copper processing;
2. Acid plant blowdown from primary lead processing; and
3. Air pollution control scrubber blowdown from primary tin processing.

b. Materials not Meeting the Processing Waste Definition and Wastes Which Fail the Volume Criterion. In response to the proposed rule, commenters nominated many additional waste streams that they believed should be retained within the temporary exclusion. EPA has reviewed these nominations, and in most instances, has concluded that these additional wastes should not be afforded special waste status, and hence, is today proposing to remove them from the temporary exclusion (a few, however, fall within the exclusion as extraction and beneficiation wastes). The reasons for these waste-specific decisions are varied; some wastes did not meet the definition of mineral processing wastes (e.g., are beneficiation or alloying wastes), while others are generated by processes that are outside the scope of this rulemaking (e.g., secondary metal production). The most common reason, however, for rejecting claims of Bevill status was that the nominated materials are not high volume wastes. These wastes and the reason(s) that EPA is proposing to withdraw them from the Bevill exclusion, are presented in Table 1.

2. Wastes Meeting the Processing Waste and High Volume Criteria for Which Sufficient Hazard Data are Unavailable

Of the many wastes nominated for exclusion by commenters, 33 wastes appear to meet the processing waste definition and the revised high volume criterion. Because the Agency does not have sufficient data at this time to determine whether these wastes meet the low hazard criterion, EPA is today proposing to conditionally retain these waste streams within the Bevill exclusion until EPA can collect and analyze the necessary data. These materials are listed in Table 2, below. The regulatory status of these wastes will be addressed in a subsequent proposed rulemaking (on or before September 15, 1989).

To obtain sufficient data to allow the Agency to determine whether these 33 wastes are low hazard, the Agency is planning to conduct a waste sampling and analysis effort. The Agency also plans to send letters to all facilities that it believes generate one or more of these wastes requesting information of waste characteristics under the authority of Section 3007 of RCRA. Further, the Agency solicits comments and data that could be used in helping to determine the level of potential hazard that these wastes pose to human health and the environment.

3. Wastes for Which Commenters Provided No Volume or Hazard Data

Commenters on the October 1988 proposed rule nominated several wastes for continued exclusion without providing supporting data. Commenters on one waste in particular, chrome ore roast/leach residue, implied that this waste would meet the Agency's criteria for Bevill exclusion, yet provided no data. In the absence of additional information submitted during the public comment for today's rulemaking that demonstrates that chrome ore roast/leach residue is indeed a high volume waste, EPA plans to remove it from the Bevill exclusion when this proposal is finalized by August 18, 1989.

Another candidate Bevill waste identified in the October 20, 1988 NPRM was iron blast furnace APC dust/sludge. EPA believes that the wastes generated from wet and dry air pollution control techniques at blast furnaces (and other operations) should be considered separately. Currently available data do not, however, allow the Agency to consider these waste streams individually. Accordingly, EPA solicits public comment and data regarding APC dust and sludge generation. In the absence of adequate data, EPA may conclude that neither type of waste independently meets the special waste criteria and, accordingly, propose to remove both from the Bevill exclusion.

Similarly, any other mineral processing wastes for which the Agency does not have information that demonstrates it is a high volume waste will be permanently removed from the exclusion when today's rulemaking is finalized. Therefore, any commenters on today's proposal who suggest additional wastes that should be retained within the exclusion must provide volume data for the waste, as well as any available information on pH (if the waste is a liquid) and toxicity and mobility testing results.

TABLE 1.—EXAMPLES OF WASTES PROPOSED FOR WITHDRAWAL FROM THE BEVILL EXCLUSION ON THE BASIS OF POINT OF GENERATION OR VOLUME, AND WASTES FROM BENEFICIATION THAT ARE UNAFFECTED BY THIS RULE

Sector	Waste stream	Basis for proposed withddrawal *	Information source **	Annual average generation (mt/yr)
Aluminum	Anode prep dust	Low volume	MWEP S0005	2,852
Aluminum	Baghouse bags/plant filters	Low volume	MWEP S0005	9,500
Aluminum	Casthouse dust	Low volume	MWEP S0005	831
Aluminum	Cryolite recovery residue	Low volume	MWEP S0005	30,000
Aluminum	Dross	Low volume	MWEP S0005	5,749
Aluminum	Dust	Low volume	MWEP S0005	1,692
Aluminum	Electrolysis waste	Low volume	MWEP S0005	6,568
Aluminum	Plant trash	Low volume	MWEP S0005	2,400
Aluminum	Scrap furnace brick	Low volume	MWEP S0005	3,830
Aluminum	Skims	Low volume	MWEP S0005	879
Aluminum	Sludge and dredged solids	Low volume	MWEP S0005	5,150
Aluminum	Sweepings	Low volume	MWEP S0005	1,100
Bauxite	Cooling tower blowdown	Low volume	MWEP S0005	2,100
Bauxite	Miscellaneous solid waste	Low volume	MWEP S0005	4,350
Bauxite	Salts	Low volume	MWEP S0005	2,200
Bauxite	Spent cleaning acid	Low volume	MWEP S0005	668
Bauxite	Waste alumina	Low volume	MWEP S0005	6,800
Bauxite	Water softener sludge	Low volume	MWEP S0005	950
Beryllium	Beryl Plant Discard	Low volume	MWEP00041	[1] 37,000
Beryllium	Sludge Leaching Slurry	Low volume	MWEP00041	[1] 47,000
Chromite	Chrome Contaminated Waste	Not Processing—Not Uniquely Associated.	MWEP00058, MWEP00032, 32A.	
Copper	Contact cooling water	Low volume	MWEP S0005	1,807
Copper	Crud	Low volume	MWEP S0005	127
Copper	Furnace Brick	Low volume	MWEP S0005	1,883
Copper	Slimes	Low volume	MWEP S0005	508
Copper	Tankhouse Slimes	Low volume	MWEP S0005	433
Copper	Sodium Hydroxide WWI plant sludge	Low volume	MWEP00030	5,616
Copper	Roast Leach Acid Plant Residue	Not Processing—Prospective Waste.	MWEP00054	
Ferromolybdenum	Slag	Low volume	MWEP S0005, MWEP00007	[1] 682
General	Mill Tailings and Wastewaters	Not Processing—Beneficiation	MWEP00001	
Gold	Spent Ore from Leaching	Not Processing—Benefication	MWEP00064	
Iron	APC dust from Sintering	Not Processing—Beneficiation	MWEP00066, 00028	
Iron	Coke Making Wastes	Not Processing	MWEP00066	
Lanthanides	Beneficiation Wastewater	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Lanthanides	Residues	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Lanthanides	Slag	Low volume	MWEPL0005	[1] 136
Lanthanides	Tailings	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Lead	Slag fines	Low volume	MWEP S0005	10,400
Lead	Slurried APC dust	Low volume	MWEP S0005	7,100
Lead	Solids in plant washdown	Low volume	MWEP S0005	100
Lead	Spent furnace brick	Low volume	MWEP S0005	106
Lightweight Aggregate	Kiln APC Dust	Low volume	MWEPL0006	4,137
Lightweight Aggregate	Raw Fines	Not Processing—Beneficiation	MWEPL0006	
Lime	Kiln APC dust	Low volume	(Proposed Rule; 10/20/88)	[2] 28,205
Magnesium	Slag	Low volume	MWEPL0004	18,577
Molybdenum	Roaster gas scrubber water	Low volume	MWEPL0005	[1] 1,090
Molybdenum	Tailing and solution	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Phosphoric acid (wet)	Runoff from inactive stacks	Not Processing—Not Uniquely Associated.	MWEP00034/MWEP00033	
Secondary Copper	Bleed Electrolyte	Not Processing—Secondary Operation.	MWEP00061	
Secondary Copper	Process Wastewater	Not Processing—Secondary Operation.	MWEP00061	
Shale Oil	Retorting Wastes	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Steel	Steel (BOF) APC dust/sludge	Low volume	MWEP00028	30,000
Tantalum/Niobium	Processing wastes	Low volume	MWEP00015	[1] 1,500
Tin	Slag	Low volume	MWEP00043	15,000
Tungsten	Ore leach sludge	Low volume	MWEPL0002	[3] 3,920
Tungsten	Waste treatment sludge	Low volume	MWEPL0002	[3] 1,176
Uranium	Tailing and solution	Not Processing—Beneficiation	MWEPL0005, MWEP00007	
Zinc	Filter cloths, baghouse bags, filters	Low volume	MWEP S0005	39

TABLE 1.—EXAMPLES OF WASTES PROPOSED FOR WITHDRAWAL FROM THE BEVILL EXCLUSION ON THE BASIS OF POINT OF GENERATION OR VOLUME, AND WASTES FROM BENEFICIATION THAT ARE UNAFFECTED BY THIS RULE—Continued

Sector	Waste stream	Basis for proposed withddrawal *	Information source **	Annual average generation (mt/yr)
Zinc	Goethite	Low volume	MWEP00035	22,000
Zinc	Metal residues (saleable)	Low volume	MWEP S0005	8,571
Zinc	Refractory brick	Low volume	MWEP S0005	510
Zinc	Synthetic gypsum	Low volume	MWEP S0005	16,600
Zinc	ICA tower blowdown	Low volume	MWEP S0005	540
Zinc	Zinc-lean slag	Low volume	MWEP00035, 00055	[1] 36,300

* Wastes designated as "Not Processing—Benefication" will remain excluded, pursuant to EPA's Regulatory Determination (51 FR 24496).
** Refers to comment/document number in RCRA docket, except as noted.
[1] Average is for the commenting company; all other averages are industry averages.
[2] Values are from the Proposed Rule, Oct. 20, 1988.
[3] Calculated using data from comments supplemented with data from BOM sources.

TABLE 2—PROSPECTIVE BEVILL MINERAL PROCESSING WASTES FOR WHICH EPA HAS INSUFFICIENT DATA TO EVALUATE HAZARD

Sector	Waste stream	Industry average generation (mt/yr)	Information source*
Beryllium	Barren filtrate	[1] 80,000	MWEP00041.
Beryllium	Processing raffinate	[1] 530,000	MWEP00041.
Beryllium	Bertrandite thickener slurry	[1] 660,000	MWEP00041.
Cerium	Process water	[1] 75,000	MWEPL0005.
Coal gasification	Gasifier ash	250,000	MWE030.
Coal gasification	Cooling tower blowdown	697,000	MWEP L0016.
Coal gasification	Wastewater	4,980,000	MWEP L0016.
Chromite	Roast/leach ore residue	[2] >50,000	(Proposed Rule; Oct. 20, 1988).
Copper	Bleed electrolyte	[2] 63,514	(Proposed rule; Oct. 20, 1988)
	(additional comments)	([1]) 51,455	MWEP00031A.
Cooper	Process wastewater	[2] 53,050	(Proposed rule; Oct 20, 1988).
Cooper	Slag tailings	[1] 339,500	MWEP00030.
Cooper	Calcium sulfate from WWT	75,750	MWEP00030.
Elemental phosphorus	Furnace off-gas solids	107,000	MWEP00063
	(additional comments)	107,000	MWEP00026.
Elemental phosphorus	Process wastewater	311,00	MWEP0063
	(additional comments)	([1]) 250,000	MWEP00052
	(additional comments)	311,000	MWEP0026.
Hydrofluoric acid	Fluorogypsum	267,000	MWEP00058.
Iron	APC dust/slurry from blast furnaces	[2] 133,208	(Proposed rule; Oct. 20, 1988).
Iron	Blast furnace slag	[2] 408,542	(Proposed rule; Oct. 20, 1988).
Lanthanides	Ammonium nitrate process solution	[1] 52,000	MWEPL0005.
Lead	Process wastewater	[1] 1,300,000	MWEP00036.
Lightweight aggregate	Scrubber wastewater	396,000	MWEP00063
	(additional comments)	([1]) 674,500	MWEP00029.
Lightweight aggregate	Wastewater treatment solids	63,318	MWEP00063
	(additional comments)	([1]) 67,676	MWEP00029.
Magnesium	Wastewater from the anhydrous process	2,730,000	MWEP00063
	(additional comments)	2,730,000	MWEP00018.
Molybdenum	Selenium Pl. Effluent from processing APB	54,000	MWEP00018
	(addition comments)	54,000	MWEP00063.
Phosphoric acid	Process wastewater	[3] >714,000	MWEP00033
	(additional comments)		MWEP00034
Steel	Steel (BOF) slag	200,000	MWEP00028.
Soda ash	Wastes from trona ore processing	[1] 100,000	MWEP00064
	(addition comments)	[3] 2,960,000	MWEP0013
	(additional comments)	[1] 3,600,000	MWEP00013.
Titanium	Leach liquor	[1] 78,000	MWEPL0001.
Titanium	Sulfate processing waste acids	[1] 1,498,400	MWEPL003.
Titanium	Sulfate processing waste solids	[1] 86,800	MWEPL0003.
Titanium	Chloride processing waste acids	[13] 52,933	MWEPL0003.
Titanium	Chloride processing waste solids	[13] 67,066	MWEPL003.
Zinc	Acid plant blowdown	[2] 76,450	(Proposed rule; Oct 20, 1988).
Zinc	Process wastewater	[2] 725,500	(Proposed rule; Oct 20, 1988).

*—Refers to comment number in RCRA docket, except as noted.
[1]—Average is for the commenting company; all other averages are industry averages.
[2]—Values are from the Proposed Rule, Oct. 20, 1988.
[3]—Calculated using date from comments supplemented with data from BOM sources.

V. Regulatory Impacts of This Proposal

When this rule is promulgated in final form, mineral processing wastes that have been temporarily excluded from regulation under Subtitle C of RCRA since 1980, except the 39 "special wastes" described above, may now be subject to Subtitle C requirements beginning, at the latest, on or about February 23, 1990 (i.e., six months after publication of the final rule) (approximately August 23, 1989) in those States that do not have authorization to administer their own hazardous waste program in lieu of EPA (facilities in authorized States will be subject to RCRA requirements only after the State revises its program to adopt equivalent requirements and EPA authorizes the revision). These requirements include determining whether the solid waste(s) exhibit hazardous characteristics (40 CFR 262.11) and, if so, obtaining an EPA identification number (40 CFR 262.34), complying with recordkeeping and reporting requirements (40 CFR 262.40–262.43), and submitting an application for a treatment, storage, or disposal permit (RCRA Sec. 3005 "Part A" permit) for interim status if the waste is managed on-site.

In order to qualify for interim status, owners and operators of existing facilities would have to notify EPA of their hazardous waste management activities by November 23, 1989 (i.e., 90 days after publication of the final rule) and submit a Part A permit application by February 23, 1990 (i.e., 6 months after the publication date of the final rule). Facilities that do not obtain interim status would be required to cease all hazardous waste treatment, storage, and disposal activities requiring a permit and transport all of their hazardous wastes to a permitted facility.

All interim status hazardous waste treatment, storage, and disposal (TSD) facilities (including those that may fail to qualify for interim status) would have to comply with the interim status standards set forth at 40 CFR Part 265. Subsequently, qualifying interim status facilities would have to submit a Part B application for a final RCRA permit if a date for doing so is established by the Regional Administrator. In any event, however, a Part B permit application and a certification of groundwater monitoring and finanical responsibility requirements must be filed by land disposal facilities within 18 months of publication of the final rule for such facilities to retain interim status (40 CFR 270.73(d)). Completion of final permit applications would require individual facilities to develop and compile information on their on-site waste management operations including, but not limited to the following activities: Ground-water monitoring (if waste management on land is involved); manifest systems, recordkeeping, and reporting; closure, and possibly, post-closure requirements; and financial responsibility requirements. The permit applications may also require development of engineering plans to upgrade existing facilities. In addition, many of these facilities will, in the future, be subject to land disposal restriction (LDR) standards. EPA plans to promulgate LDR standards for all characteristic hazardous wastes by May 8, 1990. Under EPA regulations, these standards must require treatment of the affected wastes to a level or by a method that reflects the use of Best Demonstrated Available Technology (BDAT) before the wastes can be disposed on the land. Thus, one future implication of today's proposal (when finalized) will be the ban on land disposal of these wastes unless they are appropriately treated prior to such disposal. Also, facililties with existing permits and permit applications that are currently treating, storing, or disposing of wastes that will be subject to Subtitle C regulation when this rule is promulgated, will have to amend or modify their permits or applications to include provisions applicable to managing these newly non-excluded wastes.

VI. Public Participation

Requests to speak at the public hearing should be submitted in writing to the Public Hearings Officer, Office of Solid Waste (WH–562), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. The public hearing will be at the Washington Plaza Hotel, 10 Thomas Circle, NW., Washington, DC. The hearing will begin at 9:00 a.m., with registration beginning at 8:30 a.m. The hearing will end at 5:00 p.m. unless concluded earlier. Oral and written staements may be submitted at the public hearing. Persons who wish to make oral presentations must restrict these to 15 minutes, and are requested to provide written comments for inclusion in the official record.

VII. Effect on State Authorizations

This proposal, if promulgated, will not be automatically effective in authorized States, since the requirements will not be imposed pursuant to the Hazardous and Solid Waste Amendments of 1984. Thus, this reinterpretation will be immediately applicable only in those few States that do *not* have final authorization to operate their own hazardous waste programs in lieu of the Federal program. In authorized States, the reinterpretation and the regulation of non-excluded processing wastes will not be applicable until the State revises its program to adopt equivalent requirements under State law.

States that have final authorization are required (40 CFR 271.21(e)) to revise their programs to adopt equivalent standards by July 1, 1990 if only regulatory changes are necessary, or by July 1, 1991 if statutory changes are necessary. These deadlines can be extended by up to six months (i.e., until January 1, 1991 and January 1, 1992, respectively) in exceptional cases (40 CFR 271.21(e)(3)). Once EPA approves the revision, the State requirements become RCRA Subtitle C RCRA requirements in that State. States are not authorized to carry out any regulations providing coverage similar to today's proposed rule as RCRA requirements until such regulations (or modifications to regulations) are submitted to EPA and approved. Of course, states with existing standards may continue to administer and enforce them as a matter of state law.

States that submit an official application for final authorization less than 12 months after the effective date of the reinterpretation may be approved without including an equivalent provision (i.e., to address "special" mineral processing wastes) in the application. However, once authorized, a State must revise its program to include an equivalent provision according to the requirements and deadlines provided at 40 CFR 271.21(e).

VIII. Compliance With Executive Order 12291

Sections 2 and 3 of Executive Order 12291 (46 FR 13193) require that a regulatory agency determine whether a new regulation will be "major" and, if so, that a Regulatory Impact Analysis be conducted. A major rule is defined as a regulation which is likely to result in:

(1) An annual effect on the economy of $100 million or more;

(2) A major increase in costs or prices for consumers, individuals, industries,

Federal, State, and local government agencies, or geographic regions; or

(3) Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Section 8 of Executive Order 12291 exempts an agency from the requirements of the order when compliance would conflict with deadlines imposed by statute or judicial order. Accumulating the information and conducting the analyses required to fully comply with the requirements of section 2 and 3 takes many months. Therefore, compliance with these requirements is not possible within the schedule specified by the Court for this rulemaking.

Today's proposed rule would remove the Bevill exclusion from all smaller volume (less than 50,000 metric ton per year) waste streams at ore and mineral processing facilities, and it would also remove the exclusion from the three high volume wastes thus far determined by the Agency to not be low hazard wastes. Therefore, the impacts of today's proposal would fall within the three metal commodity sectors producing the three high volume wastes and any other metal or non-metal ore processing sectors producing smaller volume waste streams that fail the standard EPA characteristic tests for hazardous wastes under Subtitle C of RCRA.

The Agency does not have comprehensive waste quantity or waste characteristics data with which to characterize most of the individual waste streams or sectors potentially affected by today's rule. However, past sampling of facilities in many metal product sectors indicates that some smaller volume waste streams from these sectors contain toxic constituents such as arsenic, lead, cadmium, and other heavy metals at concentrations that would cause them to be considered hazardous wastes under the characteristics testing definition (see reference to Appendix I). There is considerable variability in these data, however, such that certain waste types that test hazardous at one site would not be found hazardous at another. Furthermore, some metallic ore commodity sectors apparently do not currently produce any wastes that would be RCRA hazardous wastes, either because of the nature of the raw materials or processes involved, or because of the waste management practices (e.g., recycling) employed. Thus, EPA expects that any future Subtitle C compliance costs would be quite site- and sector-specific.

Although the Agency cannot conduct a complete economic impact analysis within the period of time allowed by the Court, the Agency's economic impact analyses conducted in support of previous Agency rulemaking and Report to Congress activities suggest that today's proposal may well not meet the criteria for a "major" rule.

As noted in the preamble to the Agency's October 20, 1988, proposed rulemaking on this same topic (53 FR 41297–99), annual costs of Subtitle C compliance for the major metals industries were previously estimated in the $10 to $20 million range. These costs did not include estimates for land disposal restrictions or corrective action requirements, nor did they address many smaller metallic ore sectors. They did, however, include several of the large volume wastes added to the tentative list of special wastes discussed in today's proposed rule; and they did conservatively include many waste streams as hazardous by analogy without specific test data confirmation.

Review of public comments on the cost estimates for the metals sectors presented in the October proposal did not reveal substantial new information regarding small volume metallic ore sector waste streams or the likelihood of their being hazardous under Subtitle C characteristics tests. The Agency also specifically sought comment and data for non-metallic ore and mineral processing sectors, but received no data indicating that these sectors contain small volume waste streams with hazardous characteristics that would be affected by either last October's or today's proposed rules. In the absence of such data, the Agency cannot conduct further substantive evaluations of compliance costs or impacts.

The Agency recognizes that its knowledge of the wastes generated by many metallic and non-metallic ore processing sectors is incomplete. To the extent that these sectors generate low volume wastes that would fail hazardous waste characteristics tests, and hence be subject to Subtitle C requirements after the effective date of this rule, EPA may, therefore, have underestimated impacts in its previous analyses. The Agency does not, however, have information at hand to suggest that there are large numbers of such wastes or that their management would impose substantial costs or impacts. The Agency again requests comment and data pertinent to small volume wastes that may be hazardous under Subtitle C.

Although the Agency does not intend to conduct a Regulatory Impact Assessment (RIA) relating to this rule, an additional economic impact review may be warranted at the time of promulgation. The extent and nature of such a review will depend on specific industry data received in public comments regarding small volume wastes generated by metallic and non-metallic mineral commodity sectors, and on the final array of high volume wastes removed from the Bevill exclusion due to application of the low hazard criterion.

Since the Agency has not in the past determined this to be a major rule, it has not previously conducted a benefits analysis under E.O. 12291. In general, the Agency's waste testing results for metallic ore processing wastes affected by this rule have indicated that some smaller volume wastes would test hazardous under EPA's current characteristics tests. Such wastes would thus pose risks to human health or the environment under plausible mismanagement scenarios typical of those which the Subtitle C regulations are designed to protect against. Therefore, management of such wastes under Subtitle C would yield benefits in terms of human health and environmental protection to the extent that they are currently mismanaged.

This proposal was submitted to the Office of Management and Budget (OMB) for review as required by section 8 of Executive Order 12291. Any comments from OMB to EPA and any response to those comments are available for viewing at the RCRA Docket.

IX. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA) of 1980 (Pub. L. 96–354), which amends the Aministrative Procedures Act, requires Federal regulatory agencies to consider "small entities" throughout the regulatory process. The RFA requires, in section 603, an initial screening analysis to be performed to determine whether a substantial number of small entities will be significantly affected by a regulation. If so, regulatory alternatives that eliminate or mitigate the impacts must be considered.

Section 608 of the Act allows an Agency head to waive or delay completion of the screening analysis in response to an emergency that makes compliance with the requirements of Section 603 on a timely basis impracticable. In this instance, the court-imposed deadline for publication of this proposed rule prevents EPA from conducting a complete analysis of

potential impacts of the rule on small entities in time to support this proposed rule, especially given the large number of industry sectors that nominated new waste streams that appear to meet the volume criterion. The Agency did, however, conduct a detailed screening analysis for all nonferrous smelting and refining and ferroalloy-producing facilities as part of the 1985 proposal to reinterpret the mining waste exclusion. Based on that analysis, the Agency determined that small business ownership (as defined by the Small Business Administration) was rare in metals processing, and further, that in those few sectors (ferroalloys, gold and silver refining) in which facilities were not all owned by large businesses or conglomerates, the small enterprises were generally of a type that would be either unaffected or not significantly affected by the proposed reinterpretation (50 FR 40300).

EPA has not studied enterprise ownership patterns or the potential cost impacts of today's rule for the non-metallic ore and mineral processing sectors. Nevertheless, based on general knowledge of the raw material processing industries and information submitted in public comment on the October 20, 1988 NPRM and on the 1985 proposed reinterpretation, the Agency believes that the general conclusions reached for the metals sectors should apply also to the non-metals sectors and that today's proposed rule would not impose adverse impacts on a substantial number of small business enterprises sufficient to warrant additional application of the Regulatory Flexibility Act. The Agency will, however, present limited additional analysis regarding ownership patterns in and potential effects of the proposed rule on the mineral processing industry when the Bevill special mineral processing waste criteria are finalized (by August 18, 1989).

The Agency solicits comment and further specific information relating to small businesses that may produce ore or mineral processing wastes that would, by virtue of the hazardous characteristics of such wastes, be subject to adverse impacts by today's proposed rule.

List of Subjects in 40 CFR Part 261

Hazardous waste, Waste treatment and disposal, Recycling, Reporting and recordkeeping requirements.

Dated: April 7, 1989.

William K. Reilly,

Administrator.

Appendix I

EXHIBIT 1.—RED AND BROWN MUDS FROM BAUXITE PROCESSING

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H20 (4)		Constituents, concentrations, regulatory levels and rations(5)									
							Percent solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	Radian ..	B-2	ND	Bauxite Residue.	H20		ND	NA	0.11	0.011	<0.002	0.22	0.002	<0.0002	0.052	<0.002
						Avg./Reg. Level.	.....	.....	0.02	0.0001	<0.002	0.04	<0.0004	<0.001	0.05	<0.0004
B	Radian ..	B-1	ND	Bauxite Residue.	H20		ND	NA	1.4	0.009	<0.002	0.81	0.002	<0.0002	<0.002	<0.002
						Avg./Reg. Level.	.....	.....	0.3	0.0001	<0.002	0.2	0.0004	<0.001	<0.002	<0.0004

Overview of Solid Waste Generation, Management and Chemical Characteristics in the Bauxite Refining and Primary Aluminum Reduction Industries, Radian Corporation, McLean, Virginia, November, 1985.

Sample number provided in the source document.

Description of waste type provided in the source document.

Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.

(5) Regulatory levels (in mg/l) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels (except pH) are taken from 40 CFR 261.24(b) and are 100x the MCLs. Constituent concentrations are in units of mg/l. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.

NA = Not applicable.

ND = No data available.

EXHIBIT 2.—ACID PLANT AND SCRUBBER BLOWDOWN FROM PRIMARY COPPER PROCESSING

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste Type (3)	EP/H2O (4)		Constituents, concentrations, regulatory levels and ratios (5)									
							Percent solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	PEDCo..	5-19	DQ828	Acid plant blowdown.	H2O		ND	ND	15.3	2.2	0.032	0.003	0.005	0.12	0.13	<0.03
A	PEDCo..	5-19	DQ829	Acid plant blowdown.	H2O		ND	ND	16	2.7	0.023	<0.002	0.006	0.09	0.13	<0.03
						Avg.			15.7	2.5	0.03	0.003	0.006	0.1	0.1	<0.03
						Avg./Reg. level.			3.1	0.02	0.03	0.001	0.001	0.5	0.1	<0.006
B	PEDCo..	5-10	DQ839	Acid plant blowdown.	EP		<0.01	2.71	21.6	0.3	0.31	0.029	2.55	<0.0006	0.028	<0.04
B	PEDCo..	5-10	DQ841	Acid plant blowdown.	EP		<0.01	ND	14.1	<0.4	0.16	0.024	1.74	<0.0006	0.068	<0.03
						Avg.		2.71	17.9	0.4	0.2	0.03	2.1	<0.0006	0.05	<0.035
						Avg./Reg. level.			3.6	0.004	0.2	0.005	0.4	<0.003	0.05	<0.007
C	PEDCo..	5-10	DR714	Acid plant blowdown.	EP		0.01	2.38	0.19	0.8	1.46	0.005	2.49	0.0013	0.16	<0.03
C	PEDCo..	5-10	DR715	Acid plant blowdown.	EP		0.01	2.4	0.18	<0.8	1.49	0.005	2.89	0.0013	0.16	<0.03
						Avg.		2.38	0.185	0.8	1.475	0.005	2.7	0.0013	0.16	<0.03
						Avg./Reg. level.			0.04	0.008	1.475	0.001	0.5	0.007	0.16	<0.006

(1) Overview of Solid Waste Generation, Management and Chemical Characteristics in the Primary Copper Smelting and Refining Industry, PEDCo Environmental, Inc., Cincinnati, Ohio, October, 1984.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/l) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels (except pH) are taken from 40 CFR 261.24(b) and are 100x the MCLs. Constituent concentrations are in units of mg/l. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
NA=Not applicable.
ND=No data available.

EXHIBIT 3.—SLAG FROM PRIMARY COPPER PROCESSING

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste Type (3)	EP/H_2O (4)		Constituents, Concentrations, Regulatory Levels and Ratios (5)									
							Percent Solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	PEDCo..	App. B	DQ824	Reverberatory Furnace Slag.	H_2O		ND	NA	0.004	<0.8	0.011	<0.002	<0.004	0.0015	<0.004	<0.03
A	PEDCo..	App. B	DQ826	Furnace Flash Slag.	H_2O		ND	NA	0.008	<0.8	0.029	<0.002	0.018	0.001	<0.004	<0.03
A	PEDCo..	App. B	DQ825	New Converter Slag.	H_2O		ND	NA	0.01	<0.8	<0.001	<0.002	0.004	0.0015	<0.004	<0.03
						Avg.			0.007	<0.8	0.01	<0.002	0.06	0.001	<0.004	<0.03
						Avg./Reg. Level.			0.001	<0.008	0.01	<0.0004	0.01	0.007	<0.004	<0.006

EXHIBIT 3.—SLAG FROM PRIMARY COPPER PROCESSING—Continued

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste Type (3)	EP/H_2O (4)		Constituents, Concentrations, Regulatory Levels and Ratios (5)								
							Percent Solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
B	PEDCo..	App. B	DR108	Composite Slag.	H_2O		ND	NA	0.016	<0.8	<0.001	<0.002	<0.004	<0.0006	0.004	<0.03
B	PEDCo..	App. B	DQ837	Aged Slag	H_2O		ND	NA	0.008	<0.8	<0.001	<0.002	0.004	<0.0006	<0.004	<0.03
B	PEDCo..	App B	DQ838	New Slag	h_2O		ND	NA	<0.006	<0.8	0.001	<0.002	0.007	<0.0006	<0.004	<0.03
						Avg.			0.01	<0.8	0.001	<0.002	0.005	<0.0006	<0.004	<0.03
						Avg./Reg. Level.			0.002	<0.008	0.001	<0.0004	0.001	<0.003	<0.004	<0.006
C	PEDCo..	App. B	DR709	Copper Slag	H_2O		ND	NA	0.086	<0.8	0.14	<0.001	<0.008	<0.0006	<0.002	<0.03
C	PEDCo..	App. B	DR706	Blast Furnace Slag.	H_2O		ND	NA	1.18	<0.8	0.032	0.01	0.23	0.0029	0.071	<0.03
C	PEDCo..	App. B	DR707	Blast Furnace Slag.	H_2O		ND	NA	1.13	<0.8	0.005	0.002	<0.17	0.0023	0.062	<0.03
						Avg.			0.8	<0.8	0.06	0.004	0.136	0.002	0.05	<0.03
						Avg./Reg. Level.			0.2	<0.008	0.06	0.0008	0.03	0.01	0.05	<0.006
D	PEDCo..	App. B	DR711	Fresh Slag	H_2O		ND	NA	<0.004	<0.8	0.023	0.002	0.024	<0.0006	<0.002	<0.03
D	PEDCo..	App. B	DR712	Fresh Slag	H_2O		ND	NA	<0.004	<0.8	0.001	<0.001	0.006	<0.0006	<0.002	<0.03
D	PEDCo..	App. B	DR713	Old Slag	H_2O		ND	NA	<0.004	<0.8	0.004	<0.001	0.021	<0.0006	<0.002	<0.03
						Avg.			<0.004	<0.8	0.01	0.001	0.02	<0.0006	<0.002	<0.03
						Avg./Reg. Level.			<0.0008	<0.008	0.01	0.0003	0.003	<0.003	<0.002	<0.006
E	PEDCo..	App. B	DR716	Waste Slag Dump.	H_2O		ND	NA	<0.004	<0.8	3.5	<0.001	0.33	<0.0006	<0.01	<0.03
						Avg./Reg. Level.			<0.0008	<0.008	3.5	<0.0002	0.066	<0.003	0.01	<0.006
F	PEDCo..	App. B	DQ831	Fresh Slag	H_2O		ND	NA	0.048	<0.8	0.048	<0.002	0.007	0.0018	<0.004	<0.03
F	PEDCo..	App. B	DQ832	Old Slag	H_2O		ND	NA	0.041	<0.8	0.002	<0.002	<0.004	0.0009	<0.004	<0.03
						Avg.			0.045	<0.8	0.03	<0.002	0.006	0.001	<0.004	<0.03
						Avg./Reg. Level.			0.009	<0.008	0.03	<0.0004	0.001	0.007	<0.004	<0.006

(1) Overview of Solid Waste Generation, Management and Chemical Characteristics in the Primary Copper Smelting and Refining Industry, PEDCo Environmental, Inc., Cincinnati, Ohio, October, 1984.
(2) Sample number provided in the source document.
(3)Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/l) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels, (except pH) are taken from 40 CFR 261.24 (b) and are 100x the MCLs. Constituent concentrations are in units of mg/l. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
NA=Not applicable.
ND=No data available.

EXHIBIT 4.—ACID PLANT BLOWDOWN FROM PRIMARY LEAD PROCESSING

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste Type (3)	EP/H20 (4)		Constituents, Concentrations, Regulatory Levels and Ratios (5)								
							Percent solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	PEI	5-15	DR083	Neut. acid plant blowdown.	EP		0.01	6.9	24.4	<0.8	2.61	<0.002	1.45	0.0038	0.089	<0.03
						Avg./Reg. Level.			4.9	<0.008	2.61	<0.0004	0.3	0.02	0.09	<0.006
D	PEI	5-15	DQ238	Neut. acid plant blowdown.	EP		0.01	11.2	0.005	0.9	0.014	0.007	22	<0.0002	0.004	<0.03
						Avg./Reg. Level.			0.001	0.009	0.014	0.001	4.4	<0.001	0.004	<0.006

(1) Overview of Solid Waste Generation, Management and Chemical Characteristics, Primary Lead Smelting and Refining Industry, PEI Associates, Inc., Cincinnati, Ohio, November, 1984.
(2) Sample number provided in the source document.
(3)Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/l) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels, (except pH) are taken from 40 CFR 261.24 (b) and are 100x the MCLs. Constituent concentrations are in units of mg/1. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.

EXHIBIT 5.—SLAG FROM PRIMARY LEAD SECTOR

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H20 (4)		Constituents, concentrations, regulatory levels, and ratios (5)								
							Percent solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	PEI	5-19	DQ230W	Granulated furnace slag—Active piles.	H20		ND	NA	<0.004	<0.3	0.024	<0.002	0.115	<0.0007	<0.002	<0.03
A	PEI	5-19	DQ231W	Granulated furnace slag—Inactive piles.	H20		ND	NA	<0.004	<0.3	0.77	<0.002	3.02	<0.0002	<0.002	<0.03
A	PEI	5-19	DQ232W	Granulated furnace slag—Active piles.	H20		ND	NA	<0.004	<0.3	0.24	<0.002	0.318	0.0003	<0.002	<0.03
						Avg			<0.004	<0.3	0.4	<0.002	1.2	0.0004	<0.002	<0.03
						Avg./Reg. Level.			<0.0008	<0.003	0.4	<0.0004	0.2	0.002	<0.002	<0.006
B	PEI	5-19	DQ233W	Granulated furnace slag—Inactive piles.	H20		ND	NA	<0.004	<0.3	0.14	<0.002	0.14	<0.0002	<0.002	0.03
B	PEI	5-19	DQ234W	Granulated furnace slag—Active piles.	H20		ND	NA	<0.004	<0.3	0.059	0.005	0.027	<0.0002	<0.002	<0.03
						Avg.			<0.004	<0.3	0.1	0.004	0.08	<0.0002	<0.002	0.03
						Avg./Reg. Level.			<0.0008	<0.003	0.1	0.0007	0.02	<0.001	<0.002	0.006

EXHIBIT 5.—SLAG FROM PRIMARY LEAD SECTOR—Continued

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H20 (4)		Constituents, concentrations, regulatory levels, and ratios (5)								
							Percent solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
C	PEI	5-19	DQ715W	Granulated furnace slag—Active piles.	H20		ND	NA	<0.002	0.8	5.02	0.005	2.2	<0.0007	0.004	<0.04
C	PEI	5-19	DQ716W	Granulated furnace slag—Active piles.	H20		ND	NA	<0.002	0.3	2.32	<0.002	1.83	0.0009	<0.004	<0.04
C	PEI	5-19	DQ717W	Granulated furnace slag—Inactive piles.	H20		ND	NA	<0.002	0.2	0.17	<0.002	0.063	0.0039	<0.004	<0.04
						Avg.			<0.002	0.4	2.5	0.003	1.4	0.002	0.004	<0.04
						Avg./Reg. Level.			<0.0004	0.4	2.5	0.0006	0.3	0.01	0.004	<0.008
D	PEI	5-20	DR076	Hot dumped blast furnace slag.	H20		ND	NA	0.28	<0.8	0.12	<0.002	0.12	0.0007	0.008	<0.03
D	PEI	5-22	DR077	Dezinced slag ...	H20		ND	NA	0.31	<0.8	0.025	0.005	0.16	0.0013	<0.004	<0.03
D	PEI	5-22	DR078	Dezinced slag ...	H20		ND	NA	0.026	<0.8	0.053	<0.002	0.15	<0.0006	<0.004	<0.03
						Avg.			0.2	<0.8	0.07	0.003	0.1	0.0009	0.005	<0.03
						Avg./Reg. Level.			0.04	<0.008	0.07	0.0006	0.03	0.004	0.005	<0.006
E	PEI	5-20	DR706	Hot dumped blast furnace slag.	H20		ND	NA	1.18	<0.8	0.032	0.01	0.23	0.0029	0.071	<0.03
E	PEI	5-20	DR707	Hot dumped blast furnace slag.	H20		ND	NA	1.13	<0.8	0.005	0.002	0.17	0.0023	0.062	<0.03
						Avg.			1.16	<0.8	0.019	0.006	0.2	0.0026	0.067	<0.03
						Avg./Reg. Level.			0.23	0.008	0.019	0.001	0.04	0.01	0.067	<0.006
F	PEI	5-20	DR949	Hot dumped blast furnace slag.	H20		ND	NA	<0.004	<0.4	0.15	<0.002	0.12	<0.0006	<0.002	<0.03
F	PEI	5-20	DR950	Hot dumped blast furnace slag.	H20		ND	NA	<0.004	0.5	0.061	<0.002	0.071	<0.0006	<0.002	<0.03
F	PEI	5-22	DR951	Dezinced slag ...	H20		ND	NA	<0.004	<0.4	0.006	<0.002	0.011	<0.0006	<0.002	<0.03
F	PEI	5-22	DR952	Dezinced slag ...	H20		ND	NA	<0.004	<0.4	<0.001	<0.002	0.008	<0.0006	<0.002	<0.03
						Avg.			<0.004	0.425	0.05	<0.002	0.05	<0.0006	<0.002	<0.03
						Avg./Reg. Level.			<0.0008	0.00425	0.05	<0.0004	0.01	<0.003	<0.002	<0.006

(1) Overview of Solid Waste Generation, Management and Chemical Characteristics, Primary Lead Smelting and Refining Industry, PEI Associates, Inc., Cincinnati, Ohio, November, 1984.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/1) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels, (except pH) are taken from 40 CFR 261.24(b) and are 100x the MCLs. Constituent concentrations are in units of mg/1. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
NA = Not applicable.
ND = No data available.

EXHIBIT 6.—FURNACE SCRUBBER BLOWDOWN FROM ELEMENTAL PHOSPHORUS PRODUCTION

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste Type (3)	EP/H2O (4)		Constituents, Concentrations, Regulatory Levels and Ratios (5)									
							Percent Solids	pH <1,>13.5	As (5)	Ba 100	Cd (1)	Cr (5)	Pb (5)	Hg 0.2	Se (1)	Ag (5)
1	PEI	126	CL-01	Scrubber Liquids.	EP		ND	2.6	0.016	0.71	3	1.6	0.037	<0.0004	0.045	<0.002
						Avg./Reg. Level.			0.003	0.007	3	0.3	0.007	<0.002	0.045	<0.0004
2	PEI	128	CL-01	Scrubber Liquids.	EP		ND	5.98	0.501	0.26	<0.002	<0.001	0.004	<0.0003	<0.005	<0.002
						Avg./Reg. Level.			0.1	0.003	<0.002	<0.0002	0.0008	<0.002	<0.005	<0.0004

(1) Evaluation of Waste Management for Phosphate Processing, PEI Associates, Inc., Cincinnati, Ohio, August, 1986.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/1) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels, (except pH) are taken from 40 CFR 261.24(b) and are 100x the MCLs. Constituent concentrations are in units of mg/1. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
ND=No data available

EXHIBIT 7—SLAG FROM ELEMENTAL PHOSPHORUS PRODUCTION

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H2O (4)		Constituents, concentrations, regulatory levels and ratios (5)									
							Percent Solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
1	PEI	126	SS-11	Slag solids	EP		ND	NA	0.0033	2.2	<0.02	<0.01	<0.84	<0.0004	<0.004	<0.02
1	PEI	127	SS-61	Slag solids	EP		ND	NA	0.012	2.1	0.035	<0.01	<0.84	<0.0004	<0.004	<0.02
						Avg.			0.008	2.15	0.028	<0.01	<0.84	<0.0004	<0.004	<0.02
						Avg./Reg. Level.			0.002	0.0215	0.028	<0.002	<0.17	<0.002	<0.004	<0.004
2	PEI	129	SS-11	Slag solids	EP		ND	NA	0.0069	0.201	<0.02	0.51	<0.84	<0.0003	<0.005	<0.02
						Avg.			0.007	0.2	<0.02	0.5	<0.84	<0.0003	<0.005	<0.02
						Avg./Reg. Level.			0.001	0.002	<0.02	0.1	0.2	<0.002	<0.005	<0.004
3	PEI	130	SS-11	Slag solids	EP		ND	NA	0.0033	0.3	<0.02	0.06	<0.84	<0.0003	<0.005	<0.02
						Avg./Reg. Level.			0.0007	0.003	<0.02	0.01	<0.2	<0.002	<0.005	<0.004

(1) Evaluation of Waste Management for Phosphate Processing, PEI Associates, Inc., Cincinnati, Ohio, August, 1986.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/1) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels (except pH) are taken from 40 CFR 261.24(b) and are 100× the MCLs. Constituent concentrations are in units of mg/l. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
NA=Not applicable.
ND=No data available.

EXHIBIT 8—PHOSPHOGYPSUM FROM PHOSPHORIC ACID PRODUCTION

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H2O (4)		Constituents, concentrations, regulatory levels and ratios (5)								
							Percent Solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
4	PEI	131	GS-11	Gypsum Solids	EP		ND	NA	0.0033	0.057	0.024	0.058	<0.084	<0.0004	<0.004	0.009
4	PEI	131	GS-61	Gypsum Solids	EP		ND	NA	0.0048	0.04	0.02	0.057	<0.084	0.0004	0.004	<0.002
						Avg.			0.004	0.05	0.02	0.06	<0.084	0.0004	0.004	0.006
						Avg./Reg. Level.			0.0008	0.0005	0.02	0.01	<0.02	0.002	0.004	0.001
5	PEI	132	GS-11	Gypsum Solids	EP		ND	NA	0.0089	0.08	0.018	0.05	0.085	<0.0004	<0.004	0.002
						Avg./Reg. Level.			0.002	0.0008	0.02	0.01	0.02	<0.002	<0.004	0.0004
6	PEI	133	GS-11	Gypsum Solids	EP		ND	NA	0.0021	0.045	0.027	0.09	<0.084	<0.0004	<0.004	0.007
6	PEI	133	GS-61	Gypsum Solids	EP		ND	NA	<0.006	0.067	0.05	0.039	0.1	<0.0004	0.004	0.004
6	PEI	133	GS-81	Gypsum Solids	EP		ND	NA	0.011	0.067	0.063	0.036	0.088	<0.0004	<0.004	0.002
						Avg.			0.006	0.06	0.05	0.06	0.09	<0.0004	0.004	0.004
						Avg./Reg. Level.			0.001	0.0006	0.05	0.01	0.02	<0.002	0.004	0.0009
7	PEI	134	GS-11	Gypsum Solids	EP		ND	NA	0.01	0.085	0.036	0.036	0.087	<0.0004	<0.004	<0.002
						Avg./Reg. Level.			0.002	0.0009	0.04	0.007	0.02	<0.002	<0.004	<0.0004
8	PEI	135	GS-11	Gypsum Solids	EP		ND	NA	<0.006	0.053	0.05	0.087	0.104	<0.0004	<0.005	0.005
8	PEI	135	GS-12	Gypsum Solids	EP		ND	NA	0.0083	0.06	0.036	0.054	<0.08	<0.0004	<0.004	0.27
						Avg.			0.007	0.06	0.04	0.07	0.1	<0.0004	<0.005	0.1
						Avg./Reg. Level.			0.001	0.0006	0.04	0.01	0.02	<0.002	<0.005	0.03
9	PEI	136	GS-11	Gypsum Solids	EP		ND	NA	0.0039	0.095	0.086	0.71	<0.084	<0.0004	<0.004	0.008
						Avg./Reg. Level.			0.0008	0.001	0.09	0.1	<0.02	<0.002	<0.004	0.002
10	PEI	137	GS-11	Gypsum Solids	EP		ND	NA	0.0063	0.072	0.032	0.031	0.084	<0.0004	<0.004	<0.002
10	PEI	137	GS-12	Gypsum Solids	EP		ND	NA	0.0042	0.054	0.012	0.01	<0.084	<0.0004	<0.004	0.007
						Avg.			0.005	0.06	0.02	0.02	0.08	<0.0004	<0.004	0.005
						Avg./Reg. Level.			0.001	0.0006	0.02	0.004	0.02	<0.002	<0.004	0.0009
11	PEI	138	GS-11	Gypsum Solids	EP		ND	NA	0.012	0.63	0.15	0.18	<0.84	<0.0004	<0.004	<0.02
11	PEI	138	GS-31	Gypsum Solids	EP		ND	NA	0.0071	0.55	0.14	0.178	<0.84	<0.0004	<0.004	<0.02
						Avg.			0.01	0.6	0.145	0.2	<0.84	<0.0004	<0.004	<0.02
						Avg./Reg. Level.			0.002	0.006	0.145	0.04	<0.2	<0.002	<0.004	<0.004
12	PEI	139	GS-11	Gypsum Solids	EP		ND	NA	0.014	0.47	0.045	1.4	<0.84	<0.0004	<0.004	<0.02
12	PEI	139	GS-12	Gypsum Solids	EP		ND	NA	0.0086	0.3	0.099	0.13	1.5	<0.0004	<0.004	<0.02
12	PEI	139	GS-31	Gypsum Solids	EP		ND	NA	0.011	0.86	0.048	1.5	<0.84	<0.0004	<0.004	<0.02
						Avg.			0.01	0.5	0.06	1	1	<0.0004	<0.004	<0.02
						Avg./Reg. Level.			0.002	0.005	0.06	0.2	0.2	<0.002	<0.004	<0.004

(1) Evaluation of Waste Management for Phosphate Processing, PEI Associates, Inc., Cincinnati, Ohio, August, 1986.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.

(5) Regulatory levels (in mg/1) shown are those for the hazard criterion presented in this proposal. Highlighted ratios indicate exceedances of the hazard criterion. The regulatory levels, (except pH) are taken from 40 CFR 261.24(b) and are 100× the MCLs. Constituent concentrations are in units of mg/1. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.

NA=Not applicable.
ND=No data available.

EXHIBIT 9.—AIR POLLUTION CONTROL SCRUBBER BLOWDOWN FROM PRIMARY TIN PROCESSING

Plant	Source (1)	Page No.	Sample I.D. (2)	Waste type (3)	EP/H2O (4)		Constituents, Concentrations, Regulatory Levels and Ratios (5)								
							Percent Solids	pH <1,>13.5	As 5	Ba 100	Cd 1	Cr 5	Pb 5	Hg 0.2	Se 1	Ag 5
A	PEI.....	5-5	DR 092	Scrubber Pond Water.	EP		<0.01	7.79	22.9	6.8	0.002	<0.002	0.01	0.0039	0.053	<0.03
A	PEI.....	5-7	DR 091	Scrubber Solids.	H2O		ND	ND	8.21	2.2	0.004	<0.002	0.004	0.0006	0.05	<0.03
						Avg.			15.5	4.5	0.003	<0.002	0.007	0.002	0.05	<0.03
						Avg./Reg. Level.			3.1	0.05	0.003	<0.0004	0.001	0.01	0.05	<0.006

(1) Overview of Solid Waste Generation, Management, and Chemical Characteristics, Primary Antimony, Magnesium, Tin and Titanium Smelting and Refining Industries, PEI Associates, Inc., Cincinnati, Ohio, December, 1984.
(2) Sample number provided in the source document.
(3) Description of waste type provided in the source document.
(4) Indicates whether the data provided are for analysis of the sample according to EP toxicity test procedures (40 CFR 261.24) or an analogous procedure in which deionized water was used as the extraction medium rather than acetic acid. For samples that contain less than 0.5% solids, the methods are equivalent because no extraction of the sample was performed.
(5) Regulatory levels (in mg/l) shown are those for the hazard criterion presented int this proposal. Highlighed ratios indicate exceedances of the hazard criterion. The regulatory levels (except pH), are taken from 40 CFR 261.24(b) and are 100x the MCLs. Constituent concentrations are in units of mg/l. "<" indicates that the concentration was below the detection limit; in these instances, the detection limit was used to compute the average concentration.
NA=Not applicable.
ND=No data available.

For the reasons set out in the preamble, it is proposed to amend Title 40 of the Code of Federal Regulations as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTES

1. The authority citation for Part 261 continues to read as follows:

Authority: Sections 1006, 2002(a), 3001, and 3002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (43 U.S.C. 6905, 6912(a) 6921, and 6922).

2. Section 261.4, paragraph (b)(7), is revised to read as follows:

§ 261.4 Exclusions.

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(b) * * *

(7) Solid waste from the extraction, beneficiation, and processing of ores and minerals (including coal), including phosphate rock and overburden from the mining of uranium ore. For purposes of this paragraph, beneficiation of ores and minerals is restricted to the following activities: crushing, grinding, washing, sorting, sizing, drying, agglomerating, flotation, and heap, dump, tank, vat, and *in-situ* leaching.

(i) The following solid wastes from the processing of ores and minerals are retained within this exclusion:

(A) Slag from primary copper smelting;

(B) Slag from primary lead smelting;

(C) Red and brown muds from bauxite refining;

(D) Phosphogypsum from phosphoric acid production;

(E) Slag from elemental phosphorus production;

(F) furnace scrubber blowdown from elemental phosphorus production.

(ii) The following solid wastes from the procesing of ores and minerals are conditionally retained within this exclusion, pending collection and evaluation of additional data:

(A) Barren filtrate from primary beryllium processing;

(B) Raffinate from primary beryllium processing;

(C) Bertrandite thickener sludge from primary beryllium processing;

(D) Process wastewater from primary cerium processing;

(E) Ammonium nitrate process solution from primary lanthanide processing;

(F) Roast/leach ore residue from primary chrome ore processing;

(G) Gasifier ash from coal gasification;

(H) Cooling tower blowdown from coal gasification;

(I) Process wastewater from coal gasification;

(J) Bleed electrolyte from primary copper refining;

(K) Process wastewater from primary copper smelting/refining;

(L) Slag tailing from primary copper smelting;

(M) Calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining;

(N) Furnace off-gas solids from elemental phosphorus production;

(O) Process wastewater from elemental phosphorus production;

(P) Fluorogypsum from hydrofluoric acid production;

(Q) Air pollution control dust/sludge from iron blast furnaces;

(R) Iron blast furnace slag;

(S) Process wastewater from primary lead smelting/refining;

(T) Air pollution control scrubber wastewater from light weight aggregate production;

(U) Wastewater treatment sludge/solids from light weight aggregate production;

(V) Process wastewater from primary magnesium processing by the anhydrous process;

(W) Process wastewater from primary selenium processing;

(X) Process wastewater from phosphoric acid production;

(Y) Wastes from trona ore processing;

(Z) Basic oxygen furnace slag from carbon steel production;

(AA) Leach liquor from primary titanium processing;

(BB) Sulfate processing waste acids from titanium dioxide production;

(CC) Sulfate processing waste solids from titanium dioxide production;

(DD) Chloride processing waste acids from titanium and titanium dioxide production;

(EE) Chloride processing waste solids from titanium and titanium dioxide production;

(FF) Blowdown from acid plants at primary zinc smelters; and

(GG) Process wastewater from primary zinc smelting/refining.

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