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Office of Solid Waste and Emergency Response

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8. Signature of Lead Office Directives Coordinator — Date 5/21/87

9. Name and Title of Approving Official
Henry L. Longest II, Director, OERR — Date 5/21/87

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

MAY 29 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

OSWER Directive 9320.1-07

SUBJECT: Interim Guidance for Consideration of Sections 105(g) and 125 of the Superfund Amendments and Reauthorization Act of 1986 Prior to NPL Proposal of Special Study Waste Sites

FROM: Henry L. Longest II, Director
Office of Emergency and Remedial Response

TO: Director, Waste Management Division
Regions I, IV, V, VII, and VIII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Waste Management Division
Regions III and VI
Director, Toxics and Waste Management Division
Region IX
Director, Hazardous Waste Division
Region X

This memo is a follow-up to my March 10, 1987, memo (attached) to the Regions that provided operating definitions of special study wastes under the Resource Conservation and Recovery Act (RCRA). The purpose of this memo is to provide interim guidance for fulfilling the requirements of Sections 105(g) and 125 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) in order to propose special study waste sites for the National Priorities List (NPL). This guidance is considered interim because Sections 105(g) and 125 require that the Agency fulfill the additional requirements only until the Hazard Ranking System (HRS) is revised. The revised HRS will consider, to the maximum extent feasible, the relative degree of risk to human health and the environment posed by special study waste sites described in Section 125.

Section 105(g) of SARA applies to sites that, (1) were not on or proposed for the NPL as of October 17, 1986, and (2) contain significant quantities of special study wastes as defined under Sections 3001(b)(2), 3001(b)(3)(A)(ii), and 3001(b)(3)(A)(iii) of RCRA. For these sites, SARA requires that the following information be considered prior to proposal for the NPL:

(A) the extent to which the HRS score for the facility is affected by the presence of the special study waste at, or released from the facility.

(B) available information as to the quantity, toxicity, and concentration of hazardous substances that are constituents of any special study waste at, or released from, the facility; the extent of or potential for release of such hazardous constituents; the exposure or potential exposure to human population and the environment, and the degree of hazard to human health or the environment posed by the release of such hazardous constituents at the facility.

Section 125 of SARA applies to facilities that were neither on nor proposed for the NPL on the date of enactment of SARA and which contain "substantial volumes" of waste described in Section 3001(b)(3)(A)(i) of RCRA. Until the HRS is revised to include consideration of enumerated factors, these sites may not be included on the NPL "on the basis of an evaluation made principally on the volume of such waste and not on the concentration of the hazardous constituents of such waste." Even though Section 125 does not contain specific considerations for the interim period, the Agency recommends that wastes covered under Section 125 follow the same requirements of Section 105(g) until the HRS is revised.

The Agency reviewed HRS packages for a number of special study waste sites to determine if they contain the information necessary to fulfill the requirements of Section 105(g). In general, the data necessary to complete the HRS package provides the needed information to fulfill the requirements described in Section 105(g). Although Section 105(g) states that available information should be used (e.g., sampling data from past or present on-site or off-site examination of the facility or releases from the facility), Section 105(g) does not preclude the gathering of additional information, if necessary, to better evaluate the site.

In order to meet the SARA requirements for these special study waste sites (as defined in the March 10, 1987 memo), the Agency recommends that Regions prepare an addendum to the HRS package which addresses these requirements whenever special study wastes are present at a site. The following guidance covers information that should be included in this addendum. Basically, the addendum is an assessment of risks based on information contained in the HRS package. The addendum is intended to complement the HRS package in addressing the requirements of SARA Sections 105(g) and 125.

Addendum

1. Effect of Special Study Wastes on HRS Score

Section 105(g)(2)(A) of SARA requires an evaluation of the extent to which the HRS score is affected by the presence of the special study wastes at the site. In order to address this regulatory requirement, the following scenarios should be considered:

1) If the special study wastes are one of several contaminants at the site, but there is insufficient information to include them in the HRS score (e.g., no information on waste quantity), then the HRS addendum need only include a discussion of the presence of the special study wastes at the site and any information that is available.

2) If the special study wastes are one of several contaminants at the site, and they do contribute to the HRS score (e.g., the observed release originates from the special study waste or they contribute to the waste quantity score), then the HRS addendum should first discuss the extent to which the score is affected. For example, if the special study wastes are excluded from the waste quantity calculation and the site still scores above 28.50, discuss this point in the addendum. In addition, due to the concern for the special study waste at the site, the evaluation discussed below needs to be performed.

3) In the final scenario, if the special study wastes are the sole contaminants at the site, then the site needs to be scored solely on the basis of these special study wastes and the evaluation discussed below needs to be performed in depth.

2. Qualitative Analysis

A. Information on Waste Constituents

The first step in the qualitative analysis section of the addendum is to identify the types of wastes at the site. Information on the site's history should assist in determining the types of special study wastes present. Site inspection and sampling data may help to evaluate the quantity of waste at the site that is special study waste. In addition to determining the quantity of special study waste, to the extent possible based on the available data, the quantity and concentration of the hazardous constituents should be determined. Both concentrations in the waste and concentrations in the environmental media should be considered.

Information on the toxicity of the hazardous constituents, in addition to that available in the SAX reference required in the HRS guidance, should be considered. Additional toxicity information can be useful in characterizing the potential hazard at the site. The Superfund Public Health Evaluation Manual (SPHEM) (OSWER Directive 9285.4-1, October, 1986)

includes toxicity values, e.g., reference doses (RFDs), health effect assessments (HEAs), carcinogenic potency values, and drinking water maximum contaminant levels (MCLs), that should be evaluated.

B. Exposure Information

The HRS package describes available sampling data on releases, if any, to the surrounding area. The condition of the containment structures along with the local geology and hydrogeology are useful to evaluate the potential for release. The factors affecting release potential should be considered qualitatively to determine the likelihood that people will be exposed.

The potential or actual exposures that may result from a potential or actual release are also considered qualitatively. An environmental transport medium (e.g., air, ground water, or surface water) for the released substance, an exposure point where human contact with the contaminated medium may occur, and a human exposure route (e.g., drinking water ingestion) at the exposure point should be evaluated. A qualitative discussion of the exposure analysis will aid in assessing the hazard posed by the site.

The Regions may have enough site information to do simple exposure modeling that could contribute to the understanding of the seriousness of the threat presented by the site. Headquarters does not recommend any one exposure model to be used during this interim period. If the Regions intend to submit an exposure model, they should consult with Headquarters on the specific model chosen prior to submission of the HRS package. However, exposure modeling is not required and should be considered at the Region's discretion.

C. Hazard Assessment

Section 105(g) also requires an evaluation of the degree of hazard to human health or the environment that may be posed by the release of hazardous constituents to the environment. This requirement is not intended to imply that a quantitative risk assessment must be conducted for the site as is typically done in an RI/FS. Rather, the goal is to provide a qualitative assessment of the probability and magnitude of hazard due to conditions at the site.

The assessment of hazard is based on an analysis of the amount and toxicity of the hazardous constituents at the site and the likelihood that people will be exposed to them. The toxicity information can be compared to site concentration data to determine whether concentrations of hazardous constituents on site are significant. When comparing toxicity information to site concentration data, both concentrations

in the waste and concentrations in environmental media should be considered, if available. This comparison is intended to indicate the relative concern warranted by the hazardous constituents of the wastes at the site and the degree to which the hazard at the site is due to hazardous constituents of special study wastes.

Clearly, the most compelling evidence of significant hazard at a site is an observed level of contamination at a point where human exposure is likely. Even where there is no current exposure, evidence that contaminants have migrated beyond the waste itself into environmental media provides important documentation that a significant potential for future exposure exists. Where high levels of contaminants are present in the waste itself, but have not been observed in surrounding environmental media, a discussion of the reasons for this result should be included.

It is important to remember that the hazard assessment is qualitative and should be conducted using existing data. It is not necessary to gather additional data in order to satisfy this requirement.

Format

A recommended format for documenting the analysis of the requirements of Sections 105(g) and 125, and a sample site analysis are attached.

We appreciate your assistance in this matter. We will work with the Regions, to the extent feasible, to prepare the special study waste addendums in order to fulfill the requirements of Sections 105(g) and 125. If your staff has questions regarding this guidance, they should call Ms. Ann Sarno, of my staff, at FTS-382-4485.

Attachments

cc: Dennis Huebner, Region I
John Czapor, Region II
Bob Wayland, Region III
Richard Stonebraker, Region IV
Mary Gade, Region V
Bob Hannesschlager, Region VI
Robert Morby, Region VII
Bill Geise, Region VIII
Keith Takata, Region IX
Robert Courson, Region X

NPL Coordinators, Regions I-X

RECOMMENDED FORMAT

Name of Site and Location

1. Introduction: Description of site, general discussion of wastes present, physical setting, proximity to potentially exposed population.

2. Information on Constituents of Waste:

   Quantity--What wastes are present at the site, how much of the wastes are special study wastes, estimated quantity of hazardous constituents in all wastes at the site (if available).

   Concentration--Estimated concentrations of hazardous constituents reported in the special study wastes, estimated concentration of hazardous constituents in all wastes at the site. Provide the range of values if there are observed releases, and not just the highest value.

   Toxicity--Toxicity or carcinogenicity of the hazardous constituents of the wastes, comparison of reported concentrations to the most sensitive toxicity value.

3. Exposure Information:

   Releases--Reported releases, site characteristics that could lead to releases, new or additional releases likely to occur given the site conditions.

   Exposures--Exposures that have occured, potential exposure pathways.

4. Hazard to Human Health and the Environment: Assessment of threats to human health and the environment based on the exposure potential and the concentration and toxicity of wastes. Summary of releases, exposures, and toxicity information.

5. Summary: Extent to which the special study wastes contribute to the hazard at the site.

6. References: Provide references for all sources of information used in the analysis, separately listing references included in the HRS package and other sources of information.

SAMPLE ANALYSIS FOR HYPOTHETICAL SITE

SMITH OIL SERVICES INC.
OIL CITY, USA

1. Introduction

The Smith Oil Services, Inc. site is an abandoned oilfield waste disposal area located north of Oil City, USA. The two pits on the site were used for separation of oil, water, and solids used in oil drilling. Another pit, now mostly dry, was reported to contain clean water. The 12 acre site began operating in the late 1970s; owners claim to have stopped receiving wastes in 1982.

The site and surrounding area are quite flat, with a surface elevation of approximately 1023 feet above sea level and a mean elevation change of about 5 feet across the site. The material within the pits is an oily sludge, containing liquids such as ethylbenzene, acetone, toluene, and xylene. No domestic or public water supply wells have been contaminated, but one water supply well used by employees on site has been contaminated by low levels of heavy metals and organic chemicals associated with oil drilling muds. Ground water from wells within 3 miles of the site serves as public water supply for 14,000 people, domestic water supply for 700 homes, and irrigation water supply for 350 acres of corn and soybean fields. Contaminants could migrate off site in surface water run-off, with the potential to reach a river used for fishing.

2. Information on Constituents of Wastes

Quantity. Evidence from the site inspection report and interviews with local residents and officials indicates that the only wastes disposed at the site are oil-based muds used in the drilling of oil and gas wells. Such muds are classified as special study wastes under RCRA Section 3001(b)(2). Therefore, all wastes at the site are special study wastes and all threats from the site are due to special study wastes.

Sampling conducted on-site indicates that the pits contain oily mud with elevated levels of chromium, lead, zinc, manganese and barium, as well as toluene, ethylbenzene, xylenes and other hydrocarbons characteristic of oily material. Other organic compounds are reported in the liquid of the two pits in very high concentrations, including phenanthrene, fluoranthene, pyrene, and benzo(a)pyrene, all of which are priority pollutants. The liquids and muds in the pit also contain large quantities of unresolved hydrocarbons characteristic of oily material. A maximum of 29,000 tons of waste have been estimated to be present on-site.

One soil sample from the middle of a former pond on the west side of the site does contains hydrocarbons similar to those found in the pits, as well as elevated levels of barium, chromium, and lead.

Concentration. Liquid in the pits contains barium at 17 mg/l, chromium at 10 mg/l, zinc at 73 mg/l, lead at 50 mg/l, and manganese at 1.5 mg/l. Manganese is found at similar concentrations in uncontaminated surface water in the area, and its presence is not likely to be associated with site contamination. High concentrations of lead and chromium were reported in soil samples taken from the former pond. Both metals were found in concentrations approaching 500 mg/kg.

Organic compounds reported in the liquid of the pits are phenanthrene (360 mg/l), fluoranthene (175 mg/l), pyrene (190 mg/l), benzo(a)pyrene (960 mg/l) and other oily, unresolvable material characteristic of oil drilling mud. Sediment in the pits contains toluene (25 ppb), ethylbenzene (45 ppb), and xylenes (100 ppb). Water in the on-site water supply well contains nine tentatively identified organic compounds with concentrations ranging from 0.003 to 0.6 mg/l. These compounds appeared to be weathered oily material but could not be positively characterized (Ref 4).

Thorough sampling of soil, sediment, and liquids in waste pits around the site and off-site has been carried out for this site in the course of site investigations starting in 1980. Results of these samplings serve as the basis for the concentration data used in this analysis.

Toxicity. Toxic components of the drilling mud and sludge found in the pits include barium, chromium, lead, acetone, toluene, ethylbenzene, and total xylenes. The metals (barium, chromium, and lead) were determined to have the highest combined toxicity and persistence score on the Hazard Ranking System (HRS). They were present in waste liquids at concentrations above their drinking water standards, which indicates a concentration of some concern. Chromium is found in the liquid of the pits at concentrations 200 times higher than the drinking water maximum contaminant levels (MCL), lead in concentrations 100 times the MCL and barium in concentrations 17 times the MCL (Ref 4). Uncharacterized hydrocarbons were found in the pits and in the liquid remains of the former pond on the western half of the site. Phenanthrene, fluoranthene, pyrene, benzo(a)pyrene, present in very high levels in the pits. These compounds are all polynuclear aromatic hydrocarbons (PAHs) and are potential carcinogens. The concentration of PAH mixtures associated with a 10^{-6} cancer risk is approximately 3 ng/l -- nine orders of magnitude lower that concentrations reported in Pit #1. Benzo(a)pyrene is a fairly potent suspected human carcinogen, having a cancer potency of 11.5 $(mg/kg\text{-}day)^{-1}$ as determined by EPA's Environmental Criteria Assessment Office (EPA, 1985). All of the above listed PAHs are listed as highly toxic in Dangerous Properties of Industrial Materials (Ref 3), the standard reference for toxicity classifications in HRS scoring. PAHs are also persistent, which would give them the highest HRS toxicity score of 18. Another concern is the unspecified mixture of hydrocarbons. Because they could not be identified, they have not been considered in the HRS scoring. Complex mixtures related to petroleum often contain hundreds of compounds, many of which are PAHs similar to those reported in Pit #1. Some of these are likely to be potential carcinogens and are likely to exist in significant quantities and concentrations on site.

3. Exposure Information

Releases. At present, contaminants may leach from the pits and soil into the ground water. This type of release is indicated by contamination in the on-site drinking water well adjacent to the pits (Ref 4). Contamination does not appear to have migrated to off-site ground water exposure points yet, because no oil-related contamination was found in drinking water wells off-site. The contamination could not be well-characterized but appeared to be weathered oily material. The waste pits are reported to be unlined, increasing the ground-water contamination potential.

Runoff from pits and the former pond to the adjacent stream is also a potential problem. Sediment and soil samples indicate that oily contamination has not been released from the pits into the adjacent stream, because samples from downstream of the site showed no observable contamination. In addition to the pits, a tank on site is reported to contain "oily material" of unknown composition and the tank is reported as potentially unsound and lacking containment structures. Contamination characteristic of oil has been reported around this tank as well. The former pond on the west half of the site was reported to be seeping into the adjacent stream in one site investigation in 1984 (Ref 13). Sampling has not confirmed evidence of contamination in the stream, however (Ref 14). This release was not considered in the HRS scoring.

Exposures. A thorough investigation of ground water and surface water users in the area appears to have been made. A large number of potential exposure points were identified. Currently, no exposures to site-related contaminants have been reported off-site, although ground water is an important resource in the area. The town of Oil City (population 14,000), as well as 700 homes with private wells, obtain their water from wells within the three mile limit considered in the HRS (Ref 10, 11, 17). The closest well is less than 1100 feet from the site (Ref 10). The productive aquifer is believed to be the same as the one contaminated at the site (Ref 8). Direction of ground-water flow was not reported, so it is not possible to determine which wells are actually threatened by site contamination. Ground water pumping in the area has affected the direction of ground-water flow. However, the general flow is to the north, toward the Oil City water wells.

The potential for surface water contamination is also significant. Contamination is present in soils that could easily wash into the adjacent stream and contaminate the Cooper River, which receives runoff from the site. This river is an important recreational resource and is popular with fishermen. Another significant possible release to surface water is overflow from the pits, particularly Pit #1. This pit was reported to have a freeboard of only 1.5 feet in the 1984 site investigation (Ref 13). Significant rains could conceivably raise water levels in the pit to a level that would overflow the pit. Runoff would likely end up in the stream and adjacent fields to the east.

4. Hazard to Human Health and the Environment

The site is not now endangering the health of surrounding residents, but the potential for harm is significant. Oil drilling muds, a special study waste under Section 3001(b)(2) of RCRA, is present on the site in large quantities. This oily waste contains lead, barium, and chromium, as well as high concentrations of a variety of organic chemicals including potentially carcinogenic PAHs stored in unlined pits. These contaminants have leached into ground water and are likely to affect local water supply wells, the closest of which is 1060 feet from the nearest hazardous substance. Evidence in the HRS package demonstrates that the contaminated aquifer is the same water-bearing system that is used as the water supply in the area. The tank on site has been used to store "slop" oil and is surrounded by soil and puddles contaminated by waste oil. Contaminants in the soil may be carried off site to the Cooper River, which is a popular recreational resource. Constituents of the oil drilling mud are highly toxic and the PAHs are also carcinogenic. Pit #1 contains chromium and lead at 200 and 100 times their drinking water MCLs, respectively. Both pits contain PAHs at a concentration nine orders of magnitude above the 10^{-6} excess cancer risk. Depth to ground water is approximately 20 feet below the bottom of the pits and the vadose zone is composed of clays, sand, and gravel that evidently have not provided an adequate buffer against site contamination, increasing the likelihood of releases and exposures. Rainfall is moderate -- net precipitation is 2 inches a year -- suggesting ground-water infiltration and surface runoff are likely to be significant exposure pathways. In conclusion, the site presents a significant potential hazard to human health and the environment.

5. Summary

The quality of information relevant to the provisions of CERCLA Section 105(g) is generally quite good. Site information indicates clearly that all wastes on-site are oil drilling mud wastes. Consequently, the entire threat at the site is due to special study waste. The constituents of these wastes are widely recognized to pose risks to human health and the environment. Available information indicates that releases of these constituents have already occurred, that there is a potential for additional releases, and that human exposures to these constituents, while not reported as yet, is a strong possiblilty. Thus, the site presents a threat to human health and the environment.

6. References

References from HRS Package

All references cited in the HRS package were evaluated for this analysis. Specific reference cited are listed below.

Reference Number	Description of the References
3	Sax, M.I. Dangerous Properties of Industrial Materials, Sixth Ed.
4	Sampling Inspection Report, 9-26-1985 by FIT Environmental Engineer-A Sarno.
8	Johnson, L., and Ford, G. Hydrogeology of Berk County, Dept. of Conservation, State Geological Survey, 1967.
10	Jones, B. Regional Engineer, State Dept. of Health and Human Resources. 1-17-83 RE. Well information.
11	USGS Topographic Maps: NW/4 Oil City 7.5 minute Quadrangle, 1983; Hillsboro Quadrangle, 7.5 minute; Smithville Quad 1975; Berk East Quad, 1975.
13	Site Investigation Report at Smith Oil - TAT Region 0. 12-29-84.
17	HRS Support Report - FIT, 12 June 86.

Additional References

In addition to references listed in the Documentation Records for Hazard Ranking System, the additional references were used:

U.S. Environmental Protection Agency, Health Effects Assessments for Benzo(a)pyrene. Environmental Criteria Assessment Office, Cincinnati, OH, 1985.

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

MAR 10 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: RCRA "Special Study" Waste Definitions: Sites That Require Additional Consideration Prior to NPL Proposal Under the Superfund Amendments and Reauthorization Act

FROM: Henry L. Longest II
Director, Office of Emergency and Remedial Response

TO: Director, Waste Management Division
Regions I, IV, V, VII, and VIII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Waste Management Division
Regions III and VI
Director, Toxics and Waste Management Division
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Director, Hazardous Waste Division
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The purposes of this memo are to discuss Sections 105(g) and 125 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent now possible, to outline the scope of these provisions by providing appropriate definitions. Both of these sections require that, until the Hazard Ranking System (HRS) is revised, the Agency evaluate additional data for sites at which "special wastes," as defined under the Resource Conservation and Recovery Act (RCRA), are present in significant quantities before these sites are proposed for the NPL.

This memo does not address the specific data and information needed to fulfill the additional requirements of Sections 105(g) and 125. We are in the process of developing guidance that will explain both the data needs and how the Agency will use the information to list special waste sites. We expect to issue this guidance in March/April 1987. Until it is available, we recommend that the Regions continue to work on developing HRS packages for such sites with the understanding that additional information acquisition may be necessary in the future.

It must be understood that, with only minor exceptions, neither RCRA nor CERCLA includes precise definitions of the wastes covered by these provisions, and the interpretations

given in this memo could change at some future point. It is unlikely, however, that such changes will occur prior to the promulgation of the HRS.

The information contained below has been reviewed by all Offices within OSWER and by the Office of General Counsel.

SARA SECTION 105(g)

Section 105(g) of SARA applies to sites that, (1) were not on or proposed for the NPL as of October 17, 1986, and (2) contain significant quantities of "special study" wastes as defined under Sections 3001(b)(2), 3001(b)(3)(A)(ii), and 3001(b)(3)(A)(iii) of RCRA. For these sites, SARA requires that the following information be considered prior to proposal for the NPL:

(A) the extent to which the Hazard Ranking System (HRS) score for the facility is affected by the presence of the special study waste at, or released from, the facility.

(B) available information as to the quantity, toxicity, and concentration of hazardous substances that are constituents of any special study waste at, or released from, the facility; the extent of or potential for release of such hazardous constituents; the exposure or potential exposure to human population and the environment, and the degree of hazard to human health or the environment posed by the release of such hazardous constituents at the facility.

The relevant paragraphs of RCRA are defined below:

(1) RCRA Section 3001(b)(2)(A): "Drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy..."

The Office of Solid Waste drafted a technical report on wastes from the exploration, development and production of crude oil, natural gas, and geothermal energy, dated October 31, 1986. In this report, EPA made some tentative determinations as to which wastes are subject to the oil and gas exemption. To make these determinations, EPA relied on RCRA's language and the legislative history to develop tentative criteria for determining which wastes are included. These criteria appear below:

1. Only waste streams intrinsic to the exploration for, or development and production of, crude oil, natural gas, or geothermal energy are exempt. Waste streams generated at oil, gas, and geothermal energy facilities that are not uniquely associated with exploration, development, or production activities are not exempt (one example would be spent solvents from equipment cleanup).

2. Exempt wastes must be associated with "extraction" process which include measures (1) to remove oil, natural gas, or geothermal energy from the ground or (2) to remove impurities from such substances, provided that the purification process is an integral part of normal field operations.

3. The proximity of waste streams to primary field operation is a factor in determining the scope of the exemption. Process operations that are distant from the exploration, development, or production operations may not be subject to exemption.

4. Wastes associated with transportation are not exempt. The point of custody transfer, or of production separation and dehydration, may be used as evidence in making this determination.

In its report, the Agency noted that these determinations may not address all exempted wastes and solicited comment on its findings. The following wastes were tentatively classified as exempt under this section (i.e., special study wastes):

Oil and Gas	Geothermal Energy
° drilling media	° drilling media and cuttings
° drill cuttings	° reinjection well fluid wastes
° well completion, treatment, and stimulation fluids	° precipitated solids from brin effluent
° packing fluids	° settling pond wastes
° produced waters	° piping scale and flash
° produced sand	tank solids (except for those
° workover fluids	associated with electrical
° field tank bottoms	power generation)
° waste crude oil and waste gases from field operations	
° waste triethylene glycol used in field operations	

Further information on oil, gas, and geothermal wastes can be found in the 10/31/86 report.

(2) RCRA Section 3001(b)(3)(A)(iii): "Cement kiln dust waste"

This category of wastes is fairly self-explanatory and has not been controversial. Cement kiln dust is the material that goes up the stack as a result of fuel combustion and the commingling of the cement additives. The dust is collected either in a baghouse or in an electrostatic precipitator. The collected dust is a high volume waste that is strongly alkaline. Cement kiln dust is usually disposed of in on-site landfills or by land reclamation.

(3) RCRA Section 3001(b)(3)(A)(ii): "Solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore"

"Extraction," in the context of RCRA, refers to the beginning or front-end operations associated with mining, including the removal of overburden in surface mines, quarrying, and other forms of collecting raw materials that contain economic concentrations of elements (ore). "Overburden" is the general term for wastes resulting from extraction operations in surface mines. Other examples of extraction operations are: dredging of placer deposits or beach sands, cutting or blasting whole rock from surface quarries, and removal of rock to construct underground tunnels. It should be noted that one form of extraction, in-situ mining, was excluded from RCRA solid waste coverage in 40 CFR 261.4(a)(5), and is not, therefore, a "special study waste."

"Beneficiation" refers to processes used to concentrate the extracted ores or minerals. This can be accomplished with simple physical processes such as crushing, screening, and washing. Beneficiation can also involve chemical processes such as leaching of metallic elements (e.g., copper, silver, gold) from ore or mill tailings using acid or cyanide solutions.

Industry uses the term "milling" to refer to most of the above operations. This term comes from the most common process in beneficiation, that of breaking, crushing, grinding, and screening the rock in large rotating rod and ball mills. Mill tailings are the most common wastes from beneficiation.

For more information on the above two categories of mining waste, the reader is referred to, "Report to Congress: Wastes from the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale." (EPA/530-SW-85-033, December 1985)

"Processing" generally includes operations that further refine or purify the product being mined beyond the beneficiation step. "Processing" is the term associated with the RCRA mining waste exclusion that has caused the most confusion and regulatory uncertainty. In 1980, EPA stated in the preamble to the hazardous waste standards that the term "processing" included the smelting and refining of ores and minerals. The Agency stated at that time, however, that it was not sure that this interpretation was consistent with the intent of Congress and that the issue would be addressed in future rulemaking. On October 2, 1985, the Agency proposed to retract its inclusion of smelting and refining in the mining waste exclusion, with the exception of a few large volume processing wastes (see Attachment I). The proposed rule was withdrawn on October 9, 1986 (see Attachment II).

At the present time, therefore, the term "processing" is broadly interpreted to include most post-beneficiation processes, specifically including smelting and refining of ores and minerals. It may be difficult to determine at what point processing ends and fabrication or manufacturing begins. Generally, wastes that result from combining the mineral product with another material (e.g., alloying) or from fabrication (a change in shape that does not cause a change in chemical composition) are not "special study" (i.e. "processing") wastes, although exceptions may exist.

SARA SECTION 125

This section applies to facilities that were neither on nor proposed for the NPL on the date of enactment of SARA and which contain "substantial volumes" of waste described in Section 3001(b)(3)(A)(i) of RCRA. Until the HRS is revised, these sites may not be included on the NPL "on the basis of an evaluation made principally on the volume of such waste and not on the concentration of the hazardous constituents of such waste."

RCRA Section 3001(b)(3)(A)(i): "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."

The temporary RCRA exemption for fossil fuel combustion wastes noted above includes all fly ash, bottom ash, boiler slag, and flue gas emission control waste resulting not only from the combustion of coal, but also from combustion of oil, natural gas, and coke. The fossil fuel component must be over 50% of fuel mix for the exemption to apply. These waste materials are included whether generated by electric utility generating plants or by industrial and commercial facilities.

When fossil fuels are burned, the noncombustible materials are converted to ash. The proportion of noncombustible material in coal is referred to as the ash content. (Petroleum also contains ash, but in far smaller quantities). The smaller ash particles entrained by the flue gas are referred to as fly ash and are produced in varying degrees by all plants. Larger ash particles that settle on the bottom of the boiler will form either bottom ash or boiler slag, depending on the furnace design. Another waste product, called FGD (scrubber) sludge, is generated when sulfur dioxide (formed from the burning of sulfur present in the coal) is removed from other flue gases. This removal process, which is required by environmental regulations for some power plants, is usually accomplished with a flue gas desulfurization (FGD, or scrubber) system.

Although these definitions are rather broad, we hope that this information will assist you in identifying sites that may fall under the relevant sections of SARA. We also solicit your input on the scope of the terms contained in this memo and will modify them in the future if appropriate.

We appreciate your assistance in this matter and expect to work closely with your staff to resolve any problems. If your staff has site specific questions, they should call Ms. Ann Sarno, of my staff, at FTS-382-4485.

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