

**MINERAL PROCESSING FACILITIES PLACING
MIXTURES OF EXEMPT AND NON-EXEMPT WASTES
IN ON-SITE WASTE MANAGEMENT UNITS**

**Technical Background Document
Supporting the Supplemental Proposed Rule
Applying Phase IV Land Disposal Restrictions to
Newly Identified Mineral Processing Wastes**

**Office of Solid Waste
U.S. Environmental Protection Agency**

December 1995

Introduction

EPA conducted a review of the National Survey of Solid Wastes from Mineral Processing Facilities (NSSWMPF) survey instruments to identify mineral processing facilities that reportedly place mixtures of exempt and non-exempt wastes¹ in on-site waste management units (WMU). This document provides the results of this review.

In February 1989, EPA administered the NSSWMPF questionnaire, herein referred to as the RTI Survey (short for the Research Triangle Institute, who conducted the survey). The RTI Surveys were distributed to the operators of 198 mineral processing facilities that, to the Agency's knowledge, generated one or more of the ore and mineral processing waste streams that the Agency was considering retaining within the Bevill exclusion. EPA received detailed responses to the RTI Survey from 106 facilities. Twenty-seven of the 47 "special wastes" candidates identified in the RTI Survey have subsequently been removed from the Bevill exclusion; today, there are 20 Bevill-exempt "special wastes." Of the 198 facilities receiving the RTI Survey, 15 responded that they did not generate any mineral processing wastes, while 77 facilities indicated that they did not generate any special wastes.

Methodology

The RTI Survey was designed to elicit information on operational characteristics of individual facilities, on sources and volumes of wastes, and on current and alternative waste management practices. Sections 4 and 5 of the RTI Survey requested the facilities to identify the various on-site WMUs, including wastewater treatment plants and surface impoundments, and the waste inflows to these WMUs. EPA analyzed the waste inflows to each WMU identified in the RTI Surveys to determine if the WMU received a mixture of exempt and non-exempt wastes. EPA used the beneficiation/processing boundaries identified in the "Identification and Description of Mineral Processing Sectors and Waste Streams," a technical background document that may be found in the docket for today's proposed rule, to determine whether the waste inflows were from an extraction/beneficiation process or from mineral processing. For example, within the copper sector, the Magma, Arizona facility places a mixture of tailings and acid plant blowdown in tailings ponds. EPA used the information on the beneficiation/processing boundary discussed in the sector analysis for copper in the technical background document and determined that the acid plant blowdown waste stream is a mineral processing waste, while tailings result from an extraction/beneficiation process. As mineral processing wastes are non-exempt and extraction/beneficiation wastes are exempt, EPA determined that the Magma, Arizona facility places a mixture of non-exempt and exempt wastes in the same WMU. EPA notes that because many of the waste stream names provided by the facility operators were different from those used in the technical background document, EPA used engineering judgment to correlate waste stream names.

¹ Exempt wastes include extraction/beneficiation wastes and the "Special 20" Bevill-exempt wastes.

The Agency also reviewed EPA site visit reports for mineral processing facilities to identify any additional facilities that reportedly place mixtures of exempt and non-exempt wastes in on-site WMUs. EPA identified one other instance of placing exempt and non-exempt wastes in the same WMU. Specifically, the EPA site visit report for the McLaughlin Gold mine indicated that Agency personnel had observed various mineral processing wastes such as mercury quench water being sent to a carbon-in-pulp, carbon-in-leach (CIP/CIL) circuit that ultimately discharges to the tailings pond. Therefore, EPA determined that the facility places mixtures of exempt (tailings) and non-exempt (mercury quench water) wastes in an on-site WMU.

Results

Exhibit 1 identifies the facilities that place mixtures of exempt and non-exempt wastes in on-site WMUs. Exhibit 1 also lists the waste streams by facility and WMU. As shown in Exhibit 1, EPA identified 20 facilities that reportedly place mixtures of exempt and non-exempt wastes in one or more on-site WMUs. The Agency notes that, for the purpose of this analysis, both the extraction/beneficiation wastes and the "Special 20" Bevill-exempt wastes are considered exempt wastes.

EXHIBIT 1
LIST OF FACILITIES PLACING MIXTURES OF EXEMPT AND NON-EXEMPT WASTES IN THE SAME WMU

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Beryllium	101006	Brush Wellman, Inc., Delta, UT	Tailings Pond	Bertrandite thickener discard slurry
				Beryl thickener discard slurry
				Raffinate
				Sludge leach slurry
				Barren filtrate
				Miscellaneous water streams
				Acid conversion discard
				Tailings
				Sump water
Chromite	CBI ¹	CBI	Wastewater Treatment Plant	Special waste # 1
				Special waste # 2
				Salt cake scrubber purge
				Chromic acid scrubber purge
				Utility area sumps and blowdown

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
				Storm sump water
				Recovery well water

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Copper	100750	Magma, San Manuel, AZ	Tailings Ponds # 1 and 2	Tailings water
				Tailings solids
				Acid plant blowdown
				Process wastewater
			Tailings Dams # 3 and 4	Tailings water
				Tailings solids
				Acid plant blowdown
			Tailings Dam # 5	Tailings water
				Tailings solids
				Acid plant blowdown
			Tailings Dam # 6	Tailings water
				Tailings solids
				Acid plant blowdown
			Tailings Dam # 10	Tailings water
				Tailings solids
Acid plant blowdown				

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Elemental Phosphorous	CBI	CBI	Hydroclarifier	Furnace scrubber blowdown
				Process wastewater
				Beneficiation acc. water
Ferrous	100958	Armco, Inc., Ashland, KY	Clarification Plant	Sinter plant
				B. F. scrubbers
				Hot strip mill
				HCL acid regenerations
				Pickle rinse water
				Waste oil plant
				Miscellaneous process waters
	101246	National Steel Corporation, Granite City, IL	Wastewater Treatment Plant	Blast furnace and storm water lagoon
				Stormwater lagoon
	101287	LTV Steel Company, East Chicago, IN	Wastewater Treatment Plant - BF/Sinter Plant Recycle	Blast furnaces
				Sinter plant
			Terminal Lagoon	BF/Sinter recycle
# 2 blooming mill				

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
				Boiler house and shops

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Ferrous (continued)				Basic oxygen furnace
				Caster
	101744	Bethlehem Steel Corporation, Burns Harbor, IN	Wastewater Treatment Plant	Basic oxygen furnace wastewater
				Blast furnace process wastewater
				Sinter plant process wastewater
Lead	100461	Doe Run Company, Boss, MO	Wastewater Treatment Plant # 1	Sinter plant
				Acid plant blowdown
				Stormwater
				Facility washdown
				D & E area runoff
				Process area runoff
				Fume slurry system
				Acid plant cooling
				Slag granulation

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
			Not Listed	Area runoff
				Acid plant blowdown

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Lead (continued)				Sinter plant
				Acid plant cooling
				Fume slurry
				Facility washdown
				Stormwater
				Slag granulation
	100404	Doe Run Company, Herculaneum, MO	Wastewater Treatment Plant # 1	Sinter plant scrubber water SVG backwash Blast furnace slag granulation Dross furnace slag granulation water Pavement washdown Neutralized acid plant blowdown Department washdown Clothes washing Plant runoff

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Phosphoric Acid	100230	Agrico Chemical Company, Mulberry, FL	Process Cooling Pond	Process wastewater
				Filter cake

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Phosphoric Acid (continued)	100198	Agrico Chemical Company, Donaldsonville, LA	Cooling Pond	Process wastewater (Sulf.)
				Process wastewater (floor)
				Process wastewater
				Process wastewater (PA)
				Process wastewater (1st stage water treatment sludge)
				Gypsum decant water
	100099	CF Chemicals, Inc., Bartow, FL	Cooling Pond	Process wastewater
				Gypsum stack
				Runoff
	101444	Royster Phosphates, Inc., Palmetto, FL	Gypsum Stack Cooling Pond	Gypsum
				Process wastewater
	100552	Gardinier, Inc., Riverview, FL	Process Wastewater Pond # 1	Phosphoric acid plant process wastewater
				Gypsum stack water
Dry product manufacturing process wastewater				
Process wastewater pond # 2				

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
				Contact acid plant process wastewater
Phosphoric Acid (continued)	100800	IMC Fertilizer, Inc., Mulberry, FL	Cooling Pond	Process wastewater
				Ammonium sulfate
Titanium	CBI	CBI	Surface Impoundment # 3	Special waste residues
				Other
	CBI	CBI	Wastewater Treatment Plant # 2	Contaminated cooling water from sulfate process
				From surface impoundment # 1
				Stormwater
				Chloride process wastewater
	CBI	CBI	001N	Sulfate process wastewater
				Stormwater
				DCS acid
				Process wastewater
				Scrubber blowdown from CO ₂
				CHLN effluent

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs			
				<table border="1"> <tr> <td data-bbox="1335 396 1793 459">CAL acid</td> </tr> <tr> <td data-bbox="1335 459 1793 522">Sulfate finishing effluent</td> </tr> <tr> <td data-bbox="1335 522 1793 574">FIN effluent</td> </tr> </table>	CAL acid	Sulfate finishing effluent	FIN effluent
CAL acid							
Sulfate finishing effluent							
FIN effluent							

EXHIBIT 1 (Continued)

Sector	RTI Survey ID	Facility	WMUs Receiving Mixtures	Waste Inflows to WMUs
Titanium (continued)				Sewage plant effluent
				Landfill leachate
Gold	NA (EPA site visit)	McLaughlin Gold Mine, Lower Lake, CA	Tailings Pond	Mercury quench water
				Tailings
				Slag from gold smelting
				Acid washing wastes from carbon stripping
				Baghouse dusts

¹ Confidential Business Information