

APPENDIX C

DATA ON CURRENTLY AVAILABLE STABILIZATION CAPACITY

This appendix has three sections:

C-1: Describes the information the Agency collected from selected treaters on available stabilization capacity for Phase IV mineral processing and TC metal wastes. It includes an overview of the Agency's approach, summarizes the results, and provides phone logs.

C-2: Discusses available capacities for metal waste stabilization and metal recovery for meeting the Phase IV TC metal and mineral processing waste LDR standards.

C-3: Provides a phone log of calls to TSDs who stabilize D008 and other TC-metal hazardous wastes.

Appendix C-1

ANALYSIS OF AVAILABLE STABILIZATION CAPACITY FOR PHASE IV WASTES

This appendix describes the information the Agency collected from selected treaters on available stabilization capacity for Phase IV mineral processing and TC metal wastes. The appendix is divided into three parts. Section 1.0 provides an overview of the Agency's approach, Section 1.2 summarizes the results, and Section 1.3 provides phone logs.

1.0 Approach

The Agency's approach for evaluating available stabilization capacity for Phase IV TC metal and mineral processing wastes involved six main steps:

1. Develop interview guide;
2. Identify interviewees (e.g., commenters);
3. Conduct preliminary interviews for a few interviewees;
4. Modify interview guide to address problem areas identified in conducting preliminary interviews;
5. Finish interviews; and
6. Incorporate other information and conduct follow-up activities.

In Steps 1 and 2, EPA developed a preliminary interview guide and identified several commercial treaters and organizations who submitted comments to the proposed Phase IV rule.¹ Also, some treaters were identified from BRS data reviews² and previous interviews.³ In Step 3, EPA conducted a few preliminary interviews and, based on the results, refined the draft interview guide to clarify questions and target key areas. The final phone interview guide used questions such as the following (individually tailored somewhat depending on data supplied previously):

1. How much waste do you treat? How much of this waste is hazardous, as defined under RCRA (i.e., RCRA Subtitle C wastes)? How much of the waste that your facility receives is non-hazardous, as defined under RCRA (i.e., RCRA Subtitle D wastes)? How much treatment capacity is commercial and how much is captive (i.e., your own company's)? Do you treat Phase IV mineral processing and TC metal wastes? If not, do you plan to treat these wastes in the future?

¹These treaters were interviewed as follow-up to comments and thus did not count toward the limited number of non-federal employees who can be contacted pursuant to the Paperwork Reduction Act

²Raghuvan, Raghu, and Jim Laurenson, Memorandum to Bill Kline and C. Pan Lee: Status Report on the Available Capacity Assessment for TC Metal and Mineral Processing Wastes. ICF Inc., June 1996.

³Schwartz, Stephan. Memorandum to Stan Moore and Suzanne Wade: Phone Calls to TSDs Who Stabilize D008 and Other TC-metal Hazardous Wastes. Versar Inc., May 1996.

2. Approximately what percentage of the Phase IV wastes that you treat are treated on site at your facility and what percentage is treated off site at the generator's facility (e.g., large volumes of mineral processing wastes)? What percentage of the wastes that you accept for treatment is part of a treatment train that began on a generator's facility (e.g., combustion at generator's site followed by stabilization of residuals at your facility site)?
3. What quantity (T/yr) of these Phase IV wastes can be treated to proposed UTS off site or at your facility at the present time and what quantity cannot? What quantity (T/yr) of these Phase IV wastes can be treated to UTS off site or at your facility in the future (*please specify time period (e.g., within one year)*)?
4. Would there be any problems treating to individual standards? Would there be any problems when constituents are in a mixed constituent Phase IV waste stream (e.g., mixed metals)? With organic UHCs? Why? What waste streams (*please specify waste codes*), if any, do you expect will cause you to make modifications in your treatment processes? What quantity (T/yr) of the total Phase IV wastes that you treat do these wastestreams comprise?
5. How extensive and difficult to implement would the modifications to your treatment processes be? How much time would be necessary for modifications to your treatment processes?
6. How much of which kind of additional Phase IV wastes (e.g., one of the wastes that may be problematic) can your facility treat? When?
7. Can you provide data to support any of the above answers?

EPA then conducted follow-up activities to fill in data gaps. To assess difficulties in meeting concentration levels, for example, EPA asked the contacts about the feasibility of meeting several hypothetical values.

Questions were faxed when requested, and follow-up calls were made through January 13, 1997.

1.2 Results

Exhibit 1 summarizes several observations that can be made from the results of this data gathering effort. These results are discussed in more detail below:

Overall treatment capacity

- All facilities treat TC metal or de-Bevilled mineral processing wastes.
- Ten facilities-Environmental Enterprises, Environmental Quality, EnviroSafe, GNI, Heritage Environmental Services, PDC, Rollins, and both of the CWM facilities-conduct 100 percent of the treatment on site at their facility. One facility, Environmental Technologies, Inc., conducts about half of its treatment off site.

- ●Current treatment at facilities ranges from 15,000 tons/year to 300,000 tons/year.
- Current available capacity of facilities ranges from 140,000 tons/year to 1,159,000 tons/year.

Modifications to treatment processes

- All but the smallest two⁴ treaters interviewed-both of the Chemical Waste Management (CWM) facilities, Environmental Quality, Environmental Technologies, Inc., EnviroSafe, GNI, LWD Inc., PDC, and Rollins Environmental Services-commented that no modifications would need to be made to their treatment processes or minimal time (e.g., four weeks) is required for very minor modifications. Environmental Enterprises and Heritage Environmental Services noted that it may take two to five years, primarily due to changing their permits.
- Most facilities commented that the exact time needed and difficulty to implement changes in treatment processes will vary depending on the degree of changes.
- Both of the CWM facilities noted that it would cost approximately \$1,000 per waste stream to develop new treatment recipes.

Additional treatment needed

- Both of the Chemical Waste Management (CWM) facilities, Environmental Enterprises, GNI, and Heritage Environmental Services gave a range of 20 to 100 percent of their TC metal waste streams that have constituents above TC or UTS levels that require additional treatment.
- Heritage Environmental Services and GNI noted that meeting the original proposed standard for cadmium would require treatment modification because it is difficult to stabilize it in a mixed constituent waste stream.
- Heritage Environmental Services and CWM in Carlyss, LA indicated that meeting the original proposed standard for lead would require treatment modification because it is difficult to stabilize it in a mixed constituent waste stream and leaching rates vary depending on pH.
- GNI, Rollins Environmental Services, and CWM in Carlyss, LA indicated that meeting the original proposed standard for selenium would require treatment modifications because it is hard to stabilize it in a mixed constituent waste stream and leaching rates vary depending on pH.
- Heritage Environmental Services, Rollins Environmental Services and CWM in Carlyss, LA indicated that meeting the original proposed standard for chromium

⁴In terms of known or estimated utilized or available capacity.

would require treatment modifications because it is hard to stabilize it in a mixed constituent waste stream and leaching rates vary depending on pH.

- Three facilities noted that treating organic UHCs would require treatment modifications. Heritage Environmental Services will incinerate those waste streams while Environmental Enterprises and PDC will send it to another facility for treatment. Two facilities-Environmental Quality and LWD Inc.-specifically stated that organic UHCs can be readily treated to UTS.

**EXHIBIT 1
SUMMARY OF PHONE LOG RESULTS**

Treater	Degree of Difficulty		Maximum Practical Capacity		Utilized Capacity	Need for Other Treatment	Additional Treatment Needed for:						Organic UHCs	
	Time	Cost	On site	Off site			Individual Standards							
							Cd	Pb	Se	Cr	As	Ni		Mixed Constituents
Chemical Waste Management Carlyss, LA	Minimal	Initial \$1000/waste stream; additional \$5-20/ton	200,000 gal/dy (234,000 tons/yr ^a)			75% incinerated to meet organic LDRs		X	X	X			X	X
Chemical Waste Management Oakbrook, IL	6 mths	Initial \$1000/waste stream				Incineration of organics		X	X	X			X	
Environmental Enterprises	3-5 yrs(due to permit modifications)				15,000 tons/yr	Incineration of organics								X
Environmental Quality, Inc. Detroit, MI	Minimal		360,000-450,000 tons/yr		300,000 tons/yr									
Envrionmental Technologies, Inc. King of Prussia, PA	4 wks		70,000 tons/yr	70,000 tons/yr		Low-level radioactive/TC metal wastes								
EnviroSafe	Minimal		150,000-200,000 tons/yr		Ohio: 1,000 tons/dy (260,000 tons/yr ^a) Idaho: 100,000 tons/yr	Organic UHCs								X
GNI (Disposal Systems) Deer Park, TX	Minimal		1,159,000 tons/yr		333,000 wet tons of liquid wastes/yr 2,400 tons of solids/yr		X		X		X		X	
Heritage Envrionmental Services Indianapolis, IN	2 yrs				29,800 tons/yr ^b	Incineration of organic UHCs	X	X		X		X	X	X
LWD Inc. Calvert City, KY	Minimal				38,962 tons in 1995								X	
PDC Peoria, IL	Minimal				41,557 tons/yr ^b	Prior treatment of organic UHCs								X
Rollins Environmental Services Deer Trail, CO	Minimal		200,000 tons/yr		100,000-125,000 tons/yr	Send selenium-bearing wastes off site			X	X				
aEPA estimate														
bFrom 1993 BRS. See Attachment A-1														

1.3 Phone Logs

Mr. Chuck Grant
Environmental Manager
Chemical Waste Management
Location: Carlyss, LA
Phone: 318-583-3774
Fax: 318-583-4615
Interview conducted by: Gillian Foster
Date of interview: August 23, 1996

Mr. Grant responded that their facility does treat Phase IV wastes, and plans on continuing treatment in the future. Approximately 25 percent of the wastes are treated to LDR standards, while 75 percent of the wastes are incinerated to meet organic LDRs, but need metals stabilization. Approximately 200,000 gallons/day of waste can be treated to UTS on site at the facility. Their facility will need to implement modifications to the types and quantities of reagents needed to treat various waste types in their stabilization facility. The time needed to modify recipes for treatment should be minimal. They estimate that it will cost approximately \$1000 per waste stream to develop new recipes. It is also estimated to increase treatment costs from \$5 to \$20 per ton. Approximately 20 to 30 percent of TC metal only waste streams have constituent concentrations above TC or UTS levels that would require additional or modified treatment. For these waste streams, meeting individual standards for selenium, chromium, and lead are going to be problematic. They recommend that the limit be set at 3.0 ppm TCLP for all three metals. They will not be able to treat TC metal-only wastes with organic UHCs because of Subpart CC.

Mr. Mitch Hahn
Chemical Waste Management
Location: Oakbrook, IL
Phone: 630-572-8800
Interview conducted by: Gail Shaw
Date of interview: September 10, 1996
Date of follow-up interview: January 2, 1997

Mr. Hahn responded that only hazardous waste is received for treatment at their facility, and Phase IV wastes are treated. Treatment is 100 percent on site. They have fixed stabilization tanks at their landfills. The quantity of Phase IV wastes that can be treated to UTS depends on the treatment method. Approximately 70 to 80 percent of the wastes can meet the lower UTS levels for metals, while 20 to 30 percent will require development of new treatment recipes (e.g., different ratios of stabilization agents). Of these 20-30%, 5-10% can not meet the lower standards and will not be accepted by this facility. Applying UHC standards will increase the metal bearing waste streams going to incinerators (i.e., for organics), but there is ample capacity. There will be problems treating some of the wastes to individual standards. Difficulties with a mixed constituent waste stream depend on the metals, which have different stabilization levels and varying rates of leaching depending on pH. The facility does not know exactly what the impact of organic UHC will be on metal bearing waste streams because those waste streams have never needed to be identified. There will be no modifications made to the physical treatment process. However, all of the waste codes with lowered treatment levels will need to have their treatment

recipes looked at to determine if any modifications need made. The difficulty of implementing modifications will vary depending on the difficulty of changes. First, a bench-scale test will be performed in the lab (requiring several days), then at the production level. It could take approximately 6 months to implement recipe modifications depending on when the facility receives the waste streams. The estimated cost is \$1000/profile to re-evaluate and develop a new recipe. Refer to the comments on the proposed rule submitted to EPA for supportive data.

In a follow-up call, Mr. Hahn said that they will not have to change any of their actual physical processes. The lower the standards are, the more difficult it will be to modify the recipes. He noted that meeting the hypothetical UTS levels for barium (D005), chromium (D007), lead (D008), selenium (D010), antimony, nickel, thallium, and vanadium would be easier than what was proposed in the August 1995 proposed rule. Only minor modifications to the treatment recipes, requiring several weeks, may be needed. The facility is working on new data.

Mr. Gary Davis
Vice President
Environmental Enterprises
Phone: 513-541-1823
Fax: 513-541-1638
Interview conducted by: Gail Shaw
Date of interview: September 23, 1996
Date of follow-up interview: January 7, 1997

Mr. Davis responded that their facility treats approximately 15,000 tons/year. Approximately 50 percent is hazardous, while the other 50 percent is non-hazardous. He noted that 100 percent of treatment capacity is commercial. They treat Phase IV wastes; 100 percent are treated on site at the facility, and no wastes are part of a treatment train. Less than 50 percent of these Phase IV wastes can be treated to UTS at the present time. In the future, Mr. Davis estimated it could take three to five years to be able to treat to UTS (primarily because the permit would need to be changed). He noted that generally there would be no problems treating to individual standards. Treating a mixed constituent waste stream that has no organic UHCs is not problematic; however, treating a mixed constituent waste stream with organics will be difficult. They will need to be sent off site to an incinerator. Mr. Davis could not estimate what modifications, if any, would need to be made to treatment processes. He estimated it could take several years, primarily due to changing the permit for part B. The facility can accept very little or no additional Phase IV wastes because they are currently close to capacity. The facility can provide supporting data if requested.

In a follow-up call, Mr. Davis noted that meeting the hypothetical UTS levels for barium (D005), chromium (D007), and lead (D008) would require modifications to both the treatment process and the treatment recipes. Each constituent would require six months to one year to implement the changes. Meeting the UTS levels for antimony and vanadium would need modifications to their treatment recipes, requiring one year to implement. The proposed UTS level for cadmium (D006) could not be met by the facility. Those waste streams would have to be sent off site for treatment. Mr. Davis noted that a UTS level of 0.20 mg/L for cadmium would not be achievable; however, a UTS level of 0.50 mg/L could be met.

Mr. Scott Maris
Technical Manager
Environmental Quality
Location: Detroit, MI
Phone: 313-699-6230
Fax: 313-699-3499
Interview conducted by: Gail Shaw
Date of interview: September 17, 1996
Date of follow-up interview: January 8, 1997

Mr. Maris responded that their facility treats 300,000 tons/year. Approximately 50 percent is hazardous, while the other 50 percent is non-hazardous. He noted that 100 percent of the treatment capacity is commercial. They do treat Phase IV waste; 100 percent of what is received on site is treated, and no percentage of the wastes are part of a treatment train. All of the Phase IV wastes can be treated to UTS at the present time and the same is expected in the future. The facility expects no problems treating to individual standards or a mixed constituent waste stream. Also, there will be no problems treating organic UHCs; their facility uses the process of chemical oxidation, with bleach being a common oxident. No modifications will need made to the treatment process. The facility can accept another 20-50 percent of additional Phase IV wastes, increasing available capacity to 360,000-450,000 tons/year.

In meeting the hypothetical UTS levels, Mr. Maris confirmed in a follow-up call that the facility would have no difficulties. The levels are all the same or higher than the UTS levels they are currently meeting.

Mr. Joseph DeSipio and Mr. Rick Valiga
Principal
Environmental Technologies, Inc.
Location: King of Prussia, PA
Phone: 610-354-9050
Fax: 610-354-9851
Interview conducted by: Gillian Foster and Gail Shaw
Date of interview: August 27, 1996
Date of follow-up interview: January 2, 1997

Mr. DeSipio responded that the facility treats 65 percent de-Bevilled wastes and 25 percent TC metals. They also treat a small amount of biological wastes. The facility uses a three-phase treatment system consisting of physical sizing, chemical leaching with acids and reagents, and liquids processing. They extract metals out of the aqueous waste stream into usable concentrations that are sent to industrial processing facilities. The wastewater is neutralized and discharged into the sewer. Solid waste residue is then returned to the soil. In general, approximately 50 percent of the wastes treated are treated off site and 50 percent are treated on site. The interviewee believed that the percentage of wastes accepted at the facility that is part of a treatment train begun at the generator's facility is low. The interviewee estimated that the facility could provide 70,000 tons annually of off site capacity and 70,000 tons annually of on site capacity for typical metal wastes. The only problematic waste stream is TC metal wastes that are

also low-level radioactive wastes. The facility does not currently treat these wastes. However, Mr. DeSipio indicated that the facility is planning to treat them in the future. The plant would need 4 weeks to be retrofitted to accept low-level radioactive/TC metal wastes. The de-watering systems for the soils that pass through would need to be expanded to handle increased quantities. The facility can accept almost no additional Phase IV wastes. They expect all individual standards to be met.

In a follow-up call, Mr. Valiga said that the facility would have no difficulties meeting the hypothetical UTS levels. He noted in particular that antimony, beryllium, nickel, thallium, vanadium, and zinc would create no treatment difficulties because they are easily soluble.

Mr. Rod Bartchy
Vice President of Public Affairs
EnviroSafe
Phone: 1-800-523-0781, ext. 5470
Fax: 215-956-5438
Interview conducted by: Gail Shaw
Date of interview: September 25, 1996
Date of follow-up interview: January 13, 1997

Mr. Bartchy commented that their facility in Ohio treats 1,000 tons/day of primarily hazardous waste, depending on the level of business. 20,000 tons/year of capacity is available for Phase IV wastes. The facility in Idaho has the design capacity to treat up to 110,000 tons/year of primarily hazardous waste. The facility usually treats less than 50,000 tons/year in terms of actual receipts. 40,000 tons/year of capacity is available for Phase IV wastes. He noted that 100 percent of treatment capacity is commercial. They do treat Phase IV TC metal wastes; 100 percent of Phase IV wastes are treated on site at the facility, and a minority of wastes may be part of a treatment train. Most of these Phase IV wastes meet the UTS at the present time, and would not be a problem in the future. There would be no problems treating to individual standards or treating a mixed constituent waste stream. However, the facility can not treat organic UHCs. No modifications will need made to the treatment process except perhaps minor additive changes. Mr. Bartchy estimated the facilities could currently accept another 150,000 - 200,000 tons of additional Phase IV wastes. The facility can provide supporting data if requested.

In a follow-up call, Mr. Bartchy said that the facility would have no difficulties meeting the hypothetical UTS levels.

Mr. Warren Norris
Sales Manager
GNI (Disposal Systems)
Location: Deer Park, TX
Phone: 713-930-0350
Fax: 713-930-2511
Interview conducted by: Gillian Foster
Date of interview: August 21, 1996
Date of follow-up interview: Left messages January 2 and January 8, 1997

Mr. Norris responded that their facility treats mineral processing wastes and wastes that fail the TC metals only. The facility does not conduct off site treatment, only on site at the facility. None of the wastes are pretreated before reaching the site. The facility accepts liquid wastes that undergo oil removal (reclaimed for heat value), dewatering, and filtration. The liquid phase is deep well injected. The facility holds a no-migration petition variance. The solid phase is stabilized on site or shipped off site for incineration. The facility manages 333,000 wet tons of liquid wastes before treatment per year. The facility has a capacity of 1,159,000 tons per year. The facility also manages 2,400 tons of solids per year. All volumes are approximate. None of the waste streams will cause the facility to make modifications in their treatment process. Approximately 50-75 percent of TC metal waste streams have constituent concentrations above TC or UTS levels. Mr. Norris expects that all TC and UTS standards will be able to be met for the TC metal waste streams. He noted that cadmium stabilization is difficult, although not impossible. Selenium does not stabilize well, and arsenic is very soluble and leaches readily. The facility handles arsenic by mixing the waste with aqueous wastes or water and then deep wells the arsenic containing liquid phase.

Mr. Terry Farrell
Heritage Environmental Services
Location: Indianapolis, IN
Phone: 317-486-2726
Fax: 317-249-2046
Interview conducted by: Gillian Foster
Date of interview: August 20, 1996
Date of follow-up interview: Left message January 8

Mr. Farrell responded that their facility does not treat a significant volume of de-Bevilled wastes, if at all, and they do not accept TC organic waste streams. Approximately 60 percent of the wastes they stabilize are generated by their on site treatment facility. This facility treats plating wastes, acids, and caustic liquid wastes through metals precipitation and treatment. The treated wastewater is then filtered in a filter press that generates a liquid, which is discharged to a sewer, and a filter cake, which is stabilized and disposed in a landfill. About 40 percent of their waste stream is filter cake that arrives from off site for stabilization and disposal. In order to meet the UTS for underlying organics, the facility has two options: 1) pre-screen waste materials against organics and refuse those waste streams; 2) undergo a "significant facility expansion" by adding a treatment process to the treatment train that will address organics (e.g., chemical

oxidation, or thermal treatment). The second option could take two years for the permit modification approval process, engineering, and construction. The time period would depend upon the type of permit modification that is required (e.g., Class I, II, or III). Almost 100 percent of the TC metal waste streams have constituent concentrations above TC or UTS levels that would require additional or modified treatment. Metals with organic UHCs are problematic at this facility. Their process is geared towards handling characteristic metals only. At the least, additional analytical expense would incur. Mr. Farrell believes that Phase IV would force waste streams to incineration because many waste metal waste streams would need to be incinerated for the organic UHCs. In a mixed constituent waste stream, nickel is the hardest constituent to stabilize. Lead, chromium, and cadmium follow nickel in stabilization difficulty. Cyanides present in the filter cake received from off site could require oxidation or chlorinating to meet the UTS.

Ms. Kim Knotts
Environmental Coordinator
LWD Inc.
Location: Calvert City, KY
Phone: 502-395-8313
Fax: 502-395-8153
Interview conducted by: Gail Shaw
Date of interview: September 17, 1996
Date of follow-up interview: January 2, 1997

Ms. Knotts responded that in 1995, their facility treated 35,320 tons of hazardous waste through incineration. Another 10 percent was non-hazardous. Additionally, 3,642 tons of hazardous waste and non-hazardous waste was treated through chemical stabilization (35 percent being non-hazardous). She noted that 99 percent of the treatment capacity is commercial. The facility does treat Phase IV waste; 100 percent can be treated to UTS at the present time and the same is expected in the future. The facility expects no problems treating to individual standards. There will be also be no problem treating organic UHCs; the facility will vary their stabilization process, using different chemicals to drive off the organics. Treatment problems may occur with mixed metals. No modifications will need to be made to the treatment process, except minor changes in stabilization processes for mixed metals. A few weeks will be necessary for these minor modifications.

In a follow-up call, Ms. Knotts noted that the facility has not tried to meet levels as restrictive as the hypothetical UTS levels.

Mr. Mark Rein
Assistant VP of Environmental Affairs
PDC
Location: Peoria, IL
Phone: 309-688-0760
Fax: 309-688-6801
Interview conducted by: Gail Shaw

Date of interview: September 17, 1996
Date of follow-up interview: January 2, 1997

Mr. Rein responded that the facility receives only hazardous waste for treatment. Phase IV wastes (30-40 percent of the waste stream) are treated; 100 percent of wastes received on site are treated. Approximately 30-40 percent of the waste stream is part of a treatment train. He noted that 90 percent of Phase IV wastes can be treated to UTS at the present time and the same is expected in the future. No problems are expected in treating to individual standards or a mixed constituent waste stream. There will be a problem with organic UHCs. Their facility does not have the capability to treat UHCs. They are treated off site at another facility prior to being received at this facility. No modifications will be made to the treatment process. Refer to the comments on the August 1995 proposed rule submitted to EPA for supporting data.

In meeting the hypothetical UTS levels, Mr. Rein commented that the facility would have no difficulties except with lead (D008). For this constituent, the treatment recipes would need to be modified, requiring approximately one month.

Mr. Richard Grondin
Technical Manager
Rollins Environmental Services
Location: Deer Trail, CO
Phone: 970-386-2293
Fax: 970-386-2262
Interview conducted by : Gillian Foster
Date of interview: August 21, 1996
Date of follow-up interview: January 10, 1997

Mr. Grondin responded that 1 percent of their facilities' total waste stream is de-Bevilled wastes. Approximately 50 percent of the total waste stream is TC for metals only wastes. The facility does not conduct off site treatment, only on site at the facility. Twenty percent of its solid waste stream is comprised of incinerator residuals received from off site. Rollins provides stabilization, chemical precipitation, chemical reduction, chemical oxidation, and on site disposal in a Subtitle C landfill. The facility presently receives approximately 100,000 tons to 125,000 tons per year of waste that can be treated to UTS. The total capacity at the facility is approximately 200,000 tons per year. Approximately 99 percent of the waste stream is solid waste and only 1 percent is liquid waste. Treating selenium (D010) through stabilization to UTS is impossible at this facility. They generally exclude waste streams with high concentrations of selenium—currently five to ten tons per year. D010 wastes comprise less than 1 percent of the total waste treated at the facility. The UTS level for selenium is unachievable due to several factors: 1) selenium is an amphoteric metal; it is leachable in many matrices at both low and high pHs; 2) selenium cannot be reduced or oxidized efficiently; 3) the optimum pH for selenium stabilization is between 6 and 7. However, at pH 6-7, all other TC metals will readily leach from the matrix at levels above the TCLP and UTS standards. As a result, many selenium bearing wastes are sent to Canada for disposal. Mr. Grondin believed that the Phase IV LDRs would result in more D010 waste shipped to Canada for disposal. In treating chromium (D007), the facility will have to increase the amount of reagent used, thus increasing the cost. D007 wastes comprise 10 percent of the total waste stream. Generally though, no extensive modifications to

the treatment processes will be necessary. Except for selenium, there should be no problem treating all other TC metal wastes and de-Bevilled wastes to UTS.

In meeting the hypothetical UTS levels, Mr. Grondin commented that the facility would have no difficulties except with selenium (D010), which could not be treated. For this constituent, he noted that a UTS level of 5.7 would be achievable.

In addition to phone conversations, a site visit to Deer Trail was conducted by Mr. Howard Finkel, Project Manager at ICF Incorporated, on August 20, 1996.



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June 14, 1996

MEMORANDUM

To: Bill Kline and C. Pan Lee, EPA

From: Raghu Raghavan and Jim Laurenson

Subject: Status Report on the Available Capacity Assessment for TC Metal and Mineral Processing Wastes.

This memorandum addresses available capacities for metal waste stabilization and metal recovery for meeting the Phase IV TC metal and mineral processing waste LDR standards. We are currently conducting the following activities:

- We are combining and substantially updating the discussion of available commercial treatment capacity given in the background document for the capacity analyses supporting the proposed LDR rule.
- We have conducted a preliminary review of the biennial reporting system (BRS) for 1993 to identify commercial facilities providing metal waste stabilization and metal recovery capacities.
- We have compiled BRS information on the maximum operational capacity and utilized capacity for various treatment systems providing stabilization or metal recovery at these facilities.
- We have compared the BRS information with the results of the capacity analysis performed for the Third Third LDR rule (1990).
- We are in the process of contacting companies who are operating selected commercial facilities to improve our data and understanding of the available capacity for the wastes affected by the proposed rule.

The remainder of this memo presents our preliminary results of the BRS data review and our activities concerning the contacting of facilities.

A facility required to submit the BRS must complete a separate and independent Form PS for each on-site hazardous waste treatment, disposal, or recycling process system that was existing and operational, for which there were plans to build and start operations, or that was in the closure process. The information given in Form PS includes estimates of the maximum operational and actually used capacities for each system type available on site. After a preliminary review and comparison of data given in the Form PS in 1991 and 1993 BRS, we

decided to focus on the RCRA capacity related information and other data given in Form PS in 1993 BRS for the following metal recovery and stabilization systems:

- Metal Recovery Systems
 - M011 High temperature metals recovery
 - M012 Retorting
 - M013 Secondary Smelting
 - M014 Other metals recovery (e.g., ion exchange, reverse osmosis, acid leaching, etc.)
 - M019 Metals recovery - type unknown
- Stabilization
 - M111 Stabilization/Chemical fixation using cementitious and/or pozzolanic materials
 - M112 Other stabilization
 - M119 Stabilization - type unknown

By using the information given in Form PS to define the commercial capacity availability of each system, we were able to list separately the facilities having commercially available and non-commercial capacities for metal recovery and stabilization. The following lists are attached with this memo as an illustration of the preliminary results of maximum and utilized RCRA capacities that we obtained from use of Form PS in the 1993 BRS:

- Commercial stabilization systems and capacities;
- Non-commercial stabilization systems and capacities;
- Commercial metal recovery systems and capacities; and
- Non-commercial metal recovery systems and capacities.

The attached preliminary tables have been analyzed further by comparing their contents with information on the utilization of capacity given in other forms — Forms WR and GM — in the 1993 BRS. As mentioned before, the BRS information was compared with the results of the capacity analysis performed for the Third Third LDR rule.

Based on the analysis of 1993 BRS completed to-date, it seems that there are nearly 30 operational facilities providing commercial stabilization capacity. The utilized capacity for stabilization appears to be approximately 750,000 tons per year. The maximum operational capacity at these commercial facilities has yet to be confirmed. (For example, the attached table on commercial stabilization indicates that several facilities reported maximum capacities that far exceeded utilized capacities. These data must be confirmed through personal contacts of the facilities or by using other reliable sources of information.) However, it seems that the available stabilization capacity would be more than the previous estimate of 1 million tons per year. The 1993 BRS information also showed that additional stabilization capacity is utilized and available at nearly 60 non-commercial facilities. As for metal recovery, nearly 60 commercial facilities have reported the utilization of approximately 600,000 tons of capacity in 1993. Additional capacity for metal recovery is also being provided at nearly 120 non-commercial facilities. The maximum operational capacity at commercial metal recovery facilities must also be confirmed. (As with stabilization capacity, the attached table on commercial metal recovery shows large differences between maximum and utilized capacities.)

At present, we are trying to improve the data obtained from BRS on maximum operational and utilized capacities for commercial stabilization and metal recovery. It is necessary, however, to improve upon the quality of these numbers through a limited number of phone contacts of selected facilities. It is also necessary to obtain at least some qualitative information addressing the logistics and applicability of existing technologies to meet the UTS for newly identified mineral processing wastes and other TC metal wastes.

We have selected the following six companies to discuss the available capacity for metal waste stabilization:

1. Laidlaw Environmental Services, Inc.
2. Rollins Environmental Services
3. Chemical Waste Management
4. Peoria Disposal Company
5. Gibson Environmental
6. Republic Environmental Systems, Inc.

The first three companies operate commercial hazardous waste landfills in different states and commented on the proposed Phase IV LDR rule. Most of these landfills were reported in EPA's Commercial Treatment/Recovery Data Set (May 1990) and in the 1993 BRS to have stabilization capacity on site. The last three companies listed above were also reported in BRS to have large capacities for metal waste stabilization. All of these companies may be interested in providing available capacity on stabilization for some of the hazardous waste affected by Phase IV LDRs.

We have selected the following six companies to discuss the available capacity for metal recovery:

1. INMETCO, Inc.
2. Quemetco, Inc.
3. Revere Smelting and Refining Corp.
4. Recontek Inc.
5. ETICAM Process
6. Encycle Texas Inc.

INMETCO provided comments on the proposed Phase IV LDR rule. The next two companies showed high utilization of secondary smelting capacity at their facilities. The last three companies were selected due to the need for confirming that they are active in processing a wide range of metal-bearing hazardous wastes, as reported in the capacity analysis background document supporting the proposed rule. We are expecting to resolve some of the major discrepancies between maximum and utilized capacities shown in the attached table on commercial metal recovery systems (e.g., Phibro-Tech, Inc.) without contacting the facilities.

We are asking one or more of the following questions (depending on the information already provided or expected) after contacting the right person in each of these companies:

- What is the maximum capacity for stabilization and/or metal recovery installed at each of the facilities operated by the company? How was this capacity measured?

- When was the facility originally built? What kind of technology confirmation was required before designing, building, or starting operations at the facility?
- What is the current utilization of capacity at each facility? What percentage of capacity is utilized for commercial purposes? Are there any limitations in the use of commercial capacity? What is the non-commercial capacity used for?
- What are the types of capacities available? For example, is stabilization technology based on physical encapsulation or chemical fixation? As another example, what are the metals recovered from the wastes? Are there any technical limitations in the use of technology(ies) used at the facility?
- What types of industries/wastes are being provided with commercially available treatment capacity? Newly-identified mineral processing wastes? Other TC metals required to meet UTS?
- Will the company be interested in building and/or operating on-site metal waste stabilization or metal recovery facilities for selected new customers? Has the company considered or provided similar services in the past? What are the logistics and economic considerations in developing this additional capacity?

In addition to contacting these companies, we are in the process of contacting a few selected trade associations to confirm our new findings on the availability of commercial stabilization or metal recovery capacity, and the feasibility of building new waste treatment capacities on site. We also plan to discuss these topics with some technical specialists in metal waste stabilization or metal recovery. For example, we plan to contact one of the authors of the attached paper on chemical fixation, Gregory Indelicato, to discuss the applicability of new techniques in chemical fixation for hazardous waste treatment.

Please call Raghu Raghavan at 703-934-3417 or Jim Laurensen at 703-934-3648 if you have any questions on this memorandum.

Commercial Stabilization Systems and Capacities¹
(Basis:1993BRS-Form PS)

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
COD991300484	HIGHWAY 36 LAND DEVELOPMENT CORP	M111	40,000,000	17,233
CAD980883177	GIBSON ENVIRONMENTAL	M111	1,752,000	47,231
ILD000805812	PEORIA DISPOSAL CO INC	M111	1,167,840	41,557
PAD085690592	REPUBLIC ENVIRONMENTAL SYSTEMS, INC.	M111	547,500	8,862
UTD991301748	USPCI - GRASSY MOUNTAIN FACILITY	M111	468,000	14,880
ALD000622464	CHEMICAL WASTE MANAGEMENT	M111	428,442	57,370
MID000724831	ENVOTECH MANAGEMENT SERVICES, INC	M111	385,804	142,132
IND093219012	HERITAGE ENVIRONMENTAL SERVICES, INC	M111	350,000	29,800
MID074259565	DYNECOL INCORPORATED	M112	224,648	27,243
PAD059087072	MILL SERVICE INC - BULGER	M111	175,000	-
GAD096629282	CWM RESOURCE MANAGEMENT INC	M112	132,919	423
PAD004835146	MILL SERVICE INC - YUKON	M111	130,088	9,558
KYD985073196	LWD SANITARY LANDFILL, INC.	M111	120,000	656
NYD049836679	CWM CHEMICAL SERVICES, INC.	M111	106,392	60,822
OKD065438378	U.S. POLL. CONTROL, INC.-LONE MOUNTAIN	M111	95,200	93,568
OHD045243706	ENVIROSAFE SERVICES OF OHIO INC	M111	80,000	56,500
OHD980568992	ENVIRITE CORPORATION	M112	75,000	41,056
MID096963194	CHEM-MET SERVICES INCORPORATED	M111	73,502	19,960
ILD010284248	CID RECYCLING & DISPOSAL FAC	M111	67,200	2,843
IDD073114654	ENVIROSAFE SERVICES OF IDAHO, INC	M111	52,000	10,920
IND078911146	CHEMICAL WASTE MANAGEMENT OF INDIANA INC	M111	50,700	34,197
PAD010154045	ENVIRITE CORPORATION	M112	50,000	32,267
CTD072138969	ENVIRONMENTAL WASTE RESOURCES INC	M111	40,000	1,323
OHD083377010	ENVIRONMENTAL ENTERPRISES INC	M111	25,200	16,200
OHD000816629	SPRING GROVE RESOURCE RECOVERY INC	M111	15,230	2,116
IND984874230	ROANOKE WASTEWATER TREATMENT PLANT	M111	14,900	7,450
CTD089631956	EAST COAST ENVIRONMENTAL SERVICES	M111	5,000	22
NVT330010000	US ECOLOGY INC	M111	670	40,810
OKD000402396	PERMA-FIX TREATMENT SERV., INC.	M111	107	21
OKD082708371	HUGO RAILCAR	M111	55	32
GAT000001971	GEORGIA DEPARTMENT OF TRANSPORTATION	M111	8	8
OKD007224702	BARTLETT-COLLINS GLASS CO.	M111	4	4
CAT080010101	APPROPRIATE TECHNOLOGIES 11, INC.	M111	-	4
CAT080033681	CHEM-TECH SYSTEMS, INC.	M111	-	-
ILD000608471	CLEAN HARBORS OF CHICAGO INC	M111	-	-
LAD000777201	CHEMICAL WASTE MANAGEMENT	M111	-	50,973
NED981117153	HOUSTON J-M CORPORATION	M111	-	-
OKD096648837	NORRIS SUCKER ROD	M111	-	1
CAD021774559	AMERICAN BRASS & IRON FOUNDRY	M111	-	273
TOTAL QUANTITY FOR COMMERCIAL FACILITIES			46,633,208	868,312

Louisiana, Texas

¹ Data in this memorandum has not undergone extensive review by the Agency.

Non Commercial Stabilization Systems and Capacities
(Basis: 1993 BRS-Form PS)

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
ID4890008952	USDOE IDAHO NAT'L ENGINEERING LABORATORY	M111	360,000	-
MID005356860	GMC, INLAND FISHER GUIDE	M111	190,360	107,871
LAD010395127	ROLLINS ENVIRONMENTAL SERVICES	M111	130,000	65
ALD003397569	ACIPCO (AMERICAN CAST IRON PIPE COMPANY)	M111	60,034	2,000
CAD009151671	E I DUPONT DENEMOURS & CO	M111	50,000	18,080
ALD046481032	SANDERS LEAD COMPANY, INC.	M111	44,777	26,019
ILD006271696	OLIN CORP	M112	40,320	1,309
ILD005263157	NORTHWESTERN STEEL & WIRE #2	M111	35,092	27,192
CAD009114919	CHEVRON USA PRODUCTS CO, RICHMOND REFIN	M111	31,590	-
AZ4570024055	DAVIS MONTHAN AFB	M111	25,000	24,167
LAD008184137	SCHUYLKILL METALS CORP	M111	25,000	10,499
IND005146683	THE FORD METER BOX CO., INC.	M112	15,000	1,721
NCD986181451	MANNINGTON CERAMIC TILE	M111	12,000	7,935
OHD032271975	MARION STEEL COMPANY	M112	4,500	3,277
NYD980779540	WEST VALLEY DEMONSTRATION PROJECT	M111	2,865	906
ALD983191966	VIRGINIA CAROLINA CHEMICAL SO	M111	2,500	2,500
VAD065417008	GRIFFIN PIPE PRODUCTS CO	M111	2,300	1,236
IND064708845	KUNKLE FOUNDRY CO.,INC.	M111	1,125	244
GAD033842543	TRI-STATE STEEL DRUM INC	M111	1,040	175
CO7890010526	U.S. DEPARTMENT OF ENERGY - ROCKY FLATS	M111	831	-
ALD095688875	ZENECA INC-COLD CREEK	M112	500	244
FLD984243097	BIO MEDICAL SERVICE CORP	M112	459	137
NM0890010515	U.S. DOE LOS ALAMOS NATIONAL LABORATORY	M111	173	60
MOD006308407	A.B. CHANCE COMPANY ALLEN STREET COMPLEX	M111	150	52
IND121581698	WABASH NATIONAL CORPORATION	M112	117	11
PAD004329835	PENNZOIL PRODUCTS CO ROUSEVILLE REFINERY	M111	100	65
CAD982412165	TOPPAN WEST, INC	M111	75	5
PAD041731670	CERDEC CORP - DRAKENFELD PRODUCTS	M111	75	23
MOT300010022	A C F IND SHIPPERS CAR LINE DIVISION	M111	40	10
MSD033353129	THE CLARION LEDGER	M111	34	34
MSD097909485	RELIABLE ELECTRIC UTILITY PROD	M111	25	12
FLD982120024	BOSTON WHALER INC	M112	24	24
IND056041213	LEER MIDWEST	M111	4	4
OKD000758557	CHROMALLOY DIVISION-OK	M111	3	24
GAD098583909	HERCULES INC OXFORD PLANT	M112	0	0
MOD981709272	IT ANALYTICAL SERVICES ST. LOUIS	M111	0	0
CTD981063431	PFALTZ & BAUER INC	M111	0	0
DC8170024311	NAVAL RESEARCH LABORATORY	M112	0	-
KSD007150477	GNB INCORPORATED	M111	-	170
OKD001824564	AMERICAN AIRLINES, M & E CENTER	M111	-	187
OKD007220148	AMERICAN AIRLINES, COMPOSITE CENTER	M111	-	38
OKD081398612	UNIT PARTS COMPANY	M111	-	212
OKT410010797	GEA RAINEY PLANT #II	M111	-	7
CAD001216548	JOSLYN JENNINGS CORP	M112	-	-
CAD056160336	LITTON IND ELECTRON TUBE DIV.	M112	-	-
CAD982324154	COMPOSITE STRUCTURES	M112	-	-
CO7890010526	U.S. DEPARTMENT OF ENERGY - ROCKY FLATS	M112	-	-
MED001097237	SNS PLASTICS CO INC	M112	-	8
OKD000829440	ZINC CORPORATION OF AMERICA	M112	-	3
VAD003444379	VIRGINIA METALCRAFTERS INC	M112	-	-

Non Commercial Stabilization Systems and Capacities
(Basis: 1993 BRS-Form PS)

MOD985821719	MIDAMERICAN TRUCK MAINTENANCE	M119	-	-
OKD000829440	ZINC CORPORATION OF AMERICA	M119	-	3
MD6150004095	NATIONAL INSTITUTES OF HEALTH	M111	-	0
MD6150004095	NATIONAL INSTITUTES OF HEALTH	M112	-	0
TOTAL FOR NON-COMMERCIAL FACILITIES			1,036,112	236,526