



U.S. Department of Energy
Oakland Operations Office, Oakland, California

**MISCELLANEOUS METAL DISPOSITION LETTER
REPORT**

for

Laboratory for Energy-Related Health Research
(LEHR)
University of California at Davis, California

Prepared for:

United States Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, California 95612-5208

Prepared by:

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Rev. B

DOE Oakland Operations Contract DE-AC03-96SF20686

1. INTRODUCTION

1.1 Objectives

The objective of this disposition letter report is to document the authorized release of approximately 31,000 pounds of metal debris recently stored at the Laboratory for Energy-related Health Research (LEHR) to a metal recycler for final disposition.

1.2 Background

Metal debris recycled was generated during several phases of facility decontamination activities at LEHR. Galvanized sheet metal, sheet metal, stainless steel, carbon steel, motors, and assorted metals were generated during the decontamination and decommissioning (D&D) of Animal Hospital Building Number 1 (AH-1) and Animal Hospital Building Number 2 (AH-2) in 1993. The D&D of the Cobalt-60 Building and Imhoff followed in 1994 and 1995 adding galvanized steel piping and a stainless steel source shutter unit to the inventory. Another major D&D phase occurred in 1995 and 1996 when the Eastern Dog Pen and Western Dog Pen (WDP) Areas were dismantled contributing much of the aluminum, galvanized steel, and remaining sheet metal. The LEHR decided to investigate the option for recycling most of the generated metal as opposed to off-site disposal in order to be consistent with the United States Department of Energys (DOEs) commitment to waste minimization and pollution prevention practices.

The miscellaneous metal generated were palletized and moved into the following interim storage locations: the Cobalt-60 Field Storage Area located in a fenced area behind the Cobalt-60 Building, or in the WDP Storage Area. In 1997, IT Corporation (IT Corp) inventoried all miscellaneous metal stored at the WDP and the Cobalt-60 field storage areas (IT Corp, 1997). Miscellaneous metal which did not have sufficient radiological survey data collected as part of the D&D activities to evaluate authorized release under the guidelines of DOE Order 5400.5, "Radiation Protection of the Public and the Environment" (DOE, 1990) were surveyed further with the intention of acquiring data sufficient to meet this goal.

Based on Environmental Management Services (EMS) recommendation, the DOE authorized release of 512 empty 55-gallon carbon-steel drums to a drum recycler vendor. The entire inventory of drums were transferred to Capitol Drum, Inc. of Sacramento, California in June 1998. Data supporting the disposition of these drums is documented in the Disposition of Excess Clean and Empty Drums from the LEHR to a Drum Recycler (EMS, 1998).

1.3 Evaluation Process

Under a subcontract to Weiss Associates (WA), DOE prime contractor, EMS was tasked to review survey data, identify data gaps, and evaluate and recommend disposition options of the stored miscellaneous metal focusing on recycling when feasible. This disposition letter report documents the disposition activities which were based on the results of this evaluation. Specifically, EMS' evaluation process consisted of the following:

- Reviewing Miscellaneous Materials and Waste Inventory Summary (IT Corp, 1997) and verifying previously defined categories for the metals;
- Identifying metal debris with insufficient data to justify authorized release;
- Implementing process knowledge on miscellaneous metal to determine level of survey required;
- Reviewing survey procedures;
- Obtaining existing and new radiological survey data;
- Evaluating minimum detectable activity for each instrument;
- Comparing contamination results to release criteria;
- Ensuring metal debris which exceed the release criteria were segregated; and
- Identifying potential metal recycler vendors.

2. DISPOSITION

2.1 Justification for Authorized Release

Table 1 summarizes the survey results for each metal and provides a reference to the release criteria for comparison. The release criteria was developed from the surface residual radioactivity guidelines from DOE Order 5400.5 to determine whether the miscellaneous metal can be released for unrestricted use. The data presented in Table 1 were compared to the release criteria and, along with the application of process knowledge, used as justification for authorized release. A more detailed discussion on the data used to justify authorized release of the metal is provided in the Final Miscellaneous Metal Disposition Report (EMS, 1999). Approval of authorized release as the final disposition option was received from the DOE on June 1, 1999. The approval letter is provided in Attachment 1.

2.2 Disposition Activities

Activities supporting the disposition of the miscellaneous metal were performed between June 18 and June 25, 1999. The metal recycler, Alco Iron & Metal Company (Alco) of San Leandro California, provided the containers and transportation necessary for the transfer of the metal to their recycling plant. The containers provided were 40 cubic yard trailers, which hitch directly to a semi-tractor truck. The schedule consisted of delivering, loading, and removing one trailer each working day.

The metal was loaded into the containers by IT Corp personnel utilizing a front end loader and a Gradall telescopic forklift. A list of the miscellaneous metal transported to the recycler is included in Table 2.

Surveying activities performed in 1998 indicated several fence posts had areas exceeding the release criteria for unrestricted use. On June 24, 1999, a Radiological Control Technician collected beta/gamma surface scan measurements from these fence posts utilizing a Ludlum Model 3 portable survey meter. The measurements were collected to determine where the section of the post cleared for unrestricted use could be separated from the section of the post with readings exceeding the release criteria. IT Corp personnel then used a band saw to separate the two sections of each post. The end of the posts cleared for unrestricted use were loaded into the trailers for transportation to the recycler. The ends of the posts that exceeded the release criteria were placed in a B-25 box for on site storage until further evaluation of disposition options can be performed.

Several fence posts included wooden blocks which were bolted on to one end of the posts. These wooden blocks were removed by IT Corp personnel and placed in 55-gallon drums for on site storage. The fence posts were then loaded into the trailers for transportation to the recycler.

Prior to each trailer leaving the site, the Alco representative inspected the load to ensure there were no potential transportation hazards. Five trailers were required to complete the transfer of the metal to the recycler. Attachment 2 provides the recyclers acknowledgement of transfer of the metal.

Attachment 3 contains photos showing several essential activities associated with the disposition of the miscellaneous metal.

3. REFERENCES

Environmental Management Services (EMS), 1998. The Disposition of Excess Clean and Empty Drums from the Laboratory for Energy-Related Health Research to a Drum Recycler. Walnut Creek, CA. June.

Environmental Management Services (EMS), 1999. Final Miscellaneous Metal Disposition Report for Laboratory for Energy-Related Health Research, University of California at Davis. Walnut Creek, CA. May.

IT Corporation (IT Corp), 1997. Draft Miscellaneous Materials and Waste Inventory Summary at the Laboratory for Energy-Related Health Research, University of California at Davis. Martinez, CA. December.

United States Department of Energy (DOE), 1990. DOE Order 5400.5: Radiation Protection of the Public and the Environment. Washington, DC. June.

TABLES

Table 1
Surface Contamination Survey Results

	Surface Contamination ⁽¹⁾ (dpm/100 cm ²)			
	Fixed Contamination		Removable Contamination	
	Alpha	Beta/Gamma	Alpha	Beta/Gamma
Surface Radioactivity Guidelines⁽²⁾	Average: 100 Maximum: 300	Average: 1,000 Maximum: 3,000	20	200
Miscellaneous Material				
Aluminum				
Perforated Frame	0	<125	<16	<78
Table Tops, Sheetting	<9	<417	8	95
Galvanized Steel				
Chain Link Fence Gates	70	788	8	47
Chain Link Fence Attachments	40	232	3	6
Chain Link Fence Top Rail with Barbed Wire	10	390	7	4
Chain Link Fencing	40	528	8	61
Chain Link Fence Posts	85	652	11	47
Lamp Posts	10-15	271-333	4	<MDA ⁽³⁾
Electrical Conduit	75	412	4	6
Pipe	40	821	7	4
Pipe with Foam Insulation	10	121	<MDA ⁽⁴⁾	<MDA ⁽³⁾
Galvanized Sheet Metal				
Galvanized Sheet Metal - Miscellaneous	71	<511	10	73
Centrifugal Fan Unit Housing and Stacks	55	432	10	73
Barrel/Drum Retainer Rings	40	568	3	10
Sheet Metal				
Dog Pen Shed	50	260	4	37
Filing Cabinets	<69	<381	16	78
Air Conditioning Unit	15	458	3	11
Gas Infrared Radiant Wall and Ceiling Heaters	10	242	3	44
Stainless Steel				
Washing Machine with Drain Pans	20	292	6	34
Fume Hood	<69	<381	<16	<78
Source Shutter Unit	<79	<349	<16	<79
Miscellaneous Light Fixtures	<69	<381	<16	<78
Cage Floor Racks	30	758	11	67
Copper Wire	20	208	3	8
Motors with Assorted Metals	<71	<416	10	73

(1) Surface contamination presented is the maximum level measured for each material.

(2) Allowable total residual surface contamination guidelines from DOE Order 5400.5 (DOE, 1990).

(3) The calculated MDA for the Ludlum 2929 Dual Scaler is 84 dpm/100cm² for beta-gamma.

(4) The calculated MDA for the Ludlum 2929 Dual Scaler is 11 dpm/100cm² for alpha.

dpm = disintegrations per minute

cm² = square centimeters

MDA = Minimum Detectable Activity

Table 2
Miscellaneous Metal Physical Characteristics and Origination

METAL Category	Weight (pounds)	Volume (cubic feet)	Area of Origination
Aluminum Perforated Frame Table Tops, Sheeting	1200	400	<ul style="list-style-type: none"> • Specimen Storage Room 425 • Dog Pens
Galvanized Steel Chain Link Fence Gates Chain Link Fence Attachments Chain Link Fence Top Rail with Barbed Wire Chain Link Fencing Chain Link Fence Posts Lamp Posts Electrical Conduit Pipe Pipe with Foam Insulation	7700	14500	<ul style="list-style-type: none"> • Dog Pens • Cobalt-60 Field Storage Area
Galvanized Sheet Metal Galvanized Sheet Metal - Miscellaneous Centrifugal Fan Unit Housing and Stacks Barrel/Drum Retainer Rings	4200	1100	<ul style="list-style-type: none"> • Animal Hospital 1 • Animal Hospital 2 • Dog Pens
Sheet Metal Dog Pen Shed Roofing from Dog Pen Walkways Roofing from Chemical Shed Filing Cabinets Air Conditioning Unit Gas Infrared Radiant Wall and Ceiling Heaters	2600	2300	<ul style="list-style-type: none"> • Animal Hospital 1 • Dog Pens • Geriatrics Building 1
Stainless Steel Washing Machine with Drain Pans Fume Hood Source Shutter Unit Miscellaneous Light Fixtures Cage Floor Racks	13600	800	<ul style="list-style-type: none"> • Animal Hospital 1 • Animal Hospital 2 • Building H-229
Copper Wire	700	100	<ul style="list-style-type: none"> • Dog Pens
Motors with Assorted Metals	1150	100	<ul style="list-style-type: none"> • Animal Hospital 1
Totals	31150	19300	

Weight and volume estimates were obtained from the Draft Miscellaneous Materials and Waste Inventory Summary (IT Corp, 1997).

ATTACHMENT 1

DOE APPROVAL LETTER



June 1, 1999

Wen Kao
U.S. Department of Energy
Oakland Operations Office
Environmental Programs Division
1301 Clay Street, Room 700N
Oakland, CA 94612-5208

RE: DOE Approval to Recycle Miscellaneous
Metals, LEHR ER/WM Program

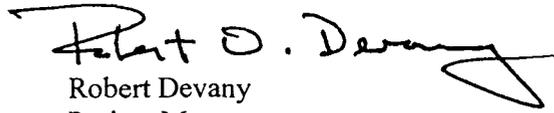
Dear Wen:

This letter requests DOE approval for the transfer of approximately 31,000 pounds of LEHR-generated scrap metals to Alco Iron and Metal Company of San Leandro, California. These metals were surveyed for radiological residues and found to be releasable for unrestricted use based on DOE 5400.5 "Surface Residual Radioactivity Guideline."

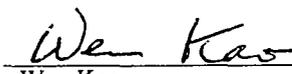
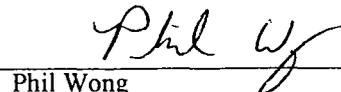
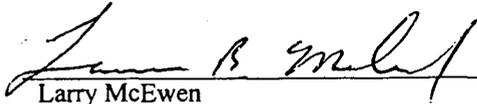
Detailed information about the subject metals, including metal description, survey protocol, survey results and recommendation for recycling are contained in the final Miscellaneous Metal Disposition Report for the Laboratory for Energy Related Health Research dated May 15, 1999.

If you concur with the proposed recycling disposition option, please sign as indicated below and return a signed copy to me. If you have any questions, please contact Salem Attiga of EMS at (925) 939-0687.

Sincerely,
Weiss Associates


Robert Devany
Project Manager

DOE Approval


Wen Kao
Project Manager
Phil Wong
Radiation Protection Manager
Waste
Larry McEwen
Deputy Director, Environmental Program Division

cc: Salem Attiga, EMS
Mary Gross, DOE/Oak
Susan Fields, DOE/OAK
Fred Gius, EMS

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ATTACHMENT 2

RECYCLERS ACKNOWLEDGEMENT

DISPOSITION OF MISCELLANEOUS METAL

We acknowledge that the following miscellaneous metal items were transferred to Alco Iron & Metal Company for recycling between June 21 and June 25, 1999:

- Aluminum Perforated Frames and Table Tops
- Galvanized Steel Chain Link Fencing, Fence Gates, Fence Posts, Attachments, and Top Rails
- Galvanized Steel Lamp Posts, Electrical Conduit, and Pipe
- Galvanized Sheet Metal Centrifugal Fan Unit Housings and Stacks
- Miscellaneous Galvanized Sheet Metal and Barrel Retainer Rings
- Sheet Metal from Dog Pen Shed and Dog Pen Walkways
- Sheet Metal Filing Cabinets, Air Conditioner Unit, and Gas Infrared Radiant Wall and Ceiling Heaters
- Stainless Steel Washing Machine, Fume Hood, Source Shutter Unit, Light Fixtures, and Dog Cage Floor Racks
- Cooper Wire
- Motors with Assorted Metals.

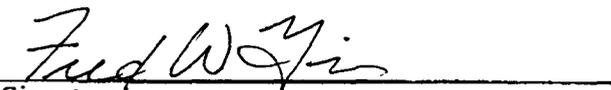
The metal transfer was approved June 1, 1999 by the DOE-Oakland Operations Office.

The miscellaneous metal was transferred from the former DOE Laboratory for Energy-related Health Research in Davis, California to the Alco Iron & Metal Company's recycling facility in Vallejo, California.

Total volume and weight of the metal was approximately 19,000 cubic feet and 30,000 pounds, respectively.



 Signature Date 6/26/99
 Alco Iron & Metal Company Representative



 Signature Date June 29, 1999
 Fred Gius
 EMS

ATTACHMENT 3

REPRESENTATIVE PHOTOS



Photo 1. Radiological survey to determine area to cut to separate material previously released for unrestricted use.



Photo 2. Empty trailer as received from metal recycler.



Photo 3. Loading trailer

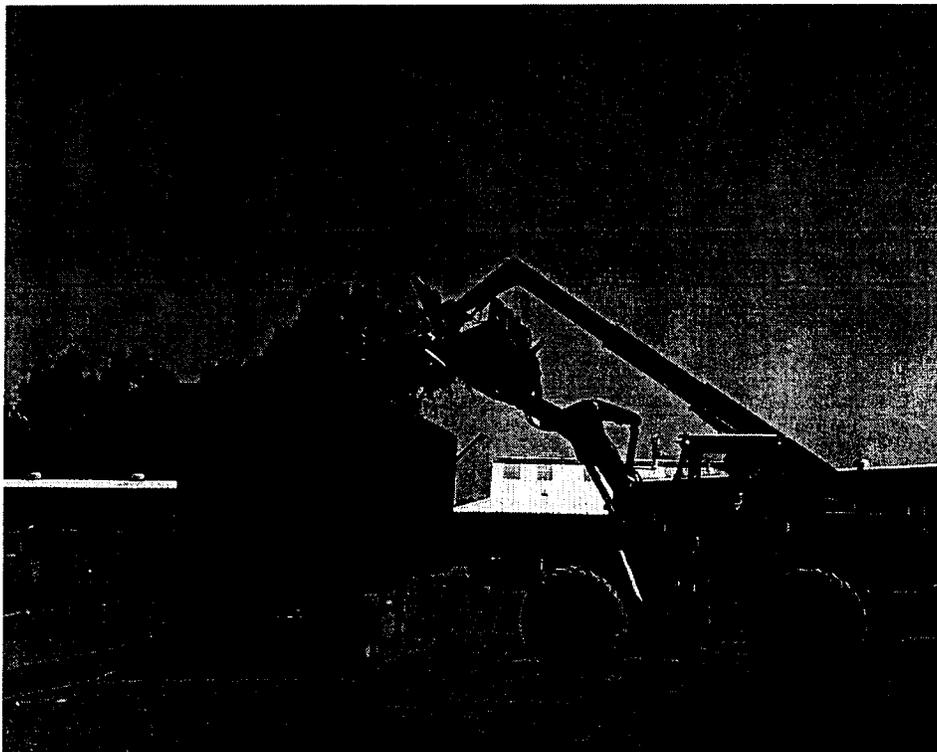


Photo 4. Loading trailer



Photo 5. Full trailer

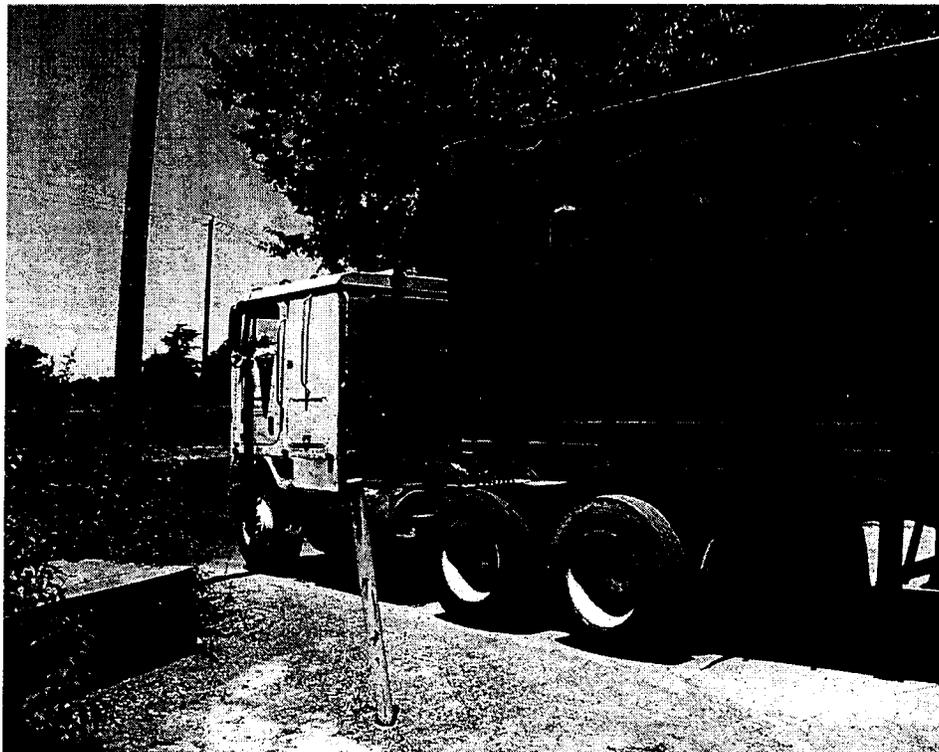


Photo 6. Loaded trailer leaving LEHR site.