Former ASARCO Smelter
The Texas Custodial Trust: Project Overview & Site Tour

Presented to

United States Environmental Protection Agency Administrator Lisa Jackson
United States Congressman Silvestre Reyes
U.S. EPA Region 6 Regional Administrator Alfredo Armendariz

January 27, 2011
Worked approximately 11,000 field man-hours to date with ZERO INJURIES
Take Away Points

- Trust Mission
- Stakeholder Buy-in
- Asset Recovery Optimization
- Innovative, Sustainable, Green Remedy
- End Vision Compatible with City Master Plan
Trust Purpose and Objectives

■ Purpose

● Carry out the requirements of the Texas Custodial Trust
  ♦ Addressing contamination on and in structures, soils, surface water and groundwater
  ♦ Remediating the Site to standards that are protective of human health and the environment with the oversight of TCEQ
  ♦ Ultimately to sell, transfer or otherwise dispose of the property

■ Objectives

● Implement a technically rigorous remedy
● Ensure a viable and beneficial final site end use
● Facilitate community participation
● Effective management of site assets to increase remediation fund
● Efficient and objective procurement of project resources
Remediation Timeline Estimate

2010  2011  2012  2013  2014  2015

PLANNING & PROCUREMENT

SITE DEMOLITION

SURFACE SOILS & SURFACE WATER REMEDY

GROUNDWATER REMEDY

LONG TERM MAINTENANCE

PROPERTY DISPOSITION

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# Available Trust Funding for Remedy (TCEQ Estimate)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition of Construction</td>
<td>$8,883,799</td>
</tr>
<tr>
<td><strong>Groundwater Construction and Operation</strong></td>
<td></td>
</tr>
<tr>
<td>Groundwater Construction</td>
<td>$7,095,000</td>
</tr>
<tr>
<td>Long-term Operation of Groundwater System</td>
<td>$14,773,372</td>
</tr>
<tr>
<td><strong>Asphalt Paving</strong></td>
<td>$9,815,000</td>
</tr>
<tr>
<td><strong>Fencing</strong></td>
<td>$68,628</td>
</tr>
<tr>
<td><strong>Engineering Design and Construction of Disposal Unit Cell 4</strong></td>
<td>$5,848,000</td>
</tr>
<tr>
<td><strong>Long Term Monitoring of Engineering Control and Groundwater</strong></td>
<td>$3,284,095</td>
</tr>
<tr>
<td><strong>SUBTOTAL FOR WASTE MANAGEMENT</strong></td>
<td>$49,767,894</td>
</tr>
<tr>
<td><strong>Other Identified Costs</strong></td>
<td>$2,237,293</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$52,005,187</strong></td>
</tr>
</tbody>
</table>

*Source: TCEQ, 2009*
The Community Effort

The Community Outreach effort has been higher than anticipated due to diverse stakeholders, a high level of community involvement, local government involvement and various community activist groups.

Avenues for Community Input

- **Website:** ([www.RecastingTheSmelter.com](http://www.RecastingTheSmelter.com))
  - The website is aimed at providing the public with current site information and activities.

- **Blog:**
  - Gives the community a forum to post their opinions and input.

- **Access to media:**

- **Ex-ASARCO Employee Group:**
  - Intensive One-on-one interaction (site tours, meetings, written communications, incorporation of concerns into work plan)

- **Elected Officials:**
  - Frequent briefings to federal, state, and local officials

El Paso Based Contractors

- We Have Utilized Local Labor & Resources As Much As Possible, ~$1.5MM to date
Constant Outreach with University of Texas El Paso (UTEP) Including:

1. **Internships**
   - We have developed 3 UTEP Student Internships with UTEP’s Center for Environmental Resource Management (CERM). Students are currently working on the project.

2. **Archive Donation**
   - Deed of Gift: Donations to the UTEP Special Collections Department Additional donations to: El Paso Historical Commission and El Paso Museum of History
   - Materials included: old records, payroll ledgers, photographs, maps, blueprints, and equipment manuals.

3. **Faculty Forum**
   - To exchange ideas and potential technologies for the Site
   - To provide an avenue for research at the site for UTEP students, (i.e. if the geology department would like to take samples)
   - Forums are held every quarter
Asset Recovery Funnel

El Paso Smelter Asset Gross Sales Summary

Stage 1 - Identify
$1,860,000
Converters, Motors, Transformers, Tube Units, Nonferrous Scrap

Stage 2 - Go / No Go
$0

Stage 3 - Propose
$8,000,000
Contop, Reverb Matte

Stage 4 - Contract
$1,900,000
Oxygen Plant

Stage 5 - Sold
$643,100
Slag Pots, Cryogenic Liquid Oxygen Tanks, Railroad, Misc. Scrap, Misc. Equipment

Potential Gross Value
$12,403,100
Current Value of Metals is Driving Our Asset Recovery

Reference: www.infomine.com

Dismantling of the reverberatory furnace.

Copper matte exposed in the bottom of the furnace.
Remedy Development – Existing Data Review and Quality

- Extensive Data Set From Prior Work by ASARCO
- Samples collected using accepted practices
- Samples properly handled by field personnel and laboratories
- Certified laboratories performed the requested analyses
- Laboratory data validated by an independent third party
- Existing database streamlined and available to project team and public
- Database quality is sufficient for decision making
Smelter Data Gap Evaluation

- Reconstruct historical smelting processes
- Document Inputs to the processes
  - Ores and Concentrates
  - Encycle materials
- Recognize chemical reactions and products
- Document Outputs
  - Metal products, Slag, Trace metals
- Recommend future investigations
  - Define Analytes of Interest
  - Define potential pathways and sampling locations
Inputs

Chalcopyrite, \( \text{CuFeS}_2 \)  

Galena, \( \text{PbS} \)  

Sphalerite, \( \text{ZnS} \)
Smelting Process

Copper Concentrate → UNLOADING → BEDDING → SMELTER → ANODE CASTING → CONVERTER → ACID PLANT

- Fugitive Dust
- Fugitive Gas and Dust

Washing → Offsite Refinery

Copper Concentrate

Matte → SO₂ → Water Treatment

Leaching

Weathering

Dust

Leaking

Slag Dump

Recycle Water

Landfill

Recycle Material
Primary Copper Smelting (415,000 tons/year)

CuFeS₂ (Sb, As, Bi, Cd, Co, Cr, Mo, Ni, Pb, Zn, Fe) + SiO₂ + heat (>2730° F) + O₂

→

Cu(metal) + Fe₂SiO₄ (crystalline slag, containing trace metals (Sb, As, Bi, Cd, Co, Cr, Mo, Ni, Pb, Se, Ag, Zn) + dust containing trace metals) + flue gas (SO₂)
Secondary Smelting Records Review

- USEPA Region 6 Website
  - ENCYCLE Records (46,486 tons, 1992-1997)
  - 17 records, 2176 pages
  - 300 Manifests

- Get the Lead Out Website
  - No Additional Information

- Smelter Records
  - 37 Records
  - One Manifest (14.9 tons, April 1998)
### Secondary Smelting

**Waste Codes Shipped to ENCYCLE (Majority)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description/Contains</th>
</tr>
</thead>
<tbody>
<tr>
<td>D001</td>
<td>Ignitable</td>
</tr>
<tr>
<td>D002</td>
<td>Corrosive</td>
</tr>
<tr>
<td>D003</td>
<td>Reactive</td>
</tr>
<tr>
<td>D005</td>
<td>Barium</td>
</tr>
<tr>
<td>D006</td>
<td>Cadmium</td>
</tr>
<tr>
<td>D007</td>
<td>Chromium</td>
</tr>
<tr>
<td>D008</td>
<td>Lead</td>
</tr>
<tr>
<td>D010</td>
<td>Selenium</td>
</tr>
<tr>
<td>D011</td>
<td>Silver</td>
</tr>
<tr>
<td>F006</td>
<td>Wastewater treatment sludge, electroplating</td>
</tr>
<tr>
<td>F039</td>
<td>Leachate from waste treatment</td>
</tr>
<tr>
<td>K002</td>
<td>Wastewater treatment sludge, chromium</td>
</tr>
<tr>
<td>K046</td>
<td>Wastewater treatment sludge, lead</td>
</tr>
</tbody>
</table>

46,486 tons shipped to El Paso, 1992-1997
## Secondary Smelting

### Rocky Mountain Arsenal - Waste Codes Shipped to ENCYCLE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description/Contains</th>
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</thead>
<tbody>
<tr>
<td>F039</td>
<td>Leachate/Brine</td>
</tr>
<tr>
<td>F001</td>
<td>Spent halogenated solvent</td>
</tr>
<tr>
<td>F002</td>
<td>Spent halogenated solvent</td>
</tr>
<tr>
<td>F003</td>
<td>Spent non-halogenated solvent</td>
</tr>
<tr>
<td>K033</td>
<td>Wastewater and scrub water, chlordane</td>
</tr>
<tr>
<td>K097</td>
<td>Vacuum stripper discharge, chlordane</td>
</tr>
<tr>
<td>P051</td>
<td>Endrin</td>
</tr>
<tr>
<td>P071</td>
<td>Methyl Parathion</td>
</tr>
<tr>
<td>U130</td>
<td>Hexachlorocyclopentadiene</td>
</tr>
</tbody>
</table>

Approximately 4,200 tons
Constituents of Concern

From RCRA Facility Investigation and Agreed Order

- Arsenic
- Cadmium
- Copper
- Chromium
- Iron
- Lead
- Selenium
- Zinc
Analytes of Interest Added by the Trust

- Antimony, Barium, Cobalt, Mercury, Molybdenum, Nickel, Silver, Hexavalent chromium (in select areas)
- Chlordane, endrin, hexachlorocyclopentadiene, methyl parathion
- Tetrachloroethylene, trichlorethylene, methylene chloride
- 1,1,1-Trichloroethane, 1,1,2-trichloroethane, carbon tetrachloride
- Chlorobenzene, ortho-dichlorobenzene, trichlorofluoromethane
- 1,1,2-Trichloro-1,2,2-trifluoroethane, dichlorodifluoromethane
- Xylene, acetone, ethyl acetate, ethyl benzene
- Ethyl ether, methyl isobutyl ketone
- n-Butyl alcohol, cyclohexanone, and methanol
Groundwater Remedy

- **ASARCO Proposed Remedy**
  - Cut-off Wall in Floodplain
  - Containment with Pump and Treat
  - No Source Control
  - End Vision: Smelter

- **Trust Proposed Remedy**
  - Groundwater to Surface Water Diversion (keeping clean water clean)
  - Point Source Removal and Treatment
  - In-situ groundwater treatment
  - Remediation of Rio Grande Floodplain
  - End Vision: Redevelopment as part of City of El Paso Master Plan

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For this to happen, Parker Brothers Arroyo must be addressed
Parker Brothers Arroyo Status

- Currently slag filled arroyo located north of the main plant site
- No money allocated in the budget to address rehabilitation
- Waste landfills will be part of the final landscape
- Objectives are:
  - Remove/contain the slag,
  - Create surface water conveyance,
  - Make the arroyo more natural in appearance, and
  - Reduces groundwater flux.
- Arroyo rehabilitation is keeping with the City Master Plan
- Seeking additional funding sources to accomplish full redevelopment vision