

ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 040-05593

License Nos.: C-5191, STB-454

License Active: July 22, 1960 - May 28, 1971

Report No.: 040-05593/96-01

Licensee: American Smelting and Refining Company (ASARCO)
Federated Metals Division

Location: 9000-9200 Market Street Road
Houston, Texas 77029

Inspection Date: November 6, 1996

Inspector: Robert J. Evans, P.E., Health Physicist
Division of Nuclear Materials Safety

Accompanied By: Michael A. Bame, Hydrogeologist
Texas Natural Resource Conservation Commission

Approved By: Charles L. Cain, Acting Deputy Director
Division of Nuclear Materials Safety

Attachments:

Attachment 1: Partial List of Persons Contacted
List of Acronyms

Attachment 2: Photographs Taken at the ASARCO Site

Report Details

1 Oak Ridge National Laboratory Review of the License

The Oak Ridge National Laboratory (ORNL) performed a review of over 16,000 NRC and Atomic Energy Commission (AEC) terminated licenses. ORNL assigned numerical scores to the former licensees, based on the potential for residual radioactive contamination and availability of materials disposition documentation in the retired docket files. Several former licensees in the State of Texas received numerical scores from ORNL which put the licenses in a category requiring prompt review by the Region IV staff.

This former licensee was authorized to manufacture magnesium-thorium anodes for cathodic protection of steel pipes and marine equipment. The license allowed possession of unlimited quantities of magnesium-thorium scrap alloy containing not more than 4 percent thorium. Several concerns were identified during the ORNL review of the docket file:

- There was a potential for contamination of the building interior although the potential was low. There was no verifiable decontamination of the site.
- No disposition information was given for the material or equipment used during the manufacturing processes.
- There was a potential for the generation of solid wastes. There was some indication of possible onsite burial or dumping.
- There was no closeout survey or AEC/NRC final inspection of the facility.

2 Background Information

The AEC issued Source Material License C-5191 to ASARCO on July 22, 1960, so the company could produce magnesium anodes for cathodic protection. The license extended to two facilities, one in Houston, Texas, and the other in Newark, New Jersey. The facility in Newark was a duplicate of the facility in Houston but with more modern equipment. This license subsequently expired on July 31, 1961, without being renewed.

In a letter dated October 2, 1961, the former licensee requested to have their AEC license renewed. The licensee acknowledged that they were untimely in the renewal process by allowing the original license to expire. License STB-454 was issued to the company on October 26, 1961, for the Houston facility with an expiration date of October 31, 1964. The license was amended on November 14, 1961, to include the Newark plant as an additional authorized place of use.

On March 20, 1963, the AEC informed the company that the State of Texas had become an agreement state as of March 1, 1963. The AEC stated that License STB-454 was being revised to delete the Houston facility from the license. The State of Texas issued ASARCO Radioactive Material License 4-419 on June 10, 1963, for the Houston site.

License 4-419 was renewed by the State in 1968 for three additional years. In their letter dated May 24, 1971, ASARCO requested that the state terminate their license. Also, ASARCO claimed that they did not have any material on hand and had not possessed any for several years. The State terminated the license on May 28, 1971, at the licensee's request.

Following an unsuccessful attempt to get the AEC to waive the license fee, ASARCO requested that the AEC cancel License STB-454 for the Newark plant. The AEC terminated License STB-454 on April 13, 1971.

3 State of Texas Site Visit

Staff members from the Texas Department of Health, Bureau of Radiation Control, visited the ASARCO site in Houston on May 9-10, 1996. Radiological surveys and samples were obtained from portions of the site. Several areas of elevated surface gamma readings were observed during the visit, including the areas around the former smelting pots and along the west fence line.

Six soil samples were obtained by the state from five locations around the site. The highest radionuclide concentration measured was from a soil sample obtained near the west fence line. The thorium-230 concentration was measured at 321 picocuries per gram (pCi/g) in this sample, while the natural thorium concentration (thorium-228 plus 232) was 368 pCi/g.

4 NRC Site Visit

According to information provided by the ASARCO Environmental Sciences Manager, ASARCO began operations in Houston during the 1940's. Different metals were used over the years in the smelting process, including zinc, brass, and aluminum. The end products included ingots and anodes. At the time of the NRC site visit, the property at 9000-9200 Market street was still owned by ASARCO. A portion of the property was occupied by Lone Star Lead Construction Company, a company owned by Doe Run Resources Corporation of St. Louis, Missouri. Lone Star Lead fabricated and constructed lead products such as lead-lined tanks and lead sheetrock for x-ray rooms.

The site property consisted of two sections, the main site property adjacent to Market Street and a section of land (roughly 800 deep by 850 feet wide) located across railroad tracks to the south of the main site. The main site property consisted of several office and shop buildings, a manufacturing plant, a pond, and

open land. The open land on the western half of the main plant site was the site where Federated Metals (a division of ASARCO) had been previously located. All that remained of the former Federated Metals site was the building foundation, paved parking lots, and laydown yards. The property located to the south of the main site was covered in thick vegetation and did not have any standing structures on it.

According to information provided by the ASARCO Environmental Sciences manager and a representative of the Texas Natural Resource Conservation Commission, the rear portion of the site was a Texas superfund site. Federated Metals had apparently dumped and buried waste materials onto the site property during previous plant operations. During the NRC site visit, a remedial investigation was in progress by ASARCO to ascertain the scope of the non-radiological hazards associated with the property. Hazardous constituents of concern included cadmium, mercury, lead, barium, magnesium, and zinc. This work was being performed under the regulatory oversight of the Texas Natural Resources Conservation Commission. The work was being performed by Geraghty & Miller, Inc., a contractor to ASARCO. The work consisted of exploratory excavations, geophysical surveys, and groundwater, soil, and sediment sampling.

The NRC inspector performed a radiological scoping survey on the outdoor portions of the main site property and the property across the railroad tracks. The property was scanned using a Ludlum Model 19 microroentgen meter which measured the ambient gamma exposure rates. No additional pockets of radioactivity were identified in the main plant other than the areas previously located by the State during their January 1996 inspection.

During the tour of the property located south of the main site (the State did not survey the southern portion of the site during their January 1996 inspection), numerous piles of waste material were identified. The waste material included debris rejected from the smelting process (dross), bricks, and other industrial scrap material. According to a representative of ASARCO, there was one large, three medium, and five small piles of waste debris on this portion of the site.

Four or five areas of the southern property were noted to contain radioactive contamination, although not all waste material at the site was contaminated. With an ambient background gamma exposure rate of 8-10 microroentgen per hour ($\mu\text{R/hr}$), the exposure rate of the waste material varied from background levels up to 1600 $\mu\text{R/hr}$ on contact. No area was identified that met the definition of a radiation area (5000 $\mu\text{R/hr}$).

During the NRC tour, workers began exploratory excavations at the site. The first excavation uncovered buried industrial waste debris. This material was not radioactive. However, the discovery of buried waste suggested that buried materials containing radioactive contamination was possible at the site. Additional excavations were planned following the completion of the NRC site visit.

The south property was determined not to be an immediate health and safety hazard because the property was not easily accessible to the general public. However, the property was not secured by gates and/or fence on all sides. The property was accessible via the railroad tracks.

5 Review of Sample Analysis

In addition to the ambient gamma survey scans, four soil samples were obtained from the ASARCO site. The soil samples were analyzed by the NRC's Region III office by gamma spectroscopy. The site location, gamma exposure rate reading on contact where the sample was obtained, and the natural thorium (combination of thorium-228 and 232) concentration measured during the laboratory analysis are listed below:

SOIL SAMPLE ID	SAMPLE LOCATION	CONTACT GAMMA READINGS (μ R/hr)	NATURAL THORIUM CONCENTRATION (pCi/g)
S01	South 650/West 775	1100	1818 \pm 107
S02	South 450/West 400	1000	670 \pm 40
S03	South 325/West 450	800	430 \pm 25
S04	West Fenceline	200	68 \pm 4

The soil samples were also analyzed for their cobalt-60 concentrations. Cobalt-60 was reputed to have been used in ASARCO's firebrick during smelting operations for determination of brick thickness. No measurable amounts of cobalt-60 were identified in these four soil samples.

6 Regional Recommendations

When the State of Texas became an Agreement State on March 1, 1963, the "Agreement Between the United States Atomic Energy Commission and the State of Texas for Discontinuance of Certain Commission Regulatory Authority and Responsibility Within the State Pursuant to Section 274 of the Atomic Energy Act of 1954, As Amended," gave the State certain rights and responsibilities with respect to byproduct, source, and small quantities of special nuclear materials. Having reviewed the Agreement, the NRC/AEC terminated license files, and the State's terminated license files, the State of Texas appears to have clear regulatory responsibility for the ASARCO site. The removal of this license from the open ORNL formerly-licensed site list will be recommended once the NRC has confirmed that the Texas Natural Resource Conservation Commission and/or the Bureau of

Radiation Control, Department of Health, has informed the NRC, in writing, that they have accepted regulatory oversight of the ASARCO facility.

7 Exit Meeting

At the conclusion of the November 6, 1996, site inspection, an exit briefing was held with representatives of ASARCO. During this exit briefing, several documents were provided to ASARCO, including a copy of the terminated license file, current NRC guidance, and a copy of the 1981 BTP, "Disposal or Onsite Storage of Thorium or Uranium Wastes From Past Operations."

Attachment 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Richardson, Manager of Environmental Sciences, Technical Services Center
T. Whitaker, Task Manager, Geraghty & Miller, Inc.

State of Texas

M. Bame, Hydrogeologist, Superfund Investigation Section, Pollution Cleanup Division
Texas Natural Resources Conservation Commission

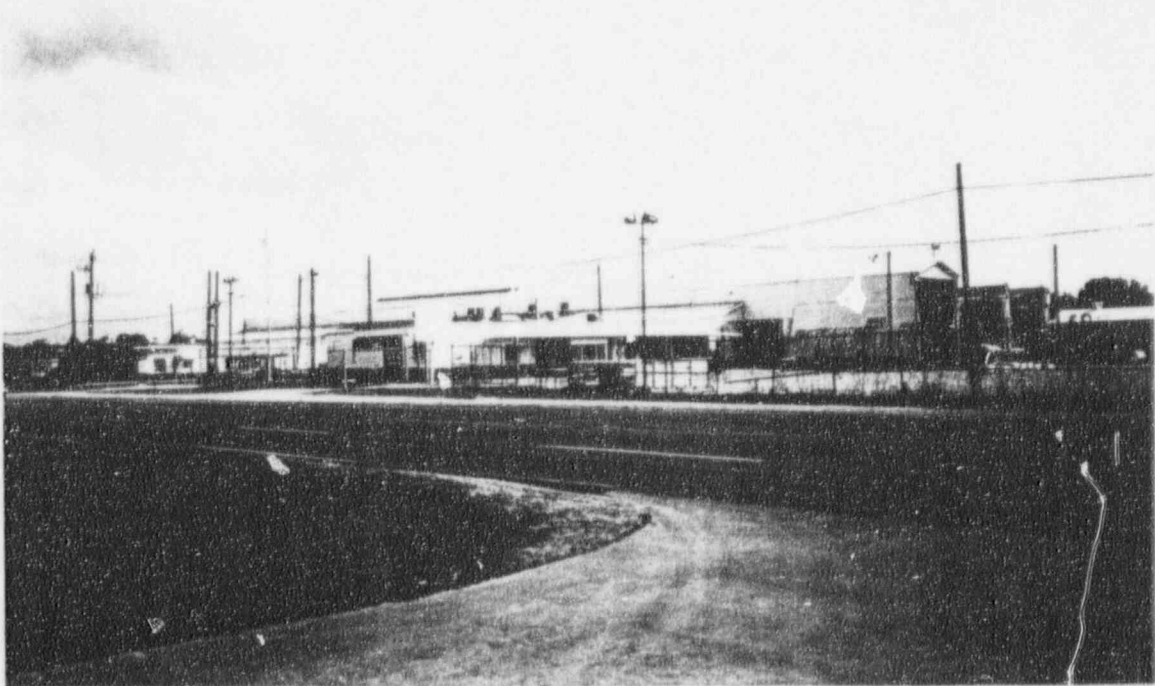
LIST OF ACRONYMS USED

AEC	Atomic Energy Commission
ASARCO	American Smelting and Refining Company
BTP	NRC Branch Technical Position
CFR	Code of Federal Regulations
$\mu\text{R/hr}$	Microrentgen per hour
ORISE	Oak Ridge Institute for Science and Education
pCi/g	picocuries per gram

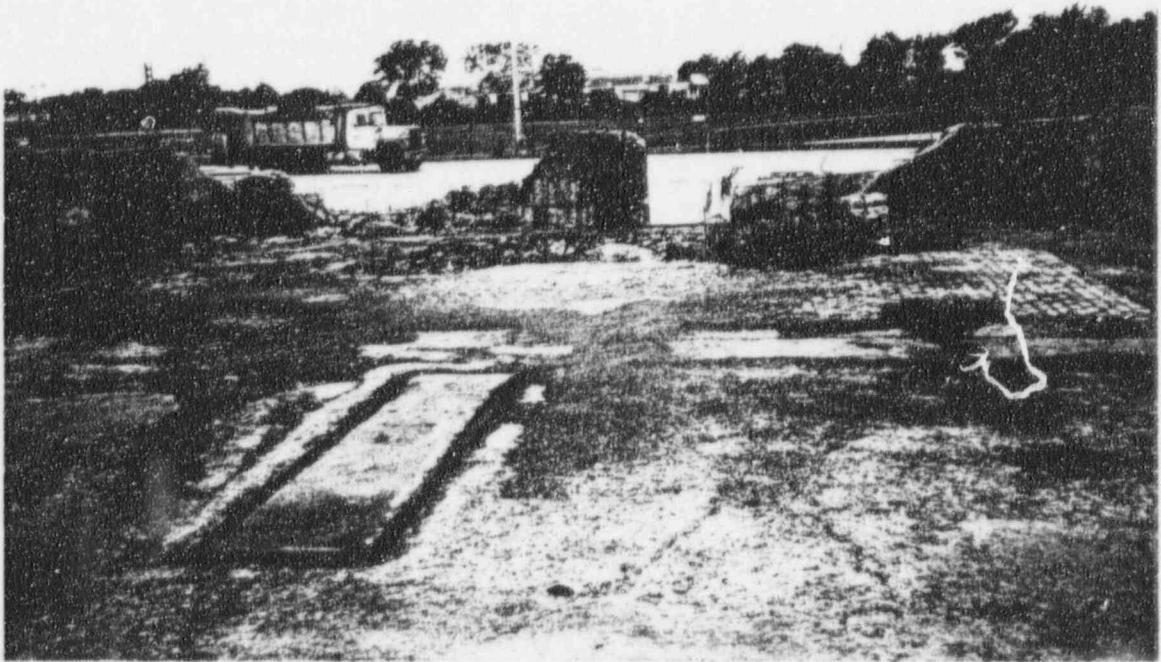
Photographs Taken at the ASARCO Site



Photograph 1 - Entrance sign to Lone Star Lead on Market Street in Houston.



Photograph 2 - The Lone Star Lead Construction facility on Market Street.



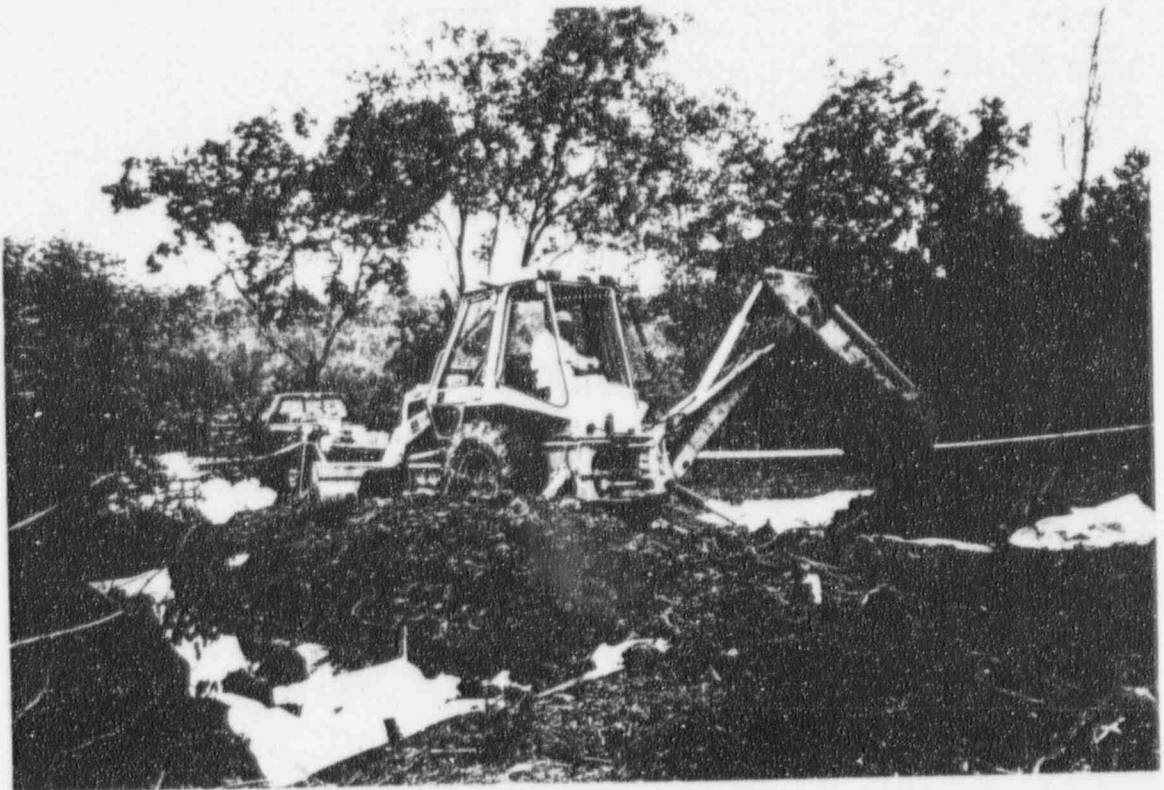
Photograph 3 - Location of former magnesium smelter.



Photograph 4 - Area along the west fenceline where slightly elevated levels of radioactivity were identified.



Photograph 5 - Debris resembling smelter waste products on southern end of site property; some of this material was radioactive.



Photograph 6 - ASARCO representatives performing excavation work on the south property; non-radioactive industrial waste was identified here.



Photograph 7 - Soil sampling in progress on one of the medium-sized waste disposal piles.



Photograph 8 - Soil sampling in progress on one of the medium-sized waste disposal piles.