AMENDED RECORD OF DECISION
TEX TIN CORPORATION SUPERFUND SITE
OPERABLE UNIT NO. 1
TEXAS CITY, GALVESTON COUNTY, TEXAS

Environmental Protection Agency
Region 6
Dallas, Texas

Site ID #TXD062113329

TEX TIN CORPORATION SUPERFUND SITE
OPERABLE UNIT NO. 1
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DECLARATION

SITE NAME AND LOCATION

The Tex-Tin Superfund Site (CERCLIS ID # TXD062113329) is located in the cities of Texas City and La Marque, Galveston County, Texas. Operable Unit No. 1, the Tex Tin Corporation smelter, is located on approximately 140 acres at the intersection of Farm to Market Road 519 and State Highway 146 in Texas City, Texas.

STATEMENT OF BASIS AND PURPOSE FOR AMENDMENT

This decision document presents the amended remedy for Operable Unit (OU) No. 1 of the Tex Tin Superfund Site located in Texas City, Texas. The remedial action is being amended in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C.§ 9601 et seq., amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300.

The original Record of Decision (ROD) for the Tex Tin Operable Unit No. 1 was signed by the Regional Administrator on May 17, 1999. In the course of court-ordered mediation, potentially responsible parties presented additional information to the U.S. Environmental Protection Agency (EPA) in support of a request to change some aspects of the selected remedy. A Proposed Plan to amend the selected remedy was issued to the public for comment on March 7, 2000. A public meeting was held on March 23, 2000, to receive comments and answer questions on the proposed remedy changes. The amended remedy presented in this document has been selected based upon review and consideration of public comment and the entire administrative record.

The Administrative Record contains the documents that form the basis for the selection of a response action. The Administrative Record is available for review at the EPA Region 6 offices at 1445 Ross Ave., Suite 1200, Dallas, Texas 75202; the Moore Memorial Public Library, 1701 Ninth Avenue North, Texas City, Texas 77590; and the Texas Natural Resource Conservation Commission, Technical Park Center, Building D, 2118 North IH-35, Austin, Texas 78711-3087.

ASSESSMENT OF THE SITE

The response action selected in this Amended Record of Decision for OU No. 1 is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

SUMMARY OF CIRCUMSTANCES REQUIRING AN AMENDMENT

Beginning in February 1999, the United States engaged in court-ordered mediation with potentially responsible parties (PRPs) connected with the Tex Tin Corporation Superfund Site. During the course of mediation, the participants generated additional information concerning historical site operations and current environmental conditions. A Supplemental Focused Feasibility Study (SFFS) report was completed in February 2000 by the PRP group. The SFFS presented additional information that was not available at the time the original Feasibility Study (FS) report was prepared (August 4, 1998) or the original Record of Decision was signed (May 17, 1999). Additional studies were conducted by the PRPs from August 1999 through December 1999. Field data was collected in October 1999. The SFFS presents new information related to the remedial action selected for site ground water and to stabilization criteria for site wastes and contaminated soils. The two fundamental changes in the Amended Remedy include the ground water component and the stabilization criteria used for treatment of principal threat waste materials and stabilization of soils which could leach contaminants to the ground water.

Stabilization Criteria

In the original Record of Decision (ROD), the stabilization criteria were based on meeting Federal drinking water standards (Maximum Contaminant Levels or MCLs) and/or conservative risk-based cleanup levels for the leachate from site wastes and contaminated soils at the surface, as determined using the Synthetic Precipitation Leaching Procedure (SPLP). During the course of mediation, the parties uncovered information tending to show that the location of contamination of the shallow groundwater at the facility is due to the historical practice of piercing the bottom of waste acid pits to increase their capacity rather than to migration of surface contaminants into groundwater; there is no correlation between high concentrations of contaminants in the surface and subsurface.

Given the lack of correlation between existing or projected future groundwater contamination and surface contaminants, the stabilization criteria were reassessed. The original stabilization criteria did not take into consideration reduction of inorganic contaminant levels through soil adsorption as the leachate moves through twenty feet of soil before reaching the shallow ground water. Moreover, the criteria did not consider that background ground water concentrations in the shallow transmissive zone ground water exceed MCLs. Requiring the leachate from stabilized materials at the surface to meet MCLs would require meeting a higher standard than background, which would be unduly conservative and possibly raise issues of technical impracticability. Finally, due to a miscalculation of the amount of soil which would have to be stabilized, the cost of meeting the extremely conservative standard would be several orders of magnitude greater than the cost estimated in the ROD. The shallow ground water is not a source of drinking water within a three mile radius of the site and is not expected to be a drinking water source in the future.

In place of the stabilization standards in the May 17, 1999, ROD, the stabilization standards for

the amended ROD are based on requirements of the land disposal restrictions promulgated pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et seq. The stabilization criteria for soils that may leach contaminants to the ground water will be based on meeting the stabilization requirements in 40 C.F.R. § 268.49 which states that soil stabilization shall reduce the toxicity concentration by 90% or to 10 times the Universal Treatment Standards (UTS) identified in 40 C.F.R. § 268.48, whichever is greatest. The non-slag source materials will be stabilized to meet the RCRA toxicity characteristic leaching procedure (TCLP) levels listed in 40 C.F.R. § 261.24. To further prevent ground water infiltration through the stabilized materials, the treated materials will be disposed of in an onsite consolidation cell (Pond 2) and covered with an impermeable cap or RCRA Type C or equivalent cap as applicable.

Field Investigation

Results of the field investigation conducted in October 1999 were used to provide input to the ground water flow model for the Site based on current conditions and develop the ground water remedial elements of the Amended Remedy for the site. The resulting changes made in the amended remedy to the ground water component will result in a fundamental change to the original ground water remedy. The field investigation concluded that the Deep Transmissive Zone is hydraulically and chemically separate from the Shallow and Medium Transmissive Zones. Whereas the Shallow and Medium Transmissive Zones originally appeared to have hydraulic heads within a few feet of each other and similar major anion/cation chemistry, the 1999 data indicated that these two zones do not have similar pH signatures. Site contamination, shown by pH and the distribution of trace metals, appears to be restricted to the Shallow Transmissive Zone after more than 40 years of site operations.

Development of Regional Calibrated Ground Water Flow Model

Concurrent with the 1999 field investigation, the consultant for the PRPs also developed a regional, calibrated ground water flow model to assess the potential for plume migration beyond the Site boundaries. The calibrated flow model was used to assess the following ground water management strategy:

- controlling horizontal flow directions with installation of a western slurry wall barrier;
- managing vertical gradients;
- reducing discharge to Ponds 24, 25, and 26 at the southern boundary of the Site; and,
- identifying site soils that should be considered principal threat soils based on mobility.

DESCRIPTION OF THE SELECTED AMENDED REMEDY

Operable Unit No.1, addressed in this Amended Record of Decision, is one of four operable units for the Tex Tin Superfund Site. OU No. 1 encompasses approximately 140 acres and is the former tin and copper smelting facility. OU No. 1 also includes Ponds 22, 24, 25, and 26, outside the facility fenceline. The other operable units are:

- Operable Unit No. 2, which includes approximately 27.23 acres of the former facility currently owned by AMOCO Corporation. AMOCO completed the response action for OU No. 2 in 1998 under the Texas Voluntary Cleanup Program.

- Operable Unit No. 3, which refers to the La Marque residential areas located approximately 2,000 feet northwest from the smelter facility. EPA completed the cleanup of the residential yards in June 1999 through a Time Critical Removal Action.

- Operable Unit No. 4, which refers to the Swan Lake ecosystem area between the hurricane levee and the shell barrier islands separating Swan Lake from Galveston Bay. OU4 includes Swan Lake, its associated salt marsh habitats, and the Wah Chang Ditch east of Loop 197. OU No. 4 will address contaminant impacts caused to ecological receptors attributed to the Tex Tin site. Selection and implementation of the remedy for OU No. 4 will be the final action for the site.

Implementing the selected Amended Remedy for OU No. 1 will prevent releases or potential releases of hazardous substances that may impact the operable units described above and will protect the public health or welfare and environment from future potential releases from source materials (non-slag and drum materials) present on the facility. The selected remedy for OU No. 1 addresses principal threat waste materials (soils, non-slag, smelter dust, and drum materials) identified at the site and other contaminated materials that could release contaminants to the environment. Preventing future site releases will be accomplished through stabilization of the principal threat waste materials, containment in an onsite consolidation cell[1], and covering the hazardous materials with a RCRA Type C or equivalent cap. Liquid principal threat waste materials will be neutralized and treated to National Pollution Discharge Elimination System (NPDES) levels prior to onsite disposal. The amended remedy is also protective because it provides containment for the low level threat materials present at the site. Implementation of the Amended Remedy for OU No. 1 is critical to addressing source materials and providing future protection to human health and the environment. The major components of the amended remedy for OU No. 1 include:

- **AP: Acid Pond and Wah Chang Ditch.** Neutralize acid liquid and dispose of in Wah Chang Ditch, (or alternatively, treat and dispose offsite); neutralize Acid Pond and Wah Chang sediments that have a pH equal to or less than 2. Excavate Wah Chang Ditch sediments exceeding preliminary remediation goals (PRGs) and dispose of onsite. Cap materials exceeding health based levels with a Clay Soil Cover to prevent exposure to contaminants.

- **DR: Drummed Materials.** Stabilize drum and supersack inorganic contents for onsite

[1]As in the original Record of Decision, given that site contaminants are generally dispersed across the entirety of OU No. 1, the Amended Remedy considers the entirety of OU No. 1 the area of contamination for purposes of remedy selection.

disposal (or alternatively, recycle offsite). Dispose of organic contents offsite. No significant change, except that the disposal cell for the stabilized materials will be located in Pond 2 rather than the Acid Pond. Cap stabilized materials passing TCLP with a Clay Soil Cover to prevent exposure to contaminants.

- **NSL: NORM Slag.** Dispose of NORM slag onsite (no additional stabilization; material is already vitrified). Cover NORM slag passing TCLP with an impermeable cap to prevent surface water infiltration and exposure to contaminants.

- **SL: Non-NORM Slag.** Dispose of hazardous non-NORM slag onsite (no additional stabilization for vitrified materials). Cover hazardous non-NORM slag with a RCRA Type C or equivalent cap. Stabilize non-slag hazardous source materials to pass TCLP levels under 40 C.F.R. § 261.24. Dispose of non-hazardous non-NORM slag onsite or alternatively recycle offsite. Cap slag passing TCLP levels but exceeding health based levels with a Clay Soil Cover to prevent exposure to contaminants.

- **SS: Surface and Subsurface Soils.** Cover soils exceeding PRGs with a Clay Soil Cover, including the existing Low-Level Radioactive Landfill area. Stabilize and dispose of soils identified as principal threat materials (based on modeled analyses) in Pond 2. Treat hazardous soils to meet the stabilization standards under 40 C.F.R. § 268.49 and dispose of them in Pond 2; cover with a RCRA Type C or equivalent cap. Cover soils passing TCLP but exceeding health based levels with a Clay Soil Cover to prevent exposure to contaminants.

- **WP: Wastewater Ponds.** Discharge wastewater pond liquids to Wah Chang Ditch, and backfill ponds. Use Pond 2 as the consolidation cell for disposal of hazardous materials. Cover materials exceeding health based levels with a Clay Soil Cover to prevent exposure to contaminants. Cap materials exceeding TCLP levels with a RCRA Type C or equivalent cap.

- **GW: Ground Water.** Install slurry wall barrier along the western property boundary; install an enhanced evapotranspiration system along the southern boundary. Cover Pond 7 with an impermeable cap, and conduct long-term ground water monitoring.

- **AST: Aboveground Storage Tanks.** Dispose of Aboveground Storage Tank organic contents offsite. No difference from the original remedy.

- **BLD: Buildings and Structures.** Remove dust and all asbestos from buildings, demolish buildings and dispose of debris onsite. Recycle building structural components. Leave building foundations in place, to function as part of cap/cover over surface contamination.

STATUTORY DETERMINATIONS

The selected Amended Remedy for OU No. 1 is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the amended remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The Amended Remedy also satisfies the preference for treatment as an element of the remedy which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants identified as principal threat waste materials at the site. Because this amended remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the amended remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Amended Record of Decision. Additional information can be found in the Administrative Record file for the site.

- Chemicals of concern (COC) and their respective concentrations.
- Cleanup levels established for chemicals of concern and the basis for these levels.
- How source materials constituting principal threats are addressed.
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water that will be available at the site as result of implementing the Amended Remedy.
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the amended remedy cost estimates are projected.
- Key factors that led to the selection of the amended ROD.

AUTHORIZING SIGNATURE

/s/ Myron O. Knudson
for Gregg A. Cooke
Regional Administrator
U. S. Environmental Protection Agency
Region 6

9/28/2000
Date

AMENDED RECORD OF DECISION
TEX TIN CORPORATION SUPERFUND SITE
OPERABLE UNIT NO. 1
TEXAS CITY, GALVESTON COUNTY, TEXAS

CONCURRENCE SIGNATURES

_____	_____
Carlos A. Sanchez Remedial Project Manager	Date
_____	_____
Pamela J. Travis Senior Attorney	Date
_____	_____
Mark Peycke, Chief Superfund Branch Office of Regional Counsel	Date
_____	_____
Gus Chavarria, Chief ARK/OK/TX Project Management Section	Date
_____	_____
William K. Honker, Chief ARK/OK/TX Branch	Date
_____	_____
Myron O. Knudson, P.E. Director, Superfund Division	Date
_____	_____
Lawrence E. Starfield Regional Counsel	Date

AMENDED RECORD OF DECISION
TEX TIN CORPORATION SUPERFUND SITE
OPERABLE UNIT NO. 1
GALVESTON COUNTY, TEXAS CITY, TEXAS
DECISION SUMMARY

SITE NAME AND LOCATION

The Tex-Tin Superfund Site (CERCLIS ID # TXD062113329) is located in the cities of Texas City and La Marque, Galveston County, Texas (Figure 1). Operable Unit No. 1 is the Tex Tin Corporation smelter located on approximately 140 acres at the intersection of F.M. 519 and State Highway 146 in Texas City, Texas. This industrial facility operated as a primary and secondary smelter from 1941 to 1991.

LEAD AND SUPPORT AGENCIES

U.S. Environmental Protection Agency (EPA) Region 6 - Lead Agency
Texas Natural Resource Conservation Commission (TNRCC) - Support Agency
The Amended Remedy for OU No. 1 will be implemented by Potentially Responsible Parties (Private and Federal) pursuant to a Consent Decree lodged on May 5, 2000.

PURPOSE

The Record of Decision for Operable Unit No. 1 of the Tex Tin Corporation Site issued on May 17, 1999, is being amended in accordance with CERCLA Section 117, 42 U.S.C. § 9617, and the National Contingency Plan, 40 C.F.R. § 300.435(c)(2)(ii), based on new information received during mediation with responsible parties connected with the Site.

ADMINISTRATIVE RECORD

The Administrative Record contains the documents that form the basis for the selection of a response action. This ROD Amendment will become part of the Administrative Record file for the site (40 C.F.R. § 300.825(a)(2)). The Administrative Record for the Tex Tin site is available for review at the following information repository locations:

Moore Memorial Public Library; 1701 Ninth Avenue North; Texas City, Texas 77590; (409) 643-5979; Monday through Friday from 9:00 a.m. to 6:00 p.m.; Saturday from 10:00 a.m. to 4:00 p.m.

U.S. Environmental Protection Agency; 12th Floor Library, 1445 Ross Avenue; Dallas, Texas 75202-2733; (214) 665-6427; Monday through Friday from 7:30 a.m. to 4:30 p.m.

Texas Natural Resource Conservation Commission; Building D, Record Management, Room 190;

12100 Park 35 Circle; Austin, Texas 78753; (512) 239-2920; Monday through Friday from 8:00 a.m. to 5:00 p.m.

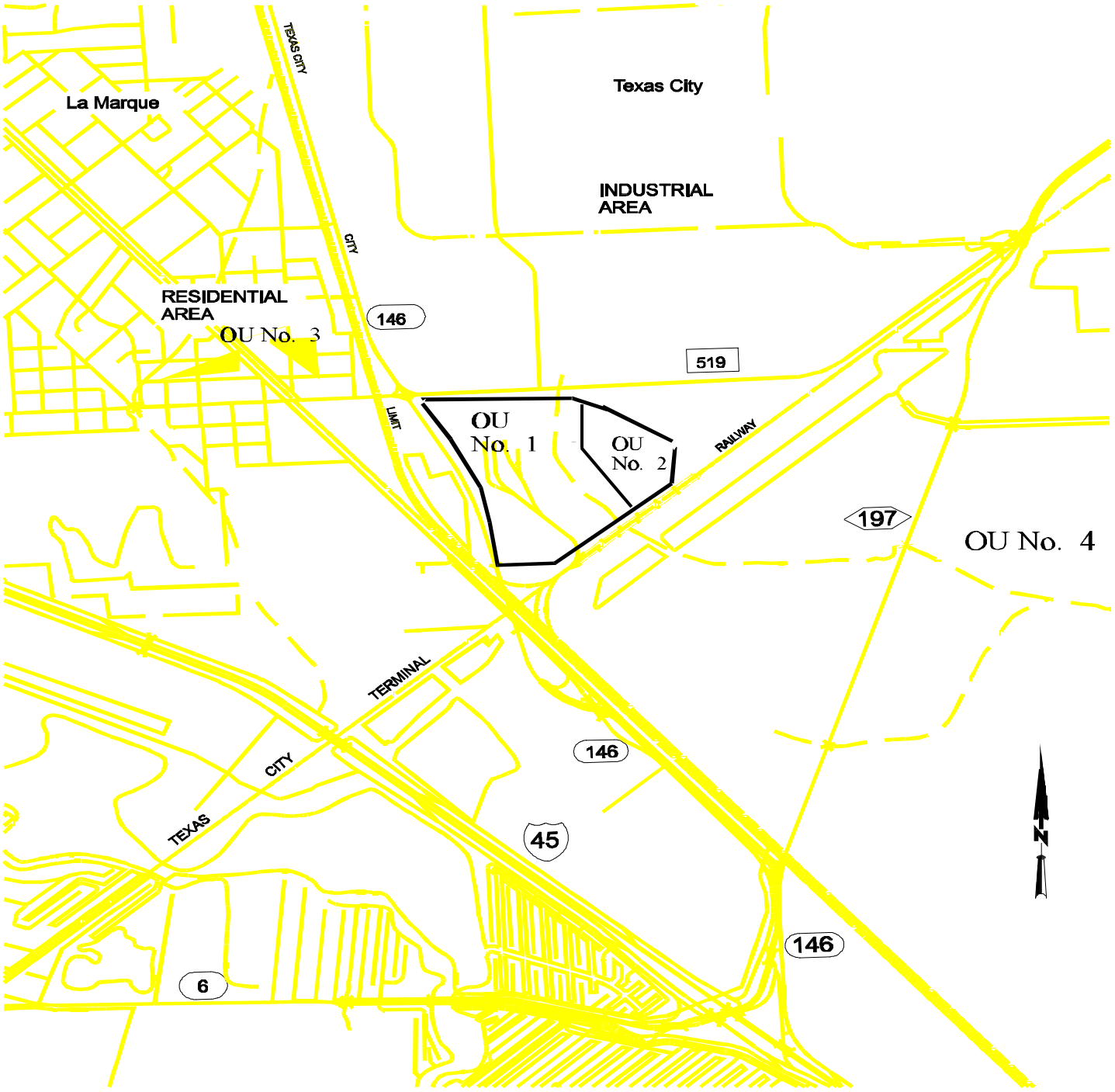
SITE HISTORY

Operable Unit 1 of the Tex Tin Corporation Superfund Site encompasses approximately 140 acres in Texas City, Texas (Figure 1). The Site is located approximately 10 miles north of Galveston, in the southeast quadrant of the intersection of Farm-to-Market Road 519 and State Highway 146. The city of La Marque lies 2,000 feet to the west and northwest of the former tin and copper smelting facility. More than 10,000 people reside within a 1 mile radius of the Site. The areas north and east of the site are dominated by large petrochemical facilities. A municipal golf course, an industrial waste disposal facility, and marsh areas are located less than 0.5 mile to the south and southwest of the Site. The southern boundary and a portion of the western boundary of the Site are fenced with a 3-strand barbed wire fence. The remainder of the fence surrounding the Site is a 7-foot chain link fence. Tex Tin Corporation has provided 24-hour security at the facility since it was closed in 1991.

The tin smelter at Texas City was constructed by the United States Government as a World War II emergency tin supply plant, and operated under a Government contract from 1941 to 1956 as the Tin Processing Corporation. The Wah Chang Corporation (Wah Chang) purchased the property from the U.S. Government in 1957. In 1967, the Teledyne Corporation purchased Wah Chang and proceeded to sell the tin smelting operations to the Fred H. Lenway Corporation in 1968. Wah Chang also sold approximately 27 acres of land adjacent to the smelting operation to the Amoco Chemical Company in 1969. In 1970, the Fred H. Lenway Corporation sold the smelting operation to the Gulf Chemical and Metallurgical Company (GCMC), which was subsequently acquired by Associated Metals and Minerals Corporation (AMMC) in 1970. In 1984, the facility was renamed the Tex Tin Corporation, which operated as a wholly owned subsidiary of AMMC.

From 1941 through 1989, the facility primarily produced tin. Waste products generated by the operation included iron-rich liquid acid (ferrous chloride) and tin slag. The liquids were transferred to holding ponds (Ponds 18 through 21) to the south of the smelting facility. Various other production operations were reportedly carried out on site, including an ammonia-based copper washing process, which started in 1972 and continued for an undetermined number of years, and a secondary copper smelting process, which replaced the tin smelting operations in 1989 and continued through 1991. In addition to producing pure tin, the facility produced ferrous chloride which was used as feed material for the production of ferric chloride. The production of ferric chloride was terminated in 1983. From 1983 until the Site ceased production in 1991, the ferrous chloride solution was stored in the acid pond (Pond 6).

During the 1970s, GCMC constructed a neutralization and metal precipitation treatment system to process the plant wastewater. The treated wastewater was then discharged to the Wah Chang Ditch under the authority of National Pollutant Discharge Elimination System (NPDES) permit



SITE VICINITY MAP

Tex Tin Corporation Superfund Site
FIGURE 1

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number TX0004855. The treatment ponds were not constructed to prevent vertical or lateral migration of contaminants. In March 1971, GCMC applied for an amendment to the NPDES permit to allow for an increase of its wastewater discharge from 10,000 gallons to an average of 572,811 gallons with a maximum of 864,000 gallons per day. In May 1972, GCMC initiated an ammonia-based copper washing process for generation of relatively pure copper. It was estimated that 350,000 gallons of 15 percent ammonia waste solution was pumped into the various on-site ponds. During the 1970s, and in addition to tin smelting, GCMC used the Site to store spent uranium/antimony catalysts for antimony recovery at GCMC's facility located in Freeport, Texas. When the antimony recovery process was discontinued, drums containing the catalyst were either removed or buried on site. A site inspection by the Texas Department of Water Resources (now a part of the TNRCC) on May 9, 1978, revealed that radioactive material was being landfilled on site. In October 1981, GCMC stopped receiving uranium-bearing materials and reported that approximately 135,000 pounds of material containing low-level uranium was landfilled onsite.

From 1982 to 1983, Morchem Resources (Morchem) leased the northwest corner of the property and operated a waste oil recovery process. Waste materials were obtained from chemical and refining companies. In December 1983, Morchem's lease with GCMC was terminated, and Morchem was given 30 days to vacate the property. Morchem was requested to remove all waste and oils stored in drums and aboveground storage tanks (ASTs), as well as oil-contaminated soils, from the leased property. Morchem filed for bankruptcy in the mid-1980s. The drums, ASTs, and contaminated soil left on site by Morchem have never been removed.

In 1985, the Tex Tin Corporation installed a deep injection well, permitted by the Texas Water Commission (TWC, now a part of TNRCC), and began injecting ferric chloride solution into the Lower Miocene formation at an approximate depth ranging from 5,600 to 6,600 feet below ground surface (BGS). Records indicate that the well was plugged in September 1987 by placing cement plugs within the well casing from: 0 ft. to 50 ft. BGS, 1,700 ft. to 1,800 ft. BGS, 5,000 ft. to 5,400 ft. BGS, and at 5,980 ft. to 6,380 ft. BGS.

On June 17, 1996, EPA proposed to add the Site to the National Priorities List (NPL) of Superfund sites. 61 Fed. Reg. 30575 (June 17, 1996). The Tex Tin NPL listing became final on September 18, 1998. The original Record of Decision for OU No. 1 was signed on May 17, 1999. Most recently, some of the buildings and surface structures on-site were demolished in the cause of an early removal action initiated in May 2000 and completed in August 2000.

COMMUNITY PARTICIPATION

The EPA has met the public participation requirements under CERCLA Section117, 42 U.S.C. §9617, and the NCP, 40 C.F.R. §§300.435(c)(2)(ii) and 300.825(a)(2). The EPA published the Proposed Plan for the Amended ROD for public comment for thirty days, from March 7, 2000, through April 5, 2000. Additionally, oral comments were received at a public meeting held on March 23, 2000, at the City Council meeting room, City Hall, in Texas City, Texas. The public

was also invited to review site information which can be found in the Remedial Investigation, Supplemental Remedial Investigation, the Baseline Human Health Risk Assessment, Ecological Risk Assessment, Feasibility Study, and Supplemental Focused Feasibility Study reports, along with other documents contained in the Amended Administrative Record (AR) file for the Site. Detailed information which formed the basis for the amended remedy is presented in the Supplemental Focused Feasibility Study (SFFS) Report found in the amended AR.

SCOPE AND ROLE OF OPERABLE UNIT

Due to the complex and multiple components associated with the Tex Tin Site, the Site was broken into four operable units to facilitate management of the site wide response actions. Operable units are specific response actions that comprise incremental steps toward comprehensively addressing site problems. This Amended Remedy addresses only OU No. 1 which consists of the Tex Tin industrial property and Ponds 22, 24, 25, and 26. Given the general dispersal of contaminants across OU No. 1, the entire operable unit is considered an area of contamination. OU No. 2 consists of approximately 27 acres of property which at one time were part of the Tex Tin facility. This property is currently owned by Amoco Chemical Company (Amoco). Amoco completed a response action for OU No. 2 in June 1998 under the Texas Voluntary Cleanup Program. OU No. 3 refers to the LaMarque residential areas where EPA conducted a cleanup of residential properties from March 1999 through June 1999. OU No. 4 is the Swan Lake Salt Marsh area along the former discharge channel of the Wah Chang Ditch located between the current hurricane levee and the shell barrier islands which separate Swan Lake from Galveston Bay. OU No. 4 will address contaminant impacts to ecological receptors attributed to the Site.

SUMMARY OF SITE CONTAMINATION

Except for the new information included in the Supplemental Focused Feasibility Study report regarding the contaminated plume in the shallow transmissive zone, contaminated areas identified in the original Record of Decision signed on May 17, 1999, for the site have not changed. The following table lists the chemicals of concern identified in the draft Baseline Human Health Risk Assessment:

CONTAMINANTS OF CONCERN	
Contaminant	**Health Effects and Concerns**
1,2 - Dichloroethane	Breathing very high levels of 1,2 - Dichloroethane vapor is deadly; the long term human health effects after exposure to low concentrations of 1,2 - Dichloroethane are not known.
Antimony	Breathing air contaminated with antimony can cause heart and lung problems, lead to stomach pain, diarrhea, vomiting and stomach ulcers. It is not known if antimony is a carcinogen.
Arsenic	Inorganic arsenic has been recognized as a human poison since ancient times, and large doses can produce death. Inhalation exposure to arsenic increases the risk of lung cancer.

CONTAMINANTS OF CONCERN	
Contaminant	**Health Effects and Concerns**
Asbestos	Workers who breath in asbestos may slowly develop scar-like tissue in their lungs and in the membrane surrounding their lungs. This tissue makes breathing difficult. This disease is called asbestosis.
Barium	Eating or drinking very large amounts of readily soluble barium compounds such as barium acetate, barium carbonate, barium chloride, barium hydroxide, barium nitrate, and barium sulfide may cause paralysis or death in a few individuals. There is no reliable information to tell if barium causes cancer.
Benzene	The U.S. Department of Health and Human Services has determined that benzene is carcinogenic. Leukemia (cancer of the tissues that form the white blood cells) and subsequent death from cancer have occurred in some workers exposed to benzene for periods of less than 5 and up to 30 years.
Beryllium	Beryllium can damage the lungs when breathed. Breathing large amounts of soluble beryllium compounds can cause a disease resembling pneumonia. Some people are allergic to beryllium and develop chronic inflammatory reactions to doses of beryllium which would not cause an effect on most other people. Both the pneumonia like disease and the chronic inflammatory reactions can be fatal. Some studies have shown beryllium to be a probable human carcinogen.
Cadmium	Breathing air with high levels of cadmium severely damages the lungs and can cause death. Breathing lower levels of cadmium for years leads to a build-up of cadmium in the kidneys that can cause kidney disease. Workers who inhale cadmium for a long time may have an increased chance of contracting lung cancer.
Chloroform	Chloroform affects the central nervous system, brain, liver, kidneys after a person breathes air or drinks liquids that contain large amounts of chloroform. Studies of persons who drank chlorinated water showed a possible link between the chloroform in chlorinated water and the occurrence of colon and urinary bladder cancer. Consequently chloroform is a possible human carcinogen.
Chromium	The U.S. Department of Health and Human Services has determined that chromium and certain chromium compounds are known carcinogens. Long-term exposure of workers to airborne levels of chromium higher than those in the natural environment has been associated with lung cancer. Lung cancer may occur long after exposure to chromium has ended.
Copper	Very large single or daily intakes of copper can be harmful. Long term exposure to copper dust can irritate the nose, mouth, and eyes, and cause headaches, dizziness, nausea, and diarrhea. Drinking water that contains higher than normal levels of copper may cause vomiting, diarrhea, stomach camps and nausea. Intentionally high intakes of copper can cause liver and kidney damage and even death. Copper is not known to cause cancer.
Lead	Exposure to high levels of lead can cause the brain and kidneys of adults and children to be badly damaged.
Mercury	Long-term exposure to either organic or inorganic mercury can permanently damage the brain and kidneys. Short-term exposure to high levels of inorganic and organic mercury will have similar health effects; but full recovery is more likely after short-term exposures, once the body clears itself of the contamination.
Radium 226 & 228	There is no clear evidence that long-term exposure to radium at the levels normally present in the environment is likely to result in harmful health effects. However, exposure to higher levels of radium over a long period of time may result in harmful effects including anemia, cataracts, cancer and possibly death.
Selenium	Selenium is an essential nutrient, however when taken in amounts five to ten times the recommended dietary allowance, selenium can be harmful. In extreme cases, people may lose feeling and control in arms and legs. However these effects have been seen only in cases where people were exposed to doses from about 1 to 25 ：g/kg/day for several months or years. Studies show that most selenium compounds do not cause cancer.

CONTAMINANTS OF CONCERN	
Contaminant	**Health Effects and Concerns**
Thorium 228, 230 & 232	Studies on thorium workers have shown that breathing thorium dust may cause an increased chance of developing lung disease and cancer or pancreatic cancer after many years of exposure.
Uranium	Uranium is a radioactive chemical which may cause kidney damage or a bone cancer. However, cancer from an exposure to naturally occurring Uranium 238 is unlikely. Most cancer is caused by an exposure to enriched uranium.

The preliminary remediation goals (PRGs) established for OU1 in the Feasibility Study Report dated August 1998 were based on identification of risks contained in the draft Baseline Human Health Risk Assessment. The PRGs were then used to determine the nature and extent of contamination based on the results of the remedial investigation. Except for lead, the risk based PRGs were calculated based on cleanup levels that fall within EPA's acceptable human health risk levels for an industrial setting and are consistent with the NCP. The lead PRG of 2,000 parts per million (ppm) was based on Bower's model for adult lead exposure at an industrial setting.

The risk based industrial PRG for arsenic was calculated at 194 mg/kg or parts per million (ppm). The arsenic cleanup level is within the TNRCC's policy standard of 200 ppm for an industrial site. Since the other metal contaminants of concern do not have a cancer slope factor, their PRGs were based on a concentration level that would not exceed a hazard index (HI) quotient of one (1) for current and future anticipated industrial land use. The HI quotient represents a level at which there may be concern for potential non-cancer effects from lifetime exposure to contaminants.

Contaminant Concentrations and PRGs for the Tex Tin Site Soil/Sediments		
Analyte	Max. Concentration (mg/kg)	PRGs Cleanup Objectives (mg/kg)
Arsenic	19,256	194
Cadmium	2,183	2,044
Chromium (total)	16,804	1,577
Copper	108,409	75,628
Lead	27,362	2,000
Mercury	29	613
Nickel	21,764	40,880
Zinc	6,990	613,200

PRINCIPAL AND LOW LEVEL THREAT WASTES

Several contaminated media at the site have been identified as "principal threat wastes" because the chemicals of concern are highly toxic, could be highly mobile, and may leach contaminants to the shallow ground water. Principal threat wastes identified at the site include:

- Drummed waste material
- Non-slag pile source material
- Residual dust source material from buildings
- Contaminated soils that fail TCLP and may leach contaminants to the ground water
- Organic tank sludge materials
- Soil that could leach contaminants to the shallow ground water identified by calibrated ground water model

PRINCIPAL THREAT WASTE

Principal threat wastes are those hazardous wastes, systemic toxins and carcinogenic source materials containing chemicals of concern considered to be highly toxic or highly mobile that generally can not be reliably controlled and present a significant risk to human health and the environment should exposure occur. The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 C.F.R. §300.430(a)(1)(iii)(A)). A source material is material that includes or contains hazardous substances, pollutants, or contaminants that acts as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure.

LOW-LEVEL THREAT WASTE

Low-level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Waste materials that constitute low-level threats include, but are not limited to, the following:

- Non-mobile contaminated source material of low to moderate toxicity - surface soil and vitrified slag materials containing chemicals of concern that generally are relatively immobile in air or ground water (i.e., non-liquid, low volatility, low leachability contaminants such as high molecular weight compounds) in the specific environmental setting.

- Low toxicity source material - soil and subsurface soil concentrations not greatly above reference dose levels or that present an excess risk near the acceptable risk range were exposure to occur.

Low level threats identified at the Site include:

- Contaminated site ground water; specifically in the shallow transmissive zone.
- Contaminated soils that pass TCLP and do not leach contaminants to the ground water but exceed health-based levels.
- Slag materials that are vitrified but still pose a risk to human health and the environment.
- Contaminated sediments that pass TCLP and do not leach contaminants to the ground water but exceed health-based levels.

CONTAMINATED MEDIA IDENTIFIED IN THE ORIGINAL OU NO. 1 ROD

A summary of the contaminated media previously identified in the original ROD includes:

Acid Pond and Wah Chang Ditch (AP)

The 4-acre acid pond, Pond 6, was constructed in the late 1950s as a holding pond for the ferrous chloride solution generated by site operations. Pond 6 is presently enclosed by 18-foot high earth berms. The liquid in the acid pond has a measured pH of 1.5. The low pH of this liquid waste exhibits the characteristic of corrosivity under the Resource Conservation and Recovery Act (RCRA). Sediment samples from 10 to 20 feet below the pond water surface had a measured pH of 2.6. Toxicity Characteristic Leaching Procedure (TCLP) analysis of the sediments showed that all detected analytes were below RCRA regulatory limits. Soil samples from the inside edge of the pond berm had a pH of 2.0, with arsenic, copper, and lead concentrations exceeding the PRGs. Approximately 32,000 cubic yards of sludge/sediment and 8.5 million gallons of liquid were identified in the acid pond. It is estimated that 15,000 cubic yards of metals-contaminated soils exist within the berm that surrounds the acid pond. The Wah Chang Ditch traverses the smelter site from north to south between Ponds 2 through 5 and Ponds 1 and 6, and is the primary drainage feature at the Site. The ditch discharges to Ponds 24, 25, and 26 south of the site. It is estimated that sediments along the entire portion of the Wah Chang Ditch contain arsenic and lead at concentrations that exceed PRG levels.

Wastewater Ponds

Wastewater Ponds 1 through 5 were used as part of the facility's wastewater treatment system. These ponds occupy approximately 22.3 acres of the Site, including levees. Pond 1 has an approximate surface area of 0.4 acre and served as the initial settling basin for the wastewater treatment process. Lime slurry was added to Pond 1 for neutralization purposes before pumping the wastewater to Pond 2. Water flowed from Pond 2 to Ponds 3 and 4 through breaches in the berms. Ponds 2, 3, and 4 have approximately 4.5, 4.9, and 4.1 acres of surface area, respectively. Pond 5 with a surface area of approximately 3.0 acres is not connected to the settling ponds but occasionally receives wastewater through overflow of the levee adjacent to Pond 4. Ponds 4 and 5 appear to be recharged from ground water, since they maintain nearly constant water levels within their bounds. Ponds 1 through 3 are often dry during the summer months.

Samples collected from the sediments of Wastewater Ponds 1 through 5 had elevated concentrations of total metals. Pond 1 had concentrations above the PRGs for arsenic and lead to a maximum depth of 10.8 feet. Pond 2 sediments contained concentrations above the PRGs for arsenic, chromium, antimony, and lead to depths of 9.3 feet. Pond 3 had concentrations above the PRG for arsenic, chromium, and lead to a maximum depth of 6.1 feet. Pond 4 had concentrations above the PRG for arsenic, chromium, and lead to a maximum depth of 3.5 feet. Pond 5 had arsenic, chromium, antimony, and lead concentrations above PRGs to a depth of 3.4 feet. For Ponds 1 through 5, inorganic TCLP analysis showed that all detected analytes were below RCRA regulatory limits for metals.

The surface water in Ponds 1 through 5 was sampled and analyzed during the Phase II Remedial Investigation (RI). Overall the water in the wastewater ponds has relatively low contaminant levels. The concentrations of metals detected in the pond waters did not exceed the discharge limits of the facility's NPDES permit limits.

Ground Water

The ground water PRGs for the deep transmissive zone are based on maximum contaminant levels (MCLs) or media-specific concentrations. The ground water PRGs for the shallow and medium transmissive zones are based on Alternate Concentration Levels (ACLs) developed for industrial use. Derivation of the ACLs is presented in Appendix D of the August 4, 1998 Feasibility Study Report for OU No. 1.

The average total dissolved solids (TDS) content of ground water in the shallow transmissive zone for all wells across the Site is 47,076 mg/L, and the maximum TDS concentration is 223,000 mg/L at MW-25S wells. The TDS in unaffected background wells averaged 2,918 mg/L. For ground water in the medium transmissive zone, analytical results indicate that some wells had inorganic contamination that exceeded TNRCC water standards for potentially potable water. The TDS in the background wells in the medium transmissive zone averaged 4,350 mg/L. The TDS concentrations in the shallow and medium transmissive zones up gradient from the Site indicate that the two zones are considered moderately saline under the TNRCC classification.

For ground water in the deep transmissive zone, analytical results indicate that selenium concentrations were above the Maximum Contaminant Level (MCL) in three of the four deep monitoring wells. Lead concentrations in the deep transmissive zone also slightly exceeded the action levels in two of the four deep wells, and benzene exceeded the MCL in one of the four deep wells.

The hydrogeological study portion of the Phase II RI indicated that Ponds 4, 5, 6, 24, and 25 are hydraulically connected with the shallow transmissive zone. The vertical gradient between the shallow and medium transmissive zones is generally downward with locally sporadic reversed vertical gradients. Ground water flow in the shallow transmissive zone is highly influenced by manmade features present on OU No. 1. The horizontal flow direction is generally from

northwest to southeast, with the wastewater treatment ponds influencing flow in an easterly direction from former Ponds 9 through 14. Ground water flow is in a south-southwesterly direction near the location of former Ponds 18 through 21. The horizontal flow direction in the medium and deep transmissive zones appears to be from northwest to southeast. Data from monitoring wells surrounding the acid pond indicate ground water contamination with a low pH (range: 1.0 to 3.0) in the shallow transmissive zone. Data also indicate that there has been little downward movement of contaminants into the well-developed clay that makes up the underlying confining layer.

As part of the cleanup conducted by Amoco for OU No. 2, a slurry wall was constructed along the eastern boundary of OU No. 1. The slurry wall runs north and south between the OU No. 1 and OU No. 2 boundaries. The slurry wall was constructed by Amoco to prevent ground water contaminants in the shallow transmissive zone from migrating to OU No. 2, the Amoco property.

For potential future ground water use, downgradient from OU No. 1, the ground water cleanup levels were set to meet ACLs for industrial use for the shallow and medium transmissive zones and MCLs for the deep zone. After completion of the remedial action for OU No. 1, compliance ground water monitoring will be conducted downgradient to ensure that cleanup levels for the transmissive zones are not exceeded.

Drums

The majority of the drums and supersacks found on OU No. 1 contain catalyst material, a powdery substance that is typically high in inorganic analytes. It is estimated that approximately 6,500 drums and supersacks are currently present at the site. It is estimated that the drums and supersacks contain approximately 1,600 cubic yards of contaminated waste materials. Drum samples collected and analyzed for total inorganic analytes revealed high concentrations of total metals, including copper concentrations up to 595,000 milligrams per kilogram (mg/kg), lead up to 72,600 mg/kg, arsenic up to 330,000 mg/kg, and cadmium up to 2,490 mg/kg. TCLP concentrations in the sample extracts (lead up to 1,040 milligrams per liter (mg/L), arsenic up to 4,055 mg/L, and cadmium up to 44.7 mg/L) exceeded regulatory levels for RCRA characteristic hazardous waste.

Aboveground Storage Tanks (ASTs)

Seventy-three (73) ASTs are located on site. Forty-nine (49) ASTs and eight ball boilers are located in the former process area, and 16 ASTs are located within the Morchem facility. The ASTs served various purposes including fuel storage, storage of high-purity electrolytic-grade tin metal, electrolyte storage, chlorine storage, conversion of ferrous chloride into ferric chloride, and scrubber tanks in series associated with the Kaldo furnace system. Tanks found in the former process area appear to be in the most deteriorated condition; most are highly corroded with some ruptures. The approximate volumes of waste materials stored in the ASTs were as follows: 34,350 gallons of acid-oxidizer liquids; 14,500 gallons of flammable liquids; 227,000 gallons of

non-hazardous liquids; 3,500 gallons of base liquids; 3,500 gallons of base solids; and 7,000 gallons of mixed liquids (organic/water).

Surface and Subsurface Soils

Fill material and debris throughout the Site have resulted in a highly variable soil profile. Surface soils in Areas B, C, and J have the highest overall concentrations of inorganic analytes. Radionuclide and low-level gamma radiation levels were detected for surface soils in Areas B, C, D, E, F, and J. Subsurface soils in all areas of the Site have been impacted by site activities with contamination extending to the upper 2 to 5 feet in the process area, and to an average depth of approximately 12 feet in the closed ponds area and the slag storage areas. Analytical results indicated that all soil samples tested were below the established TCLP criteria for RCRA characteristic hazardous waste. In Area C all analytical results met regulatory levels with the exception of a few samples that failed to meet TCLP requirements for lead.

NORM Slag (NSL) Piles

Naturally Occurring Radioactive Material (NORM) slag piles total approximately 14,100 cubic yards of material that originated from the tin smelting processes and contain elevated levels of radionuclides. Radium-226 and 228, thorium 228, 230, and 232, and total uranium were detected in the surface soils and in the site sediments. Gamma spectral analysis results indicated that activities for bismuth-214 ranged from below detection limits to more than 100 picocuries per gram (pCi/g), with 67 percent of the samples analyzed having bismuth-214 activity greater than 20 pCi/g. Because equilibrated bismuth-214 equates to radium-226 activity, most of the samples analyzed have radium-226 activities greater than the 5 pCi/g surface cleanup standard specified under Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA, 40 CFR. Part 192, Subpart B), which has generally been applied as an ARAR for non-UMTRCA sites. Off-site sampling revealed radium-226 activity in excess of 60 pCi/g at a location approximately 1 meter outside the fence line.

Non-NORM Slag Piles

There are approximately 52,000 cubic yards of non-NORM slag pile materials located on site. These slag piles originated from the tin and copper smelting processes and consist of tin slag (granular, pebble- to sand-sized, black- to reddish-brown, glossy material), copper silicon, and copper slag (cobble- to boulder-sized black and green glossy material). Other site piles include ore material and precipitate, which were dredged from on-site ponds.

Materials failing TCLP criteria are defined as characteristic hazardous waste (Section 101(14) of CERCLA, 42 U.S.C. § 9601(14) and 40 C.F.R. §302.4). Several slag samples analyzed for total inorganic analytes exhibited high concentrations of total metals, including copper up to 78,200 mg/kg, lead up to 15,800 mg/kg, arsenic up to 2,200 mg/kg, and cadmium up to 32.1 mg/kg. TCLP analysis showed concentrations for lead exceeding established regulatory levels for RCRA

characteristic hazardous waste. Approximately 20,000 cubic yards of slag materials have been identified as characteristic hazardous wastes because they exceed TCLP criteria. The remaining 32,000 cubic yards of slag materials are considered non-hazardous since they pass TCLP criteria. Although the latter category of materials are considered RCRA non-hazardous, their contents may still exceed the PRGs for the site and are therefore considered hazardous to human health.

Buildings

At the time the original ROD was issued, prior to the removal action completed in August 2000, a total of 11 buildings remain in the process area. They are the Smelter Building with the associated Kaldo furnace buildings and ancillary structures, the Ore Storage Building, the Roasting and Leaching (R&L) Building, the Maintenance Building, Warehouses No. 1 through 3, the Engineering Building, the Laboratory and Office Building, the Change Room and Garage, and the Generator House. Additionally, one cooling tower, two 10,000-gallon steel water towers, one 65-foot brick flue stack, and one 250-foot concrete flue stack remain in the process area. All buildings were constructed in the 1940s, with the exception of the Kaldo buildings, which were constructed in the 1970s. Inspection of the buildings by a licensed professional found that the R&L Building had major corrosion damage at the column bases and could collapse during heavy wind conditions at any time. The Smelter, Ore Storage, and Maintenance Buildings were found to have experienced lesser degrees of corrosion damage at the column bases.

Hazardous materials, associated with the smelting process, are present in the buildings and could pose a health hazard if releases occur in the future due to continued building deterioration and possible collapse. Also, significant quantities of asbestos-containing materials (ACM) are present in the buildings. Approximately 490,000 square feet of transite panels containing asbestos materials were identified for the buildings. An additional 26,500 square feet of ACM were found throughout the site buildings. Approximately 4,500 linear feet of asbestos pipe insulation were also identified. The laboratory building may contain miscellaneous chemicals in small quantities.

Existing Low-Level Radioactive Landfill

A low-level radioactive landfill (License No. RW1270) is located in the southwest part of the Site. From 1975 to 1977, spent antimony-uranium catalyst containing uranium-238 (U-238) was buried in the landfill. TNRCC files indicate that approximately 135,353 pounds of U-238 were buried in this landfill. The landfill was closed in 1978 and a quarterly monitoring program was established by the Texas Department of Health (TDH) Bureau of Radiation Control. This monitoring program ceased in the first quarter of 1996. Results of the monitoring indicate that the landfill does not appear to pose a potential or actual threat to public health, if public access remains prohibited. The existing cap over the low-level radioactive landfill will be upgraded with one of the soil alternatives being considered for the site. The area over the landfill will be graded, covered with a clay soil cover, and sloped to prevent ponding. Six inches of topsoil will be added and native grasses planted to prevent erosion. Operation and maintenance (O&M) for the clay soil cover and ground water monitoring will be included as part of the overall O&M for the site. The

entity that assumes O&M for OU No. 1 would have to meet the decommissioning and post-closure institutional control requirements of the TNRCC radiation rules, 30 TAC Chapter 336. Deed recordation of the landfill area would be required to prevent potential exposure to radioactive materials.

Off-Site Ponds

Because of their proximity to the facility, Ponds 22, 24, 25, and 26 are included under Operable Unit No. 1 of the Tex Tin site. Pond 22 (approximately 6.7 acres) is located across State Highway 146, to the west of the Site. This pond was originally constructed as a borrow pit for clay and sand used in Texas City area construction projects. Historical information obtained indicates that this pond was never part of site operations. Construction of dikes along the northwestern edge of this pond limits the amount of runoff received from the Site. Pond 23 (approximately 2.5 acres) is adjacent to the southern boundary of the Site and primarily collects rainwater that drains from the Site, the overpass of State Highway 146, and the railroad right-of-way. Ponds 24 (approximately 7.9 acres), 25 (approximately 15.0 acres), and 26 are located southeast of the Site, adjacent to the hurricane protection levee. These ponds (borrow pits) resulted from the construction of the hurricane protection levee. The Wah Chang Ditch flows directly to Pond 25, which is connected to Ponds 24 and 26 by a common inlet/outlet. The human health risk from exposure to pond sediments is low since humans would not be exposed to the sediments on a regular basis. Therefore, no remedial alternatives were evaluated in the Feasibility Study Report dated August 4, 1998 for Ponds 22, 24, 25, and 26.

In October 1999, EPA contracted with the United States Geological Survey (USGS) to collect fish samples from Ponds 22, 24, 25, and 26. The edible portion of the fish samples was tested by the Texas Department of Health (TDH) to determine if consumption of fish from Ponds 22, 24, 25, and 26 posed a risk to human health. The fish tissue laboratory results were evaluated by the Seafood Safety Office of TDH. Results indicate elevated levels of PCBs present in fish from Ponds 22, 24, 25, and 26. Although PCBs were not identified as a contaminant of concern for the site, TDH is recommending that access Ponds 22, 24, 25, and 26 be limited to prevent consumption of fish from these ponds. TDH will contact the pond owners and recommend that the owners restrict access to these ponds. Based on this information, no remedial action is warranted for Ponds 22, 24, 25, 26 under the Superfund program and therefore no remedial alternatives were evaluated in the SFFS Report.

ORIGINAL ROD SELECTED REMEDY

The original selected sitewide remedy (SW3) in the ROD signed on May 17, 1999 had an estimated present worth cost of $28.6 million and included the following elements:

- Onsite stabilization of Acid Pond sediments and Wah Chang Ditch sediments, Stabilization of drum and supersack inorganic contents, offsite disposal of organic contents, stabilization of NORM and hazardous non-NORM slag;

- Soils exceeding PRGs but not SPLP (including low-level radioactive landfill) covered with compacted clay cover; soils exceeding SPLP stabilized and capped;

- Wastewater pond liquids discharged to Wah Chang Ditch, and ponds backfilled;

- Long-term ground water monitoring;

- Offsite disposal of organic Aboveground Storage Tank contents, onsite treatment of inorganic AST waste; and

- Removal of dust and all asbestos from buildings, demolition of buildings and onsite disposal of debris.

BASIS FOR ROD AMENDMENT

Summary of ROD Amendment Information

A Supplemental Focused Feasibility Study (SFFS) report was completed in February 2000 by a group of potentially responsible parties (PRPs) connected with this Site ("Supplemental Focused Feasibility Study Report for Operable Unit No. 1, Tex Tin Superfund Site, Texas City, Texas" (Environmental Resources Management, Feb. 2000)). The SFFS presents additional information that was not available at the time that the original Feasibility Study (FS) report was prepared or the original Record of Decision signed. The PRPs' study was conducted from August 1999 through December 1999. Field ground water data was collected in October 1999. Details of the new information are presented in the SFFS.

Information compiled in the SFFS which was not considered for the May 17, 1999 ROD included the following:

- Documents obtained from the National Archives demonstrated that millions of gallons of acidic leach solutions exhibiting a low pH and containing high concentrations of heavy metals were injected into the shallow ground water beneath the Site. This information raised the question whether the practice of injection, rather than contaminants leaching from surface source material, caused the ground water contamination observed in other Site studies.

- Previously collected site data was loaded into a Geographic Information System (GIS) program and used to evaluate spatial relationships between contaminated soils and other materials identified as source materials, and to define the shape and location of the ground water contaminant plume. This evaluation confirmed the implications of the historical document search described above that there is a poor correlation between the identified source material at the ground surface and the underlying ground water plume.

- Additional field investigations performed during the summer and autumn of 1999 demonstrated that the injected wastes are relatively stationary, but that the contaminant plume is reconfigured and has moved slightly toward the southeastern property boundary.

- A calibrated regional ground water flow model was developed to assess feasible ground water management options and to identify the contaminated soils which could have an impact on ground water. The regional ground water flow model was constructed from previous geological and hydrogeological work and from groundwater flow models previously constructed for both the Site and an adjacent facility. New geologic and hydrogeologic data from on site and surrounding facilities were also incorporated into the model, as were allowances for the influence of significant upgradient surface water features such as Lake Lardie and the Amoco Borden pond.

This information suggested that fundamental changes to the ground water and stabilization components of the remedy should be considered.

Field Investigation

A field investigation was conducted during October 1999 by the PRP consultant to better understand current ground water conditions at the Site. The results of the 1999 field investigation were used to provide input to the ground water flow model for the Site based on current conditions and develop the ground water remedial elements of new proposed Site-wide Alternative, SW7. The investigation included collection of the following:

- Ground water elevation data from 70 monitoring wells;
- Surface water elevation data from 7 ponds;
- Continuous water level data from Pond 6 and adjacent monitoring wells;
- Field geochemical parameter data from 28 monitoring wells; and
- Field geochemical parameter data from 11 ponds/surface water bodies.

The results of the 1999 field investigation indicate that the ground water flow direction and gradient are similar to the direction and gradient described in previous RI reports. In addition, it concluded that the Deep Transmissive Zone is hydraulically and chemically separate from the Shallow and Medium Transmissive Zones. Whereas the Shallow and Medium Transmissive Zones appear to have hydraulic heads within a few feet of each other and similar major anion/cation chemistry, the 1999 data indicated that these two zones do not have similar pH signatures. They are, therefore, only weakly connected in the vicinity of the Site, but are probably in hydraulic communication at an off-site location. Site contamination, shown by pH and trace metals, is still restricted to the Shallow Transmissive Zone after more than 40 years.

The water elevation data collected in 1999 supports the RI conclusion that Ponds 6, 24 and 25 are hydraulically linked to the Shallow Transmissive Zone. It has also been demonstrated that Ponds 24 and 25, located near the southeast boundary of the Site, fully penetrate the Shallow

Transmissive Zone.

Based on a comparison of previous RI information and 1999 data, the low pH ground water plume has remained fairly consistent with the following exceptions. The extent of the low pH ground water is slightly greater than was previously measured. In addition, the lowest pH ground water appears to have migrated a very short distance in the general direction of ground water flow. However, the movement of the low pH plume (and other contaminants) is much slower than the ground water movement, suggesting significant natural processes are occurring by natural attenuation.

Development of Regional Calibrated Ground Water Flow Model

Concurrent with the 1999 field investigation, the consultant for the PRPs also developed a regional, calibrated ground water flow model to assess the potential for plume migration beyond the Site boundaries. The calibrated flow model was used to evaluate ground water migration; both in the area of the contaminated plume and beyond the Site boundaries. In developing an alternative ground water protection strategy in the SFFS, the calibrated flow model was used to develop options for a more active control of Site ground water. The calibrated flow model was used to assess the following three different facets of the alternate ground water management strategy:

- Controlling horizontal flow directions;
- Managing vertical gradients; and
- Reducing discharge to Ponds 24, 25 and 26 at the southern boundary of the Site.

In addition, the flow model was used in combination with the extensive Site soil database to identify on-site soils that should be considered principal threat soils based on mobility.

Controlling Horizontal Flow Directions

A first step in managing the on-site ground water contaminant plume is to limit the number of directions it could potentially flow off-site. The first objective of the modeling was to understand, and develop a means of controlling, horizontal flow. Both the October 1999 ground water level data and model-simulated ground water contours indicate a significant component of ground water flow in a south to southeasterly direction towards Ponds 24, 25, and 26, as well as a westerly component of ground water flow towards Pond 22. Based on the modeled analysis, it appears that flow from the site plume area could discharge to Pond 22. Therefore, to meet the RAO of no further degradation to off-site ground water sources, long term management of the western component of ground water flow is needed.

An effective ground water management strategy along the western portion of the Site would include the installation of a ground water barrier wall along the western Site boundary. The ground water barrier wall would help meet the Site RAOs. In summary, the ground water flow

modeling results indicate that the installation of a western barrier wall is an effective management tool for limiting the off-site westward flow of ground water. Any potential increase in hydraulic head that might be caused by the installation of such a wall is effectively eliminated with the use of a Clay Soil Cover.

Managing Vertical Gradients

The limitation of horizontal ground water flow due to the construction of a low permeability barrier wall often results in the mounding of ground water on the upgradient side of the wall. In turn, the mounding of ground water could result in an increase in the vertical gradients and a higher potential for vertical ground water flow.

The calibrated model was used to compare ground water heads between the Shallow and Middle Transmissive Zones. The ground water head difference between the Shallow and Middle Transmissive Zones under existing conditions (without western barrier wall) indicates that the highest magnitude of downward gradients is in the southwestern portion of the Site in the area of the ground water mound. Upward gradients are observed in the areas of Ponds 24 and 25 and Pond 22 due to ground water discharge to the surface water ponds in these areas.

Placement of a barrier wall along the western Site boundary results in a predicted increase in vertical gradients along the western Site boundary upgradient of the barrier wall. This indicates an increase in the potential for vertical ground water migration in these areas. However, the western barrier wall will not be implemented as the sole remedy element at the Site. Surface infiltration controls will be included as part of the overall ground water remedy. Based on the calibrated model simulation results, recharge due to infiltration comprises approximately 70% of the total on-site water flow in the Shallow Transmissive Zone. These results indicate that the dominant source of water to the Shallow Transmissive Zone is infiltration from the surface. The model further indicates that the surface grading and infiltration controls required for other areas of the site remedy, unrelated to the ground water remedy, are expected to be an effective technique for reducing the overall potential for vertical ground water flow, as well as reducing the potential for outward horizontal flow across the western wall. Surface infiltration controls consist of:

- Surface grading to direct surface drainage primarily toward the Wah Chang Ditch;
- Filling of low lying areas to prevent water from ponding which would result in an increased infiltration;
- Placement of Clay Soil Cover over materials that exceed health based levels; and
- Growth of native vegetation, which would further reduce infiltration and enhance evapotranspiration.

The results of the modeled head differences before and after installation of surface infiltration controls indicate that significant control of the vertical and horizontal gradients in the southwestern quadrant of the Site can be achieved by reducing the amount of surface infiltration. This remedy component will reduce downward gradients in the southwestern portion of the Site.

Reducing Discharge to Ponds 24, 25, and 26

Once the flow direction and vertical gradient of the shallow ground water plume are controlled, the final means to minimize its impact is to reduce the rate at which it discharges to surface water. Reduction of the total southward ground water flow to Ponds 24, 25, and 26 is the third objective of the model simulations. An enhanced evapotranspiration system was selected for this purpose. The Enhanced Evaporation System will consist of trees located along the southern property boundary. Water level controls in Ponds 24, 25, and 26 would enhance this objective. However, the control measures are contingent on an agreement with the pond owners/operators. The ponds water level control measures are not critical to the success of Site-wide Alternative SW7.

The combination of all the ground water management techniques will result in a significant reduction in the total flux of ground water to Ponds 24, 25, and 26. An estimate of the time required for the selected remedy to reach steady state was calculated using the ground water flow model. The results indicate that Site conditions would reach steady state within approximately three months after completion of the Site-wide remedy.

Stabilization Criteria

Along with the fundamental change made to the ground water component of the Amended Remedy, the other fundamental change is the stabilization criteria used for treatment of principal threat waste materials and stabilization of soils which could leach contaminants to the ground water. Stabilization criteria in the May 17, 1999 ROD were set at exceedingly conservative levels to eliminate any potential for migration of contaminants to ground water, based upon the assumption that surface contaminants constituted a major source of the existing groundwater contaminant plume. As noted above, information gathered from the National Archives indicated that waste acid contained in the acid ponds had been historically injected into the base of the ponds to increase their storage/disposal capacity. Moreover, the SFFS documented the absence of a correlation between high concentrations of surface contaminants and the location of the ground water plume.

In the original ROD, the stabilization criteria were based on meeting Federal drinking water standards (Maximum Contaminant Levels or MCLs) for the leachate at the surface. These criteria were very conservative. They did not take into consideration the fact that inorganic contaminant levels will be reduced through adsorption as the leachate moves through the twenty feet of soil between the surface and the uppermost layer of shallow ground water.

Moreover, the overall remedial approach to groundwater, both in the May 17, 1999 ROD and this Amended ROD, is containment of the contaminant plume on-site and prevention of further migration. Background ground water concentrations in the shallow ground water exceed MCLs for antimony, beryllium, chromium, and lead. Requiring the leachate from the stabilized materials to meet MCLs would require meeting a higher standard than background for no apparent benefit to groundwater quality, based on the demonstrated disconnect between surface contaminants and

the location of the subsurface plume.

There is some indication that meeting the stabilization standards for some soil contaminants, particularly arsenic, may not be technically practicable. Moreover, given the quantity of material to be stabilized (which potentially could be underestimated by as much as 800,000 cubic yards in the May 17, 1999 ROD -- the volume estimate was based on contaminated materials passing TCLP criteria, which was not adjusted when a more stringent standard of meeting MCLs was adopted for the ROD), would be very expensive. The shallow ground water is not a source of drinking water within a three mile radius of the site and is not expected to be a drinking water source in the future. For a number of reasons, then, the stabilization criteria are being changed.

The stabilization criteria for soils that may leach contaminants to the ground water will be based on meeting the Alternative LDR treatment standards for contaminated soil promulgated pursuant to the Resource Conservation and Recovery Act (RCRA) as specified in 40 C.F.R. § 268.49. The RCRA alternative treatment standards for soil states that soil stabilization shall reduce the toxicity concentration by 90% or 10 times the Universal Treatment Standards (UTS) identified in 40 C.F.R. § 268.48, whichever is greatest.

The non-slag source materials will be stabilized to meet the RCRA toxicity characteristic leaching procedure (TCLP) levels listed in 40 C.F.R. § 261.24. To further prevent ground water infiltration through the stabilized materials, the treated materials will be disposed of in an onsite consolidation cell (Pond 2) and covered with an impermeable cap or RCRA Type C or equivalent cap as applicable.

AMENDED ADMINISTRATIVE RECORD INFORMATION

A Supplemental Focused Feasibility Study (SFFS) report was completed in February 2000 by consultants for a group of PRPs. The SFFS presents the new information that forms the basis for the Amended Record of Decision for the site. This ROD Amendment will become part of the Administrative Record File for the site (NCP 300.825(a)(2)). The Amended Administrative Record file is located at the three repositories listed on Page 8.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Tex Tin facility, OU No. 1, is currently in an advanced state of disrepair. Most of the buildings are in poor condition and some have significantly deteriorated. The smelter building, the roasting and leaching building, the cooling tower, one steel water towers, and other auxiliary deteriorated structures were demolished in a removal action conducted from May through August 2000. No maintenance or other preventive measures appear to have been taken at the site by the facility owners since the smelter ceased operations in 1991. The smelter facility is zoned for industrial use. The site is located in an industrial area in Texas City that is used primarily for chemical manufacturing and petroleum refining. Therefore, it is not anticipated that the zoning designation for the site will change in the future. The city and community have expressed an

interest for the site to be redeveloped for industrial use, possibly as part of the city's proposed megaport plans. Texas City has applied for a Superfund redevelopment grant. To the extent practicable, EPA will consider future redevelopment plans in conducting the cleanup for the site. The cleanup standards will meet the requirements for future industrial development.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) for the amended remedy will not change from those listed in the original ROD. The RAOs were developed for the Tex Tin site for those chemical and contaminant sources that pose a carcinogenic risk or non-carcinogenic hazard to human health and the environment based on site-specific risk calculations and such that Applicable or Relevant and Appropriate Requirements (ARARs) are met. The RAOs refer to specific sources, contaminants, pathways, and receptors. The RAOs for the Tex Tin OU No. 1 site are:

- Prevent direct contact, ingestion, and inhalation of surface and subsurface soil, sediments, waste piles, drummed (spent catalyst) materials and ground water containing contaminants that exceed PRGs;

- Prevent the release of contaminants from the Acid Pond, wastewater ponds, drums (spent catalyst), above ground storage tanks, and slag piles to surface and subsurface soils, surface water, and ground water. Protect off site ecological receptors by preventing off site contaminant migration as a result of on-site releases;

- Prevent external radiation exposure and prevent direct contact, ingestion, and inhalation of soils and slag piles that contain radium-226 material exceeding 40 C.F.R. Part 192 criteria;

- Prevent further degradation of the Shallow and Medium Transmissive Zone ground water outside the operable unit boundaries;

- Prevent migration of contaminated ground water outside the operable unit boundaries in the Deep Transmissive Zone by addressing the site source materials and preventing further degradation of the shallow and medium transmissive zones; and

- Prevent the release of friable asbestos-containing materials in buildings and structures on-site.

EVALUATION OF AMENDED REMEDY

Except for the changes in the stabilization criteria and ground water strategy, the changes to the remedy selected in the May 17, 1999 ROD are not sufficiently significant to require re-evaluation of the nine criteria. Although many of the alternatives presented in the Amended Record of Decision appear different from the original ROD, the differences are not so fundamental as to require a re-evaluation using the nine criteria.

NINE CRITERIA EVALUATION
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50% to -30%.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analysis and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

The proposed amended remedy was evaluated in accordance with the nine criteria specified in the NCP, 40 C.F.R. § 300.430(e)(9) and (f)(1). Components of the remedial action selected in the ROD signed on May 17, 1999 have already been evaluated based on the nine criteria.

In the discussion that follows, the overall amended remedy will be evaluated in general terms. Details of the evaluation will be provided for the ground water remedial action components and the stabilization criteria, since changes to these items constitute fundamental changes made to the original remedy selected on May 17, 1999. The other changes made in the amended remedy do not constitute fundamental changes and therefore do not require a re-evaluation.

The FS report provided a comprehensive screening of many possible components of various remedies and of six separate Site-wide Alternatives; an extensive discussion of these alternatives is contained in the May 17, 1999 ROD. EPA selected Site-wide Alternative SW3 in the original ROD on the basis of this screening. Because the SFFS introduced a single, new Site-wide Alternative, the screening portion of this SFFS is focused only on a comparison between Site-

wide Alternative SW3 (the ROD Selected Remedy) and Site-wide Alternative SW7. Except for the fundamental changes to the ground water remedy and the stabilization criteria, there is little difference between the two site-wide alternatives when compared under the aforementioned nine criteria.

Overall Protection of Human Health and the Environment

The Amended Remedy will provide protection to human health and the environment through treatment, engineering controls, ground water controls and monitoring, and institutional controls. This approach significantly reduces the volume of soil that requires stabilization, but still addresses principal threat soils and waste materials. The amended remedy will more actively manage ground water via construction of a barrier wall along the western Site boundary and an enhanced evapotranspiration system along the southern Site boundary. Like the ROD Selected Remedy, the Site-wide Alternative SW7 will sufficiently reduce the carcinogenic risks and non-carcinogenic hazards associated with Site contaminants by eliminating the pathways to the potential receptors from each contaminant source.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

ARARs for the Site are provided in Appendix A of the Feasibility Study Report for the site. The ARARs for the site did not change in preparation of the SFFS report. The primary focus of the discussion provided in Appendix D of the SFFS report is the classification, management and disposition of remediation materials during implementation of the Amended Remedy, Site-wide Alternative SW7. To meet ARARs, hazardous source materials will be stabilized to pass RCRA TCLP levels under 40 C.F.R. §261.24 prior to onsite disposal. This treatment will address principal threat source waste materials identified at the site. Prior to onsite disposal, hazardous soils identified as principal threat materials due to mobility and the potential for leaching contaminants to the Shallow Transmissive zone, will be treated to comply with the Alternative Standards for LDR treatment requirements as specified in 40 C.F.R. §268.49. The components of the amended ground water remedy will meet the ground water ARARs identified in the Original ROD.

Other modifications included in this Amended Proposed Plan are consistent with the selected ROD remedy and have been evaluated in the Feasibility Study report and do not require further evaluation under the nine criteria. The Amended Remedy (SW7) will meet the ARARs listed on Tables 3.12.2- 1, 3.12.2-2, and 3.12.2-3 in the original ROD signed on May 17, 1999.

Long-term Effectiveness and Permanence

The site-wide Amended Remedy (SW7) utilizes stabilization and neutralization treatment technologies to the extent practicable and includes abatement, consolidation, and passive and active ground water management to provide a long-term, effective and permanent solution for reducing the carcinogenic risks and non-carcinogenic hazards identified at the Site. The Amended

Remedy adds the western barrier wall, surface infiltration controls in the area of the plume, an enhanced evapotranspiration system, and (contingent) control on water levels in Ponds 24, 25, and 26. The site-wide Amended Remedy provides assurance that future changes in the management of surface water bodies surrounding the Site will not influence the direction and rate of movement of the contaminated plume. This will ensure that the remedy is effective in providing long term protection of human health and the environment.

Reduction of Toxicity, Mobility or Volume Through Treatment

The stabilization and neutralization treatment components of the Amended Remedy will reduce mobility of site contaminants. Off site disposal and incineration of organic waste materials will reduce their toxicity, mobility, and volume. The Amended Remedy includes treatment of contaminated soils that could potentially leach contaminants to the shallow ground water. Slag materials that are already vitrified will not require additional treatment. The site-wide Amended Remedy includes significant measures to control the mobility of Site contaminants through the installation of a western barrier wall and the installation of an enhanced evapotranspiration system to reduce the volume of contaminated ground water discharging to Ponds 24, 25 and 26.

Short-Term Effectiveness

The short-term effectiveness of the Amended site-wide Remedy is enhanced over that of the original remedy as a result of the addition of the western barrier wall, the surface infiltration controls in the area of the plume, and the initial effect of the enhanced evapotranspiration barrier. In combination, these elements will provide an almost immediate response to the recently observed movement of the low pH ground water plume in the Shallow Transmissive Zone and the potential movement of that plume to the west, thereby greatly reducing the potential threat of off-site migration.

Implementability

The Amended Remedy can be readily implemented and contains less uncertainty in the amount of materials requiring treatment (i.e., stabilization). Additionally, a smaller volume of materials will require stabilization since vitrified slag will not be further treated to meet the RAOs for the site.

Cost

The cost uncertainty associated with the Amended site-wide Remedy (SW7) is significantly less than that associated with the original ROD Selected Remedy. The present worth estimated cost to implement the ROD Selected Remedy ranges from the FS report of $28.64 million to the potential responsible parties' consultant's (ERM's) independent estimate of approximately $94 million. The present worth estimated cost of implementing Site-wide Alternative SW7 is $27.12 million.

State Acceptance

State acceptance is provided through TNRCC's participation in reviewing and providing comments on the Amended Proposed Plan, Supplemental Focused Feasibility Study Reports and other reports and documents contained in the Amended Administrative Record for the site. The TNRCC also has been provided the opportunity to review and comment on the draft Amended Record of Decision for the site. It is anticipated that TNRCC will continue to provide technical support on EPA actions at the Site. EPA will continue to consult with TNRCC in the implementation of the remedy for OU No. 1 and selection of actions for the other operable units.

Community Acceptance

Community acceptance is an important consideration in the final decision for the Site. EPA issue the Amended Proposed Plan for a 30-day public comment period starting on March 7, 2000. A public meeting was held on March 23, 2000 to receive public comments and answer questions. EPA has evaluated all public comments received prior to selecting the Amended Remedy for the site. No new information was presented during the public comment period that would require changing the remedy as proposed in the Amended Proposed Plan.

DESCRIPTION OF THE SELECTED AMENDED REMEDY

The selected amended remedy consists of the following major components. Additional remedy breakdown cost information is provided in the Cost Summary section.

<u>Acid Pond and Wah Chang Ditch (AP)</u>
Neutralize Acid Pond Water and Sediments and Backfill Pond
Total Present Worth Cost: $3,400,000

Under the selected Amended Site-wide Remedy (SW7), the Acid Pond (Pond 6) will not be used for disposal and capping of treated hazardous materials. Instead, it will be backfilled to grade and allowed to drain to the Wah Chang Ditch. The final configuration of Pond 6 will be compatible with the expected future industrial land use for the site.

The calibrated ground water flow model predicts that a geomembrane cut-off wall is not needed to dewater Pond 6. The contaminated surface water will either be treated on-site to remove the corrosivity characteristic and meet the site NPDES standards prior to discharge to the Wah Chang Ditch or transported off-site to a nearby treatment facility, if possible. The first preference is for on-site treatment. Regarding off-site treatment, one facility that might be capable of accepting Pond 6 water is the Gulf Coast Waste Disposal Authority's 40-Acre Facility, which is within a short distance of the Site. The determination of whether the water will be treated on-site or off-site is dependent on a number of factors, such as feasibility, permitting requirements and cost at the off-site facility, and will be made during the remedy design phase. The cost estimate presented in the Amended ROD is based on the water being treated onsite and discharged to the

Wah Chang Ditch.

For onsite treatment, the low pH water will be treated to raise the pH level above 2.0 and to comply with the RCRA Corrosivity standards under 40 C.F.R. §261.22. Likewise, the low pH sediment in the bottom of Pond 6 will be treated by raising the pH to 2.0 standard units or above. Sufficient neutralizing agent and sufficiently aggressive mixing will be utilized to achieve the pH target within a reasonable period of time. The exact methodology to be employed in raising the pH will be developed during the design phase. It was assumed for cost estimating purposes that commercial lime will be used as the stabilization agent and that it will be added at a rate of 20% by volume. The estimated volume was based on a depth of eight feet of sediments requiring treatment.

After placement of the lime, the perimeter berm materials that exceed PRGs can be used as backfill for Pond 6 or other site ponds with the exception of the top two feet. If the berm soils do not exceed health based levels, they can be used for backfill or graded on site. After backfilling, Pond 6 will be covered with a 2-foot Clay Soil Cover that includes six inches of top soil and is graded to drain. After grading to design elevations, surface stormwater runoff will flow from the location of the former pond into the Wah Chang Ditch.

This component of the remedial action also includes excavating those portions of the Wah Chang Ditch sediments that exceed PRGs from the north end of the property (where the ditch enters the Tex Tin property) to the point where the ditch discharges into Ponds 24, 25, and 26, south of the Tex Tin property boundary. Using the Site GIS database, the volume of this material was estimated to be approximately 9,600 cubic yards. Wah Chang sediments having a pH equal to or less than 2 shall be treated to meet 40 C.F.R. §261.22 requirements prior to subsequent action. Sediments requiring treatment can be treated in-situ or excavated and treated onsite prior to disposal. Sediments that exceed health based levels require excavation and removal to prevent exposure to contaminants or they may be covered with a Clay Soil Cover. If the sediments are excavated and removed from the ditch, they can be used as backfill material in Pond 6 or in other site ponds. After removal of the Wah Chang sediments, the ditch will be backfilled and graded to reestablish the original flowline elevations. In places where the backfill would restrict flow or where the backfill would be subject to significant erosion, backfill will not be placed but the ditch will be graded to provide smooth flow.

Upon completion of the above work, the custodial trustee for the OU1 property will record a deed restriction and/or deed notice i) identifying the location of on-site landfills and the areal extent of capping and/or clay cover on OU1, to notify future purchasers or users of the property that excavation in these areas may cause a release of hazardous substances to the environment, ii) prohibiting construction or excavation on the property that may affect the efficacy of the remedial action, iii) prohibiting use of the Shallow, Medium, and Deep Transmissive Zone groundwater under OU1, iv) restricting future use of the OU1 property to industrial uses or other use consistent with the level of protectiveness achieved by the Remedial Action. The O&M activities associated with this alternative would include inspection and maintenance of the clay soil cover

and vegetative layer.

Wastewater Ponds (WP)

NPDES Discharge of Water, Consolidation of Hazardous Materials in Pond 2 and Coverage with a RCRA Type C or Equivalent Cap, Backfill Ponds 1, 3, 4, and 5 and Cover with Clay Soil Cover.

Total Present Worth Cost: $4,030,000

Under this alternative, water from Ponds 1 through 5 would be directly discharged to the Wah Chang Ditch under the limits set in the facility's NPDES permit. Wastewater Pond 2 will be used to construct a consolidation cell or cells to provide on-site landfill capacity for the treated principal threat waste materials found in OU No. 1, the area of contamination, and designated for on-site disposal. Hazardous vitrified slag materials, as well as asbestos-containing materials (ACM) from building demolition and other building demolition debris will also be landfilled in Pond 2. Disposal of the asbestos-containing material will be performed in accordance with State requirements under 30 Texas Administrative Code (T.A.C.) § 330.137. Disposal will involve the isolation of ACM from other materials in the disposal cell in order to mitigate the potential for fiber release to air or water and to provide a record of where ACM has been buried.

The landfill disposal cell containing vitrified hazardous slag and other materials that fail TCLP will be covered with a RCRA Type C or equivalent cap. Other landfilled materials disposed in Pond 2 could be covered with an Impermeable Cap and graded to drain. The cap includes 6 inches of level course material, a Geosynthetic Clay Liner (GCL), 12 inches of soil fill, 6 inches of topsoil, and surface vegetation. The Impermeable Cap will reduce the potential for any contaminant of concern to leach to the ground water and prevent exposure to site contaminants. Designated materials will be used as fill within the cell to establish grades for the Impermeable Cap base. As needed, the existing berms will provide the necessary containment.

The perimeter berm materials surrounding each of the ponds not used to construct the consolidation cell will be used to backfill the ponds not used for the consolidation cell and graded to facilitate placement of a Clay Soil Cover. Those berm materials which exceed health based levels and are not used for backfill can be graded on site over other materials that exceed PRGs and covered with the Clay Soil Cover to prevent direct contact exposure. After completing the work, surface runoff from the entire area will drain into the Wah Chang Ditch and discharge from the Site.

The O&M activities associated with this alternative will include inspection and maintenance of the RCRA Type C or equivalent cap and the impermeable cap for the consolidation cell(s) of Wastewater Pond 2 and the vegetative layer. For Ponds 1, 3, 4, and 5, O&M will include inspection and maintenance of the Clay Soil Cover. Because contaminants will remain onsite above health based levels, institutional controls will be required as described above.

Ground Water (GW)

The RAOs for the site ground water include preventing further degradation of the shallow and medium transmissive zones offsite and preventing migration of contaminated ground water to the deep transmissive zone offsite. Preventing discharge of ground water contaminants to offsite ponds at concentrations that would impact ecological receptors is also an objective.

The calibrated ground water model for the site prepared by the PRP Group's consultants indicate the need for a slurry wall along the western perimeter of the site boundary to prevent potential ground water movement in the shallow transmissive zone to off site areas. This would also control movement of the contaminated plume in the shallow ground water.

Slurry Wall Installation, Impermeable Cap, Enhanced Evapotranspiration and Long Term Ground Water Monitoring
Total Present Worth Cost: $2,890,000

The ground water components of the amended remedy constitute a fundamental change from the ground water remedy selected in the original ROD. The amended ground water remedy components include:

- A barrier wall along the western Site boundary;
- An enhanced evapotranspiration system along the southern Site boundary;
- An Impermeable Cap on Pond 7;
- A multi-level monitoring program; and
- Maintenance of the water level in Ponds 24 and 25 at the Army Corps of Engineers design elevation (as a contingent action).

Western Barrier Wall. A slurry wall will be constructed along the western boundary of the Site to promote ground water flow towards the southern boundary and eventually into Ponds 24, 25, and 26. The movement of the shallow ground water in a westerly direction is predicted by the site calibrated model. The western slurry barrier wall would measure approximately 40 feet deep and 2,950 feet long and will eliminate the westerly component of the ground water flow. It is estimated that it will take three months to install the slurry wall.

Enhanced Evapotranspiration System. The Enhanced Evapotranspiration System consists of hybrid trees which would be placed along the southern boundary of the Site, upgradient of Ponds 24 and 25. Experience at other sites and flow modeling indicate that this system should have a significant effect on the amount of ground water reaching the ponds. The species, spacing, root depth, and number of trees to be planted will be determined during the remedial design phase of the project.

Pond 7 Cap. A geographic evaluation of soil and ground water data using Site Geographic Information System (GIS) data indicate that the elevated levels of metals in the Pond 7 sediments

could potentially leach contaminants to the shallow ground water. An Impermeable Cap will prevent water infiltration into sediments containing elevated levels of metals and will also eliminate exposure to site contaminants. For cost estimating purposes, it is assumed that Pond 7 would be backfilled with non-hazardous site materials and covered with an Impermeable Cap. The Impermeable Cap includes 6 inches of level course material, a Geosynthetic Clay Liner (GCL), 12 inches of soil fill, 6 inches of topsoil, and surface vegetation. The Impermeable Cap will reduce the potential for any contaminant of concern to leach to the ground water.

Maintenance of Water Level in Ponds 24, and 25. A contingent component of the ground water management program is to control the elevation of water in Ponds 24 and 25. Although this element is not critical to the success of the Amended Remedy (SW7), if implemented, it will reduce the flux of ground water to Ponds 24 and 25. The manner in which the water level in Ponds 24 and 25 is controlled (if implemented) will be determined during the remedial design.

Monitoring Program. A monitoring program will be developed based on the RAOs and monitoring criteria established in the original ROD for the site ground water. The details of the monitoring program will be developed during the remedial design. However, for planning purposes, it is assumed that up to four well nests for compliance monitoring will be located along the southern portion of the Site between the site boundary and Ponds 24 and 25. In addition, up to three piezometer pairs will be placed along the western barrier wall for use as a performance monitoring system to demonstrate that the western barrier wall is functioning as designed, including monitoring the deep transmissive zone. It is anticipated that implementation of the Amended Remedy (SW7) ultimately will result in a decrease of ground water contaminant concentrations below the alternate concentration limits (ACLs) developed for industrial use. ACLs for the site are listed in the table below. Derivation of the ACLs is presented in Appendix D of the August 4, 1998 Feasibility Study Report for OU No.1.

Tex Tin Site - OU No. 1
Perimeter Action Levels
for Contaminants of Concern

Contaminant of Concern	Deep Zone MCLs (mg/L)	Shallow and Medium Zones Perimeter ACLs (mg/L)
Inorganic constituents		
Antimony	0.006	7.05
Arsenic	0.05	0.05
Barium	2.0	1,230.00
Beryllium	0.004	0.011
Cadmium	0.005	8.81
Chromium	0.1	17,600.00

Copper	1.3	652.00
Mercury	0.002	5.29
Nickel	0.1	352.00
Selenium	0.05	88.10
Volatile organic compounds		
Benzene	0.005	0.081
Chloroform	0.1	0.909
1,2-Dichloroethane	0.005	0.102
Radionuclides		
Radium 226 & Radium 228	5 pC/L	5 pC/L
Gross alpha particle radioactivity	15 pC/L	15 pC/L

O&M activities associated with this alternative include annual ground water sampling, evaluation of the monitoring wells, and monitoring of the slurry wall. Deed recordations to prevent onsite use of the shallow, medium, and deep ground water will also be implemented as part of the original remedy. O&M activities associated with Pond 7 would include inspection and maintenance of the impermeable cap and the vegetative cover. Because contaminants will remain onsite above health based levels, institutional controls would be required as discussed above.

Drums (DR)
Stabilization of Drummed Contents and Onsite Disposal
Total Present Worth Cost: $450,000

There are no significant differences between the original ROD and the Amended Remedy (SW7) for this component of the remedial action. Inorganic smelter materials which are not disposed of offsite, will be stabilized and disposed of in the consolidation cell within Pond 2. Under this alternative, the drum materials will be bulked, transported to the consolidation cell located within Wastewater Pond 2 and then stabilized with Portland Cement or other pozzolanic material to meet the stabilization TCLP standards specified in 40 C.F.R. §261.24. The stabilized materials will be covered with an Impermeable Cap to prevent the potential for contaminants to leach to the shallow ground water and prevent exposure by surface receptors to site contaminants. The drum containers will be crushed and placed in the consolidation cell(s) along with their contents. For purposes of cost estimation, the assumption has been made that organic wastes removed from approximately 220 drums in the former Morchem facility will be disposed of offsite with the AST organic wastes. O&M activities, institutional controls, and deed restrictions associated with this alternative have been included as a component for the consolidation cell(s) in the Wastewater Pond 2 alternative.

Aboveground Storage Tanks (ASTs)
Offsite Disposal of AST Contents
Total Present Worth Cost: $400,000

There are no differences from the selected original ROD remedy. There are approximately seventy three (73) ASTs present onsite. Inorganic waste materials from the smelting process can be treated and disposed of onsite or recycled at an offsite facility. Inorganic waste materials mixed with or contaminated with organic waste from the former Morchem activities must be disposed of at an offsite permitted facility. For inorganic smelter materials treated and disposed of onsite, O&M activities and institutional controls will be those associated with the consolidation cell of Pond 2.

Surface and Subsurface Soils (SS)
24-Inch Clay Soil Cover over Non-Hazardous Soils, Stabilize Hazardous Soils
Total Present Worth Cost: $2,760,000

The existing Low-Level Radioactive Landfill area is included in the soil remedy for the site. The intended action for the landfill is to ensure that the existing soil cover has not eroded away or has settled to the point that it is ponding water. The action for the radioactive landfill area will be consistent with the proposed clay soil cover for other areas of the site; the thickness of the cover will be consistent with surrounding grading and drainage levels. The maximum cover will consist of placement of a 24-inch clay soil cover that includes six inches of topsoil. O&M would include inspection of the clay soil cover and ground water monitoring associated with the overall site remedy. Additionally, the entity that assumes O&M for OU1 would have to meet the decommissioning and post-closure institutional control requirements of the TNRCC radiation rules, 30 T.A.C. Chapter 336. As described above, deed recordation of the landfill area will be required to prevent disturbance of the landfill that could result in exposure to radioactive materials.

Under the amended remedy, hazardous soils that constitute a principal threat due to mobility and potential leaching of contaminants to the ground water will be excavated and stabilized to meet the stabilization requirements in 40 C.F.R. § 268.49 which states that soil stabilization shall reduce the toxicity concentration by 90% or to 10 times the Universal Treatment Standards (UTS) identified in 40 C.F.R. § 268.48, whichever is greatest. Stabilized soils would be placed in the consolidation cell in Pond 2 and covered with an impermeable cap or a RCRA Type C or equivalent cap, whichever is applicable. Soils which have the potential to leach contaminants to the ground water (identified by the calibrated model) will be treated and covered with an Impermeable Cap or excavated, stabilized and disposed of in Pond 2. Approximately 7,500 cubic yards of soil were identified by ground water modeling as having the potential to leach contaminants to the ground water.

Other soils exceeding the PRGs (located within two feet of the ground surface) will be capped with a Clay Soil Cover in areas not already covered by existing structures, pavement, or other

containment covers, in order to mitigate the risk to human health from exposure to Site contaminants in these surface soils. The Clay Soil Cover will consist of eighteen (18) inches of clay-rich soil, and six (6) inches of topsoil capable of sustaining vegetation. “Clay rich soil” will be defined as clayey soil meeting either of the two classification types "CL" or "CH" under the Unified Soil Classification System (USCS), as established in ASTM Standard D2487. The clay soil cover objective is to provide a barrier to prevent direct contact, ingestion or dust inhalation from the underlying contaminated soil, and not to act as an impermeable barrier. For this reason, the Clay Soil Cover will not be subject to compaction requirements, in-place density or hydraulic conductivity specifications and vegetation will be allowed to grow on and through the Clay Soil Cover. Some compaction will occur during placement and grading of the clay soil cover. For cost estimating purposes, the GIS database from the previous Site investigations was used to identify the area over which surface or subsurface soil exceeded the PRG for arsenic. The clay soil cover will be provided for all areas that exceed the PRGs for the site. Approximately 314,400 square feet will be covered with the Clay Soil Cover.

To protect the cover system, the custodial trustee will record a deed restriction described above. O&M activities associated with this alternative include inspection and maintenance of the clay soil cover to ensure the integrity of the cap. Erosion and uneven settlement of the cap would be addressed as part of the O&M activities.

NORM Slag (NSL)
NORM Slag Landfilled Onsite, No Additional Stabilization.
Total Present Worth Cost: $1,305,000

NORM slag at the site has been vitrified and has already achieved the stabilization performance objective of the Federal Radiation Protective Programs, namely “stabilization of the wastes to a bearing capacity sufficient to support the final cover” (40 C.F.R. § 192.20(a)(3) Guidance for Implementation.). The slag will be segregated from other slag and contaminated materials and consolidated in a disposal cell within Area C (the former location of Ponds 18-21) adjacent to the existing Low-Level Radioactive Landfill. NORM slag materials which do not exhibit the toxicity characteristic using TCLP will be covered with an impermeable cap. NORM slag materials failing TCLP will be covered with a RCRA Type C or equivalent cap. The actual configuration and elevation of the cell will be established during the design phase and will comply with CERCLA requirements for isolation and cleanup for radioactive materials at Superfund sites and with the State of Texas requirements under 30 T.A.C. § 336.

After the disposal cell is closed, the unit will be monitored in accordance with 30 T.A.C. §336.731 to provide early warning of any potential release of radionuclides, and/or chemical constituents before they leave the disposal site boundary. The monitoring activities will include a periodic assessment of ground water and inspection and maintenance of the Impermeable Cap and the RCRA Type C or equivalent cap. The material placed in the disposal cell will be covered with soil and the Impermeable Cap or the RCRA Type C or equivalent cap (as necessary based on TCLP testing). The landfill will be designed to meet the radiation human health exposure levels at

the surface for occupational workers and individual members of the public (30 T.A.C. § 336.305 and 30 T.A.C. § 336.313).

The Site owner or custodial trustee will record a deed restriction or deed notice after placement of the cover system to notify future owners that excavation of material from this area may result in the release of hazardous substances to the environment or exposure to levels of radioactivity that exceed the criteria listed in 40 C.F.R. Part 192. O&M activities include ground water monitoring, cap inspection and maintenance, and institutional controls.

Non-NORM Slag (SL)
Stabilization of Non-Slag Hazardous Materials, Placement of Non-NORM Slag in Consolidation Cell, Onsite Disposal of Non-hazardous Non-NORM Slag
Total Present Worth Cost: $2,310,000

The total volume of RCRA characteristic hazardous waste pile material is approximately 20,000 cubic yards. The total volume of non-hazardous, non-NORM slag piles is approximately 32,000 cubic yards. Several piles of non-slag materials also remain on site. These piles include granular feedstock materials as well as piles of crushed concrete, soils, and gypsum scrubber sludge. To clarify this distinction, this material is referred to as "non-slag piles" in the SFFS. For this component of Amended Remedy (SW7), non-slag piles that exceed TCLP criteria will be stabilized to pass RCRA TCLP levels under 40 C.F.R. §261.24 prior to onsite disposal in the consolidation cell (Pond 2), and covered with the Impermeable Cap. For the purpose of cost estimating, it is assumed that 12,000 cubic yards of non-slag pile material will be placed in this cell. Non-slag piles that exceed human-health based cleanup levels (but do not exceed TCLP criteria) will be graded over areas that exceed PRGs and covered with the Clay Soil Cover or used as backfill material and covered with the Clay Soil Cover. Alternatively, non-slag piles may be recycled or disposed off-site in accordance with applicable laws and regulations. Non-slag piles that do not exceed PRGs levels can be used as backfill material or leveled and graded.

Non-NORM slag which has previously been stabilized through vitrification but which exceeds TCLP levels will be placed in the consolidation cell (Pond 2) and covered with a RCRA Type C or equivalent Cap. Non-NORM slag that exceeds human health based cleanup levels, but does not exceed TCLP criteria, can be used as backfill material or graded over materials that exceed PRGs and covered with the Clay Soil Cover. Non-NORM slag that does not exceed human health based cleanup levels can be used as backfill material or leveled and graded. An additional option for some of the slag materials is recycling at an offsite facility. Analyses indicate that some materials contain metals in sufficiently high concentrations that recycling could be a viable option.

Subsequent to implementation of this component of the remedy, the custodial trustee will record a deed restriction as described above. O&M activities and institutional controls would be those associated with the onsite disposal in the consolidation cell or associated with the clay soil cover O&M activities, depending on the action taken for the materials.

Buildings and Structures (BLD)
Building Demolition and Recycling, Asbestos Removal and Onsite Disposal
Total Present Worth Cost: $9,570,000

This component of the amended remedy is similar to the original ROD Selected Remedy and includes asbestos removal and building demolition, with onsite disposal of building debris. Under the amended alternative, friable and non-friable asbestos would be removed from site buildings and disposed of in an onsite landfill. Buildings on this site (including those demolished in the May through August 2000 removal action) are clad with an estimated 356,000 square feet (prior to removal action) of asbestos-containing siding and roofing materials, over 90 percent of it being transite panels. Building debris will be placed in the consolidation cell located within the Wastewater Pond and capped with an impermeable cap. Other non-hazardous demolition debris (e.g., masonry) will be used for backfill purposes or graded across the Site to improve drainage. Materials exceeding PRGs will be capped with a Clay Soil Cover. The concrete foundations and adjacent slabs associated with each of the decommissioned buildings will be left in place. The building foundations and slabs will be evaluated as part of the remedial design to determine whether the conditions of the foundations and slabs are such that they will meet the Site cover requirements to prevent exposure of contaminants.

An important element of the building demolition plan is to first decontaminate the interior structural components by removing smelter dust. This will be performed by vacuuming and/or high pressure washing of those structures in which any such dust has accumulated, with the resulting wastewater collected for removal of metal-bearing sediments. Those sediments will then be stabilized to meet the RCRA Toxicity Characteristic standards for leachability of the applicable metals, and will be placed into the consolidation cell for on-site disposal.

Some of the buildings and structures on-site were demolished in the course of an early removal action initiated in May 2000 and completed in August 2000. During the remedial design, EPA will further evaluate the remaining buildings on site. EPA will require building demolition when:

- There are no long term buildings maintenance plans to prevent building deterioration, which may present a release or threat of release of a hazardous substance to the environment;

- The building presents a safety hazard to response workers;

- The building components are so contaminated that decontamination is impracticable;

- The building components are so corroded or otherwise compromised that decontamination is impracticable; or

- Building demolition is necessary to facilitate implementation of other components of the remedial action.

Structural components of the demolished buildings will be decontaminated, sized and staged for off-site recycle as non-regulated materials. O&M costs and institutional controls will be those associated with the onsite disposal consolidation cell.

COST SUMMARY

The following cost tables show the estimated costs for all of the components of the selected Amended Remedy. Some of the costs presented are the same as those in the original ROD but are present to show the total remedial costs. Costs estimates also include items already completed during the removal action conducted from May through August 2000.

Acid Pond and Wah Chang Ditch (AP)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	6	MO	$8,967	$53,802
Health and Safety	6	MO	$6,247	$37,482
Excavation/Transportation of Wah Chang Ditch Sediment	9,600	CY	$5.39	$51,721
Backfill WCD Channel Excavation	9,600	CY	$15	$144,000
On-Site Treatment, Pond 6	8,500,000	GAL	$0.04	$340,000
On-Site Treatment, Pond 6 Infiltration	3,000,000	GAL	$0.04	$120,000
Pond 6 Sediment Stabilization	32,000	CY	$25	$800,000
Pond 6 Berm Regrading	22,648	CY	$8	$181,182
Slag or Soil Fill	0	CY	$8	$0
Clay Soil Cover, 2 VF, Pond 6 Interior	164,900	SF	$0.99	$162,823
Seeding, Pond 6 Interior	164,900	SF	$0.08	$13,192
General Equipment Mob and Demob	$1,904,203	LS	6%	$114,252
Air Monitoring	-----	-----	Included in	SS Item
Deed Record	1	LS	$5,000	$5,000

Subtotal, AP Items Direct Capital Costs			$2,023,455
	Overhead and Profit	25%	$505,864

	Total, AP Items Direct Capital Costs (To Nearest $10,000)		$2,530,000
Indirect Capital Costs			
	Engineering and Design	7%	$177,100
	Legal fees and License/Permit Costs	5%	$126,500
	Total Indirect Capital Costs		$303,600
	Subtotal Capital Costs		$2,833,600
	Contingency	15%	$425,040
	Total Capital Cost (To Nearest $10,000)		$3,260,000
O&M Costs			
Cover Inspection and Maintenance	1 LS $5,862		$5,862
	Subtotal		$5,862
	Overhead and Profit	25%	$1,466
	Subtotal (To Nearest $10,000)		$10,000
	Administration	5%	$500
	Insurance, Taxes, Licenses	2.5%	$250
	Contingency	15%	$1,500
	Total O&M Costs (To Nearest $1,000)		$12,000
	30-year Cost Projection, 8% ADR, 11.2578		$135,093
	Present Worth of O&M (To Nearest $1,000)		$135,000
	TOTAL COST (To Nearest $10,000)		**$3,400,000**

Wastewater Ponds (WP)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Access Bridge Across Wah Chang Ditch	1	LS	$60,000	$60,000

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Surface Water Removal System	1	LS	$28,670	$28,670
Impermeable Cap, Consolidation Cell, Pond 2	79,357	SF	$1.73	$137,288
RCRA Type C Cap, Pond 2	80,000	SF	$8	$640,000
Clay Soil Cover, Ponds 1,3,4,5	798,963	SF	$0.99	$788,902
Grade Soils in Ponds 1,3,4,5 Under Clay Soil Cover	21,520	CY	$8	$172,159
Level Berms to Grade	15,134	CY	$8	$121,070
General Equipment Mob and Demob	$1,492,130	LS	6%	$119,624
Air Monitoring	3	MO	$100,000	$300,000
Deed Record	1	LS	$5,000	$5,000
	Subtotal, WP Items Direct Capital Costs			$2,418,355
	Overhead and Profit		25%	$604,589
	Total, WP Items Direct Capital Costs (To Nearest $10,000			$3,020,000
Indirect Capital Costs				
	Engineering and Design		7%	$211,400
	Legal Fees and License/Permit Costs		5%	$151,000
	Total Indirect Capital Costs			$362,400
	Subtotal Capital Costs			$3,382,400
	Contingency		15%	$507,360
	Total Capital Cost (To Nearest $10,000)			$3,890,000
O&M Costs				
Cap Operation and Maintenance	1, LS		$7,072	$7,072
	Subtotal			$7,072
	Overhead and Profit		25%	$1,768
	Subtotal (To Nearest $10,000)			$10,000

	Administration	5%	$500
	Insurance, Taxes, licenses	2.5%	$250
	Contingency	15%	$1,500
	Total O&M Costs (To Nearest $1,000)		$12,000
	30-year Cost Projection, 8% ADR	11.2578	$135,093
	Present Worth of O&M (To Nearest $1,000)		$135,000
	TOTAL COST (To Nearest $10,000)		**$4,030,000**

Ground Water (GW)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Performance Monitoring System				
Installation of Six New Piezometers	6	EA	$4,000	$24,000
Compliance Monitoring System				
Installation of Four New Monitor Wells, Shallow TZ	4	EA	$4,000	$16,000
Installation of Four New Monitor Wells, Medium TZ	4	EA	$10,000	$40,000
Installation of Two New Monitor Wells, Deep TZ	2	EA	$28,000	$56,000
Cap Pond 7				
Regrade Waste	5,179	CY	$8	$41,430
Impermeable Cap	138,100	SF	$1.73	$238,913
Barrier Wall Work Platform	2,950	LF	$27	$79,650
Western Boundary Barrier Wall				
Length	2,950	LF		
Depth	40	FT		

Item		Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Area		118,000	SF	$4	$472,000
Barrier Wall Cap		2,950	LF	$10	$29,500
Enhanced Evapotranspiration System, Southern Boundary		122,500	SF	$2.30	$281,221
General Equipment Mob and Demob		$1,324,356	LS	6%	$79,461
Air Monitoring		3	MO	$100,000	$300,000
Deed Record		1	LS	$5,000	$5,000
	Subtotal, GW Items Direct Capital Costs				$1,708,818
	Overhead and Profit			25%	$427,204
	Total, GW Items Direct Capital Costs (To Nearest $1,000)				$2,136,000
Indirect Capital Costs					
	Engineering and Design			7%	$149,520
	Legal Fees and License/Permit Costs			5%	$106,800
	Total Indirect Capital Costs				$256,320
	Subtotal Capital Costs				$2,392,320
	Contingency			15%	$358,848
	Total Capital Costs (To Nearest $10,000)				$2,750,000
O&M Costs					
Ground Water Monitoring	10 Samples			$837	$8,372
	Subtotal				$8,372
	Overhead and Profit			25%	$2,093
	Subtotal (To Nearest $10,000)				$10,000
	Administration			5%	$500
	Insurance, Taxes, Licenses			2.5%	$250
	Contingency			15%	$1,500

	Total O&M Costs (To Nearest $1,000)	$12,000
	30-year Cost Projection, 8%, ADR, 11.2578	$135,093
	Present Worth O&M (To Nearest ($1,000)	$135,000
	TOTAL COST (To Nearest $10,000)	**$2,890,000**

Drums (DR)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	1	MO	$8,967	$8,967
Health and Safety	1	MO	$6,247	$6,247
Loading and Crushing of Drums				
Staging	6,500	EA	$8.99	$58,457
Load and Transport to Consolidation Cell, Pond 2	6,500	EA	$17.99	$116,913
Sampling/Analysis of Drum Contents	10	EA	$1,507.70	$15,077
Stabilization in Consolidation Cell, Pond 2	1,770	CY	$35	$61,955
General Equipment Mob and Demob	$267,616	LS	6%	$16,057
Air Monitoring	Included in SS Items			

	Subtotal , DR Items Direct Capital Costs		$283,673
	Overhead and Profit	25%	$70,918
	Total, DR Items Direct Capital Costs (To Nearest $10,000)		$350,000
Indirect Capital Costs			
	Engineering and Design	7%	$24,500
	Legal Fees and License/Permit Costs	5%	$17,500
	Total Indirect Capital Costs		$42,000
	Subtotal Capital Costs		$392,000
	Contingency	15%	$58,800

Total Capital Costs (To Nearest $10,000)	**$450,000**

Aboveground Storage Tanks (AST)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Loading of AST Contents for Disposal	1	LS	$101,448	$101,448
Decontamination and Disassembly of ASTs	1	LS	$69,428	$69,428
Salvage Value of ASTs	872	TNS	($45)	($39,240)
Transportation to Disposal Facility	2	TRIP	$600	$1,200
Transportation to Disposal Facility	19	TRIP	$550	$10,450
Transportation to Disposal Facility	57	TRIP	$350	$19,950
Disposal of Base Liquid/Sludge	7,000	GAL	$1.60	$11,200
Disposal of Acid Oxidizer	55,800	GAL	$0.25	$13,950
General Equipment Mob and Demob	$234,028	LS	6%	$14,042
Air Monitoring	Included in	BLD	Items	

	Subtotal , AST Items Direct Capital Costs		$248,069
	Overhead and Profit	25%	$62,017
	Total, AST Items Direct Capital Costs (To Nearest 10,000)		$310,000
Indirect Capital Costs			
	Engineering and Design	7%	$21,700
	Legal Fees and License/Permit Costs	5%	$15,500
	Total Indirect Capital Costs		$37,200
	Subtotal Capital Costs		$347,200
	Contingency	15%	$52,080
	Total Capital Cost (To Nearest $10,000)		**$400,000**

Surface and Subsurface Soils (SS)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Low Level Radioactive Landfill				
Grade Existing Cover to Drain	3,227	CY	$8	$25,813
ROD "Clay Cover"	87,120	SF	$1.64	$142,490
Principal Threat Soil Treatment (based on GW modeling				
Excavation	7,500	CY	$8	$60,000
On-site Haul	7,500	CY	$3	$22,500
Stabilization in Consolidation Cell (Pond 2)	7,500	CY	$35	$262,500
Excavation Backfill, On-Site Soils	7,500	CY	$8	$60,000
Clay Soil Cover Over Soil Exceeding PRGs				
Area Requiring Clay Soil Cover	314,403	SF	$0.99	$310,443
Maximum Possible Area that can be Regraded Using On-Site Material	1,646,388	SF		
General Equipment Mob and Demob	$929,388	LS	6%	$55,763
Air Monitoring	3	MO	$100,000	$300,000
Deed Record	1	LS	$5,000	$5,000

	Subtotal, SS Items Direct Capital Costs		$1,290,152
	Overhead and Profit	25%	$322,538
	Total, SS Items Direct Capital Costs (To Nearest $10,000)		$1,610,000
Indirect Capital Costs			
	Engineering and Design	7%	$112,700
	Legal Fees and License/Permit Costs	5%	$80,500

	Total Indirect Capital Costs				$193,200
	Subtotal Capital Costs				$1,803,200
	Contingency			15%	$270,480
	Total Capital Costs (To Nearest $10,000)				$2,070,000
O&M Costs					
Cover Inspection and Maintenance	1	LS	$38,716		$38,716
	Subtotal				$38,716
	Overhead and Profit			25%	$9,679
	Subtotal (To Nearest $10,000)				$50,000
	Administration			5%	$2,500
	Insurance, Taxes, Licenses			2.5%	$1,250
	Contingency			15%	$7,500
	Total O&M Costs (To Nearest $1,000)				$61,000
	30-year Cost Projection, 8% ADR, 11.2578				$686,725
	Present Worth of O&M (To Nearest $1,000)				$687,000
	Total Cost (To Nearest $10,000)				**$2,760,000**

NORM Slag (NSL)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Loading of NORM Slag	14,100	CY	$1.69	$23,829
Sampling/Analysis of Soil Below NORM Slag	10	EA	$608	$6,076
Disposal Cell in Area C				
Base Excavation	2,792	CY	$8	$22,336
Perimeter Berm Fill	12,617	CY	$15	$189,259
Impermeable Cap	64,590	SF	$1.73	$111,741

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Gas Vents	3	EA	$500	$1,500
General Equipment Mob and Demob	$400,383	LS	6%	$24,023
Air Monitoring	3	MO	$100,000	$300,000
Deed Record	1	LS	$5,000	$5,000
	Subtotal, NSL Items Direct Capital Costs			$729,406
	Overhead and Profit		25%	$182,352
	Total, NSL Items Direct Capital Costs (To Nearest $10,000)			$910,000
Indirect Capital Costs				
	Engineering and Design		7%	$63,700
	Legal Fees and License/Permit Costs		5%	$45,500
	Total Indirect Capital Costs			$109,200
	Subtotal Capital Costs			$1,019,200
	Contingency		15%	$152,880
	Total Capital Cost (To Nearest $10,000)			$1,170,000
O&M Costs				
Cover Inspection and Maintenance	1	LS	$5,862	$5,862
	Subtotal			$5,862
	Overhead and Profit		25%	$1,466
	Subtotal (To Nearest $10,000)			$10,000
	Administration		5%	$500
	Insurance, Taxes, Licenses		2.5%	$250
	Contingency		15%	$1,500
	Total O&M Costs (To Nearest $1,000)			$12,000
	30-year Cost Projection, 8%, ADR, 11.2578			$135,093

	Present Worth O&M (To Nearest $1,000)	$135,000
	TOTAL COST (To Nearest $10,000)	**$1,305,000**

Non-NORM Slag (SL)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Field Overhead and Oversight	3	MO	$8,967	$26,901
Health and Safety	3	MO	$6,247	$18,741
Non-NORM Slag and Non-Slag > TCLP Criteria				
Stabilize (Non-Slag Pile)	12,000	CY	$35	$420,000
Excavate	20,000	CY	$8	$160,000
Haul On-Site	20,000	CY	$3	$60,000
Spread and Compact Consolidation Cell (Pond 2)	20,000	CY	$6	$120,000
Non-NORM Slag < TCLP Criteria				
Excavate	32,000	CY	$8	$256,000
Haul	32,000	CY	$3	$96,000
Spread and Compact	32,000	CY	$6	$192,000
Cap Non-NORM Slag and Non-Slag Piles > TCLP Criteria in Pond	Included in	WP Items		
Cover Non-NORM Slag and Non-Slag Piles < TCLP Criteria with Clay Cover	Included in	SS Items		
General Equipment Mob and Demob	$1,349,642	SUM	6%	$80,979
Air Monitoring	Included in	SS Item		
Deed Record	1	LS	$5,000	$5,000

	Subtotal, SL Items Direct Capital Costs		$1,435,621
	Overhead and Profit	25%	$358,905
	Total SL Items Direct Capital Costs (To Nearest $10,000)		$1,790,000

Indirect Capital Costs			
	Engineering and Design	7%	$125,300
	Legal Fees and License/Permit Costs	5%	$89,500
	Total Indirect Capital Costs		$214,800
	Subtotal Capital Cost		2,00,4,800
	Contingency	15%	$300,720
	TOTAL COST (To Nearest $10,000)		**$2,310,000**

Buildings and Structures (BLD)

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Cost
Building Demolition (ROD Estimate - Direct Capital Cost)	1	LS	$7,415,450	$7,415,450
Slab Removal from ROD (Not Included)	1	LS	($230,000)	($230,000)
Excavation and Transportation of Soil from ROD (Not Included)	16,133	CY	($6)	($96,798)
In-Situ Stabilization from ROD (Not Included)	4,840	CY	($35)	($169,400)
RCRA Landfill from ROD (Not Included	113,000	SF	($8)	($904,000)
Backfill Using Non-Hazardous Material from the Site (Not Included)	16,133	CY	($5)	($80,665)
	Subtotal, BLD Items Direct Costs			$5,934,587
	Overhead and Profit		25%	$1,483,647
	Total, BLD Items Direct Capital Costs (To Nearest $10,000)			$7,420,000
Indirect Capital Costs				
	Engineering and Design		7%	$519,400
	Legal Fees and License/Permit Costs		5%	$371,000
	Total Indirect Capital Costs			$890,400
	Subtotal Capital Costs			$8,310,400

	Contingency		15%	$1,246,560
	Total Capital Cost (To Nearest $10,000)			9,560,000
O&M Costs				
Annual Maintenance, Present Value	1	LS	$678	$678
	Subtotal			$678
	Overhead and Profit		25%	$170
	Subtotal (To Nearest $1,000)			$1,000
	Administration		5%	$50
	Insurance, Taxes, Licenses		2.5%	$25
	Contingency		15%	$150
	Total O&M Costs (To Nearest $1,000)			$1,000
	30-year Cost Projection, 8%, ADR, 11.2578			$11.258
	Present Worth O&M (To Nearest $1,000)			$11,000
	TOTAL COST (To Nearest $10,000)			**$9,570,000**

TOTAL PRESENT WORTH OF AMENDED REMEDY: $27,115,000

EXPECTED OUTCOME OF AMENDED REMEDY

The Amended Remedy for OU No. 1 of the Tex Tin site will address the source control and site ground water at the former smelter facility. Pursuant to a consent decree lodged with the U.S. District Court, Southern District of Texas, Galveston Division, a group of Potential Responsible Parties (PRPs) agreed to conduct the remedial action activities for Operable Unit No. 1 of the Tex Tin site. EPA, with TNRCC assistance, will oversee the PRPs' implementation of the amended remedial action. Following completion of the amended remedial action, O&M activities will begin and five year reviews will be conducted in accordance with OSWER Directive 9355.7-03B-P "Comprehensive Five-Year Review Guidance" dated October 1999.

There is high interest in future redevelopment of the site. The remedial action will meet industrial cleanup standards and can be redeveloped for industrial use or other non-residential development if the necessary precautions are taken. Hazardous materials will remain on site above health based levels; however, this should not prevent redevelopment of most of the 140-acre site.

SUPPORT AGENCY COMMENTS

The State of Texas, through the Texas Natural Resource Conservation Commission (TNRCC), has provided technical assistance to EPA throughout the Superfund process at this Site, through review and comments on site documents and reports. Additionally, TNRCC reviewed and commented on the Draft Amended Proposed Plan for the site and reviewed and commented on the Draft Amended Record of Decision for the site. The State of Texas, through TNRCC, concurs with the Amended Remedy for OU No. 1 of the Tex Tin site.

STATUTORY DETERMINATIONS

Under CERCLA §121, 42 U.S.C. § 9621, and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements, are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element; CERCLA remedies are expected to minimize off-site disposal of untreated wastes. The following paragraphs discuss how the Amended Remedy meets these statutory requirements.

Protection of Human Health and the Environment

The Amended Remedy, Sitewide Alternative, SW7, will protect human health and the environment through the treatment of the principal threat waste materials identified at the site and through containment of low level threat waste materials.

Treatment includes neutralizing the acid pond liquids and sediments and stabilization of hazardous source materials and contaminated soils. Neutralizing the acid pond liquids and sediments would remove the RCRA Corrosivity Characteristic listed under 40 C.F.R. §261.22. Increasing the pH of these materials will remove a source that could contribute to the mobility of the inorganic contaminants present at the site. Non-slag source materials, if not shipped off-site for recycling, will be stabilized to pass RCRA TCLP levels under 40 C.F.R. §261.24 prior to onsite disposal. Treated materials will be capped with an impermeable cap. Soils identified by the calibrated model as having the potential to leach contaminants to the shallow ground water will be stabilized to meet the treatment requirements under 40 C.F.R. §268.49 prior to capping with an impermeable cap or placement in a landfill capped with an impermeable cap. Treatment and capping of these materials will prevent exposure of surface receptors to contaminants and prevent potential leaching of contaminants to the shallow ground water.

Hazardous soils will be stabilized to meet the treatment requirements under 40 C.F.R. §268.49 and will be covered with an impermeable cap or RCRA Type C or equivalent cap, as applicable. Slag (vitrified) materials that fail TCLP will be covered with a RCRA Type C or equivalent cap to prevent leaching of contaminants to the shallow ground water and prevent exposure to hazardous

materials.

Containment and/or capping of materials that exceed health based levels will reduce the excess cancer risk from exposure to a level within EPA's acceptable human health risk range, and the Hazard Index to less than 1.0. Additionally, the risk of lead exposure will be reduced such that blood lead levels do not exceed the Centers for Disease Control goal of less than 5% of the population having blood lead levels greater than 10 ug/dL.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected Amended Remedy, which consists of treatment of source waste materials and other principal threat waste materials and capping of low level threat contaminated materials, complies with all Federal and State ARARs. Specific ARARs were listed in the nine criteria evaluation of the Amended Remedy and are also presented on Tables 3.12.2- 1, 3.12.2-2, and 3.12.2-3 in the original ROD signed on May 17, 1999.

Cost-Effectiveness

The Amended Remedy is more cost effective than the original remedy for the site and provides less uncertainty regarding the volume of materials that will be treated. It is estimated that the Amended Remedy will reduce the cleanup cost by about $1.5 million.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

Preference for Treatment as a Principal Element

Through the use of treatment technologies such as stabilization of source waste materials and soils that could potentially leach contaminants to the ground water and neutralization of liquids and sediments that exhibit a corrosive characteristic, the Selected Amended Remedy addresses principal threat waste materials present at the site. By utilizing stabilization and neutralization as a portion of the remedy, the statutory preference for using treatment technologies to the maximum extent practicable is met.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is protective of human health and the environment.

AMENDED RECORD OF DECISION FOR
TEX TIN CORPORATION SUPERFUND SITE
OPERABLE UNIT NO. 1
RESPONSIVENESS SUMMARY

The United States Environmental Protection Agency (EPA) has prepared this Responsiveness Summary for the Tex Tin Corporation Superfund Site (Tex Tin Site), as part of the process for making final remedial action decisions for Operable Unit No. 1 (OU No. 1). This Responsiveness Summary documents, for the Administrative Record, public comments and issues raised during the public comment period on EPA's recommendations presented in the Amended Proposed Plan for the contaminated areas of the Tex Tin Site, OU No. 1, and provides EPA's responses to those comments. EPA's actual decisions for OU No. 1 are detailed in the Amended Record of Decision (ROD) for OU No. 1. Pursuant to Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617, EPA has considered all comments received during the public comment period in making the final decision contained in the Amended ROD for OU No. 1.

Overview of Public Comment Period.

EPA issued its Amended Proposed Plan detailing remedial action recommendations for OU No. 1 for public review and comment on March 7, 2000. Documents and information EPA relied on in making its recommendations in the Amended Proposed Plan were made available to the public on or before March 7, 2000 in three Administrative Record File locations, including the Moore Public Library located in Texas City, Texas. EPA provided thirty days for public comment. EPA held a public meeting to receive comments and answer questions on March 23, 2000, at City Hall in Texas City, Texas. All written comments as well as the transcript of oral comments received during the public comment period are included in the Administrative Record for OU No. 1 and are available at the three Administrative Record repositories.

Comments and Issues Raised During the Comment Period:

Public Meeting, March 23, 2000, Texas City, City Hall - Comments received.

COMMENT: MAYOR DOYLE of Texas City: I want to welcome you and the other participants that you've already introduced, and I want to welcome all of the citizens of Texas City who are here and from La Marque, who are the two communities that are really impacted by this superfund site. As you know, I'm not running for reelection. I have spent my entire career as mayor working on Tex-Tin, Tex-Tin being what we're really here talking about tonight, and what most of the people in the communities that have an interest in this project refer to as Operating Unit No. 1 is Tex-Tin, if you want to just get right down to a simple description. It's 140 acres of land. And it's primarily everything you see that has been the target of our discussions and many, many hours of work trying to find a solution to a very complex problem, one that was borne out

of necessity in 1941 because we were at war, and we had no source of tin. And, very frankly, it was a very important contributor to our winning World War II because of the fact that we were deprived of tin from our customary sources prior to the war. We tend to forget that that site really was a war hero. But it turned into -- when the government disposed of it -- you can read the history under the site background. I thought we had the program well underway in May of 1999 and that we were going to move forward. This thing is bogged down not only by EPA, TNRCC and all other agencies that have an interest, but the United States government also is a principal responsible party in the program, along with a lot of private industry. And some of them, very innocently, became involved when they acquired property from one of the former owners, that being Amoco, and they already cleaned up -- it hasn't been released, but they've cleaned up -- I don't believe it's been released yet, but it's been cleaned up to everyone's satisfaction and costing millions of dollars. So it explains the new world we operate in that -- and I just found the other day -- just as coincidence, we, the City of Texas City, are cleaning up our city everywhere, not just industry but commercial areas, residential areas. We've spent millions and millions of dollars cleaning this community up and improving our environment. But we found out just the other day that our museum had accepted from one of our former banks here a site that they originally operated the museum, and we now are going to have to clean it up because it has three underground storage tanks in it. You don't want to accept -- sometimes it looks like a gift. Sometimes it can be an albatross when you accept it if you don't take great care in evaluating what that gift is that you're about to accept. I'm glad to see us reach this stage. I think all the parties have worked hard. Judge Kent on April the 5th will be, hopefully, approving his role in this whole matter. The bankruptcy court in New York, hopefully, will be approving all of this. You see, we haven't just had the EPA and TNRCC and their rules and regulations to deal with. You wouldn't believe this, but the most progress was made when we enforced local ordinances against Tex-Tin to make them tear down the old furnace area that was actually causing asbestos to just be blowing freely in the air in that general vicinity. But everyone -- it's frustrating, but everyone has worked very hard. We now, the city, has applied for a superfund redevelopment pilot program grant. The EPA granted 10 of those last year. I think they expect to grant 40 this year. We see this site as a very viable part of our megaport that we intend to get here in Texas City in the near future, and we think it can connect very well to show point -- and we can recycle this back into jobs and economic vitality for our community if we can just get on with this. I'm here to make the statement on behalf of the city commission unanimously that we're supporting this proposed amended plan that is dated March the 7th. We want to get this work underway. It is our understanding that the EPA will take emergency funds and begin immediately once the ROD has been approved and the public comment time has passed, and they will start even before the complete design has been completed and start removing some of the structure; that it stands today as a threat if we were to have a hurricane to the evacuation route of 146 and also what is known as the main street in La Marque that passes by that site. So we're very optimistic about this, and we hope that we will get a lot of support from moving on a fast track from this point forward. Thank you.

EPA RESPONSE: Thank you Mayor Doyle for your comments. We understand your frustration and the community's frustration in the fact that cleanup activities have not started at

the site. We at EPA, together with the State, have been working for many years in first getting the site listed on the National Priorities List, or Superfund, and now working with the Potentially Responsible Parties to conduct the cleanup. As you indicated, the site is large and complex from a contamination standpoint as well as from an enforcement standpoint due to the many Potentially Responsible Parties that contributed different percentages of contamination to the site. All we can promise is that we will continue to work hard for as long as it takes to clean the site up. The cleanup will ultimately provide protection to human health and the environment and result in useful redevelopment of the site.

COMMENT: The proposed plan, I believe, is a cover-up literally and not a multi-media cleanup. The proposed plan is not based on human health-based standards for the various hazardous chemicals, both radioactive and non-radioactive, that are leaking from the site. You ask us to accept on blind faith that the public health will not be harmed by the chemicals that continue to leak off the site. The reason I came tonight to the EPA was: I believe, again, you continue to set a dangerous precedent when you say that this is the best available technology to work this problem. There was no in-depth discussion, little depth. You have a cartoon cross-section that's basically simply the idealized geology. You still don't have a realistic model. And it turns out you didn't show the number. You showed the well names. You didn't show the depth. That's not a detail. You say -- the state tells us the protected water zone is up to 1100 feet. You say that the per 60 feet has literally been expensed. So I continue to be concerned. I know we have available technology for detailed site characterization for good geological models. I saw nothing in tonight's presentation to demonstrate that. All you showed me was that your high concentration zone was there. And I cannot believe from your cross-section that the reality isn't, in fact, that there was migration into those ditches and deeper. Okay? It just has to happen geologically. You've giving me a sand, and I'm saying you did not define a very tight permeability barrier. There's no documentation there are permeability barriers across that site. So that's really why I'm here. And I asked a question of EPA last time, and they didn't give me an answer. So I'll ask it again even if it's rhetorical. Do you have the authority to waive liability to persons outside the superfund site?

EPA RESPONSE: The Proposed Plan is not a coverup and the information presented in the Amended Proposed Plan is just a summary of the extensive information that has been gathered for the site and the human health risk assessments that have been prepared from site specific data. Numerous reports and documents are available at the three repositories listed in the Proposed Plan, including the Moore Public Library here in Texas City. We have nothing to hide; the information is there for everyone to look at and we encourage the public to look at those documents. All of our decisions are based on scientific information from the hundreds of environmental samples collected from the site and the very conservative risk assessment prepared from site specific data for the different site contaminants. We believe if you would just take the time to look at the Administrative Record documents that you would reach the conclusions that we have in identifying the nature and extent of contamination and in the selection of remedial alternatives to address site contaminants. Regarding waiver of third-party liability, you may be referring to CERCLA Section 113(f)(2), which is not, strictly speaking, a waiver provision, but

states that a person who resolved its liability to the United States or a State in an administrative or judicially approved settlement shall not be liable for claims for contribution regarding matters addressed in the settlement. Such settlement does not discharge any of the other potentially liable persons unless its terms so provide, but it reduces the potential liability of the others by the amount of the settlement. 42 U.S.C. §9613(f)(2).

COMMENT: You're saying you're doing a health based, and I'm saying you did regulatory allowable levels, and those levels are not tied to specific health-based studies for human health. That's documented in the library. I didn't see any changes from that. You're talking about allowable levels, regulated levels, legal levels, and I'm saying that that's not the same thing as a human health-based study.

EPA RESPONSE: As I stated before, we conducted site specific human health risk assessments for the site based on site specific data. The site specific results are then compared to allowable values that are use to make risk management decisions for the site. The remedial action cleanup goals for the site are based on data that will result in protecting human health and the environment. That is information that is also available for the public to review at the three repositories. We would be glad to sit down with you and our toxicologist and go over the specific risk assessments that were done to come up with cleanup levels for the site. You have a different opinion, and that's fine. That's what we're here for.

COMMENT: The post-plan simply wasn't applied science. There is no -- very little applied science, applied geology, applied geophysics, applied geochemistry. It's not applied. It's theoretical, hypothetical and regulatory defined. And I didn't come to argue. I just came to make public comments. And I appreciate -- I understand what you're saying. I'm just saying from 1998 I hadn't changed my mind. You hadn't changed the information. You hadn't changed the $28.6 million figure. You had not changed the quality of the work. So you haven't changed my perspective as a citizen. I'm talking the burden of a citizen, to go and to cite that gobbledygook. That's gobbledygook. That's not applied science.

EPA RESPONSE: EPA believes that the data for the site is applied science and that the risk assessments conducted for the site show the human health risk represented by the different site contaminants. We have engineers and scientists working on this project. We may be the only ones here at this particular meeting, but we have toxicologists, scientists, geologists, hydrogeologists, and chemical and civil engineers working on these documents that provide extensive details on the nature and extent of contamination and alternatives to address those contaminants. I don't know if you had the time to look at them. But, again, those documents are there for the public, and that's part of the administrative record for the site. Numerous investigations have been conducted and extensive investigations have been conducted for this site, and we believe that that information offers enough details for recommending the amended remedy as discussed in the Amended Proposed Plan for the site.

COMMENT: I thank you for the opportunity to speak. I'm not arguing a point. They just don't

have the facts to support their position. It's not arguable. The burden of the public is: There is no one in Galveston County that I know that represented the public -- okay – the general public. They may have represented the State of Texas. I know of no one -- and EPA has not provided any grant for the citizen -- any citizen group to get their own independent review. They've got to wait till after your plan is accepted.

EPA RESPONSE: We have generated more data on this site than at most other Superfund sites to support our position in the selection of remedial alternatives for the site. Again, the extensive information gathered for the site is available for review at the site repositories. Regarding technical assistance for the community, we are still working to provide a Technical Assistance Grant to a group or groups that represent the community. In the meantime, we believe that as a Government agency, that EPA represents the general public and the interest of the community. That is part of the reason for conducting this public meeting, to receive your comments that will be evaluated before a final decision is made in selecting a remedy for the site.

COMMENT: But the mayor said he's been trying for ten years, and I haven't seen it in ten years. In ten years where has the citizen group been provided technical assistance? Not from the state. Their own selection -- they can select their own experts or their own knowledgeable people. That's it.

RESPONSE: EPA and the State have also been working for ten years to list the site on the National Priorities List (NPL) or Superfund. Only when a site becomes a Superfund site is the Technical Assistance Grant available to the public. The Tex Tin site was only recently listed as an NPL site in September 1998. As soon as this occurred, EPA, through a published notice, made the grant available to the public. Unfortunately the first applicant did not qualify for different reasons, but we are still working to provide the grant to the community. We will again make the TAG grant available to the community. The community representatives need to fill out the application forms and submit the necessary paperwork.

COMMENT: We are in walking distance of the Tex-Tin site. Over the years that we have lived in the community, practically all black community, we want to know what is -- I mean why -- we have lived in that neighborhood for so long. I've been there over 20 years. Some of these other people have been there longer than I have. And we are not told anything. We hear things. We see things. When it rains, it floods. Water from that site backs down to our property. Some time ago somebody came out. Half of the neighborhood didn't know what was going on. They put on their gear and masks, and they dug up some grass in yards. They left shrubs. If they were going to clean up, why didn't they clean up everything? And another thing I'd like to say. When these people come out there, they didn't notify anybody. Somebody said they had a meeting. We didn't hear about it. We didn't know it was going on. Some of us have to work. I had to leave my job tonight to come out here. I may get fired. But, anyway, I want you all to know that we have been living in a dangerous neighborhood for years, and nobody cared. Nobody cared. So we are stuck out here. We can't sell our property. Who wants to buy it? Nobody. So we have to stay there until we die from sickness. All of us that are here have health problems, but we're stuck.

And I just wanted to let you all know how we feel over on Lee Drive in the Lee addition of La Marque.

EPA RESPONSE: Back in 1995, 253 homes in that area were sampled to determine what type of arsenic contents were found in the residential yards. Based on the results of that sampling, 24 homes were cleaned up from April through June of 1999. The results of the investigation were provided to all of the homeowners back in 1995. When we came back to clean up those 24 homes, the residents that required cleanup were informed ahead of time. We cannot go to a residential area and start doing any cleanup without first getting access agreements from the residential property owners. So we wouldn't just show up to a residential property and start doing a cleanup without having the access agreement. So the residents that required cleanup were informed ahead of time, and documentation was made of the existing conditions of those yards and homes. We wanted the cleanup to be conducted such that the properties were restored to as nearly as possible the condition they were prior to the cleanup. That is the process that we went through in cleaning up those 24 homes. We had a public meeting before the cleanup started on the evening of March 16, 1999. We had another follow-up public meeting the next morning to give the residents who were not able to attend the meeting in the evening the opportunity to attend the following morning. So we actually had two public meetings in March 1999 to inform the residents that the cleanup was going to start in a few weeks. I don't know why you may not have been informed of the meetings, but we advertized the meetings in the local newspaper and informed the citizens in our mailing list directly by mail.

As far as flooding problems, the whole area is relatively flat and any time you have high rainfall amounts, it is going to flood. However, the flooding is localized and it is not water coming from the Tex Tin site. The Tex Tin site drains to the Wah Chang Ditch which discharges to the southern Ponds 24 and 25. Parts of the site drain to the ditches that run along the east side of Highway 146. Some of the water from these ditches drains to Pond 22 and the rest drains to the south and not north or northwest to the La Marque residential area.

The shrubs and trees are not going to cause any health problems. They do not need to be removed to conduct the yard cleanup. In some cases they may have been removed but that was done to replace the ones that were damaged and not because they posed a health problem.

COMMENT: What I'd like to say is: What are y'all calling cleaning up property? The thing is: Y'all didn't clean up no property because when it rains, it rains on all. Now, this contamination didn't settle in some spots. It settled all over that area. Now, you can go up in the attics and you find that same contamination in attics and yet still not -- y'all -- what you call frozen rock and hedge (sic) to hand. This is what caused this commotion. Because really when y'all came out, you had people -- the people that was working, they was dressed in special equipment for doing the job that they were supposed to perform. And, now, we got kids running around in that area playing barefooted, short pants. And these people, some of them's feet wasn't touching the ground. They was on backhoe deals. And the ones that was, they had on equipment to do the work. Now, I want to know why -- if this place wasn't contaminated, if it wasn't harmful, why did

they have on this type of equipment? If it wasn't harmful – now OSHA requires you to have on fit clothes to do the job that you was doing. Now, if this place wasn't harmful, they never would have had on equipment that they did have on. So, now, what y'all are doing: Y'all are telling the people one thing, and it's entirely a different thing. Now, why was these people dressed like that if it wasn't harmful? And one more question. Why did they clean out some yards -- they cleaned right up to my line and then tell me, "Well, you was on the safe side." You know, the thing about it, the man right behind me, my neighbor, they cleaned his front yard out. They didn't want to pay for replacing his fence. They come right down the side of this line and dug this part and then told him, "Well, we done cleaned your place up." What about his backyard? Now, in another area over there they skipped a whole -- they skipped two blocks, went in one area in the middle of the block and dug up a yard. Now, you mean to tell me that's cleaning up? What would you call it? The thing about it is this: Y'all don't have no regards for the people that are staying in this area or either the kids. The thing about it is the money thing. Y'all spent a little money to make the people think that y'all was doing something. Y'all didn't do anything. The place is still in the same shape it was. Now, I'd like to know: What have y'all cleaned up? They didn't sample my yard. They didn't sample the backyard or front yard. Why check some yards and not check ours? You just told me the yards they checked, they replaced the soil. Now, why wasn't mine?

EPA RESPONSE: In the residential locations, we cleaned up what we considered the source of the contamination, the arsenic-contaminated soil. Two hundred fifty-three (253) residential locations were sampled in what is considered the air deposition area. Based on the sampling results, the locations that exceeded the action lead for arsenic were designated for cleanup. The action level was set at a conservative level to provide even greater protection than what the risk assessment indicates would still be safe. The action level was set at 20 parts per million (ppm) of arsenic. While a level as high as 37 ppm is still considered protective, 20 ppm was used as the cutoff point. So it may seem that the cleanup was spotty, but it was based on sampling results and the action level. For example, one yard may have an arsenic concentration of 21 ppm that would generate a cleanup while the next door yard may have a concentration of 19 ppm arsenic that would not warrant a cleanup. Based on this criteria, even the same home may only require cleanup of the front yard and not the backyard. Initial sampling locations were based on air modeling information that indicated the most likely locations that were affected by smelter contaminants due to air deposition. Residential yards within the air modeling area were sampled and those exceeding the removal action cleanup level of 20 ppm arsenic were cleaned.

While the workers conducting the cleanup may appear to have overly protective clothing, they not. It is the minimal clothing requirement for conducting a cleanup. While children playing barefooted and in shorts may seem unsafe, they are not. The main route or method by which arsenic contamination enters the body is through eating contaminated soil and breathing contaminated dust. The eating of contaminated soils and breathing of contaminated dust would have to be done every day of the year for many years for health affects to occur. The cleanup at each residential yard took only days and the whole cleanup was completed within three (3) months. Little to no dust was generated during the cleanup of residential yards. First of all, the workers kept the soil moist and the cleanup in the La Marque area was conducted during a rainy

or wet season. We would expect that once the source of contamination is removed from the residential locations, that residents would cleanup the dust (which may or may not be contaminated) from inside their homes.

COMMENT: What area did the cleanup consist of? The Lee addition? Now, why wasn't I and a number of these other people's places wasn't in that 253? Where did you get your information from? In other words, you spot sampled these properties. Well, you must have because you missed me. You told me before at the meeting that y'all are sampling that whole Lee addition area. You had it marked out. I stay in the Lee addition area and a number of these other people. Why wasn't my property marked out on it? Now, how did I get missed? You told me -- you contradicted yourself. You told me before that you had taken samples in the whole Lee addition. That's not necessary for me to give you my address. I stay in the addition. I stay right on the corner of Lee Drive, Nanlee and Lee Drive. Now, y'all came right behind me and sampled -- did some digging, and yet still, just like I told you, y'all didn't want to spend no money. You wanted to make the people think that you were doing something when y'all wasn't doing anything.

EPA RESPONSE: I am not aware of the full boundaries of the Lee Addition neighborhood. At the meetings EPA held in La Marque back in March 1999, EPA presented a map which marked (as you indicated) what was considered the air deposition area. This is the area that was sampled and where the cleanup was conducted. People at the meeting mentioned that the area that had been marked off was the Lee Addition. That is why in meetings since then, when people ask if the area that was sampled or where the cleanup occurred was the Lee Addition, I answer yes. Maybe the area sampled does not include everyone in the Lee Addition, but the sampling and removal were not based on the boundaries of the Lee Addition. It was based on scientific information and actual sampling results. So just because you live in the Lee Addition does not mean that your yard was automatically sampled. Some yards outside the Lee Addition were also sampled back in 1995. It does not matter where you live, the decisions regarding the cleanup are based strictly on the sampling results and not if you live in the Lee Addition. In 1995, 253 residential properties were sampled and out of those 253, 25 yards were above the action level for arsenic and 24 were cleaned up. One resident refused to grant access for cleanup.

COMMENT: Well, tell me this: If you didn't want to spend no money, now, you mean to tell me this man's property's contaminated, come up to my line, that line is not contaminated? Is that what you're telling me? Y'all dug this man's front yard. You didn't want to replace his fence. What about his backyard? You're going to come down his line by his fence and leave his fence standing and tell him, "Well, the rest of your property is all right." But when you're speaking of cleaning up, there was a mistake. There wasn't no cleaning up. I wanted you to answer me here where the people can hear.

EPA RESPONSE: If we didn't want to spend any money, we would not have spent money in sampling the residential yards and we would not have conducted the cleanup. The cleanups that we conduct under Superfund are based on sampling results and not on what someone believes is contaminated. We can only clean up those areas that exceed health based levels and pose a threat

to human health and the environment. We know that contamination does not stop at a fence line and it does not start at a fence line either. When we determine that a residential yard is going to be cleaned up, we do not just clean a spot on the yard, we clean the whole front yard or the whole back yard up to the property line even if the contaminant levels are not exceed all the way to the property line. This is done to ensure that all of the contamination within the yard was removed and for backfill construction reasons. Arsenic contaminated dust did not just fall on some residential yards and skipped others. Many residential yards received arsenic contaminated dust, but we cleaned up only those that exceeded the action level cleanup level. I am not saying that the residential yard next to one that required cleanup did not receive arsenic contamination, I am saying that the arsenic levels at that yard do not exceed the removal action cleanup level and therefore did not required a removal action.

COMMENT: I'm a retired professional engineer and a concerned citizen. I asked for and served on the MOTCO Trust Group. One of my points here tonight is to try to get an economical cleanup of this site. And serving on the trust group, we saw so many things, so many dollars of our tax money being spent for reasons that could have been eliminated with proper planning. To begin with, the bids that we received for the initial contract was awarded to the lowest contractor, and practical engineers pointed out that the bid that they had submitted would not cover the cleanup of the site that we had at MOTCO. Well, as you know, the contract went to EI. They came in and set up their equipment. They had a process. They guaranteed that they could neutralize the area. And they proceeded to start to work. Well, it finally came down to the point where they could not get proper neutralization from the equipment they had here, the process that they had approved. So the BPC terminated them. We started all over again, re-formulated and re-plans on everything. And that is a time in which I saw enormous amounts of money being spent, in my opinion, from a practical engineering standpoint, that was unnecessary. We sat in meetings out there when we were trying -- and I'm glad the mayor pointed this out, that your -- we're going ahead with the physical cleanup and making decisions about some of the design that may follow. I saw a big holdup on the design of the cap out here on that site because the EPA -- the representative, full-time person there at the EPA, did not follow through on getting the cap design finalized. I saw dirt -- millions of tons of -- I say millions -- an awful lot of dirt being moved that was not necessary, working around trying to get the cap design. I would like to see this site cleaned up in a practical manner. I think it's a good place to put expansion for our industrial area here in Texas City, along with our megaport, which is going to call for it, but I'd like to see it done from a practical standpoint. I'd like to see the original contract reviewed real thoroughly before the work to be sure that a proper figure is coming in and they do have the ability to perform, as requested to do, and then I would like to see EPA stay on the job full time, as we did this at MOTCO, but we had many, many holdups because of the gobbledygook, somebody said, of getting the decisions made from EPA. So I would like to see this site cleaned up. I'm a practical person. I think there's a practical way of cleaning it up. I think there's a practical way of cleaning it up sufficiently that we can put another industry on that site and not do a table top clean job as we were forced to do at the MOTCO site. I think -- and considering health, of course. I think health should be considered in the thing. But I think there are practical ways of doing the thing and use some people with some common knowledge on some of these

things, not some of these folks that come out of Washington that designed these laws that we're working with that were created in the 1970's that we in the refining industry and so forth -- you think gasoline is high now. It's a wonder you're not paying $5 a gallon for it by the things we're having to comply with in the refinery. Thank you very much for allowing me to state my position on the thing, and I hope we can get it cleaned up in a real fast manner.

EPA RESPONSE: Thank you for comments. The cleanup at the MOTCO site was conducted by the Responsible Parties and not the Government. They did the hiring of all contractors. EPA conducted oversight activities to ensure that the cleanup was performed in accordance with the Record of Decision for the site and that it met cleanup standards. However, we also learn from the mistakes at Superfund sites whether the cleanup is conducted by private companies or the Government. Although taxpayers' money was not used to cleanup the Motco site, it does not change the fact that a significant amount of money was used and that some of the money spent may have been wasteful. We will try not to repeat the mistakes made at the MOTCO site. Our ultimate goal is to clean up the site so that it protects human health and the environment. We will try to conduct the cleanup activities such that the site can be redeveloped and put back to re-use by the community. We will continue to work with the Potentially Responsible Parties in conducting the cleanup in a timely manner. We at EPA will review and approve documents such that our actions do not hold up work at the site, and make quick decisions to continue site progress.

COMMENT: I came here in 1939. I'll point out that we used to play as kids over there. I was superintendent of the contract that did the first work out of the tin site. I would say I've been involved in 90 percent of the levies that it put out in the pits that's been dug in that plant. A couple of things that's come to my attention. What's the difference between the first sand and the second sand? Is the existing water system still available and working in that plant? What's the depth of the wells?

EPA RESPONSE: In terms of depth? The first sand is about 22 feet deep below ground surface and the second one is between 30 and 35 feet. The groundwater system is in excess of 500 feet.

COMMENT: You say you're going to leave the foundations. Is that right? And that includes about 22 acres of land? Could this be a detriment to future redevelopment. Give me your thoughts of why you're doing this again, please

EPA RESPONSE: There are about 20 acres of land where the buildings are located that includes foundations and also slabs and aprons. The slabs and foundations were constructed in a reinforced manner. So they provide an excellent means of preventing migration. If there are contaminants under the slabs and foundations, they would also serve as a cap to prevent exposure to those contaminants. So the slabs and foundations are means of control techniques for those purposes. They could also serve for future use of the site to have that concrete in place, depending on what future use is.

COMMENT: Personally, I'd like to see it removed. I think the subcontractor coming in -- some company's coming in. They're going to have their own engineering. And certainly we can take care of the surface area but not go to the expense of taking up the concrete. Now, the ditch that runs on the east side that goes all the way to the base -- you're familiar with what I'm talking about? We dug that ditch originally for the county; did the work for the county. What provision now has been made for the existing pits that you're going to cap to keep from getting water? What provisions have been made for those existing pits? I know the big one. It took 24 hours a day to do it. What's going – what bearings -- or what's going to keep the sand from -- the acid from filtering into the sand? After you cap these pits, the bearings -- what kind of bearing would you have that future buildings could be constructed on? I'm very interested in getting this site so another tenant can come in and be a part of Texas City.

EPA RESPONSE: As we stated, the slabs and foundations will serve as a cap to prevent migration of surface water and prevent exposure to site contaminants. An added benefit would depend on what the site is used for in the future. Although we want to the site to be redeveloped in the future, our primary objective is to protect human health and the environment and if we can accommodate a specific future use, we try to do so. Regarding the pits, the water will be removed from the pits and if necessary treated prior to disposal in the Wah Chang Ditch or at a permitted facility. The sediments (sands) in the acid pond will also be treated. In the acid pond, the treatment would extend into the shallow ground water and probably to the acid plume. The ponds would then be backfilled with site materials. Those materials would be compacted by the equipment as they are spread by layers and also as loading of the materials occurs by adding backfill. The ponds would be topped off with clean fill consisting of a clay cover or impermeable cap, depending on what materials are placed in the ponds. The ponds will be backfilled to grade with topsoil and sloped to drain. In the cleanup process, we will do everything we can to leave as much area as possible for future redevelopment. Some areas will require the future tenant to take special measures, but it will not prevent future redevelopment.

COMMENT: The first thing I'd like to say is: Mayor Doyle, I have to credit you with trying to force the EPA in cleaning the Tex-Tin site up, but it's not enough. I was at the meeting in March of '99. I just want to make a few comments. I'm not going to really ask any questions. I think I've pretty much done my homework. I am the spokesperson for the majority of people at the Lee subdivision. These people do have a health problem over there, and I believe that more than half of them are addressing it through attorneys, which I'm assuming that they cannot go into detail about. Carlos, back in March of '99 you did talk about testing the 253 homes. I believe it was said at that time that it was done in a checkerboard fashion where they were skipping one, doing one, skipping this one, and they were looking for arsenic. And what I addressed to you back then that I never got an answer about is the radioactive materials that are currently on the site. I have a letter here dated June 13th, 1996. You said that the people in that area were notified. Well, the way that they were notified was by a letter from the EPA that says, "Dear Residents," and it was put on their door, and in this letter it says that they were sending the letter "Because your yard was sampled as part of the EPA superfund process and process of the Tex-Tin site. EPA recommends common sense precaution, such as limiting contact with soil in your yards and using

precautions when working outside, such as using dust masks for moving, et cetera." What Mr. Winston was addressing is: Why, when the EPA had the funds to test each and every yard -- and I'm talking 253 yards -- why was it not done? 152 homes of record in EPA documents were tested, not 253. There was an inquiry made at the U.S. Department of Justice. There was an audit performed. There were two EPA employees that were relieved from their positions for basically fraud. The money was not spent like it was supposed to. Trees and shrubberies that were supposed to have been replaced in these yards were not. The same trees and the same shrubbery were put back into the ground. These contaminated trees and shrubbery were placed back into the soil. That's what these people are complaining about. There are no facts to support your mediation program. You have not addressed the problem with radionuclides. I have a letter – and, again, this comes out of the EPA documents – from the TNRCC dated April 1st, 1998. The TNRCC told EPA that there were numerous contaminations, including uranium and its daughters, U238, U234, TH230, RA226, PBT (unintelligible), natural thorium and its daughters. All this is sitting in a pond at the Tex-Tin site that has never been addressed. Not only that, it says that "A review of the wood (unintelligible) that indicates mounting of groundwater under the radioactive material burial site on the Tex-Tin site." This implies that the rate of transmission of water through the cover of the spent uranium (unintelligible) may be greater than that through the underlying layers of natural clay material. Nobody has addressed the remediation of the radioactive materials. 361 pounds of spent uranium sitting at that site, along with all these other radionuclides, which have migrated off site. It's a matter of record. I went to the library, and I did my homework. The EPA needs to address it. We've sent numerous letters to Carol Brown and informed her she's got a huge problem out there. I think the city has done as much as they could. They've spent the taxpayers' money trying to get this cleaned up. The letter here says that the migration has occurred over ten years. This is TNRCC, April 1st, 1998, well documented. Nothing has been addressed about this. The tag grants that the people are talking about that basically I think you said were incomplete, well, there was one group here that did apply for it. They've never gotten a response. The public has had to go out and hire attorneys to represent their best interests. Why should the public have to bear the burden of proving to the Federal government that you people just literally screwed up? And in doing so, you subjected to these good people their health. You cut their life spans by 40 years or more. They can't sell their homes. They're stuck in a place they don't want to be. That's all the comment that I have, and I thank you for letting me talk.

EPA RESPONSE: Regarding the residential sampling, I did not say that the sampling was conducted in a checkerboard pattern. The sampling conducted at 253 residential properties was based on air modeling information and then actual field samples were collected and analyzed. I can go back and double-check on that, but I'm pretty certain it was 253 homes that were sampled in the La Marque area, and out of those, 25 residential yards exceeded the removal action cleanup level of 20 mg/kg arsenic and 24 yards were cleaned up.

The Texas Department of Health (TDH) conducted quarterly monitoring of the Low Level Radioactive Landfill at the site from 1978 through 1996. The TDH thermoluminescent dosimeter monitoring near the site showed results that were below the limits of the Texas Regulations for

Control of Radiation. Down gradient wells do not show radiation levels above MCLs or drinking water standards and clearly shows that radionuclides have not migrated offsite.

The TAG Grant has not been awarded yet. We had applications that were rejected for different reasons. In the near future, we intend to make the TAG Grant available again and to solicit applications. We hope that we can award the TAG Grant before cleanup activities start next year.

As far as facts to support the proposed remedy for the site, numerous reports and documents are available in the Administrative Record that clearly show the nature and extent of contamination at the site and alternatives are evaluated to address site contaminants. The facts are there in the remedial investigations, risk assessment and feasibility studies conducted for the site.

COMMENT: It's a matter of public record that 253 homes were slated to be tested. The Texas Department of Health in a March, 1999, meeting -- the woman said it was a checkerboard sampling, is what they did. What they should have done was the 253 homes, which the funds were earmarked for, but it was not spent. I'm just making it a matter of record that it's already a matter of record that there was fraud involved. Money was earmarked for the testing. It did not get done. There were trees that were supposed to have been replaced that did not get done. It's actually a moot point. It is a matter of record. It's right over there at the Texas City Library. You can check your own website or check EPA documents. It's in there. I have documents. So I'm not going to come in and speculate. I have the facts and these people have the facts. And what we're saying is: It's been a long time coming. The program that you're trying to put in place for the remediation of Tex-Tin is simply not going to work. There's been too much migration. And even you people have said, "Well, anything that's gone off site we're not responsible for." That's where the third-party liability comes in.

EPA RESPONSE: Sampling and analyses were conducted in the residential areas of La Marque to determine the extent of contamination. It is a matter of record and that information is available to the public in the Administrative Record located at the Moore Public Library in Texas City. Specifically, the information regarding the residential sampling in located in the Supplemental Remedial Investigation Report, Volume 1, dated March 1997. The residential test results are presented on Table 3.76, pages 3-219 through 3-224.

COMMENT: I hope the 28.6 million is going to be enough. An earlier commentator had mentioned about not having much success in neutralizing the acid pits in MOTCO. I just don't know if the 28.6 million is going to be adequate to clean up this site. The Federal government has had a big part in this. And to try to clean up these properties dating back 50 years ago is going to be impossible, even though we're here to talk about the clean up of Tex-Tin and not the off-site contamination. Looking at the Brownfields development, this community probably stands in the way of a megaport. So they may need to be relocated for that reason in addition to the health reasons. The EPA really needs to sit down, as you alluded to, with every household in the community and discuss their soil samples. One of the problems with the levels -- the screening levels, the ESL's -- are you using ESL's for your – effective screening levels in order to determine

that the levels are not affecting public health? Is that what you're using, ESL's? Because the ESL's, as you are probably aware, are based on a healthy 26-year- old white male and not based on children. So we always have problems with these allowable – so-called allowable levels. There's a lot of discrepancy, that we don't really believe that these are allowable levels that are protecting children and our elderly folks. So we have a problem with that. But I would just like a commitment that you would sit down with each and every family that has a home in that community, go over the soil samples that you took or didn't take and wherever all that money was spent and, you know, really sit down with the community and find out what the kind of contamination they have on their property is. It's totally made the community feel uneasy when you come in and do this kind of Band-Aid approach, as it's been called. And I know this is Operable Unit 1 that we're discussing here. I was wondering why – there has been an acid pond that was injected, and I'm just wondering why that technology is not being used. Of course, we need some geologists and some experts to tell us perhaps why the acid pond is not being injected; instead it's being neutralized?

EPA RESPONSE: We did consider deep well injection as one of the alternatives back when we were evaluating remedial alternatives during the selection of the original remedy for the site. Deep well injection was not selected because it was not cost effective and regulatory requirements for disposal of hazardous materials had to be met or a waiver requested. The waiver process would have been time consuming and there were no guarantees that the waiver would be approved. So that is why the injection alternative was abandoned.

EPA's risk assessments for residential areas are based on protecting children. We looked at the specific data that was collected from each of the residential homes and took a conservative approach and cleaned up residential properties that had arsenic levels above 20 parts per million in the surface soil in the yard. As I stated earlier, from a risk standpoint, the acceptable level is actually higher than that, but we went an extra step and used a much lower level than what is acceptable to provide protection to human health and the environment. So to say that the cleanup levels that were used are not protective is wrong. We at EPA are out here in the community providing information and facts while others are making accusations and providing misleading information that plant doubts in the minds of the community. I believe that those persons are not helping the community understand the facts but are making the confusing statement for their own agenda.

COMMENT: But there already was an acid pond that was injected in the past.

EPA RESPONSE: There is currently a pond (Pond 6) onsite that is referred to as the acid pond because the liquids in the pond have a pH of 2 or less. This pond was used for storage of ferric chloride liquids which have a low pH; it was not used as an injection pond.

COMMENT: It's -- neutralizing the acid pond, that may be a problem, technical problem. I don't know enough about it. But I do understand that when metals come in contact with acids, it will cause the metals to move. So I would think that, you know, removing that acid as far away as

possible from all of the metal contamination and inorganics would be advisable. I guess the NORM -- when we're talk talking about NORM wastes, is that considered the slag piles? You can say that that's totally vitrified? And that was natural vitrification? Is that where the arsenic contamination is coming from? Is there material blowing off of those stacks into the community at this point in time?

EPA RESPONSE: There may be a problem in neutralizing the acid pond, but treatment studies will be conducted and experts will be involved to determine the best method to treat the acid pond liquids and sediments. After treatment, plans are to remove the liquids from the pond and backfill the pond with site materials and clean fill. The liquids would be treated to meet discharge standards prior to disposal in the Wah Chang Ditch. Some of the site slag piles have NORM waste materials. NORM slag material has been processed and is in a vitrified state. It is not natural vitrification, the vitrification resulted from the smelting process. The vitrified materials are solid and appear like rocks. So whatever contaminants are present in the slag materials, they are tightly bound in the rock-like mass and will not blow away. The arsenic that was deposited in the community occurred when the smelter was in operation. Arsenic contaminated dust came out of the smelter stack and was blown to the surrounding area. The smelter stopped operations in 1991 so there have been no smelter stack emissions since then.

COMMENT: It would be interesting to see how you remediate the building materials on the site and how -- all of that asbestos, and hopefully you will be communicating all of this as you proceed, but I still question whether there's enough money involved, and the community is -- the health concerns of the community really need to be addressed, and I know the Galveston County Health Department has indicated that they are going to try to do an assessment, and we had started that process, but there were some problems with the health surveys that were being used, but we do hope to conduct some kind of survey in the community to try and identify some patterns of health problems that are going on. We also would like to see personally -- I know there's a lot of Federal funding for lead screening. Medicaid pays for lead screening. The levels of lead in the documentation that I was looking at here are very notable in all and then arsenic, cadmium (unintelligible). All these levels look high. And given the ease of doing lead screening, it could even be used to justify some grant funding and mapping lead levels in children in the community, and I would like to see something like that done as well. And we kind of come back to our basic accounting principles which are used today that assume a piece of property cannot lose value, but we all know that that can happen. And as the mayor alluded to a purchase; that they're now being responsible for that. I think we need to change something in the basic economic system that we're operating under, and I hope you will consider what you're -- how to remediate the community as well as the Operable Unit 1. And I don't have enough technical background to understand. That's why we are applying for the tag grant, so that we will be able to hire a technical assistant to help us evaluate the extent of the site.

EPA RESPONSE: All site work will be conducted by companies that have experience with this type of work. Experts will be involved that are familiar with the type of contaminants present at the site and know how to handle those materials. The work will be done in a safe manner that

does not cause releases of contaminants above health based levels and will not harm the surrounding community and site workers.

We will work with local, state, and federal medical agencies in any way we can to help address health issues in the community. The source of contamination in the residential yards has been addressed through EPA's removal action. We are concerned with health uses but health problems need to be addressed by local or state health agencies. EPA's mission under Superfund is very specific and that is the area that we are addressing. This is not to say that we are indifferent to the community health concerns, but it is not something that EPA can address. We are still willing to help in anyway we can and work with local, state, or even other federal agencies to address the community health concerns.

The TAG Grant has not been awarded yet. We had applications that were rejected for different reasons. In the near future, we intend to make the TAG Grant available again and to solicit applications. We hope that we can award the TAG Grant before cleanup activities start next year.

COMMENT: I've lived in Texas City for about 40 years. I'm an attorney. I've been involved in various environmental projects around the area, several superfund sites, including the MOTCO site, which was one of the first superfund sites around the area or in the United States that underwent an extensive cleanup as that one did. I'd like to think that the MOTCO site was a learning experience for the EPA and for the industry as a training program that we can get the benefit of at this site. I have a comment, and then I have a question. I want to commend the effort that is being made to conduct this remedy at the site. I'm not technically capable of making my own judgment as to whether it will be adequate. I have to assume that, in fact, it will since it's been designed by folks a lot smarter than I am. My basic thought is that the site is not near as dangerous a site as some might think and that the remedy of remediating the materials on the site is probably a good one. I would ask about the off site. We know that there were materials that flowed down the Wah Chang Ditch all the way to Swan Lake. Is there any long-term intention of addressing that off-site contamination? And I encourage you to move on with it. We want to see that site change the face of the area real quick.

EPA RESPONSE: Yes, we are currently working to address the off-site contamination in the Swan Lake salt marsh area. We refer to this area as Operable Unit No. 4 of the Tex-Tin site. EPA has completed sampling investigations in the Swan Lake Salt Marsh area and prepared an ecological risk assessment. EPA's contractor is currently preparing a feasibility study which will evaluate different remedial alternatives to address the contamination in the Salt Marsh area, where the Wah Chang Ditch crosses the Salt Marsh area before it discharges into Swan Lake. We have had some discussions with the State and Federal Natural Resource Trustees regarding potential alternatives to address the contamination present in the Swan Lake Salt Marsh Area. We are continuing to move forward to address the onsite and offsite contamination associated with the smelter facility. Now that we have an agreement with the PRP Group, we believe that site activities will start to move quickly.

COMMENT: I hope you folks will get your public relations people ironed out before you start this job. I can remember when we started the MOTCO job that we had a full-page picture in the Texas City SUN showing a guy in a pressurized zoot suit, they call it, when they handled HF acid and a guy out there catching a sample. I'll bet you the equipment that guy had on would run $50,000 or so. Char (sic) and myself are 80 years old. We're examples of -- we've lived in this area for many years. We know that God made our bodies to take care of some of the contaminants in the air and so forth. But for goodness sakes, don't get people out there -- you saw an example of how alarmed people can get by seeing a zoot-suited fellow out there catching a sample. So that public relations thing really does mean an awful lot to this community.

EPA RESPONSE: The PRP Group has hired a community relations firm to work with EPA in providing information to the community and address its concerns. We are making plans to have the public and the city fully involved during the cleanup activities. We will release fact sheets to the community on a regular basis that will provide status information for the cleanup activities and hold open house meetings to hear directly from the community and answer your questions and find out what your concerns are.

We do not want to alarm the community and that is why we hold public and open house meetings to make you aware of what we are doing and why. Some activities require a certain type of protective equipment that site workers are required to use. Workers in the residential area used tyveks which is equivalent to a coverall. It does not provide more protection than regular clothes. It is not a moon suit or a zoot suit.

COMMENT: I live in the Lee addition, but I've lived in La Marque since I was 14 months old. So I can't say that I know a lot about chemicals and a lot about what's going on, but the thing that I do know and I'm concerned about is the -- you know, it's like I went and I sat down and I read what I got in the mail. I think it was the other -- well, some time ago, and I read about the site background, and some of it was really kind of alarming to me that all these things have been going on in this area and a lot of people don't really know about it. I, for one -- you know, I've been living in the Lee addition for 20 years, and my children grew up in the area, and a lot of things I've heard about -- people have tried to explain to me how things bypass over, you know, the property and over time, but when -- you know, my tree was big in my front yard when I first moved there. It wasn't that big though, not till -- over the years since 19 -- what's that -- '41 or whenever -- when the plant was first built, to have stopped, you know, any type of chemicals that are in the area because EPA wasn't around then. So a lot of things happened before EPA came into existence. And there are lot of causes that I've heard about since I've been coming to these meetings and everything else. So I'm just wondering: When the cleanup starts -- and I know the attorney said that, you know, a lot of things that we've said -- you know, it may not be as bad as it seems, but when you are -- when you're already sickly and you're already old or either you're young, it doesn't take a lot to cause harm to your body. And I don't care how much you try to stop things from getting into the air. It's going to get into the air. And I'm speaking from experience because my son has been sick from something that he just caught in the air. So I'm making this statement because you-all are going to clean up, and y'all say that that's asbestos out

there, and y'all talk about the groundwater. You-all talk about all of these things. And we live over in this area, and none of you-all live over there. So it won't affect you-all. And if it seeps out by accident, what do we do then? You-all, you know, are not going to give us enough money to pay for our house to move, and if you do, you'll give us the cost of that house. But there are a lot of elderly people in that area. You give them the cost of their home, that means that they're still going to have to pay a house note when they move, and a lot of these people have already paid for their homes. So I'm looking at -- yeah, there are probabilities. You cannot say that it's going to be perfect. Yes, you learned something from MOTCO, but did you learn enough to the fact that you have a lot of people that live in this area, in the Lee addition area, a lot of people? And you-all just say that you cleaned up the 25 areas that were high -- arsenic level was high, higher than normal, but not high enough to kill somebody. Is that about right? Am I right? I should say to harm someone.

EPA RESPONSE: As stated previously, EPA collected soil samples from 253 residential properties in La Marque and out of those, 25 exceeded the conservative removal action level of 20 mg/kg arsenic that triggered the cleanup action. Cleanup of the smelter site will be conducted in a controlled manner to prevent contaminants from leaving the site during construction activities. Air monitoring will be conducted during cleanup activities to ensure that emissions are not leaving the site at unsafe levels.

COMMENT: All right. But over a period in time -- if people planted in their yards and they ate the vegetables or fruit or whatever they grew, over a period of time these -- the yards that were dug up -- and how much property -- I mean, how much of this land did you-all -- six inches, was it?

EPA RESPONSE: EPA's removal action excavated to about six inches in depth and sometimes deeper if contamination was still present after removing the initial layer of soil. Regarding eating vegetables that may be contaminated, we discussed that topic with EPA's toxicologist and he indicated that vegetables would not accumulate metal contaminants at levels that would be harmful for human consumption.

COMMENT: Okay. Now, is that over a period of time, or is that just for once or twice?

EPA RESPONSE: That is over a long period of time. Our risk assessments are based over a 70-year time of exposure to contaminants. The risk assessments that we do are very conservative, and they're based on exposure over a 70-year period.

COMMENT: So you're saying that everything else is okay. So you're saying that all the food would be okay. But the trees died. You just mentioned about the vegetation. You're not mentioning about the trees and the shrubs that have died in people's yards.

EPA RESPONSE: Based on our discussions with EPA's toxicologist, consumption of home grown vegetables are not a problem from smelter contaminants. We don't know why the trees

and shrubs died. We do not believe that it is related to smelter contamination. Tree, shrubs, and grass are growing well all over the smelter site where contaminant levels are hundreds of times higher than what they are on the residential properties. So I don't think the arsenic is causing trees and shrubs to die.

COMMENT: I'm going to get back to the cleanup because I know that this was the main thing that you-all are talking about tonight. So you're saying that during the cleanup, there won't be any type of leakage, there won't be anything in the air, anything like that to harm anyone in that area.

EPA RESPONSE: When we do this type of cleanup, we incorporate extensive monitoring into the cleanup process. We incorporate many engineering techniques that prevent releases above health based levels. That is one of the reasons that Superfund cleanups are very expensive. Demolition work, excavations, and treatment of contaminated materials are done in a controlled manner to ensure that contaminants do not leave the site at levels that would be harmful to human health. We can't just go in there and start bulldozing buildings the way it is done at non-Superfund sites. We take many precautions to ensure that the public and site workers are not exposed to harmful levels of contaminants. So a lot of those things are done to prevent outside migration or outside releases of contaminants that may be harmful to the public. All of these things are taken into consideration before the cleanup is started. That is why it takes months to get field activities started. A design needs to be prepared and reports submitted that outline how the workers will be protected, how the work is going to be done, how hazardous materials will be handled, etc. These reports and documents have to be reviewed by EPA and TNRCC and approved before cleanup activities start.

COMMENT: So my main point is: If this is going to happen, with us being so close, then I hope that you're extra careful. Because, see, I've raised three children in that area, and it's, like -- my son -- my youngest will be leaving. He's in 11th grade now. But I'll still be there, and I don't want to have to be concerned about the cleanup and if I'm going to get sick, and I don't have to -- you know, it's, like, all the other elderly people in the area because we don't have money to just pick up and move just because you-all are going to start cleanup. You know, it's bad enough that we have to live amidst all the plants, you know, and I don't know what I was smelling the other day, you know, but -- anyway. An extra problem other than what we already go through is something that we'd rather not have to deal with.

I just hope that whatever you tell the community is not something that's just to cover up a problem, you know. Be honest with everybody because we're tired of getting worries of trying -- of things being covered up. We're tired of that. We want the honest to God truth about what we have to live with and what we have to deal with. We're not here to play. We're not here trying to keep arguing over the subject. We just want to know what's going on. And we can -- if you want us to move, we'll be glad to move. We want to move. Trust me. Trust me. We want to get out of there because we don't like living over there, but it's not easy all the time for us to be able to afford to move. Because we don't like living over there and watching people's trees die. I'm going to leave. But those are my concerns. And thank you for giving me the time.

EPA RESPONSE: I can assure you that we're taking extensive precautions to prevent releases of contaminants to the community from happening. We are trying to award the Technical Assistance grant to a community group so they can hire a technical consultant to review the cleanup activities at the site. We will work directly with the consultant and the community to address your concerns and provide periodic updates on the progress of cleanup activities. Also, as reports and documents are generated, they will be placed in the local information repository here in Texas City. That information will be available to anyone that wants to see it.

COMMENT: I just have two questions. The first one: They said they're going to leave the slabs of the buildings there. Do you know what's under the slabs? Have you checked? Have you done any gamma radiation tests on the site? I know there is some gamma radiation there, and, of course, you know that gamma penetrates steel. Gamma penetrates the slabs. So if you don't know what's buried underneath the slabs, don't you think it would make sense to find out what's under there?

EPA RESPONSE: We have not checked under the slabs, but the slabs are going to be checked to make sure that they're functioning as a protective cap for areas that may be contaminated. That's the purpose of leaving the slabs in place, to not disturb the area and for the slab to function as a protective cap. We have done radiation testing at the site. We have not done testing of the materials under the slabs. That is in part because the buildings were not constructed before source materials were processed at the site and therefore waste materials would not have been generated prior to construction of the site buildings. The other reason is that the slabs will serve as a cap or cover to prevent exposure to contaminants that may be found under the slabs. The slabs will be evaluated during the remedial design to determine if they are structurally sound to serve as a protective cap. As part of the final site cleanup, we will test for radiation levels, including gamma radiation, to ensure that radiation levels at the site do not exceed health based levels.

COMMENT: And Brio is a perfect example. You talk about MOTCO being a learning experience. Brio, 529 contaminants. Over 130 (unintelligible) migrated off site, and they did find buried drums under the slabs over at Brio 15 years after they tried to clean it up. That's the only reason I'm asking the question. The second question is: In this letter of 1998. It says in here that the cleanup determinations were according to the EPA national primary drinking water standards. And as I said, I got here late, and I'm just now reading this, and this says that the cleanup criteria is going to be according to the UTS standards. Why did we change standards, and what is the universal standard? Why the difference between the two standards, and why did we change? Is one less strict than the other or –

EPA RESPONSE: The universal treatment standard (UTS) refers to the stabilization of the contaminated soil and waste materials. The UTS is less strict than the MCLs. At the Tex Tin site, investigations indicate that the shallow ground water upgradient from the site already exceeds MCLs. Therefore, it would be nearly impossible to clean the shallow ground water to MCLs. It was concluded that the most practicable standard to use would be the UTS.

Consequently, the stabilization standard was based on UTS. Additionally, the materials that are stabilized will be placed under an impermeable cap that would prevent water migration through the materials and then to the shallow ground water.

COMMENT: So what you're saying is that the universal standards are less strict than the EPA drinking water standard. What is the depth at which you consider to be drinking water quality? Is it beyond 60 feet?

EPA RESPONSE: The universal treatment standards are less strict than drinking water standards, but they are still protective. Both of those are EPA standards, but it depends on what you're trying to protect. In this particular situation the shallow groundwater is not a drinking water source and it is not anticipated that it would be a drinking water source in the future. So the MCL standards are not applicable to shallow groundwater. The groundwater zone that will be protected is the deep transmissive zone which is located approximately 80 to 100 feet below ground surface. This transmissive zone is a potential drinking water source. Wells within a three-mile radius that are used as a drinking water source, are located in the deep transmissive zones, although there are no wells downgradient from the site located in the deep transmissive zone.

COMMENT: There was a superfund site in Harris County called the French Limited Superfund Site. It was cleaned up or remediated. It was paid by industry 100 percent. It was allegedly cleaned up to drinking water standards. And that sits in the flood plain of the San Jacinto River. Just a comment. Refer to the standard. Industry paid 100 percent, $93 million, and they cleaned it to a drinking water standard. The site -- superfund site on the north side of Highway 90 was not paid out of private dollars, spent $143 million, did not meet that standard. I'm saying you have flexibility in applying the standards, whether it's to industry or the government. Tax dollars.

EPA RESPONSE: That site that you're referring to, the contamination went down to more than 20 feet below ground surface, and that's why it was cleaned up to a different standard to protect the ground water. Also the groundwater that was contaminated went down deeper than it does here at the Tex-Tin site. So it's a totally different site and different contamination that you're referring to. The contaminants at the French Limited site were more mobile than the contaminants at the Tex Tin site and could therefore more easily contaminate deeper drinking water transmissive zones.

We do not have cleanup standards that are based on who is doing the cleanup. The cleanup standards are based on site specific conditions and the contaminants present at the site. As a matter of fact, a group of PRPs will be conducting the cleanup here at the Tex Tin site. So your statement that we would use different standards because the French Limited cleanup was conducted by PRPs is not correct; PRPs are also cleaning up the Tex Tin site. We believe that the cleanup at both sites is protective of human health and the environment.

COMMENT: The chemistry at French Limited was virtually the same as the Sikes Superfund

Site, which is incredibly similar to Brio. I'm talking about standards and drinking water and water quality. And I don't say that you can't -- if you don't have different chemistries, it's appropriate to use different methods. I'm talking about standards and the flexibility EPA allows itself with tax dollars. You have engineers experienced in this area saying historically, Y'all aren't too economical, and there are ways to be effective and in good economics."

EPA RESPONSE: The Superfund sites you mentioned were not former smelter facilities and the contaminants present at those sites are totally different from those found at the Tex Tin site. If you want to make a comparison, those sites you mention could be compared to the MOTCO site. But as the people of Texas City and La Marque know, the MOTCO site is totally different from the Tex Tin site. EPA does have some flexibility in conducting cleanups at Superfund sites based on the site environment and contaminants present. The bottom line at all Superfund sites is that the cleanup has to be protective of human health and the environment, which is the goal for the Tex Tin site. We believe that when the remedial action is completed, the remedy will be protective and the site can be put back to productive use. In the process of selecting a remedy for the site, many different alternatives were evaluated that provided a range of protection at different costs. We believe we have selected the remedy that offers the best protection at a reasonable cost.

COMMENT: I had read in some of the literature in the past that there was a fish advisory, and then you showed on your slide that the pond across the road does have contamination from that acid pit. Why is there no fish advisory posted there? I think it would be a good media approach to, you know, even begin the activities over there. There should be a fish advisory on that pond. Also, I remember in the documentation there were some people on wells downstream from that in a little community, and I don't know anyone from that community or -- that has been taken care of. There are people that were on – I read it in the documentation

EPA RESPONSE: The Texas Department of Health is proposing a fish advisory for the private Pond 22 and Ponds 24, 25, and 26 located along the southern boundary of the site. The fish advisory would be to alert the public to high levels of PCBs. PCBs have not been identified as a contaminant of concern for the site. We do not know where the elevated levels of PCBs are coming from. Fish consumption advisories can only be made by the TDH. We will work with TDH and the pond owners to limit access to the ponds in question. The Texas Department of Health is going to talk directly to the owner of Pond 22 regarding a fish advisory for that particular pond.

We are not aware of a community located within a few miles downgradient from the Tex-Tin site. However, as mentioned earlier, ground water sampling from the deep transmissive zone, that could be use as a drinking water source, indicate that even the wells located immediately down gradient of the Tex Tin site have not been impacted by site contaminants. Metal contaminants would not be expected to travel a long distance without natural attenuation occurring.

COMMENT: So that's not EPA responsibility. The wells that she's talking about (unintelligible)

three-and-a-half miles west of the Tex-Tin site, TNRCC has the documents on file, public record, that the wells at 160 feet are contaminated with radionuclides. That's a matter of record, and that has been sent to the EPA (unintelligible). Uranium, strontium 90, those are not naturally occurring. They're not the NORMS that are found in the water. Uranium -- what is it -- 238, 234 uranium, thorium 210, strontium 90, those are not naturally occurring, and EPA has finally admitted to that. My understanding is: They are dispatching a team down here of hydraulics to find out what is going on in this county.

EPA RESPONSE: If there are radionuclides in the well you are referring to, they are not radionuclides from the Tex-Tin site. There are no indications that site contaminants have migrated to the deep transmissive zone at the site which is 80 to 100 feet below ground surface. Therefore, it would not be expected that contaminants have migrated to a depth of 160 feet to a well that is three-and-a-half miles upgradient from the site. I too would like to know what the source of the radionuclides is. There is one thing I can say with certainty, there is no way that a well three-and-a-half miles upgradient from the Tex-Tin site is going to have contaminants from the Tex-Tin site.

COMMENT: Well -- I won't go there. Well, I did find the information here about the residents in the unnamed beach community located approximately one mile south of the site rely on 25 private (unintelligible) – But there are still 25 wells that are in that beach community, and some of them screen out at the 80-foot -- 84-foot level. So those need to be checked into. I don't know any people that are in that area, that beach community down there. This is your documentation, the health assessment, and it says, "Residents in the unnamed beach community located one mile south of the site rely on 25 private wells."

EPA RESPONSE: There is not a beach community located one mile down gradient from the Tex Tin site. There may be a community located across Swan Lake which would be several miles from the Tex Tin site and not one mile. As previously stated and as indicated in the site investigation reports, test results do not indicate that site contaminants have migrated to the deep transmissive zone which would be the likely source of drinking water for that community.

COMMENT: MAYOR DOYLE: I'd like to thank the EPA for your help on the Malone site since it was mentioned. We've been exposed to hurricanes and potential damage to the ecology and all of that and estuaries had there been any severe flooding, and you-all have used emergency funds to correct that, and hopefully next month we'll be having an announcement that it is now clean and no longer a threat to the surrounding communities of Bayou Vista, Tiki, La Marque, Texas City. So we appreciate that. I want to thank everyone for coming out and making your comments. I would like to add though the request that we always like to make of EPA and any of our visitors to the community that have an interest here that involve spending money and contracting for services. We've got a lot of talent here in our community, environmental talent as well as talent for demolition and cleanup of the site, and we would hope that you would use your best efforts to employ minority and under-used contractors who are local and general contractors of all types who are local both for the applicants for the trustee to operate the site and for

individuals to work at the site. We all know we always have a problem with the government having credibility with people, but we have a lot more credibility if we work their neighbors and their friends who they know at church and in the civic organizations that they see. When they know they're out there cleaning it up, it makes it more credible and more acceptable to the community. So I'd strongly urge you to use your best efforts to do that. I would hope that you keep on track. As I said earlier, May 17, 1999, we thought we were going to be further along than we are today. We now have a new revised schedule that says June, 2000, we will have a signed amended ROD. July, 2000, we'll start the remedial design; December, 2000, complete that design; March, 2001, start remedial action; June, 2002, complete -- hopefully Unit 1 will be complete in 2002 and that we will be far ahead of that curve on removing all the structures, which you have stated you will use your best efforts to start even before the remedial design has been completed. Thank you.