

Chronology 2016 Soil Response Action Completion Report – March 2017 Former ASARCO Smelter Site, El Paso, TX

The remedial investigation at the Former ASARCO Smelter Site has been conducted since the late 1990s with response actions occurring concurrent with investigation activities. The on-site response action is scheduled for completion in 2016 and monitoring of the effectiveness of the groundwater response action will continue for a 30-year period based on model results. Post response action care is projected to last through 2055. A chronology of events is presented below based on information presented in the remedial investigation (RI) reports for Phases 1 through 3 of the RI (Hydrometrics, 1998, 2000, and 2001), Phase 4 of the RI (Asarco Consulting, Inc., 2003), Revised Supplemental RI (Malcolm Pirnie, 2005), the Expert Report (TCEQ, 2009), and the Response Action Plan (Arcadis 2016e).

February 1990	Hydrocarbons were observed seeping into the American Canal in February 1991. The Texas Natural Resource Conservation Commission (TNRCC, now the Texas Commission on Environmental Quality [TCEQ]) issued a leaking petroleum storage tank (LPST) number - 094594 to manage the characterization and cleanup at the leaking tank site.
March 1990	In March 1990, ASARCO observed visible staining adjacent to the underground piping of an 18,000-gallon diesel tank and dispenser pump. An estimated 62,291 gallons of diesel was released. LPST No. 095897 was assigned to the release by the TNRCC. Under agency oversight, the tank and all associated piping were dismantled and removed.
June 13, 1994	The TNRCC conducted compliance inspections at the ASARCO El Paso Copper Smelter Site (Site).
January 1995	The TNRCC conducted soil, groundwater, and surface water sampling at the Site, and documented the unauthorized discharges of industrial solid wastes, wastewater, and stormwater.
August 1996	TNRCC issued ASARCO an Agreed Order (Docket No. 96-0212-MLM-E), which required ASARCO to complete a remedial investigation for the Former ASARCO El Paso Copper Smelter Site.
October 1998	ASARCO submitted the RI report for the Former ASARCO Copper Smelter Site in October 1998 (Hydrometrics, 1998). The RI report identified arsenic, cadmium, lead, and selenium as the principal chemicals of concern (COCs) in both soil and groundwater media. The Phase I report concluded that impacts to soil were centralized around smelting and process areas, ponds, and slag storage and disposal areas such as the Boneyard, Fines Pile, and arroyos. Multiple arroyos were filled in with native soil, slag, and building debris to level the surface of the Plant Site. The Phase I RI provided the first documentation of Category I, Category II, and Category III materials to identify final disposal requirements.
January 2000	ASARCO designed and constructed an on-site Stormwater Collection and Reuse System (SWCRS) in 2000 to eliminate stormwater discharges from the Site. The SWCRS operates as a zero discharge facility for up to a 25-year storm event. Stormwater is directed to three stormwater ponds that have an approximate capacity of 12 million gallons. Stormwater captured by this network is evaporated

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and, only if stormwater discharge limits are met, is discharged through on-site outfall SW-5, located upstream of the American Dam.

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| July 2000 | ASARCO submitted the report for Phase 2 of the RI for the Site in July 2000. The Phase 2 RI report (Hydrometrics, 2000) expanded the number of on-site areas of interest and delineation of sources of COCs to on-site soil and groundwater. Soil investigations were extended to the arroyos on the East Property, the Ephemeral Pond, and the South Terrace. The additional groundwater monitoring events conducted as part of the Phase 2 RI supported the conclusion that although the highest concentrations of COCs in groundwater occur and remain within the vicinity of their respective on-site source areas, migration of COCs occurs from on-site source areas to downgradient receptors including the Rio Grande and American Canal. |
| November 2000 | TCEQ issued a closure letter for LPST site No. 094594 for cleanup at the leaking tank site. |
| November 2001 | The Phase 3 RI (Hydrometrics, 2001) continued monitoring of existing groundwater, surface water, and sediment locations, and expanded the soil investigation at plant sites, the on-site portions of the East Property, and on-site property adjacent to the La Calavera (LC) and floodplain areas. The baseline risk assessment (BRA) was updated as part of the Phase 3 RI. Conclusions of the risk assessment were that on-site risk from exposure to COCs in soil and groundwater to smelter workers could be managed with appropriate health and safety planning and procedures. The exposure of ASARCO and International Boundary and Water Commission (IBWC) workers in the Floodplain area to COCs in soil was below a level that would result in an unacceptable threat to human health, while exposure to COCs in groundwater could be controlled through institutional controls. Finally, the Phase 3 RI indicated that elevated concentrations of arsenic and selenium in surface water are present during low-flow events in the Rio Grande. |
| December 2001 | The USEPA initiated an investigation of the extent of soil impacted by COCs, principally arsenic and lead, surrounding the Site. Data collected in two studies overseen by the USEPA (Roy F. Weston, Inc., 2001 and Weston Solutions, Inc., 2002) indicated that locations around the smelter stacks and extending to the southeast are related to historical stack emissions. Additional data presented by both USEPA (Roy F. Weston, Inc., 2001) and ASARCO (ASARCO Consulting, Inc., 2003) have characterized concentrations of COCs in soil at off-site locations in the LC property. Data presented in these reports provide lateral and vertical delineation of COCs in surface soil from historical aerial deposition of stack emissions and fine slag particulate from crushing operations. The data presented clearly demonstrate that the extent of impacted soils are within a few feet of the surface and are not related to groundwater impacts reported at the Site. |
| November 21, 2003 | The Phase 4 RI report (ASARCO Consulting, Inc., 2003) was submitted in November 2003. The off-site investigation at the Floodplain demonstrated that most or all of the arsenic and lead are located in the first 2 to 3 feet of surface soil. These data support the position that COCs do not migrate vertically to the |

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groundwater table. The Phase 4 RI presented a summary of results for surface soil samples collected from off-site residential properties around the LC Assessment Area (AA). The data demonstrate generally decreasing concentrations of lead and arsenic with increasing soil sampling depth. The data confirm what was reported in the floodplain that metals are not migrating vertically and are not impacting groundwater.

May 2005

The TCEQ issued a Corrective Action Directive (TCEQ, 2005) identifying the boundaries of the Area of Contamination (AOC) and the required elements of the corrective action to be completed. The required corrective actions included:

1. Construction of an on-site landfill for Category I material and installation of five monitoring wells;
2. Establishing financial assurances for closure and post-closure care of the landfill under solid waste regulations;
3. Excavation of areas with Category I material until COC concentrations are below Risk Reduction Rules (RRR) standards or equivalent TCEQ risk-based levels protective of human health and the environment;
4. Installation of an asphalt cap over areas designated as containing Category II materials;
5. Design and installation of a groundwater remediation system to prevent metals in groundwater at concentrations above MCLs from leaving the property boundary; and
6. Dust control during excavation activities.

March 2009

ASARCO submits status report on Corrective Action progress stating that 22 acres of Category II material had been addressed with asphalt covers, removal of 179,000 cubic yards of material, and landfill covers constructed on Waste Control Units (WCUs) No.1 and No.2. Approximately 10.2 acres of Category II was covered in 2006, with an additional 10.4 property was placed beneath the asphalt covers in 2006 and approximately 11.2 Acres were covered by asphalt in 2007.

April 2009

TCEQ submits the Expert Report for the Estimation of Costs to Perform Cleanup at the ASARCO El Paso Smelter on Behalf of TCEQ in April. The report provides costs to implement the remaining portions of the TCEQ's 2005 Corrective Action Directive for the site including groundwater treatment, industrial waste landfill (Cell 4) construction, cover construction and source removal. The estimate is for \$52 million to achieve remediation goals presented in the 2005 Corrective Action Directive.

June 2009

ASARCO files for Chapter 11 bankruptcy.

December 2009

The Texas Environmental Custodial Trust Agreement establishing a custodial trust for the remediation of the former ASARCO El Paso Smelter Site was signed, establishing a \$52,080,000 trust fund to implement the corrective action

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described in the TCEQ 2005 Corrective Action Directive, which was determined to meet the remediation standard for protection of human health and the environment for the AOC as defined by the TCEQ.

December 2010	Remedial Action Work Plan is submitted and approved for implementation of a remedial strategy to meet the goals of the 2005 TCEQ Corrective Action Directive. Remedial strategy was revised to complete groundwater response using permeable reactive barriers and gradient control through upgradient groundwater extraction and impermeable covers along with source removal to achieve groundwater remedial objectives. Regulatory approach was to finish the Remedial Investigation (RI) under RRR (30 TAC §335), then transfer to Texas Risk Reduction Program (30 TAC §350) to complete the response action.
April 2011 to October 2013	TCT performed demolition, disposal, and asset recovery of smelter buildings, facilities, and equipment at the plant site over a 2.5-year period. Salvageable materials were managed, wastes were segregated and disposed of at appropriate on-site and off-site facilities based on waste characteristics, and documentation of demolition and removals.
November 2011 to December 2017*	TCT performed removal and construction activities in Lower PBA, including removal of Category II material, construction of subgrade and liner for Cell 4 Landfill, filling of landfill with Category I Material, and completion of cap and interim closure of the landfill through related remediation activities at the Site.
October 2012	TCT installed permeable reactive barriers (PRBs) in Parker Brothers Arroyo (PBA).
October 2012	TCT initiated backfilling of basements at Plant Site.
August 2013 to September 2014	TCT performed removals of Category I and Category II Material areas on the East Property AA to Residential PCLs.
October 2013	TCEQ issued a closure letter for LPST site No. 095897 for cleanup at the leaking tank site.
May 2014	TCT placed Category II/III material at North and South pads.
March 2015	TCT completed grading and construction of channel and liner system in Lower PBA.
May 2014	TCT installed groundwater hydraulic barrier (GHB) extraction system to control groundwater gradient entering the PBA.
April 2015	TCT completed backfilling of Plant Site basements.
July 2015	TCT completed abandonment of Plant Site utilities.
July 2015 through Dec 2016	TCT continued placement of Category II/III material at South Pad.
August 2015	TCT placed Category II material at East Property Stockpile/Material Storage Area.

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May 2016	TCT completed placement of ET cover at North Pad, and, lining and swales with geomembrane at North Pond.
November 2016	TCT began grading and construction of liner system in portion of Upper PBA.
November 2016	TCT completed Fines Pile ET cover.
November 2016	TCT graded Plant Site and constructed cover on South Pad. TCT placed ET cover with exception of approximately 5 acres at north portion and 0.5 acre at south portion.
November 2016	TCT completed construction of portion of Lower PBA Outlet.
November 2015 to December 2016	TCT submitted Response Action Plan (RAP, Arcadis 2016e) and received approval to implement the RAP to meet the goals of the Texas Risk Reduction Rules Program.
March 2017	TCT submitted Response Action Completion Report (RACR) for soil response actions at the Site completed through December 2016.
December 2017	TCT to submit 2017 Soil RACR documenting soil response action activities completed in 2017.
March 2017* to December 2045*	Monitoring of response action in groundwater and soil through groundwater, stormwater, and surface water monitoring programs documented in Response Action Effectiveness Reports (RAERs) every 3 years.
December 2045*	Submittal of Groundwater RACR documenting completion of groundwater response actions at the Site.
December 2046* to December 2056*	Post response action monitoring period following submittal of groundwater RACR including monitoring natural attenuation of COCs in groundwater of Rio Grande floodplain and documented in annual Post Response Action Care Reports (PRACRs).

*Estimated future date.