

LHAAP-16 Landfill 16 Remedial Design Update

Site History and Current Remedial Design Status

LHAAP-16 is a capped landfill located in the south-central portion of the Longhorn Army Ammunition Plant (LHAAP). The site encompasses approximately 20 acres, of which approximately 13 acres are covered by the cap. The landfill was established in 1940s and was used for disposal of solid and industrial wastes until the 1980s. The Army and the U.S. Environmental Protection Agency (EPA) signed a Record of Decision (ROD) in 1995 approving an interim remedial action, which consisted of a multilayer landfill cap that was completed in 1998. In 1996 and 1997, a groundwater extraction system was voluntarily installed by the Army as part of a treatability study to prevent contaminated groundwater from migrating to Harrison Bayou. Development of the remedial design for the final remedial action presented in the ROD was placed on hold from October 2011 to March 2016 as a result of a dispute between the Army and EPA over the ROD. Following dispute resolution, the Army prepared a draft revised ROD that is currently undergoing EPA and Texas Commission on Environmental Quality (TCEQ) review. Concurrently, the draft remedial design is being developed based on the draft revised ROD.

Site Chemicals of Concern and Potentially Affected Environmental Media

Surface drainage from LHAAP-16 is carried in small gullies and ditches to Harrison Bayou, which flows along the northeastern edge of the site and discharges into Caddo Lake. The subsurface soil at the site consists of medium plastic sandy silt and fine sands, separated by clay layers that create four distinct groundwater-bearing units identified as the Shallow, Intermediate, Upper Deep, and Deep Zones. The groundwater flow direction is northeast toward Harrison Bayou in the Shallow, Intermediate and Deep Zones, and southeast toward Harrison Bayou in the Upper Deep Zone. The contaminated media include the buried waste and soil under the cap and groundwater in the Shallow and Intermediate Zones. The main chemicals of concern (COCs) at LHAAP-16 are volatile organic compounds (VOCs) including trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride (VC); and perchlorate.

Human Health and Ecological Risk

Construction of the landfill cap under the interim remedial action eliminated the direct exposure pathway to source area waste material, prevented contaminant transport to surface water via surface runoff, and reduced leaching of contaminants to the groundwater, resulting in an overall reduction of risk to human health and the environment. The reasonably anticipated future use of this site is non-residential as part of the Caddo Lake National Wildlife Refuge. However, groundwater at the site is considered a potential future source of drinking water. Concentrations of some groundwater COCs have exceeded cleanup levels. The site currently does not pose an unacceptable risk to potential ecological receptors.

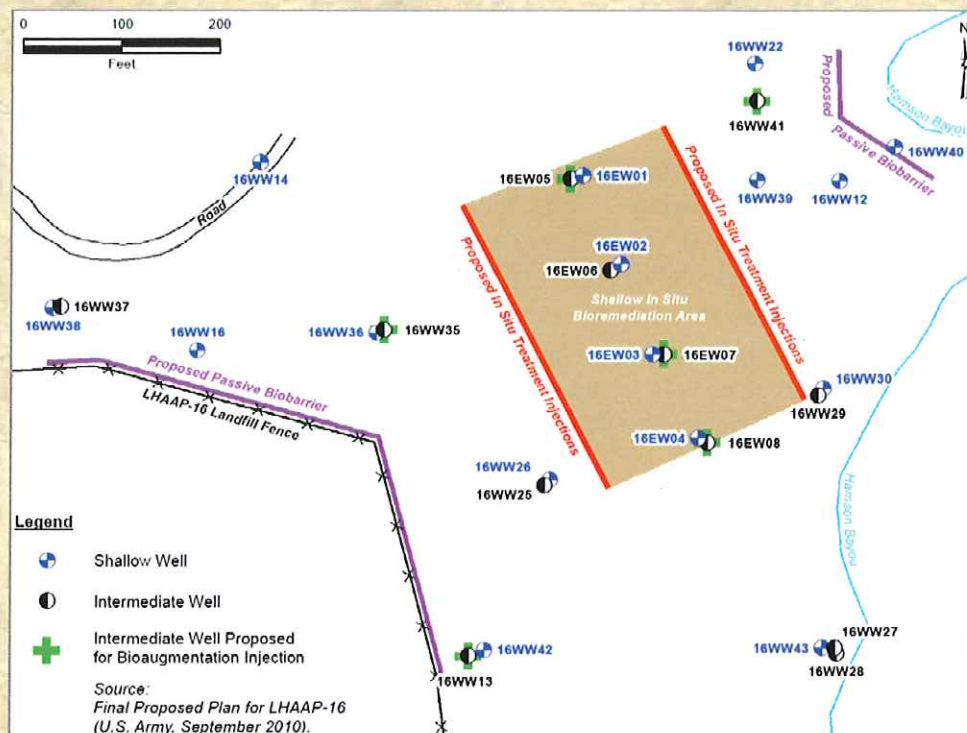


Figure 1: LHAAP-16 Selected Remedial Alternative 7 includes maintenance of landfill cap, land use controls, in-situ enhanced bio-remediation, passive bio-barriers, and monitored natural attenuation

Remedial Action Objectives (RAOs)

The RAOs for LHAAP-16 are:

- Preventing exposure to landfill contents.
- Reducing leaching and migration of landfill hazardous substances into the groundwater.
- Preventing human exposure to groundwater contaminated with COCs.
- Preventing groundwater contaminated with COCs from migrating into nearby surface water.
- Returning groundwater in the Shallow and Intermediate Zones to its potential beneficial use as drinking water.

Remedial Alternatives

A total of seven remedial alternatives (plus two slight variations on Alternatives 3 and 5) were developed to address the LHAAP-16 RAOs. Alternative 1 is the No Further Action alternative, which is always evaluated to represent site baseline conditions. Land use control is a technology that is common to Alternatives 2 through 7. Monitored natural attenuation is common to Alternatives 3, 6, and 7; and inspection/long-term monitoring is common to all Alternatives, except Alternatives 5a and 5b. In addition to these common technologies, Alternatives 2 and 3b include groundwater extraction; Alternatives 4, 5a, and 5b include passive groundwater treatment; Alternatives 5a and 5b include landfill waste removal and off-site disposal; Alternative 6 includes in-situ treatment of landfill waste; and Alternative 7 includes in-situ enhanced bio-remediation and passive bio-barriers.

Evaluation of Remedial Alternatives and Selection of Proposed Alternative

All of the seven remedial alternatives identified for LHAAP-16 were evaluated individually and comparatively against the nine criteria identified in the National Oil and Hazardous Substances Pollution Contingency Plan. Based on these evaluations, the Army identified Alternative 7 as the preferred alternative for LHAAP-16. It achieves the RAOs and is consistent with the reasonably anticipated future use of the site as a wildlife refuge. **Alternative 7 includes maintenance of the landfill cap, land use controls, in situ enhanced bio-remediation, passive bio-barriers, and monitored natural attenuation.** This satisfies the Remedial Action Objectives for LHAAP-16 for the protection of human health and the environment. All seven alternatives were evaluated in the Feasibility Study and are summarized in Final Proposed Plan. Both documents are located in the Administrative Record. **Figure 1** shows the active remedy components of Alternative 7, as presented in the Final Proposed Plan for the LHAAP-16 site. The remedial design will be subject to change, based on updated data and requirements of the revised Final ROD.