

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

LHAAP-04 (Former Pilot Wastewater Treatment Plant)

- Contaminants of Concern (COCs): Perchlorate in Groundwater
- Prior Remedial Activities: Excavation, In-Situ Enhanced Bioremediation (ISB)
- Current Remedial Activities: Post-ISB Groundwater monitoring

LHAAP-12 (Landfill 12)

- COCs: Trichloroethene (TCE) in Groundwater
- Prior Remedial Activities: Land Use Controls (LUCs) and monitored natural attenuation (MNA)
- Current Remedial Activities: MNA (sampling and reporting), Long-Term Monitoring (LTM) for groundwater, LUC documentation and reporting

LHAAP-16 (Old Landfill)

- COCs: TCE, cis-1,2-dichloroethene (DCE), Vinyl Chloride (VC), and Perchlorate in Groundwater
- Prior Remedial Activities: ISB, Groundwater extraction
- Current Remedial Activities: Post-ISB Groundwater monitoring

LHAAP-35B (37) (Former Chemical Laboratory)

- COCs: 1,1-DCE, TCE, and Tetrachloroethylene (PCE) in Groundwater
- Prior Remedial Activities: Enhanced ISB
- Current Remedial Activities: LUC documentation and reporting and MNA (sampling and reporting)

LHAAP-46 (Plant 2 Area)

- COCs: TCE, cis-1,2-DCE, and VC in Groundwater
- Prior Remedial Activities: LUCs and MNA
- Current Remedial Activities: LUC documentation and reporting and MNA (sampling and reporting)

Fact Sheet: Active Sites
Longhorn Army Ammunition Plant (LHAAP)
27 June 2024 Restoration Advisory Board Meeting

LHAAP-50 (Former Sump Water Tank)

- COCs: Perchlorate, PCE, TCE, 1,1-DCE, 1,2-Dichloroethane (DCA), cis-1,2-DCE, and VC in Groundwater
- Prior Remedial Activities: MNA, Excavation, ISB
- Current Remedial Activities: Post-ISB Groundwater monitoring

LHAAP-35A (58) (Shops Area)

- COCs: PCE, 1,1-DCE, TCE, and VC in Groundwater
- Prior Remedial Activities: Enhanced ISB
- Current Remedial Activities: MNA (sampling and reporting) and LUC documentation and reporting

LHAAP-67 (Former Aboveground Storage Tank Farm)

- COCs: 1,1-DCE, 1,2-DCA, 1,1,1-trichloroethane (TCA) , 1,1,2,-TCA, and TCE in Groundwater
- Prior Remedial Activities: MNA and LUCs
- Current Remedial Activities: MNA (sampling and reporting) and LUC documentation and reporting

LHAAP-001-R-01/-003-R-01 (Site 27, South Test Area, Bomb Test Area/ Site 54, Ground Signal Test Area)

- COCs: None
- Prior Remedial Activities: Removal of surface munition and explosives of concern
- Current Remedial Activities: Limited groundwater monitoring and LUCs

LHAAP-18/24 (Burning Ground No. 3 / Unlined Evaporation Pond)

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

- COCs: Methylene Chloride (MC), TCE, cis-1,2-DCE, PCE, Benzene, 1,1,2-TCA, VC, Bromodichloromethane, 1,3,5-trinitrobenzene (TNB), 1,4-dioxane, arsenic, barium, chromium, cobalt, nickel, and perchlorate in Groundwater; TCE, MC, and PCE in Soil
- Prior Remedial Activities: Excavation
- Final Remedial Design submitted 1 March 2024
- Interim Remedy: Groundwater Treatment Plant operation from 1996 to current
- Selected Remedy: Groundwater extraction and treatment, Enhanced ISB, In-Situ Thermal Desorption (ISTD) of Dense Non-aqueous Phase Liquid (DNAPL), Maintenance of the Unlined Evaporative Pond (UEP) cap, Excavation and off-site disposal, MNA, LTM, and LUCs

LHAAP-29 (Former TNT Production Area)

- COCs: TCE, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, MC, VC, 2,4-dinitrotoluene (DNT), 4-nitrotoluene (NT), 2-NT, 3-NT, arsenic, mercury, selenium, nickel, and perchlorate in Groundwater; 2,4,6-trinitrotoluene (TNT), 2-4-DNT, 2,6-DNT, and perchlorate in Soil; 1,3-dinitrobenzene (DNB), 2,4,6-TNT, 2,4-DNT, 2-amino-4,6-DNT, and 4-amino-2,6-DNT in Transite TNT Wastewater Line and Cooling Water Drain Line.
- Prior Remedial Activities: None
- Final Remedial Design submitted 29 February 2024
- Selected Remedy: Flush, inspect, and plug TNT wastewater and cooling water lines, Excavation and off-site disposal, ISTD, MNA, and LUCs

LHAAP-47 (Plant 3 Area)

- COCs: Perchlorate, TCE, cis-1,2-DCE, VC, 1,1-DCE, PCE, 1,2-DCA, acetone, chloroform, trans-1,2-DCE, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, bis(2-ethylhexyl) phthalate, pentachlorophenol, aluminum, antimony, arsenic, cadmium, chromium, cobalt, manganese, nickel, silver, strontium, thallium, tin, and vanadium in Groundwater; Perchlorate and TCE in Soil
- Prior Remedial Activities: Plastic Liner to prevent migration in soil
- Current Remedial Activities: LUCs, Excavation, ISTD, Enhanced ISB, Biobarriers (permeable reactive barrier), and MNA

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

LHAAP-17 (Burning Ground No. 2 / Flashing Area)

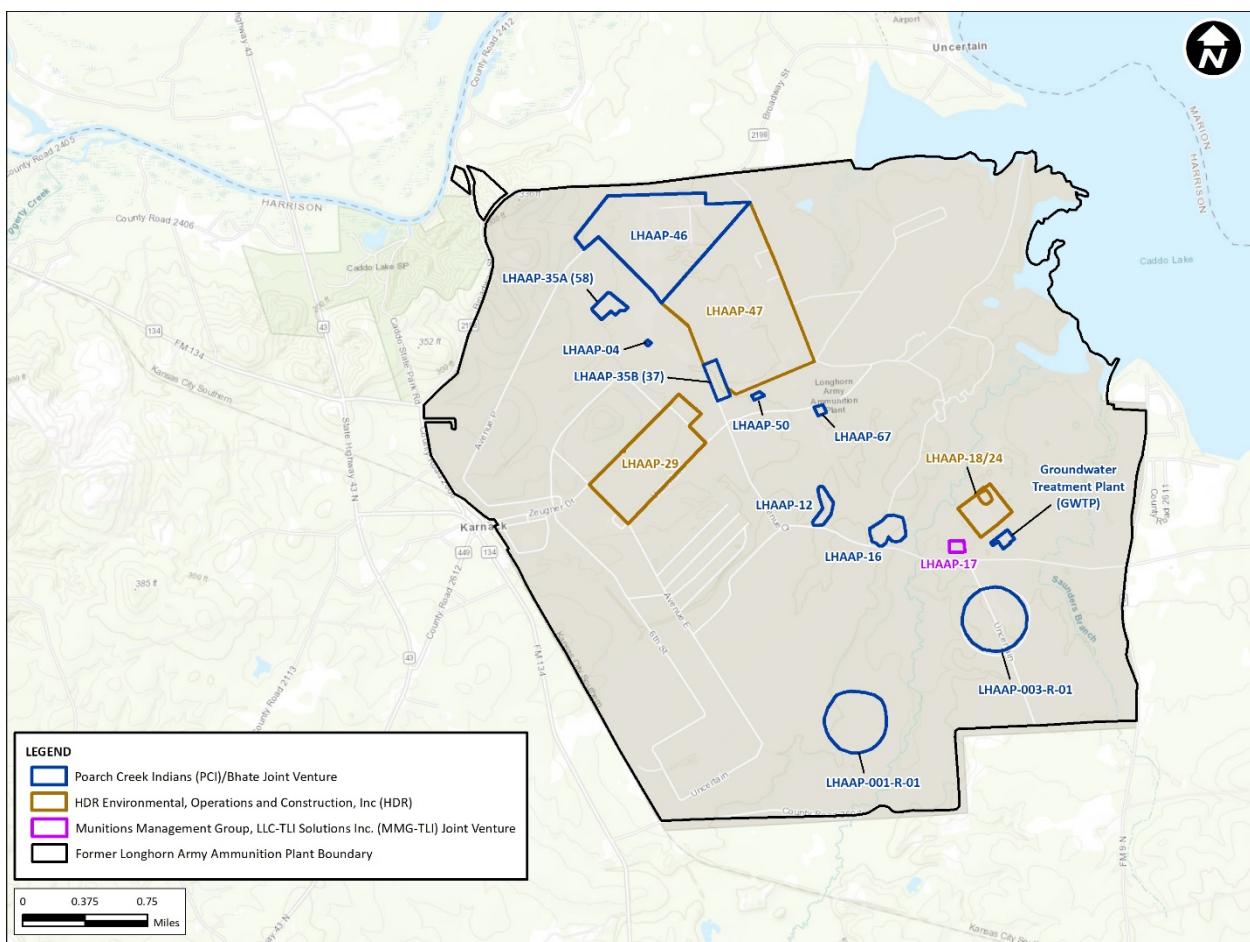
- COCs: Perchlorate, TCE, 1,1-DCE, 1,1-DCA, 1,2-DCA, and VC in Groundwater; Perchlorate, 2,4,6-TNT, 2,4-DNT, and 2,6-DNT in Soil
- Prior Remedial Activities: Excavation
- Current Remedial Activities: Groundwater Extraction and Performance Monitoring

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

LHAAP SITE MAP



Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

Definitions

In Situ Bioremediation (ISB) of Groundwater - Bioremediation is an engineered technology that modifies environmental conditions (physical, chemical, biochemical, or microbiological) to encourage microorganisms to destroy or detoxify organic and inorganic contaminants in the environment. The process can be applied above ground in land farms, tanks, biopiles, or other treatment systems (referred to as ex situ) or below ground in the soil or groundwater, referred to as in situ.

More info at [Community Guide to Bioremediation \(epa.gov\)](#)

In situ thermal desorption (ISTD) is an intensive thermally enhanced environmental remediation technology that uses thermal conductive heating (TCH) elements to directly transfer heat to environmental media. The ISTD/TCH process can be applied at low (<100 °C), moderate (~100 °C) and higher (>100 °C) temperature levels to accomplish the remediation of a wide variety of contaminants, both above and below the water table. ISTD/TCH is the only major in situ thermal remediation (ISTR) technology capable of achieving subsurface target treatment temperatures above the boiling point of water and is effective at virtually any depth in almost any media. TCH works in tight soils, clay layers, and soils with wide heterogeneity in permeability or moisture content that are impacted by a broad range of volatile and semi-volatile organic contaminants.

More info at [Community Guide to In Situ Thermal Treatment \(epa.gov\)](#)

Natural attenuation relies on natural processes to decrease or “attenuate” concentrations of contaminants in soil and groundwater. Monitoring typically involves collecting soil and groundwater samples to analyze them for the presence of contaminants and other site characteristics. The entire process is called “monitored natural attenuation” or “MNA.” Natural attenuation occurs at most contaminated sites. However, the right conditions must exist underground to clean sites properly and quickly enough. Regular monitoring must be conducted to ensure that MNA continues to work.

More info at [Community Guide to Monitored Natural Attenuation \(epa.gov\)](#)

Groundwater extraction and treatment or pump and treat is a common method for cleaning up groundwater contaminated with dissolved chemicals, including industrial solvents, metals, and fuel oil. Groundwater is pumped from wells to an above-ground treatment system that removes the contaminants. Pump and treat methods may involve installing one or more wells to extract the contaminated groundwater. Groundwater is pumped from these “extraction wells” to the ground surface, either directly into a treatment system or into a holding tank until treatment can begin. The treatment system may consist of a single cleanup method, such as activated carbon or air stripping, to clean the water. However, treatment often requires several cleanup methods if the groundwater contains different types of contaminants or high concentrations of a single contaminant. The approach to treatment may be modified as contaminant concentrations decrease

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

More info at [Community Guide to Pump and Treat \(epa.gov\)](#)

Bioremediation is the use of microbes to clean up contaminated soil and groundwater. Microbes are very small organisms, such as bacteria, that live naturally in the environment. Bioremediation stimulates the growth of certain microbes that use contaminants as a source of food and energy. Contaminants treated using bioremediation include oil and other petroleum products, solvents and pesticides.

More info at [Community Guide to Bioremediation \(epa.gov\)](#)

Air stripping is the process of moving air through contaminated water in an aboveground treatment system to remove chemicals called “volatile organic compounds” or “VOCs.” VOCs are chemicals that easily evaporate, which means they can change from a liquid to a vapor (a gas). The air passed through contaminated water helps evaporate VOCs faster. The chemical vapors are collected, and either treated or vented outside if VOC levels are low enough. Air stripping is commonly used to treat groundwater as part of the pump and treat cleanup method.

More info at [Community Guide to Air Stripping \(epa.gov\)](#)

A permeable reactive barrier, or “PRB,” is a wall created below ground to clean up contaminated groundwater. The wall is “permeable,” which means that groundwater can flow through it. Water must flow through the PRB to be treated. The “reactive” materials that make up the wall either trap harmful contaminants or make them less harmful. The treated groundwater flows out the other side of the wall.

More info at [Community Guide to Permeable Reactive Barriers \(epa.gov\)](#)

Acronyms and Abbreviations

COC	Contaminant of Concern
DCA	Dichloroethane
DCE	Dichloroethene
DNAPL	Dense Non-aqueous Phase Liquid
DNB	Dinitrobenzene
DNT	Dinitrotoluene
ISB	In-Situ Bioremediation
ISTD	In-Situ Thermal Desorption
LHAAP	Longhorn Army Ammunition Plant
LTM	Long Term Monitoring
LUC	Land Use Control
MC	Methylene Chloride
MNA	Monitored Natural Attenuation

Fact Sheet: Active Sites

Longhorn Army Ammunition Plant (LHAAP)

27 June 2024 Restoration Advisory Board Meeting

NT	Nitrotoluene
PCE	Tetrachloroethene
TCA	Trichloroethane
TCE	Trichloroethene
TNB	Trinitrobenzene
TNT	Trinitrotoluene
UEP	Unlined Evaporative Pond
VC	Vinyl Chloride