

Subject: Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)

Location of Meeting: Karnack Community Center, Karnack, Texas

Date of Meeting: October 18, 2012, 6:30 – 08:00 PM

Meeting Participants:

LHAAP/BRAC: Rose M. Zeiler

USACE: John Lambert, Aaron Williams, Wendy Lanier

USAEC: Robin Paul

AECOM: Dave Wacker, Gretchen McDonnell, Marwan Salameh, Rick Cramer

TCEQ: Fay Duke

USEPA Region 6: Rich Mayer, Janetta Coats, Charles Faulty
Kent Becher (USGS Liaison to USEPA)

USFWS: Mark Williams

RAB: **Present:** Paul Fortune, Robert Cargill, Charles Dixon, Carol Fortune, Judith Johnson, Judy Van Deventer, Richard LeTourneau, Nigel Shivers, Tom Walker
Absent: Ken Burkhalter, Lee Guice, Ted Kurz, Jim Lambright, E.V. Wilson, Pickens Winters

Public: Mary Britt, Terry Britt, Terry Echols, B. Mauthe, Vicki Pace, Ray Polk, Tony Thomas (Karnack Independent School District), Jay Webb, Dawn Orsack and George Rice (CLI - TAG)

An agenda for the RAB meeting was distributed prior to the meeting. Paul Fortune called the meeting to order.

Welcome – Rose Zeiler

Rose welcomed attendees to the meeting.

Open Items – Rose Zeiler

Minutes

Rose stated that RAB meeting minutes for all 2011 meetings and the July 2012 meeting had been distributed to the RAB members for review and comment. Judy Vandeventer made a motion to approve all 2011 RAB meeting minutes and the July 2012 RAB meeting minutes. Motion seconded by Judith Johnson.

Website

Robin Paul of USAEC stated that Longhorn has been identified to receive a RAB website as part of a test program. The timetable for having the website up and running was unknown but anticipated to be before the end of the 2013 fiscal year. Dawn Orsack, CLI-TAG noted that CLI has also created a website where meeting materials and some documents have been posted.

RAB Member Attendance

Paul Fortune noted that some RAB members have not been attending meetings regularly. His intent is to check the charter to determine the procedure to remove inactive RAB members to allow selection of new members. His intent is to send a letter to inactive members asking them to participate one final time before moving forward with selection of new members. AECOM will provide a record of meeting attendance for the last two years to assist the RAB in their evaluation.

RAB Tour

The last RAB tour of the facility was two years ago. Judith Vandeventer suggested waiting to conduct the next tour until new RAB members have been added. Rose suggested and the group agreed to tentatively plan for a tour in conjunction with the March 2013 RAB meeting.

Community Involvement Plan (CIP) Update Status

Ms. Paul informed the group that a draft of the revised CIP is being prepared now that all required data has been collected and interviews conducted. RAB members will each receive a copy of the new CIP.

Defense Environmental Restoration Program (DERP) Update – AECOM (Dave Wacker)

Introduction of Project Team

AECOM Project Manager Dave Wacker introduced other members of the AECOM team attending the meeting. Gretchen McDonnell was introduced as the Deputy Project Manager assisting Dave. Marwan Salameh was introduced as the task leader for the LHAAP 18/24 site and the Groundwater Treatment Plant (GWTP). Rick Cramer was introduced as the lead on the Conceptual Site Model work for LHAAP-18/24.

In addition to AECOM staff, a limited number of subcontractors will be assisting AECOM with LHAAP operations. Specifically, World Environmental has hired the two long-time LHAAP GWTP technicians and another local individual to support daily operations. Additionally, Eagle Environmental Services of Shreveport will be utilized to provide supplemental technical staff as needed for field efforts.

Judith Johnson requested that AECOM provide a more detailed organizational chart showing AECOM project staff for the next RAB meeting.

Overview of Scope and Approach

AECOM's contract period of performance ends September 20, 2017. Dave summarized that AECOM's ultimate goal is to achieve either "Remedy in Place" or "Operating Properly and Successfully" status for all LHAAP sites under their contract before that date. At the next RAB meeting, AECOM will present a slide describing the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) process to help in understanding where each of the sites are on the path to closure. Dave presented a slide showing the names and locations of the LHAAP sites included in AECOM's contract.

Document Status/Environmental Sites

Status reviews were presented for sites with significant activities upcoming in the near-term.

LHAAP-04. Soil impacts have been addressed. Perchlorate in groundwater is the remaining contaminant to be addressed.

LHAAP-47. Soil and groundwater remedies will be completed for this site. AECOM showed a slide depicting extent of soil and groundwater impacts at this site.

LHAAP-46. Remedial Design is complete. AECOM is preparing the Remedial Action Work Plan to implement the design to address impacted groundwater.

LHAAP-67. Remedial Design is complete. AECOM is preparing the Remedial Action Work Plan to implement the design to address impacted groundwater.

LHAAP-18/24. A historical data review is being conducted and the Conceptual Site Model (CSM) for the site is being updated. AECOM is preparing a Post-Screening Investigation (PSI) work plan to collect information to fill data gaps. USACE was asked to prepare an "activity/source map" of LHAAP-18/24 showing the locations of all disposal areas and activities.

Compliance Sampling. Completed in September for LHAAP-18/24 and the 6 perimeter wells.

Five-Year Review. A kick-off meeting has been held for this work. The draft Five-Year Review Report is planned to be delivered to the Army for review by the end of February. Public notice of the Five-Year Review activities will be published in the Marshall paper. AECOM was asked to prepare a slide showing the sites that will be included in the Five-Year Review.

Groundwater Treatment Plant (GWTP) Update

The GWTP began treating water on September 6, 2012 to continue containment of the plume at LHAAP-18/24. Operations had halted on May 21, 2012 when a bearing on the scrubber blower shattered causing hot gases from the catalytic oxidation unit to enter the scrubber stack which resulted in warping of the stack. Since the GWTP was restarted, 512,722 gallons of water have been treated and returned to the site through the sprinkler system. Because the catalytic oxidation unit and damaged air scrubber are off-line, monitoring of untreated gas emissions is being conducted as an interim solution to allow plant operation until a long-term plan for the GWTP treatment train is developed.

Paul Fortune asked what happens when the GWTP wears out, since it looks like there's no end in sight for its operations. Dave Wacker stated that everything has a lifespan, but that AECOM has proposed to refurbish the GWTP and evaluate the plant to determine the best long-term

operation plan. The GWTP is very efficient at removing contaminants and controlling the plume, but AECOM is evaluating whether there is a better final remedy that should be proposed. Rose stated that AECOM must ensure the GWTP continues to work until a final remedy is decided upon; the ultimate goal is to more aggressively clean-up LHAAP-18/24 and shut the GWTP down. However, there are no solid dates on when the GWTP might be able to shut down and the plant needs to continue to operate until then.

Paul asked how many GWTP operators AECOM is using. Dave replied that there are two full-time operators (the same individuals who have been running the GWTP for years under previous contractors) and one part-time local employee who focuses more on mowing and maintenance. Currently, AECOM also has another GWTP operator from their San Antonio office at Longhorn to assist in the refurbishing of the facility.

Upcoming Field Work

LHAAP-18/24. The PSI work plan will be executed to collect additional field data relating to geology and groundwater.

LHAAP-46 and LHAAP-67. Remedial Action Work Plans will be executed, including monitoring well installation and groundwater sampling.

Proposed Plan Public Meeting

December 11, 2012 is the tentative date of public meetings associated with the Proposed Plans for LHAAP-04 and LHAAP-47. A public notice will be published in the Marshall Messenger. Notice of the meeting will also be sent to RAB members and the “interested parties” list. Judith Johnson requested that the public notice sent to the newspaper be emailed to the RAB who will further distribute to help get the word out.

Military Munitions Response Program (MMRP) – USACE

Recent Groundwater Monitoring

Rich Mayer, USEPA stated that results have been received for groundwater monitoring conducted in August for ten wells at the two munitions sites. USEPA redeveloped the wells prior to the sampling event. Perchlorate levels were lower than the last groundwater sampling event. Groundwater elevations were lower.

Other DERP Environmental Restoration Update – Rose Zeiler

LHAAP-37 Bioplug Demonstration Project

Rose informed the group that the bio-plug system has been installed, and inoculation with aerobic microbes, air and nutrients began in September. A presentation on initial results is anticipated to happen this spring.

Sitewide Land Use Controls (LUC) Management Plan Update

Rose stated that the plan will contain a list of all LUC signs required for each site. The document will be kept current and authentic through annual “recertification” updates that will be done even if no changes to the plan are needed. All the LUC plans will be in one tabbed document for consolidated reference.

Other Environmental Restoration Issues – Rose Zeiler

Dispute Resolution

Dispute resolution continues. Nothing specific to update since last RAB meeting.

Look Ahead at the Schedule

The public meeting for LHAAP-04 and LHAAP-47 Proposed Plans is scheduled for December 11, 2012. Notice of the meeting will be provided to RAB members.

The next RAB meeting was tentatively scheduled for January 31, 2013 at the Karnack Community Center.

New Items/Question and Answer

A question was asked if the “perimeter wells” recently sampled are for the perimeter of the entire plant or just one site? Rose replied that the perimeter wells are for the entire plant. A question was asked if there is any change in the amount of sampling AECOM will be doing as compared to Shaw. Rose replied that sampling requirements are set by regulatory agreement.

Paul Fortune inquired on the condition of the INF Pond liner. Rose provided background information that INF Pond was first constructed to support the Rocket Motor Burn-Out area, but it was never used. The only water routed to the Pond is treated water from the GWTP, and that only occurs when the bayou is dry. (When the bayou is dry, treated water cannot be discharged to the bayou, and must be held until it can be discharged) While the current volume of treated water is being handled by returning directly to the site by the sprinkler system (water is not routed to the Pond), the Pond is available to provide additional treated water storage capacity if needed. As for current status of the liner, Rose stated that the liner issue from last year where there were trees growing up through the edge of the liner has been resolved. There is currently a small amount of erosion of the soil cover along one edge that is being taken care of by AECOM.

A member of the public asked why the water can't be released to the dry bayou if the water is treated. Rose responded that the chloride and sulfate (salts) in the water require stream flow to meet discharge criteria.

A member of the public stated there was a health risk study done in 2003, and inquired what information there is before that regarding the impacts to the health of citizens and their offspring. Rose stated that USEPA is waiting to receive a list of specific health risk questions from Mr. Winters, and those questions will be addressed.

A member of the public asked who pays for fixing the GWTP equipment. Rose stated that operation and repair of the GWTP is part AECOM's responsibility. The gentleman then asked why the Army allowed the Catalytic Oxidation (CATOX) unit to be offline since May. John Lambert explained that there were two options when the CATOX unit failed; either repair the CATOX or run the GWTP without the CATOX. To repair the CATOX, the repair parts (blower bearing) would take 6-8 weeks to obtain. To run the GWTP temporarily without the CATOX unit, Army received regulatory approval as a short term measure while assessing the system. AECOM is now collecting data on the air emissions to determine whether the CATOX unit should be part of the long-term solution and identified that the air data to date met all health screening levels.

George Rice, CLI asked which sites will be included in the upcoming Five-Year Review. Rose stated that only sites with a remedy in place are included. Rose requested that George request a list of the Five-Year Review sites by email.

Paul Fortune asked for additional information regarding the revision of the CIP. Janetta Coats introduced herself as the USEPA's community involvement coordinator working with Army. Army has the lead on the CIP. USEPA did not participate in the CIP interviews but has received the list of questions asked. Paul asked when the new CIP would be received. Rose stated that USAEC has the contract to do the work. Robin Paul of USAEC stated they did not yet have a date for completion of the CIP. Paul asked how people were selected to be interviewed. Robin stated that input was received from the RAB, USEPA, CLI, local businesses, public officials and other interested parties. While the actual names of those interviewed are not disclosed, they were selected to provide input from a broad spectrum of the community.

The next RAB meeting was tentatively scheduled for January 31, 2013 at the Karnack Community Center and will be followed up by notification letters to the RAB.

A motion to adjourn was made by Judith Johnson and seconded by Judy Van Deventer.

Adjourn

October Meeting Attachments and Handouts:

- *Meeting Agenda*
- *Minutes from July meeting*
- *LHAAP-04 Alternatives Analysis Fact Sheet*
- *LHAAP-47 Alternatives Analysis Fact Sheet*

Acronyms

AECOM	AECOM Technical Services, Inc.
CATOX	Catalytic Oxidation
CERCLA	Comprehensive, Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
CLI	Caddo Lake Institute
CSM	Conceptual Site Model
DERP	Defense Environment Response Program
GWTP	Groundwater Treatment Plant
INF	Intermediate-Range Nuclear Forces
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Controls
PSI	Post-Screening Investigation
RAB	Restoration Advisory Board
TAG	Technical Assistance Grant
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey



LONGHORN ARMY AMMUNITION PLANT
RESTORATION ADVISORY BOARD
Karnack, Texas
(479) 635-0110

AGENDA

DATE: Thursday, October 18, 2012
TIME: 6:30 – 8:00 PM
PLACE: Karnack Community Center, Karnack, Texas

- 06:30** Welcome and Introduction
- 06:35** Open items {RMZ}
-RAB Administrative Issues
- Minutes
- Website
- RAB Tour
- 07:05** Defense Environmental Restoration Program (DERP) Update {AECOM}
-Introduction of Project Team
- Overview of Scope and Approach
-Documents Status/ Environmental Sites
-Groundwater Treatment Plant (GWTP) Update
- 07:25** Other DERP Environmental Restoration Update {RMZ}
- Status of Demonstration at Site 37
- Sitewide LUC Management Plan Update
- 07:30** Military Munitions Response Program (MMRP) {USACE}
- 07:35** Other Environmental Restoration Issues {RMZ}
- Dispute Resolution
- 07:50** Look Ahead at the Schedule
- 08:00** Adjourn {RMZ}



Prepared by
Tulsa District Corps of Engineers

Subject: Minutes, Quarterly Restoration Advisory Board (RAB)
Meeting, Longhorn Army Ammunition Plant (LHAAP)

Location of Meeting: Caddo State Park Recreation Hall, Karnack, Texas

Date of Meeting: July 19, 2012, 6:30 – 08:30 PM

Meeting Participants:

LHAAP/BRAC: Rose M. Zeiler

USACE: John Lambert, Aaron Williams, Wendy Lanier

USAEC: Marilyn Plitnik

AECOM: Dave Wacker, Manish Joshi

TCEQ: Fay Duke

USEPA Region 6: Steve Tzhone, Terry Burton, Rich Mayer, Paul Torcoletti,
Janetta Coats, Barry Forsythe (USFWS Liason to EPA),
Kent Becher (USGS Liason to EPA)

RAB: **Present:** Paul Fortune, Carol Fortune, Judith Johnson, Ted Kurz,
Judy Van Deventer, Richard LeTourneau

Absent: Ken Burkhalter, Lee Guice, Robert Cargill, Charles
Dixon, Jim Lambright, Nigel Shivers, E.V. Wilson, Pickens
Winters

Public: Lee Thomas, William Techels, William Hatfield (Harrison Co.
Commissioner), Dawn Orsak (CLI - TAG), Bryan Hughes
(Texas House Representative)

An agenda for the RAB meeting was distributed prior to the meeting. Paul Fortune called the meeting to order.

Welcome – Rose Zeiler

Dave Wacker and Manish Joshi were introduced as the new contractors (AECOM) conducting environmental restoration at Longhorn. They were asked where they were located. They responded that they will perform the contract from offices in San Antonio, Dallas, Austin, and

Houston Texas. Ted Kurz asked what the deliverables are on the contract. Since AECOM had just received notice that stop work had been rescinded on Monday there was no time to put together a presentation. A discussion of deliverables will be included at the next meeting.

William Hatfield was introduced as the Harrison County Commissioner-elect. Bryan Hughes was introduced as the Texas State Representative-elect.

The previous RAB meeting minutes were distributed as handouts and the RAB was informed that if they had any revisions for the meeting minutes to submit comments for inclusion prior to uploading the minutes to the Administrative Record. Ted Kurz made a motion that the January 2012 minutes be approved and Judith Johnson seconded the motion. Rose Zeiler noted that in the future RAB minutes will be sent to RAB members for review so that approval can take place at the next meeting. Any comments or edits can be sent to Paul Fortune who will send them on to Army. Judy Vandeventer asked about previous meeting minutes. Rose Zeiler responded that they were available in the administrative record. Because the minutes for meetings held in 2011 were inadvertently not presented to the RAB for review, comments on the minutes will be accepted through the next RAB meeting. The 2011 meeting minutes will be emailed to the RAB for review.

Open Items – Rose Zeiler

Charter Approval Status

Rose informed the group that the RAB charter had been approved and the signed copies were emailed to the group and provided as handouts at the RAB.

Community Involvement Plan (CIP) Update Status

Rose informed the group that the Community Involvement Plan was being revised, not merely updated as previously indicated. Marilyn Plitnik with AEC reported that the funds to support new interviews and a revised CIP are in the works. It was determined that new interviews should be conducted since the last interviews were conducted in 2002. Steve Thzone stated that Janetta Coats with the EPA would also be involved in supporting the effort of updating the CIP.

Wooden Cover on way to Fire Station

Rose informed Paul Fortune that she would discuss the matter with him after the RAB meeting.

Contract Status - USACE

John Lambert informed the group that the stop work order on the new contract was rescinded on Monday and that the post-protest process was completed. AECOM was introduced as the new contractor. Ted Kurz asked about the length of the contract. AECOM responded that the contract covered 5.75 years.

April 2012 Minutes

The April 2012 minutes were provided as a handout and the minutes will be emailed to the RAB group again since the RAB members reported they did not receive the original email.

Groundwater Treatment Plant (GWTP) Update

Aaron Williams informed the group that Groundwater Treatment Plant operations halted on May 21st when a bearing on the scrubber blower shattered causing hot gases from the catalytic oxidation unit to enter the scrubber stack which resulted in warping of the stack. The Groundwater Treatment Plant had been operating in recirculation mode to keep the bacteria in the Fluidized Bed Reactor alive up until recently when the PLC programming went down. AECOM is assessing the GWTP status. An interim measure to allow untreated gas emissions from the air stripper is being considered to get the GWTP up and operational in the near-term while more permanent long-term solutions are reviewed. The Groundwater Treatment Plant has been down before for periods of weeks and months in the past.

Wendy Lanier presented historical information leading to the Interim Remedial Action (IRA) at LHAAP-18/24. The Army considers LHAAP-18/24 to be the most contaminated site at Longhorn. Wendy was involved in the Corp's initial design of the IRA. The GWTP was constructed in the 96/98 timeframe. Construction photos were shared in a binder at the meeting for those who were interested in seeing the level of effort that went into it. It was pointed out that the GWTP as part of the IRA has outlived its estimated life going on almost 10 years. The timeline from beginning operations at the Burning Ground to GWTP operations was presented. Details of operations at LHAAP 18/24 were presented including washing out of rocket motors at the Unlined Evaporation Pond and use of the Air Curtain Destructor and washout pads. Wendy explained why the IRA was implemented. From comparing the Methylene chloride (MEC) and Trichloroethylene (TCE) 1992 plumes to the 1993 plumes it was clear that the plume was migrating in the shallow groundwater. Wendy presented the findings to the Longhorn Installation Commander. The Commander subsequently requested funds to implement an IRA to remove source material at the site which include the highly contaminated soil and shallow groundwater. The Army provided the U.S. Army Corps of Engineers Tulsa District with \$15 million to begin the design/construction process to address the source material that was contributing to plume migration, ASAP. Wendy pointed out that the timeline from conceptual design of the IRA to construction and operation was extremely fast due to the Army's and regulator's commitment to working together by such means as agreeing to quick reviews and use of a Cost Plus Contract. Wendy discussed some of the technical aspects of the IRA (i.e. Interceptor Collection Trenches, use of an organic slurry (guar gum) to hold trenches open during construction, treatment of at least 30,000 cubic yards of contaminated soil in a low temperature thermal treatment plant and extracting and treating groundwater). A comparison of the 1993 sampling results to the 2009 sampling results at LHAAP-18/24 were displayed to show that the Interim Remedial Action has been effective controlling the MEC/TCE plume migration and bringing the concentrations in the shallow groundwater down significantly.

Perimeter Well/Surface Water Sampling (Creek) Results and Update

Aaron Williams informed the group that handouts for the recent creek sampling have been provided but that there is nothing new to report since the creeks were dry during the June sampling event.

Other DERP Environmental Restoration Update – Rose Zeiler -LHAAP-37 – Bioplug Demonstration Project

Rose informed the group that the demonstration consists of bioplug wells offset by 10 feet and inoculated with aerobic microbes, air and nutrients. Project will last 2 years. To date 81 out of

the 300 bioplugs have been installed. Plan to start operation in late August. Monitoring wells were sampled during the week to establish baseline.

Other Environmental Restoration Issues – Rose Zeiler, Steve Tzhone, Fay Duke -Four RODs

Army and Regulators re-iterated to the RAB that they are currently in dispute resolution over 8 issues arising from four RODs and 1 dispute over stipulated penalties. In the last month the Army and Regulators have come close to resolution on 7 issues. Based on those discussions, Army prepared redline RODs for regulator review. TCEQ comments have been received on the redline RODs addressing the 7 issues. EPA comments are pending. For the remaining issue regarding perchlorate cleanup concentration, Army and TCEQ disagree with EPA. The perchlorate issue will most likely go to the next level for resolution, the SEC, as will the stipulated penalties issue. Steve Tzhone explained that if the SEC cannot resolve the issue that it would then go to the EPA regional administrator for resolution. The Army and TCEQ would at that time have the opportunity to issue a written notice elevating the dispute to the Administrator in Washington D.C..The details for the dispute issues are included in the Administrative Record. Judy Vandeventer asked whether the Administrative Record could be accessed online. The answer was no, but that the CD was located at the Marshall Public Library for public access and that folks certainly could burn a CD from the one in the Marshall Public Library for their own copy. There followed some discussion about access to the Administrative Record CD.

EPA Sampling of MMRP Sites' wells

EPA informed the group that they were going to be sampling the 10 monitoring wells at the MMRP sites the week of August 13th.

EPA Research Project - Phytoforensics study update – Rich Mayer

Rich Mayer discussed the phytoforensics research effort conducted at Longhorn. The study included sampling of 200 trees throughout LHAAP-16, -17, and -18/24 including background trees and monitoring wells in and around the sites. One-third of the samples had TCE and perchlorate detections. This was the first time perchlorate had been analyzed for in a phytoforensics study. Rich displayed the grids for the sampling activities at the sites and provided a demonstration of how a tree coring is collected. Ted Kurz asked if there were any signs of stress to the trees. The answer was that there was no visual stress to the trees and it was added that trees have been used in studies to help remediate groundwater contamination.

Look Ahead at the Schedule

Presentation provided: Upcoming Field Work includes groundwater monitoring in September at LHAAP-18/24 and creek sampling quarterly.

New Items/Question and Answer

A member of the public asked why it is taking so long to cleanup, is it because the cleanup standards keep changing? Response was that sometimes standards change but that the reason for lengthy cleanup times was due to the nature of the contaminant and the media, with its lenses of clay which takes a long time to cleanup with current technology. The question was asked whether the site would be cleaned up during the life of one's grandchildren. The response was no for Site 18/24, but most likely yes for some of the smaller plumes, like Site

67. It was also pointed out that the lengthy cleanup being discussed was for groundwater and that soil cleanup is being done more quickly. The land will be available for refuge activities (e.g. bird watching) sooner.

Ted Kurz wanted to know whether funding would be available in 50 years. The response was that budgets are shrinking but the Army will get funding since it is a NPL site and there is a FFA. Each year Army prepares a 30-year environmental liability projection for the annual report to Congress. It was also pointed out that DERA funds are “fenced money” that is the funds must be used for environmental remediation.

The next RAB meeting was tentatively scheduled for October 18, 2012. The group had one objection to meeting at the Caddo State Park Recreation Hall for future meetings. Paul Fortune will discuss with other absent RAB members to reach a consensus on location for the next meeting. (Note: Immediately after adjournment, Judith announced that a decision was reached among the RAB members present that the next meeting will be held in the Karnack Community Center.)

A motion was made by Carol Fortune to adjourn and seconded by Ted Kurz.

Adjourn

July Meeting Attachments and Handouts:

- *Meeting Agenda*
- *Meeting Minutes from April meeting*
- *Surface Water Sampling Results*
- *Signed RAB Charter*
- *IRA Presentation*
- *Phytoforensics Presentation*
- *Look Ahead*

Acronyms

<i>CIP</i>	<i>Community Involvement Plan</i>
<i>DERP</i>	Defense Environment Response Program
FFA	Federal Facilities Agreement
<i>GWTP</i>	Groundwater Treatment Plant
IRA	Interim Remedial Action
<i>MMRP</i>	military munitions response program
<i>PBC</i>	Performance Based Contract
PLC	Programmable Logic Controller
<i>ROD</i>	Record of Decision
SEC	Senior Executive Committee
TCE	Trichlorethene
<i>USGS</i>	United States Geological Survey

LHAAP-04

Former Pilot Wastewater Treatment Plant

Site History

The Former Pilot Wastewater Treatment Plant at LHAAP-04 began industrial wastewater treatment operations in 1984 and historical operations resulted in environmental impacts to soil and groundwater. Demolition of the Former Pilot Wastewater Treatment Facility structures, tanks, and piping, and the disposal of associated wastes were completed in the summer of 1997 as part of Resource Conservation and Recovery Act (RCRA) closure of the plant. Numerous sampling events were conducted from 1993 through 2008 to identify contamination from past operations and its impact to soil. Soil contaminated with perchlorate and mercury was removed in 2009, eliminating the principle threat at the site.

Site Characteristics

LHAAP-04, the Former Pilot Wastewater Treatment Plant, is located in the central portion of LHAAP at the northwest corner of 6th and 60th Streets near the former fire station and covers approximately 0.5 acre. LHAAP-04 is surrounded by light duty roads. The LHAAP-04 site is situated on an outcrop of the Wilcox Group which generally consists of a few feet of residually derived soils overlying interbedded silts and clays. Based on the potentiometric surface map for LHAAP -04, the groundwater flow direction in the shallow saturated zone is to the northeast.

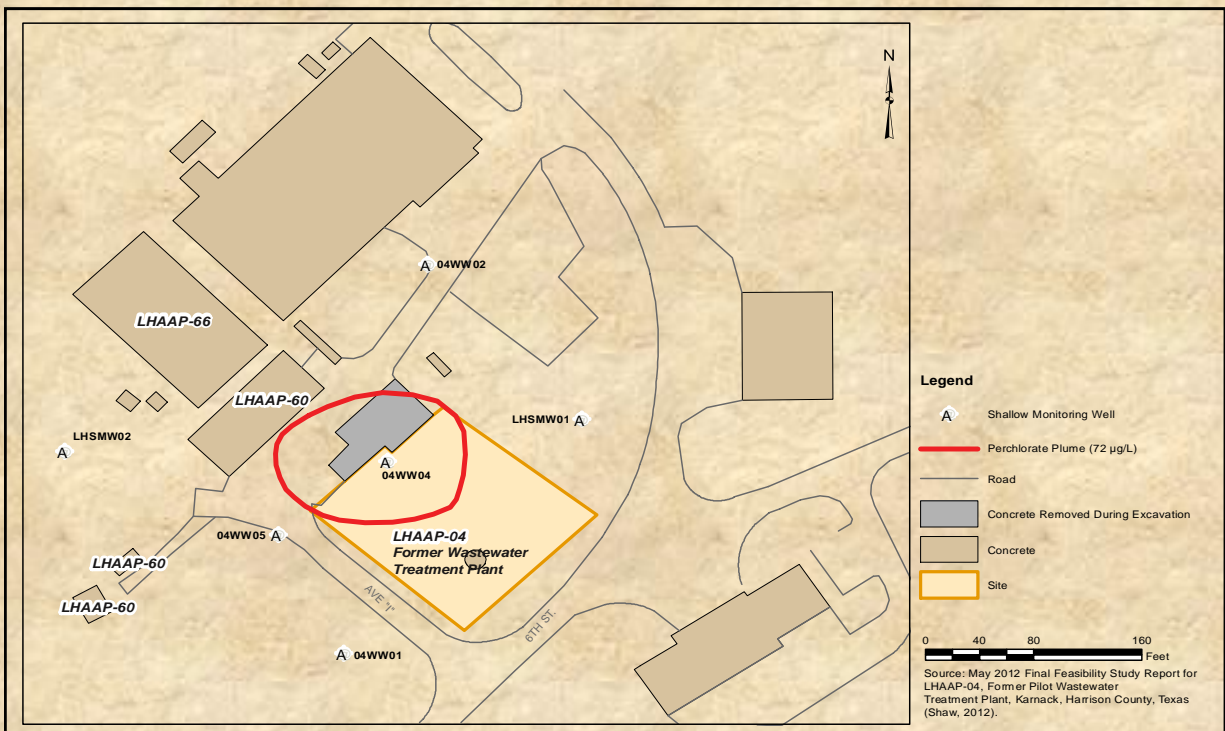
Risk Assessment

Baseline human health risk assessment (BHHRA) and baseline ecological risk assessment (BERA) studies were conducted for LHAAP-04 to determine current and future effects of contaminants on human health and the environment. Additional soil and groundwater data was collected and analyzed after completion of the risk assessments.

The baseline ecological risk assessment (BERA) concluded that no unacceptable risk was present in the Industrial Sub-Area of which LHAAP-04 is a part, and therefore, no further action is needed at LHAAP-04 for protection of ecological receptors (Shaw, 2007).

Soil samples collected after the BHHRA were observed to contain perchlorate and mercury concentrations posing unacceptable risk or hazards to human health. These soils with high perchlorate and mercury concentrations were removed and sent to an off-site landfill in 2009. Soil remaining after completion of the removal activity does not pose unacceptable risk or hazard to human health based on exposure pathway for a future maintenance worker in an industrial scenario.

Groundwater data collected after the risk assessment indicated that perchlorate concentrations in the groundwater exceed acceptable concentrations, so are presumed to pose an unacceptable risk to human health and require remediation.



Chemicals of Concern

Various sampling events were conducted at LHAAP-04 from 1993 through 2008 to assess contamination from past operations and its impact to the soil and/or groundwater. The chemical of concern (COC) for LHAAP-04 is perchlorate, which was found at concentrations exceeding acceptable levels in the shallow groundwater zone.

Remedial Alternatives for LHAAP-04

The RAOs for LHAAP-04, which address contamination associated with the media at the site and takes into account the future uses of LHAAP streams, land, and groundwater include:

- 1) Protect human health by preventing exposure to groundwater contaminated with perchlorate.
- 2) Protect human health and the environment by preventing groundwater contaminated with perchlorate from migrating into nearby surface water.
- 3) Return groundwater to its potential beneficial use, wherever practicable, within a reasonable time period given the particular site circumstances.

Alternative 1

No Action

Estimated Present Worth: \$0

Alternative 2

Monitored Natural Attenuation and Land Use Controls

Estimated Present Worth: \$565,000

Alternative 3

In-situ Bioremediation and Land Use Controls

Estimated Present Worth: \$638,000

Alternative 4

Groundwater Extraction, On-Site Treatment, and Land Use Controls

Estimated Present Worth: \$730,000

Alternative 5

Interceptor Collection Trenches, Groundwater Extraction and Treatment, Long-Term Operation and Land Use Controls
Estimated Present Worth: \$783,000

The five remedial alternatives will be evaluated using nine required criteria to select a remedy.

- 1) *Overall protection of human health and the environment*
- 2) *Compliance with ARARs*
- 3) *Long-term effectiveness and permanence*
- 4) *Reduction of toxicity, mobility, or volume through treatment*
- 5) *Short-term effectiveness*
- 6) *Implementability*
- 7) *Cost*
- 8) *State/support agency acceptance*
- 9) *Community acceptance*

LHAAP-47, PLANT AREA 3

SOLID ROCKET MOTOR FUEL PRODUCTION

Site History

LHAAP-47, historically known as Plant 3, is located in the north-central portion of the former Longhorn Army Ammunition Plant, covering an area of approximately 275 acres. Plant 3 produced rocket motors from 1954 until the early 1980s when operations were converted to produce pyrotechnic and illumination devices. Production activities continued through 1997. Industrial solid wastes and possibly hazardous wastes such as parts cleaners and spent solvents may have been generated by these activities. Fifty waste process sumps and three waste rack sumps were located within the LHAAP-47 site. The soil, groundwater, surface water, and sediment at the LHAAP-47 site have been the subject of numerous investigations to identify potential contamination. Jacobs Engineering conducted Phase I, Phase II, and Phase III remedial investigations in 1993, 1995, and 1998, respectively, and additional remedial investigations from 1996 through 2001. In 1999, the Army installed plastic liner material around Building 25-C over perchlorate-contaminated soils to prevent migration of perchlorate to Goose Prairie Creek.

Site Characteristics

The surface features at the LHAAP-47 site are a mixture of asphalt-paved roads, parking areas, remnants of building foundations, old buildings, and areas covered with dense vegetation. The topography in this area is relatively flat with surface water drainage flowing into tributaries of Goose Prairie Creek, which eventually enters Caddo Lake.

The soil at the LHAAP-47 site consists of layers of silty clay, underlain by silty sand to clayey sand. Below this are rocks of the Wilcox Group, generally consisting of interbedded silts and clays.

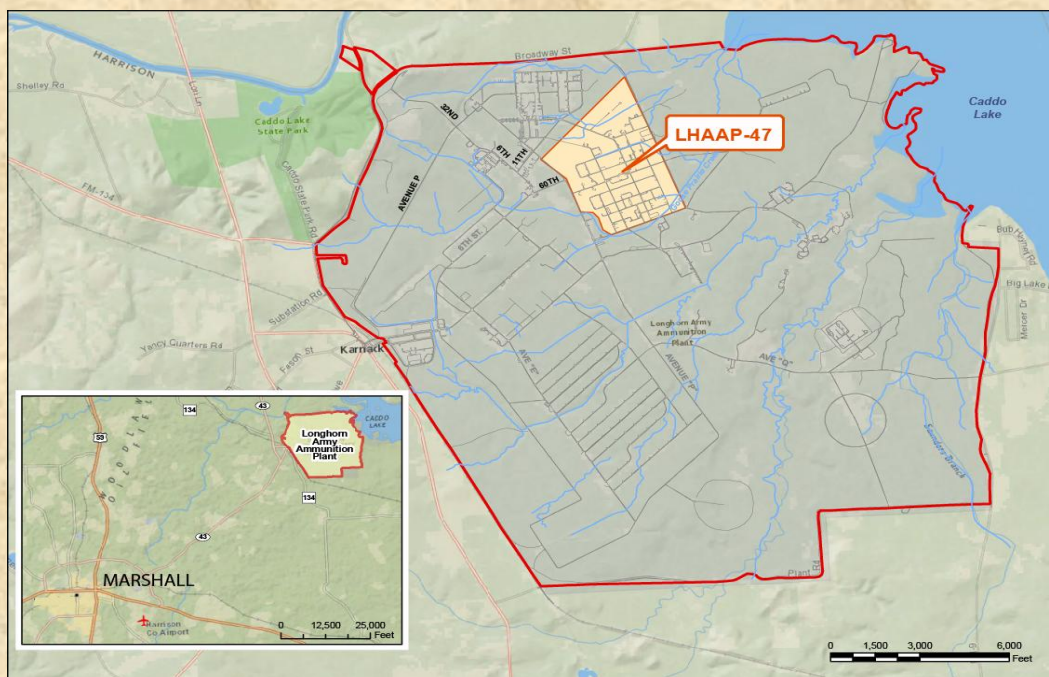
Groundwater at the site is divided into four zones: shallow, shallow/intermediate, intermediate and deep. The shallow and intermediate groundwater zones are interconnected over much of the site except in the east-central portion of the site where they are separated by a clay layer. The groundwater flow direction in the shallow and intermediate saturated zones is to the northeast, with groundwater in the deep zone flowing to the north-northeast.

Risk Assessment

Baseline human health risk assessment (BHHRA) and screening level ecological risk assessment (SLERA) studies were conducted for LHAAP-47 in 2003 to determine current and future effects of contaminants on human health and the environment and determine whether further ecological risk assessment was needed. In 2007, a baseline ecological risk assessment (BERA) was conducted to further assess potential risks to the environment.

The BERA concluded contaminant levels at the site posed no unacceptable ecological risk. The BHHRA concluded the concentrations of contaminants in soil at the site did not pose a cancer risk or non-cancer hazard to the hypothetical future maintenance worker under an industrial scenario. However, groundwater posed unacceptable cancer risk and non-cancer hazard, requiring remediation for the protection of the hypothetical future maintenance worker.

Surface water impacts resulting from leaching of perchlorate-contaminated soils were addressed in 1999 with a temporary measure where plastic liner was installed over perchlorate-contaminated soils at Building 25-C, to prevent leaching of perchlorate.



Chemicals of Concern

Investigations conducted at LHAAP-47 have identified perchlorate in soil near Building 25C as a potential source for groundwater perchlorate contamination. Chemicals of concern (COCs) identified in shallow, shallow/intermediate, and intermediate groundwater zones include perchlorate, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and 2,4,6-trinitrotoluene (TNT).

Remedial Alternatives for LHAAP-47

The RAOs for LHAAP-47, which address contamination associated with the media at the site and takes into account the future uses of LHAAP streams, land, and groundwater include:

- 1) Protection of human health by preventing human exposure to the contaminated groundwater.
- 2) Protection of human health by preventing further potential degradation of groundwater and surface water.
- 3) Protection of human health by preventing degradation of surface water from groundwater contaminated with COCs.
- 4) Return of groundwater to its potential beneficial use as drinking water, wherever practicable.

Alternative 1

No Action

Estimated Present Worth:
\$0

Alternative 2

Excavation, In-situ
Bioremediation,
Monitored Natural
Attenuation and Land Use
Controls

Estimated Present Worth:
\$5.09 million

Alternative 3

Excavation, Recirculating
Bioremediation,
Monitored Natural
Attenuation and Land Use
Controls

Estimated Present Worth:
\$7.62 million

Alternative 4

Excavation,
Groundwater Pump and
Treat, In-situ
Bioremediation,
Monitored Natural
Attenuation, and Land
Use Controls

Estimated Present
Worth:
\$7.90 million

The four remedial alternatives will be evaluated using nine required criteria to select a remedy.

- 1) *Overall protection of human health and the environment*
- 2) *Compliance with ARARs*
- 3) *Long-term effectiveness and permanence*
- 4) *Reduction of toxicity, mobility, or volume through treatment*
- 5) *Short-term effectiveness*
- 6) *Implementability*
- 7) *Cost*
- 8) *State/support agency acceptance*
- 9) *Community acceptance*