



**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 23, 2019, 6:00 PM Central Daylight Time (CDT)

Meeting Participants:

Army BRAC: Rose M. Zeiler
USACE: Aaron Williams
USAEC: Amanda Sherman and Troy Darr
Bhate: Kim Nemmers
APTIM: Bill Foss
USEPA Region 6: Rich Mayer, Dorelle Harrison, and Kent Becher (KB)-USGS Liaison
TCEQ: April Palmie
RAB: Present: Judy VanDeventer, Deon Hall, John Fortune, Charles Dixon,
Richard LeTourneau, and Sharron McAvoy
Absent: Nigel R. Shivers, Carol Fortune; Terry Britt; John Pollard, Jr.; Tom Walker
Public: Laura-Ashley Overdyke (Executive Director of the Caddo Lake Institute [CLI])

An agenda for the RAB meeting, a color copy of the Bhate Environmental Associates, Inc. (Bhate) slide presentation, and handouts (see list at end of meeting minutes) were provided for meeting attendees.

Welcome and Introduction

Ms. Rose Zeiler, RAB Installation Co-Chair, called the RAB meeting to order at 6:05 pm CDT. Ms. Zeiler welcomed everyone and asked if there was anyone present that had not attended before. Mr. Troy Darr stated that he was from the U.S. Army Environmental Command (USAEC) Public Affairs office and that he is in training to support environmental restoration. Mr. Darr stated that he also came to assist a person from the University of North Texas (UNT) in case he was at the meeting to shoot some video. However, the person from UNT was not at the meeting.

Ms. Zeiler explained the RAB meets every 3 months and that the purpose is to promote community awareness and obtain constructive community review and comments on environmental restoration activities. Ms. Zeiler stated that the Army is committed to protecting human health and the environment. Ms. Zeiler stated the importance of engaging the community and increasing public participation in the RAB. Ms. Zeiler explained that the RAB is expected to inform the community and hear the concerns. Ms. Zeiler asked if anyone had heard from John Pollard, one of the RAB members, who had not attended a meeting in the past year. Ms. Zeiler stated that she probably needed to send him a letter to find out if he was still interested in being on the board. Ms. Zeiler stated to let her know if anyone knew of someone interested in being on the RAB board also.



Ms. Zeiler stated that Paul Fortune had stepped down as RAB co-chair and the RAB needed to select a new co-chair. Ms. Zeiler then handed out sheets of paper with the names of each of the RAB members. Ms. Zeiler asked the RAB members present to select their 1st and 2nd choices for RAB co-chair and then hand them to Mr. Aaron Williams for tally. Ms. Zeiler explained the role of the new co-chair is speak for the RAB, generally starts the meeting and coordinate opinions from RAB members. Ms. Zeiler stated that concerns or issues by the public or other RAB members (e.g. frequency of RAB meeting) should be brought to the RAB co-chair.

Defense Environmental Restoration

Ms. Kim Nemmers stated that the RAB meeting slides were available along with handouts for the groundwater treatment plant (GWTP) and surface water samples. Ms. Nemmers pointed out that the slide packet contains a map of the installation sites along with a list of abbreviations and acronyms for reference.

LHAAP-50

Mr. Bill Foss presented LHAAP-50 and explained that the site is a small site south of LHAAP-47. Mr. Foss explained the site history for LHAAP-50, including that a remedy has been in place since the Record of Decision (ROD) was signed in 2010. Mr. Foss stated that the remedy has been monitored since that time. Mr. Foss explained that the site had a 47,000 gallon aboveground storage tank that received industrial waste water from sumps throughout LHAAP from the 1950s through the late 1980s. Mr. Foss stated that the constituents of concern were chlorinated solvents and perchlorate in groundwater and perchlorate in soil. Mr. Foss indicated that the remedy selected was monitored natural attenuation (MNA) for the groundwater, excavation of soil contamination that could leach into the groundwater, and land use controls (LUCs). The ROD also had a contingency remedy of enhanced in-situ bioremediation (EISB) if the MNA was not effective.

Mr. Foss explained that MNA was found to be ineffective based upon lines of evidence (in a process developed by the U.S. Environmental Protection Agency [USEPA]) in 2018 following years of groundwater monitoring. Mr. Foss explained that the concentrations of trichloroethylene (TCE) and perchlorate increased from 2013 to 2018. Based upon these increasing concentrations and other lines of evidence, Mr. Foss explained that the Army, Texas Commission on Environmental Quality (TCEQ), and USEPA agreed that the contingency remedy was needed to address the site plumes. Mr. Foss stated that initiation of the contingency remedy was documented in the Explanation of Significant Differences (ESD), which was co-signed by the USEPA and received concurrence from TCEQ.

Mr. Foss explained that, due to the expansion of the plume, an additional well was installed in July 2019. Mr. Foss stated that the groundwater collected from the new monitoring well did not have TCE or perchlorate above the screening levels such that the plume extent is now smaller than previously depicted. Mr. Foss stated that the Remedial Action Work Plan (RAWP) is being prepared to implement the contingency remedy. Mr. Foss stated that the remedy planned is injection of emulsified vegetable oil (EVO) along with microbial culture to enhance the degradation process of TCE and perchlorate. Mr. Foss stated that the goal is to treat the most



impacted portions of the plume. Mr. Foss stated that the implementation is planned for later 2019 or early 2020 depending on the time to get the RAWP approved by the USEPA and TCEQ.

Overview of Sites

Ms. Nemmers discussed the field work completed the previous 3 months. She explained that the area had received a large amount of rainfall for an extended period of time and that this has delayed implementation of several remedies until the past 3 months. Ms. Nemmers stated that remedies are being implemented at LHAAP-03, -04, -16, and -17. Ms. Nemmers stated that bioremediation approaches, similar to what Mr. Foss presented for LHAAP-50, were being implemented at LHAAP-04 and LHAAP-16. Ms. Nemmers stated that soil excavation was being completed at LHAAP-03 and LHAAP-17. Ms. Nemmers stated that monitoring of the selected remedy has occurred at LHAAP-37, LHAAP-58, and LHAAP-18/24. Ms. Nemmers stated that new monitoring wells were installed at LHAAP-12, -16, -50, and -67 to confirm delineation of the site plumes. Ms. Nemmers stated that the extraction system, installed at LHAAP-18/24, has double-walled piping to transfer the extracted groundwater to the treatment plant. Based upon observed leaks, replacement of portions of this double-walled piping has been completed.

LHAAP-16

For LHAAP-16, Mr. Foss explained the site has perchlorate and TCE impacted groundwater similar to LHAAP-50, which he presented earlier. Mr. Foss then pointed out the location of the site. Mr. Foss explained that the plume emanates from a former landfill towards the bayou. Mr. Foss explained that the site had an extraction system for the plume. When LHAAP lost power in late December 2018, the outage continued into late August 2019 and the extraction system did not operate. Mr. Foss explained that when power was restored in August, the extraction system was operated for a couple of weeks and then the sampling was completed in September 2019 to confirm the October 2018 baseline results. Mr. Foss explained that two monitoring wells were installed on the east side of the Harrison Bayou at the beginning of August 2019. Ms. Zeiler stated that the installation of these wells was difficult and took a long time to get proper conditions for installation. Ms. Zeiler said that these wells were necessary to evaluate the performance of the remedy being implemented and determine if there was TCE across the Bayou in the groundwater.

Mr. Foss stated that injections have started at the site. Mr. Foss explained that the injections started with the Bayou Biobarrier, pointing out the location of this area on slide 13. Mr. Foss also pointed out the two new wells installed on slide 13 (16WW57 and 16WW58). Mr. Foss stated that these wells allow for evaluation of the plume along the downgradient edge. Mr. Foss explained that the area in yellow includes injection of EVO in a grid pattern using direct push technology (DPT) with recirculation to treat this area of elevated perchlorate and TCE. Mr. Foss explained that Biobarriers 1 and 3 have also used DPT for delivery of the EVO. Mr. Foss explained that Biobarrier 2 does not require DPT so the DPT rig has moved over to LHAAP-04. Mr. Richard LeTourneau asked if this site will respond better than others. Mr. Foss stated that everything went in well but the first round of groundwater monitoring, completed after all the injections are done, will help assess the performance. Ms. Laura-Ashley Overdyke asked about the data from the new wells. Mr. Foss stated that the groundwater results from the new wells will be presented in the Remedial Action Completion Report (RACR) that will be produced in 2020. Ms. Zeiler stated



that the groundwater results show that the TCE plume crosses the bayou and will be used to evaluate the effectiveness of the injections. Ms. Zeiler stated that surface water sampling will continue and that contamination is not being observed downgradient of the site. Ms. Zeiler pointed out that the field team is checking for injectate in the bayou which could be observed as a white milky material and could take away oxygen in surface water. Ms. Nemmers pointed out that the initial groundwater sampling results may not be representative of whether the site responds well because often it takes a year to observe microbial growth resulting in reduction of the TCE and perchlorate. Ms. Zeiler pointed out that the yellow area, shown on Slide 13 for LHAAP-16, is where the extraction system was located, which is now turned off, and that the area is a treatment area and not a barrier. High concentrations of TCE are found in the area in both the shallow and intermediate zone groundwater. Ms. Zeiler explained that a grid of injections is used in the shallow zone of the ISB treatment area to treat the contamination and existing extraction wells are used in the intermediate zone to recirculate injectate to get as much contact as possible with the TCE contamination in that zone. Ms. Zeiler pointed out that with the landfill being the source of the plume, additional injections will likely be needed in the future along the landfill biobarriers.

LHAAP-17

Mr. Foss explained that LHAAP-17 is located across the Bayou and southeast of LHAAP-16. Mr. Foss stated that LHAAP-17 was a burning ground and flashing site. Mr. Foss explained that the site was excavated beginning in August 2019 for explosives in the soil and that approximately 5,300 cubic yards of soil was expected to be removed. However, munition items were found during the excavation, which was unanticipated. The Army provided Ordnance and Explosives Safety Specialist (OESS) support. Mr. Foss stated that the initial rounds found were not live so the excavation continued under OESS supervision. Mr. Foss stated that the excavation was nearly completed but then additional munitions debris and munitions and explosives of concern (MEC) were found. Therefore, work has been stopped to be able to provide additional ordnance support and ensure safety of intrusive activities. Mr. Foss explained that as a safety measure the currently excavated areas will be backfilled in early November 2019.

Mr. Foss explained that the second part of the remedy involves the installation of a groundwater extraction system to treat perchlorate in groundwater. Mr. Foss stated that placement of that system will be above ground to avoid intrusive activities. Mr. Foss explained that this will allow the remedy to move forward. Ms. Judy VanDeventer asked if the remaining excavation will be done under this contract. Ms. Zeiler stated that the work will be under a separate contract. Mr. Foss stated that a report will be prepared to document the excavation and backfilling work completed at the site to date to support the scoping of follow-on excavation work. Ms. Nemmers pointed out that the dashed lines on slide 16 show the extent of the excavation. Ms. Nemmers stated that over excavation was necessary for some sidewalls as shown by dashed lines that move away from the planned excavation and that most of the planned excavation was completed.

Look Ahead

Ms. Nemmers then discussed the 3 month look ahead for LHAAP field work. Ms. Nemmers stated that the documents in the coming months include annual Remedial Action Operations [RA(O)]



Reports that document the progress of the remedies implemented. Ms. Nemmers stated that the RAWP for the injections at LHAAP-50 is going through the review process as previously discussed. Ms. Nemmers stated that the quarterly evaluation reports for the GWTP are in process for the second and third quarter of 2019.

Ms. Nemmers stated that the field work look ahead includes the four sites discussed throughout the meeting. Ms. Nemmers stated that LHAAP-03 is a small site with arsenic and lead in the soil that requires a little additional excavation based upon the soil sample results and then backfilling. Ms. Nemmers stated that LHAAP-17 field work will hopefully include installation of the extraction system in addition to backfilling the excavation. Ms. Nemmers stated that the injections will be completed at LHAAP-04 and LHAAP-16 in the coming weeks and then the sites will enter the performance monitoring phase. Ms. Nemmers stated that the other sites listed on slide 18 are the sites with remedies in place that have on-going RA(O) sampling. Ms. Zeiler reminded everyone that the field schedules are posted on the website and encouraged everyone to check for this information. Ms. Nemmers pointed out that the look ahead for documents is the same list that are currently being completed because the documents take time to get reviewed and approved. Ms. Zeiler pointed out that the Contingency RAWP is the document for the injection field work at LHAAP-50, discussed early on in the meeting.

Groundwater Treatment Plant

Ms. Nemmers stated that there were handouts with the information on the slides for the GWTP that provide more details. Ms. Nemmers pointed out that the chart depicts discharge of treated water that includes water from the INF Pond so the peaks and valleys of the chart indicate discharge to the Bayou from both the GWTP and the INF Pond if able. Ms. Nemmers explained that when the Bayou is not flowing that the treated groundwater is discharged to the INF Pond. Ms. Nemmers also stated that more water can be extracted from the ground when there is more precipitation. Mr. Charles Dixon asked if the purpose of discharging in this way was to keep the minerals low. Ms. Zeiler stated that chloride and sulfate is tested prior to discharge to the Bayou.

Surface Water Sampling

Ms. Nemmers presented the five locations sampled for surface water. Ms. Nemmers stated that surface water samples are collected on a quarterly basis when the Bayou is flowing. Ms. Nemmers explained that one of the surface water samples exceeded the screening criteria of 17 parts per billion (ppb) for perchlorate. Ms. Nemmers stated that the surface water location was resampled a couple of weeks later. Ms. Nemmers stated that the result from the resample was 1.2 J ppb, with J meaning that the result was estimated. Ms. Nemmers explained that the detection limit is typically 2 ppb and so the detection was seen by the laboratory but below the detection limit. Ms. Nemmers stated that the location of the surface water sample was the furthest downgradient sample location but has historically had detections of perchlorate. Ms. Nemmers stated that LHAAP-18/24 was sampled in this same time period and that monitoring wells upgradient of this surface water sample did not have detections of perchlorate. Ms. Nemmers stated that the surface water will be sampled in the fourth quarter but has not been sampled in October 2019 to date due to lack of surface water flow. Ms. Zeiler pointed out that the screening criteria is the groundwater drinking level. Ms. Nemmers stated that this



information is also provided in a handout.

LHAAP-18/24, LHAAP-29, and LHAAP-47

Mr. Williams explained that HDR, Inc., has a separate contract for sites that do not have a ROD and is responsible for selection of the final remedy at three sites (LHAAP-18/24, LHAAP-29, and LHAAP-47). Mr. Williams explained that the LHAAP-18/24 ROD is being reviewed by the regulators and that comments are expected later in October 2019. Mr. Williams hoped that the ROD could be signed in late 2019.

Mr. Williams stated that the Final ROD for LHAAP-29 was signed and is on compact disc (CD) at the Marshall Public Library. On October 13, 2019, Mr. Williams stated that the notice that the final ROD was available for review was put into the Marshall News Messenger and the Shreveport Times.

Mr. Williams stated that LHAAP-47 had old data so additional data was obtained. A new well installed had an elevated detection of TCE such that the remedy selected would not be effective at those high levels. Currently, Work Plan Addendum 2 is being completed. The additional investigation planned will focus on the area around monitoring well 47MW25R. Monitoring well 47MW25R had TCE detected at 120,000 ppb. Mr. Williams explained the field work planned included both soil and groundwater samples.

Ms. Overdyke asked if LHAAP-17 excavation could have contributed to the perchlorate detected in HBW-7. Ms. Zeiler stated that the excavation commenced after the surface water sampling was completed. Ms. Zeiler stated that groundwater results and water levels were evaluated but no reason for the detection could be identified. Ms. Zeiler pointed out that implementation of the remedies such as at LHAAP-18/24 makes the Army feel better about the overall progress at this site.

Next RAB Meeting Schedule and Closing Remarks

Ms. Zeiler then discussed the next meeting with the RAB members. It was decided that the next RAB Meeting will be held on **January 16, 2020**, with the **meeting starting at 6:00 pm Central Standard Time (CST)** at the Karnack Community Center.

Ms. Zeiler announced that Ms. VanDeventer was selected as the new co-chair. Ms. VanDeventer accepted the position. Mr. Kent Becher mentioned that Mr. Rich Mayer was retiring. Mr. Mayer said that he had been at the USEPA since January 1987 and will be retiring on December 31, 2019. Mr. Mayer stated that he's been with the EPA since January 1987. Mr. Mayer said that he had been reviewing documents, like those for LHAAP, for 33 years. Mr. Mayer said that he'd enjoyed working with the RAB and that a replacement had not yet been selected for him by the EPA.

Adjourn

Ms. VanDeventer made the motion to adjourn and Mr. Dixon seconded the motion. The meeting adjourned at 6:55 pm CDT.



October 2019 Meeting Attachments and Handouts:

- Color Copy of Bhate Presentation Slides
- GWTP – Processed Groundwater Volumes Handout
- Surface Water Sampling Handout