

**FINAL  
EXPLANATION OF SIGNIFICANT DIFFERENCES  
RECORD OF DECISION (ROD) FOR WESTERN PLUME  
CONTINGENCY REMEDY AT LHAAP-35A(58),  
SHOPS AREA,  
LONGHORN ARMY AMMUNITION PLANT  
KARNACK, TEXAS**

**March 2018**

**Contract Number: W9128F-13-D-0012  
Task Order Number: W912BV17F0150**

**Performance Based Remediation (PBR)  
Longhorn Army Ammunition Plant  
Karnack, Texas**

*Prepared For:*



**Longhorn Army Ammunition Plant  
Karnack, Texas**

*Under Contract To:*



**U.S. Army Corps of Engineers  
Tulsa District  
Tulsa, Oklahoma**

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DEPARTMENT OF THE ARMY  
LONGHORN ARMY AMMUNITION PLANT  
POST OFFICE BOX 220  
RATCLIFF, AR 72951

April 26, 2018

DAIM-ODB-LO

Mr. Rich Mayer  
US Environmental Protection Agency  
Federal Facilities Section R6  
1445 Ross Avenue  
Dallas, TX 75202-2733

Re: Final Explanation of Significant Differences Record of Decision (ROD) for Western  
Plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Army Ammunition Plant, Karnack, Texas, March 2018

Dear Mr. Mayer,

The above-referenced document which includes the completed signature page is being transmitted for your records. The document was prepared by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility.

The point of contact for this action is the undersigned. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at [rose.m.zeiler.civ@mail.mil](mailto:rose.m.zeiler.civ@mail.mil).

Sincerely,

A handwritten signature in cursive script that reads "Rose M. Zeiler".

Rose M. Zeiler, Ph.D.  
Longhorn AAP Site Manager

Copies furnished:

A. Palmie, TCEQ, Austin, TX  
P. Bruckwicki, Caddo Lake NWR, TX  
R. Smith, USACE, Tulsa District, OK  
A. Williams, USACE, Tulsa District, OK  
N. Smith, USAEC, San Antonio, TX  
K. Nemmers, Bhate, Lakewood, CO (for project files)



DEPARTMENT OF THE ARMY  
LONGHORN ARMY AMMUNITION PLANT  
POST OFFICE BOX 220  
RATCLIFF, AR 72951

April 26, 2018

DAIM-ODB-LO

Ms. April Palmie  
Texas Commission on Environmental Quality Superfund Section, MC-136  
12100 Park 35 Circle, Bldg D  
Austin, TX 78753

Re: Final Explanation of Significant Differences Record of Decision (ROD) for Western  
Plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Army Ammunition Plant, Karnack, Texas, March 2018

Dear Ms. Palmie,

The above-referenced document which includes the completed signature page is being transmitted for your records. The document was prepared by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility.

The point of contact for this action is the undersigned. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at [rose.m.zeiler.civ@mail.mil](mailto:rose.m.zeiler.civ@mail.mil).

Sincerely,

A handwritten signature in cursive script that reads "Rose M. Zeiler".

Rose M. Zeiler, Ph.D.  
Longhorn AAP Site Manager

Copies furnished:

R. Mayer, USEPA Region 6, Dallas, TX  
P. Bruckwicki, Caddo Lake NWR, TX  
R. Smith, USACE, Tulsa District, OK  
A. Williams, USACE, Tulsa District, OK  
N. Smith, USAEC, San Antonio, TX  
K. Nemmers, Bhate, Lakewood, CO (for project files)

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Jon Niermann, *Commissioner*  
Stephanie Bergeron Perdue, *Interim Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

April 23, 2018

Mr. Thomas E. Lederle  
Chief, ACSIM BRAC Division  
2530 Crystal Drive, Room 5000  
Taylor Bldg./NC3  
Arlington, VA 22202

Re: Explanation of Significant Differences Record of Decision for Western Plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Army Ammunition Plant Federal Superfund Site TX6213820529  
Karnack, Harrison County, Texas

Dear Mr. Lederle:

The Texas Commission on Environmental Quality (TCEQ) received the final Explanation of Significant Differences Record of Decision (ROD) for Western Plume Contingency Remedy at LHAAP-35A(58), Shops Area, Longhorn Army Ammunition Plant Federal Superfund Site in Karnack, Texas on March 29, 2018. The TCEQ has completed the review of the above referenced document and concurs that the described action is appropriate.

Sincerely,

A handwritten signature in cursive script that reads "Beth Seaton".

Beth Seaton, Director  
Remediation Division

BS/AP/ms

cc: Carl Edlund, P.E., Director, Superfund Division, US Environmental Protection Agency,  
Region 6

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Attachment 1: Response to Comments

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## ACRONYMS AND ABBREVIATIONS

| §         | Section   |
|-----------|---|
| ARAR      | Applicable or Relevant and Appropriate Requirement                    |
| CERCLA    | Comprehensive Environmental Response, Compensation, and Liability Act |
| C.F.R.    | Code of Federal Regulations   |
| COC       | Chemical of Concern   |
| DCE       | Dichloroethylene  |
| ESD       | Explanation of Significant Differences                                |
| LHAAP     | Longhorn Army Ammunition Plant  |
| LTM       | Long-Term Monitoring  |
| LUC       | Land Use Control  |
| µg/L      | micrograms per liter  |
| MNA       | Monitored Natural Attenuation   |
| NCP       | National Oil and Hazardous Substances Pollution Contingency Plan      |
| NPL       | National Priorities List  |
| RAO       | Remedial Action Objectives  |
| RD        | Remedial Design   |
| ROD       | Record of Decision  |
| TCE       | Trichloroethylene   |
| TCEQ      | Texas Commission on Environmental Quality                             |
| TNRCC     | Texas Natural Resources Conservation Commission                       |
| U.S. Army | U.S. Department of the Army   |
| UEP       | Unlined Evaporation Pond  |
| U.S.C.    | United States Code  |
| USEPA     | United States Environmental Protection Agency                         |
| VC        | Vinyl Chloride  |
| VOC       | Volatile Organic Compound   |



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# 1 INTRODUCTION AND STATEMENT OF PURPOSE

**Site and Location:** Longhorn Army Ammunition Plant (LHAAP)-35A(58) is an industrial paved area consisting of 11 acres in the north-central section of LHAAP.

**Lead Agency and Supporting Agency:**

Lead Agency – United States Department of the Army (U.S. Army)

Lead Oversight Agency United States Environmental Protection Agency Region 6 (USEPA)

Support Agency – Texas Commission on Environmental Quality

This ESD is in Compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §117 (c), 42 United States Code (U.S.C.) Section (§) 9617 (c) and National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 Code of Federal Regulations (C.F.R.) §300.435(c)(2)(i).

**Date of Record of Decision (ROD) Signature:** September 2010, Administrative Record, Bates Stamp 00098704-00098797

**Need for Explanation of Significant Differences (ESD):** The September 2010 ROD (Shaw, 2010), Section 1.4, specified the implementation of monitored natural attenuation (MNA) as the selected remedy for the western plume to verify that the trichloroethylene (TCE) plume is stable and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The ROD also specified that performance objectives will be evaluated after 2 years of monitoring and if MNA is found to be ineffective, a contingency remedy of in situ bioremediation to enhance MNA will be implemented and documented in an ESD.

The 2<sup>nd</sup> Annual Remedial Action Operation Report for LHAAP-35A(58) (AECOM, 2016) evaluated the performance of MNA for the western plume. The report presented evidence of plume migration, increasing chemical of concern (COC) trends and geochemical conditions that are not optimal for MNA and recommended that the contingency remedy (in situ bioremediation) be implemented at this time to enhance MNA in the western plume.

The purpose of this ESD is to document the significant change from the ROD selected remedy of MNA to implementation of the contingency remedy. The contingency remedy is consistent with the ROD requirement to enhance MNA, if necessary, and involves in situ bioremediation.

This ESD will become part of the Administrative Record file in accordance with NCP 40 C.F.R §300.825(a)(2). The file will be located at the Marshall Public Library:

Marshall Public Library  
300 South Alamo Blvd.  
Marshall, TX 75670

Phone: 903.935.4465

Hours:

Monday, Tuesday, and Thursday 9:30AM-7:30PM

Wednesday and Friday 9:30AM-5:30PM

Saturday 9:30AM-3:30PM

## **2 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY**

### **2.1 Site History and Contamination**

LHAAP-35A(58), the Shops Area, was established in 1942 as part of the installation's initial construction. Plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical shops served the needs of the overall facility. The site was active throughout LHAAP's mission and became inactive in 1996-1997, along with the entire installation.

Concentrations of solvents (volatile organic compounds [VOCs]), primarily 1,1-dichloroethene, cis-1,2-dichloroethene, trichloroethylene, and vinyl chloride have been detected within the uppermost water-bearing zone at the site. The concentrations of 1,1-dichloroethene as of October 2015, ranged from approximately 3,630 micrograms per liter ( $\mu\text{g/L}$ ), near the center of the plume, to 14.7  $\mu\text{g/L}$ , near the southern and eastern edges of the plume. The concentration of trichloroethylene, as of October 2015, ranged from approximately 582  $\mu\text{g/L}$  near the center of the plume, to less than 0.5  $\mu\text{g/L}$  near the eastern edge of the plume. LHAAP was placed on the National Priorities List (NPL) on August 9, 1990. A Federal Facilities Agreement became effective December 30, 1991, among U.S. Environmental Protection Agency (USEPA), the U.S. Army, and the former Texas Natural Resources Conservation Commission (TNRCC), now the Texas Commission on Environmental Quality (TCEQ). LHAAP-58 was not one of the originally listed NPL sites; however, it is being managed in the same manner because of the presence of contaminated groundwater under the site. The site has been added to the list of NPL sites at LHAAP with concurrence from the U.S. Army and USEPA Headquarters.

### **2.2 Selected Remedy**

The selected remedy, identified as Alternative 4 in Section 2.12 of the ROD, included in situ bioremediation followed by MNA and land use control (LUC) for the eastern plume and MNA and LUC for the western plume. This alternative was selected because it was consistent with the intended future use of the site as a wildlife refuge. The alternative also satisfied the Remedial Action Objectives (RAOs) for the site through LUC groundwater restriction, which would ensure protection of human health by preventing human exposure to contaminated groundwater and MNA and in situ bioremediation, which would return the contaminated water to its potential beneficial use, wherever practicable. Furthermore, Long-Term Monitoring (LTM) would assure that human health and the environment are being protected by verifying that contaminated groundwater does not migrate into nearby surface water bodies at levels that exceed maximum contaminant levels (MCLs). This alternative offered a high degree of long-term effectiveness that could be easily implemented at a lower cost than other alternatives.

The following discussion is taken from Section 2.12.2, Description of the Selected Remedy, of the ROD for the western plume groundwater remedy:

*MNA to return groundwater to its potential beneficial use, wherever practicable.*

Historic data suggests that natural attenuation of COCs is occurring at the site; however, additional data collection is necessary to fully evaluate natural attenuation. Monitoring wells will be sampled for eight consecutive quarters to evaluate and confirm the occurrence of natural attenuation in conjunction with historical data. Data from the eight quarterly events will be combined with historic data to evaluate the effectiveness of various natural physical, chemical, and biological processes in reducing contaminant concentrations.

– *Performance objectives to evaluate the MNA remedy performance after two years.* During the Remedial Design prior to implementing the remedy, the specific evaluation criteria will be developed. However, each of the general performance objectives must be met as indicated below. If the criteria are not met to illustrate that MNA is an effective remedy, a contingency action would be initiated. If MNA is effective, a baseline will be established from the data to this point in time. The MNA evaluation will be based on the USEPA lines of evidence (USEPA, 1999) and the anaerobic screening (USEPA, 1998) as follows:

– MNA potential based on evaluating biodegradation screening scores using USEPA guidance

– Plume stability (i.e., the plume concentrations are decreasing in the majority of performance wells, and the plume is not expanding in area as demonstrated with compliance wells)

– MNA Process Evaluation demonstrated based on an attenuation rate calculated with empirical performance monitoring data and MNA Process Demonstration based on the presence of daughter products and bacterial culture counts

– *A contingency remedy to enhance MNA to reach the RAOs if MNA is found to be ineffective.* The contingency remedy will use elements from the active remedial alternative included in this ROD to address the ineffective aspects of MNA. The area and the elements of the contingency remedy would be selected based on the entire data set available. If a contingency remedy is implemented, it will be documented in an ESD.

### **3 BASIS FOR THE DOCUMENT**

The September 2010 ROD (Shaw, 2010), Section 2.12.2, Western plume, contingency remedy component states that if a contingency remedy is implemented, it will be documented in an ESD. The 2<sup>nd</sup> Annual Remedial Action Operation Report for LHAAP-35A(58) (AECOM, 2016) presented evidence of plume migration, increasing COC trends and geochemical conditions that are not optimal for MNA in the western plume. The concentrations of COCs in in-plume, downgradient well LHSMW07 has increased significantly. The increase in concentration of all the COCs in LHSMW07 indicates likely migration of COCs from the upgradient area of 35AWW20 to the area of LHSMW07. Boundary well LHSMW06, a cross-gradient well, exhibited a significant increase of 1,1-dichloroethylene (DCE), TCE, and vinyl chloride (VC) to above their MCLs, which could indicate plume expansion. Concentrations of 1,1-DCE in 35AWW19, a downgradient boundary well, increased from below the MCL in October 2013 to above the MCL in subsequent sampling events, indicating plume expansion in the downgradient direction. The oxidation reduction potential for the highest impacted wells in the western plume ranged from -7mV and 486mV for the two year period which indicates that conditions within the western plume are generally aerobic and not supportive of anaerobic degradation. Total organic carbon in the western plume area wells, 35AWW20 and LHSMW07, were below the 20 mg/L threshold to support microbial activity at concentrations of 17.6 mg/L and 4.54 mg/L, respectively. The U.S. Army, USEPA and TCEQ are in agreement that MNA is not effective in the western plume based on the USEPA lines of evidence (USEPA, 1999) and that the contingency remedy should be implemented at this time.

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## 4 DESCRIPTION OF SIGNIFICANT DIFFERENCES

### **ROD Groundwater Remedy, Section 2.9.1 Description of Remedy Components, Alternative 4, Western Plume:**

- MNA to return groundwater to its potential beneficial use, wherever practicable
- Performance objectives to evaluate the MNA remedy performance after two years
- LTM semiannually for three years, annually until the next five-year review, then once every five years to evaluate remedy performance and determine if plume conditions remain constant, improve, or worsen until cleanup levels are reached
- A contingency remedy to enhance MNA to reach the RAOs if MNA is found to be ineffective

### **Change to Remedy Presented in the ROD:**

The only change to the remedy proposed in the ROD is the implementation of the contingency remedy (in situ bioremediation) to enhance MNA in the western plume. After two years of MNA performance monitoring, MNA was found to be ineffective in the western plume (AECOM, 2016). Upon implementation of the contingency remedy, two years of quarterly performance monitoring will be conducted.

### **ROD Performance Objectives for the Groundwater Remedy, Section 2.12.2 Description of the Selected Remedy, Western Plume, paragraph 2:**

The MNA evaluation will be based on the USEPA lines of evidence (USEPA, 1999) and the anaerobic screening (USEPA, 1998) as follows:

- MNA potential based on evaluating biodegradation screening scores using USEPA guidance
- Plume stability (i.e., the plume concentrations are decreasing in the majority of performance wells, and the plume is not expanding in area as demonstrated with compliance wells)
- MNA Process Evaluation demonstrated based on an attenuation rate calculated with empirical performance monitoring data and MNA Process Demonstration based on the presence of daughter products and bacterial culture counts

### **Change to Performance Objectives:**

No change to the performance objectives in the ROD is proposed. MNA is not currently meeting the performance objectives. The 2<sup>nd</sup> Annual Remedial Action Operation Report for LHAAP-35A(58) (AECOM, 2016) presented evidence of plume migration, increasing COC trends and geochemical conditions that are not optimal for MNA. The contingency remedy (in situ



bioremediation) will enhance MNA and performance objectives will be re-evaluated after two years of quarterly monitoring.

**ROD Implementability Determination, Section 2.10.6, Implementability, paragraph 2:**

Alternative 2 (MNA) is easily implemented from a technical standpoint with minimal construction activities followed by long-term sampling, maintenance and enforcement of the LUC.

**Change to Implementability:**

The contingency remedy (in situ bioremediation) would be somewhat more difficult to implement due to the specialized expertise required for design and construction. However, in situ bioremediation has been implemented in the eastern plume at LHAAP-35A(58) and over two years of monitoring has been shown to be effective in reducing the VOC concentrations and groundwater conditions remain conducive to continued reductions of VOCs (AECOM, 2016).

**ROD Protection of Human Health and the Environment, Section 2.13.1, Protection of Human Health and the Environment, paragraph 1:**

At LHAAP-35A(58) the evaluation of historical groundwater contamination trends indicates that natural attenuation processes are occurring at the site and have stabilized the western plume and slowed migration of the eastern plume. The monitoring activities associated with MNA will ensure that COCs and by-product (daughter) contaminants in groundwater do not discharge to nearby surface water bodies at such levels that ARARs are exceeded.

**Change to Protection of Human Health and the Environment:**

Currently, based on the 2<sup>nd</sup> Annual Remedial Action Operation Report for LHAAP-35A(58) (AECOM, 2016), there is evidence of plume migration, increasing COC trends and geochemical conditions that are not optimal for MNA in the western plume. The implementation of the contingency remedy (in situ bioremediation) in the western plume will enhance MNA and reduce groundwater contaminant concentrations which would prevent contaminated groundwater from migrating into nearby surface water at levels that may present an unacceptable risk to human health and the environment. Monitoring activities associated with the enhanced MNA would assure the protection of human health and the environment by documenting the return of the groundwater to its potential beneficial use as a drinking water supply, by documenting reduction of the contaminant mass and protection of surface water through containment of the plume.

**ROD Cost Estimate for the Selected Remedy, Section 2.12.3, paragraphs 1 and 2:**

Table 2-10 presents the present worth analysis of the cost for the selected remedy, Alternative 4. The information in this table is based on the best available information regarding the anticipated scope of the remedial alternative. The

quantities used in the estimate are for estimating purposes only. Changes in the cost estimates are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a ROD amendment, while significant changes may be included in an ESD. Minor changes may be documented in a memorandum included in the Administrative Record. This is an order-of-magnitude engineering cost estimate that is expected to be within -30 to +50 percent of the actual project cost.

The total project present worth cost of this alternative is approximately \$785,000, using a discount rate of 2.8%. The capital cost is estimated at \$191,000. The total O&M present value cost is estimated at approximately \$594,000. The O&M cost includes evaluation of MNA, maintenance of LUC and LTM through year 30. The LTM would support the required CERCLA five-year reviews.

**Change to Cost Estimate for the Selected Remedy:**

The implementation of the contingency remedy (in situ bioremediation) for Alternative 4 will increase the overall costs associated with this remedial alternative. This increase in cost is due to the capital cost associated with the use of in situ bioremediation technology to enhance MNA in the western plume.

It is estimated that implementation of the contingency remedy (in situ bioremediation) associated with ROD Alternative 4 will increase the original estimate for this alternative by approximately \$250,000.00.

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## 5 SUPPORT AGENCY COMMENTS

The USEPA and TCEQ have reviewed this ESD and support the changes to the selected remedy. Technical review comments by the regulators and the associated responses are presented in **Attachment 1** to this ESD.

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## **6 STATUTORY DETERMINATIONS**

The modification presented herein satisfies CERCLA §121, 42 U.S.C. §9621. The contingency remedy (in situ bioremediation) in the western plume will enhance MNA and reduce groundwater contaminant concentrations.

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## 7 PUBLIC PARTICIPATION


A notice summarizing the ESD shall be published in the Marshall News Messenger upon finalization of the ESD. This ESD and all supporting ESD documentation will be made a part of the Administrative Record file in accordance with the NCP at 40 C.F.R. §300.825(a)(2). The Administrative Record will be located at the repository identified in Section 1.0 of this document. All public participation requirements set out in the NCP at 40 C.F.R. §300.435(c)(2)(i) have been met.

The Proposed Plan for Remedial Action at the site was released for public comments on 25 January 2010. The Proposed Plan identified the preferred alternative to be Alternative 4:

- In Situ Bioremediation for Eastern Plume followed by MNA and LUCs, and
- MNA and LUCs for Western Plume

The U.S. Army reviewed all written and oral comments submitted during the public comment period. There were no significant comments captured related to the groundwater remedy.

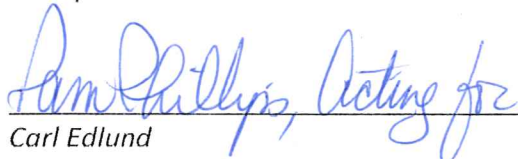
### Authorizing Signature:

  
\_\_\_\_\_  
Thomas E. Lederle  
Chief BRAC Division, ACSIM  
United States Army

Date: 27 MARCH 2017

### Authorizing Signature:

I have reviewed this document, and any comments I had have been addressed and/or incorporated:

  
\_\_\_\_\_  
Carl Edlund  
Director  
Superfund Division  
U.S. Environmental Protection Agency, Region 6

Date: Apr 13, 2018



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## 8 REFERENCES

AECOM Technical Services, Inc. (AECOM), 2016, *Draft Final 2<sup>nd</sup> Annual Remedial Action Operation Report (January 2015 – October 2015) LHAAP-35A(58) Shops Area, Longhorn Army Ammunition Plant, Karnack, Texas*. May.

Shaw Environmental Inc. (Shaw), 2010, *Final Record of Decision LHAAP-35A(58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*. September.

Shaw, 2011, *Final Remedial Design LHAAP-35A(58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*. September.

U.S. Environmental Protection Agency (USEPA), 1998, *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, EPA/600/R-98/128*, September.

USEPA, 1999, *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, Directive 9200.4-17P*, April.

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# **ATTACHMENT 1**

**Responses to Comments on  
Draft Explanation of Significant Differences (ESD) Record of Decision (ROD) for Western plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Ammunition Plant, Karnack, Texas  
2 February 2018**

1. Respondent Concur (C), Does Not Concur (D), Takes Exception (E), or Delete (X).  
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

| Comment #  | Page                        | Section/ Paragraph | Comment (December 5, 2017)  | C,D,E or X <sup>1</sup> | Response (December 8, 2017)  | A or D <sup>2</sup> | Comment | C,D,E or X <sup>1</sup> | Response | A or D <sup>2</sup> |
|--|-----------------------------|--------------------|---|-------------------------|--|---------------------|---------|-------------------------|----------|---------------------|
| <b>Reviewer:</b> April Palmie, TCEQ<br><b>Respondent:</b> Kim Nemmers, Bhate |                             |                    |   |                         |  |                     |         |                         |          |                     |
| 1  | Cover Letter and Cover Page |                    | The title in the cover letter does not match the title on the cover page. It would be nice if they both matched and both may need to be revised. Do we really need to reference Group 4? This is how the last ESD was named (ignore the all caps from copy/paste): <i>Final Explanation of Significant Differences Record of Decision for Early Interim Remedial Action at Burning Ground No. 3 Longhorn Ammunition Plant Karnack, Texas</i> . If we follow this format, the title could be "Explanation of Significant Differences Record of Decision (ROD) for Western Plume Contingency Remedy at LHAAP-35A(58), Shops Area, Longhorn Ammunition Plant Karnack, Texas" | C                       | The title on the cover letter and the title on the document cover page will be revised to match. Group 4 will also be removed from the title. The suggested revised title will be used "Explanation of Significant Differences Record of Decision (ROD) for Western Plume Contingency Remedy at LHAAP-35A(58), Shops Area, Longhorn Army Ammunition Plant Karnack, Texas". |                     |         |                         |          |                     |
| 2  | Attachment 1                |                    | Please change the title to "Response to Comments" and remove email addresses and phone numbers. Historically, the RTCs refer to reviewer and respondent where EPA and TCEQ are the reviewer and the contractor is the respondent. I've attached an example page from an RTC for this site. Please revise, as the previous format is more informative.   | C                       | The RTC Matrix for the Draft LHAAP-35A(58) document has been revised using the provided example and is currently presented here. This format will be used in all future RTC correspondence. Title will be "Response to Comments" without email addresses and phone numbers presented.  |                     |         |                         |          |                     |
|  |                             |                    | <b>END of TCEQ Comments</b>   |                         |  |                     |         |                         |          |                     |

**Responses to Comments on  
Draft Explanation of Significant Differences (ESD) Record of Decision (ROD) for Western plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Ammunition Plant, Karnack, Texas  
2 February 2018**

1. Respondent Concur (C), Does Not Concur (D), Takes Exception (E), or Delete (X).  
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

| Comment #  | Page                                  | Section/ Paragraph | Comment (November 30, 2017)   | C,D, E or X <sup>1</sup> | Response (December 8, 2017)  | A or D <sup>2</sup> | Comment | C,D,E or X <sup>1</sup> | Response | A or D <sup>2</sup> |
|--|---------------------------------------|--------------------|---|--------------------------|--|---------------------|---------|-------------------------|----------|---------------------|
| <b>Reviewer:</b> Richard Mayer, USEPA, Region 6<br><b>Respondent:</b> Kim Nemmers, Bhate |                                       |                    |   |                          |  |                     |         |                         |          |                     |
| 1  | [iii] Acronyms and Abbreviations Page |                    | "RAO" should be "Remedial Action Objectives" (in the context it is used in this document).  | C                        | The acronym "RAO" has been revised on the Acronyms and Abbreviations page to read "Remedial Action Objectives".  |                     |         |                         |          |                     |
| 2  | Page 1-1                              |                    | Please change USEPA's role from "Supporting Agency" to "Lead Oversight Agency". Similarly, change TCEQ's role from "FFA Partner" to "Support Agency".   | C                        | These changes have been made on page 1-1. The Army remains listed as the Lead Agency.  |                     |         |                         |          |                     |
| 3  | Page 1-1                              |                    | <b>Change the citation to</b> - "This ESD is in Compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §117 (c), <b>42 U.S.C. §9617 (c)</b> , and National Oil and Hazardous Substances Pollution Contingency Plan (NCP), <b>40 C.F.R. §300.435(c)(s)(i)</b> ." | C                        | This change was made to the citation on page 1-1.  |                     |         |                         |          |                     |
| 4  | Page 1-1                              |                    | <b>Change the citation to</b> - "This ESD will become part of the Administrative Record file in accordance with NCP, <b>40 C.F.R. §300.825 (a)(2)</b> ."  | C                        | This change was made to the citation on page 1-1.  |                     |         |                         |          |                     |
| 5  | Page 1-1                              |                    | It is not clear what the actual remedy is and the purpose of the ESD. Please explain further.   | C                        | Under the <b>Need for Explanation of Significant Differences (ESD)</b> , a modification of the first sentence was made to include "...the implementation of monitored natural attenuation (MNA) as the selected remedy...". This clarifies that MNA was the remedy under the ROD. The last sentence will be revised to indicate in situ bioremediation is the contingency remedy. The remaining language contained in the first and second paragraph adequately explain the terms of the remedy and what will be required (contingency remedy) if the remedy identified in the ROD is ineffective.<br><br>A third paragraph has been added to this section to explain what the contingency remedy is. It reads as follows: "The purpose of this ESD is to document the significant change from the ROD selected remedy of MNA to implementation of the contingency remedy. The contingency remedy is consistent with the ROD requirement to enhance MNA, if necessary, and involves in situ bioremediation." |                     |         |                         |          |                     |
| 6  | Page 2-1                              |                    | Please spell out "LTM" to "Long Term Monitoring".   | C                        | LTM was spelled out as "Long Term Monitoring" on Page 2-1.   |                     |         |                         |          |                     |

**Responses to Comments on  
Draft Explanation of Significant Differences (ESD) Record of Decision (ROD) for Western plume Contingency Remedy at LHAAP-35A(58), Shops Area  
Longhorn Ammunition Plant, Karnack, Texas  
2 February 2018**

1. Respondent Concur (C), Does Not Concur (D), Takes Exception (E), or Delete (X).  
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

| Comment # | Page     | Section/ Paragraph  | Comment (November 30, 2017)   | C,D, E or X <sup>1</sup> | Response (December 8, 2017)   | A or D <sup>2</sup> | Comment | C,D,E or X <sup>1</sup> | Response | A or D <sup>2</sup> |
|-----------|----------|---------------------|---|--------------------------|---|---------------------|---------|-------------------------|----------|---------------------|
| 7         | Page 2-1 |                     | The acronym FFA needs to be written in full - "Federal Facilities Agreement"  | C                        | FFA was spelled out as "Federal Facilities Agreement" on Page 2-1.  |                     |         |                         |          |                     |
| 8         | Page 2-1 | 2.2/1 <sup>st</sup> | First Paragraph, please spell out "RAO" to Remedial Action Objectives".   | C                        | RAO is now spelled out as "Remedial Action Objectives" on page 2-1, section 2.2.  |                     |         |                         |          |                     |
| 9         | Page 2-2 | 2.2/4 <sup>th</sup> | Fourth Paragraph, please spell out "RD" to Remedial Design.   | C                        | RD is now spelled out as "Remedial Design" on page 2-2, section 2.2.  |                     |         |                         |          |                     |
| 10        | Page 4-1 |                     | Under the "Change to Remedy Presented in the ROD" section - Change "implementation of the contingency remedy" to "implementation of the contingency remedy (in situ bioremediation)".   | C                        | This change was made under the "Change to Remedy Presented in the ROD" on page 4-1.   |                     |         |                         |          |                     |
| 11        | Page 4-2 |                     | At the top of the page - Change "the contingency remedy" to "the contingency remedy (in situ bioremediation)".  | C                        | This change was made to the sentence at the top of page 4-2.  |                     |         |                         |          |                     |
| 12        | Page 4-2 |                     | At the last full paragraph - Change "the contingency remedy" to "the contingency remedy (in situ bioremediation)".  | C                        | This change was made to the applicable sentence in the last full paragraph on page 4-2.   |                     |         |                         |          |                     |
| 13        | Page 4-3 |                     | The last two paragraphs - Change "the contingency remedy" to "the remedy (in situ bioremediation)".   | C                        | This change was made to both paragraphs located at the bottom of page 4-3.  |                     |         |                         |          |                     |
| 14        | Page 4-3 |                     | On page 4-3, the sentence - "Major changes may be documented in the form of a memorandum in the Administrative Record, an ESD, or a ROD Amendment" should be modified to something like-"Major changes may be documented in the form of a ROD Amendment, while significant changes may be included in an ESD. Minor changes may be documented in a memorandum included in the Administrative Record."           | C                        | The original sentence "Major changes may be documented in the form of a memorandum in the Administrative Record, an ESD, or a ROD Amendment" has been deleted and replaced with the suggested "Major changes may be documented in the form of a ROD Amendment, while significant changes may be included in an ESD. Minor changes may be documented in a memorandum included in the Administrative Record." |                     |         |                         |          |                     |
| 15        | Page 6-1 |                     | Change "the contingency remedy" to "the contingency remedy (in situ bioremediation)".   | C                        | This change was made to the single sentence on page 6-1.  |                     |         |                         |          |                     |
| 16        | Page 6-1 |                     | Change the citation to - "The modification presented herein satisfies CERCLA §121, 42 U.S.C. §9621."  | C                        | The addition to the citation has been made on page 6-1.   |                     |         |                         |          |                     |
| 17        | Page 7-1 |                     | Page 7-1, Change the citation to - "This ESD and all supporting ESD documentation will be made a part of the Administrative Record file in accordance with the NCP at 40 C.F.R §300.825 (a)(2). The Administrative Record will be located at the repository identified in Section 1.0 of this document. All public participation requirements set out in the NCP at 40 C.F.R. §300.435(c)(2)(i) have been met." | C                        | The applicable additions to the citation on page 7-1 have been made.  |                     |         |                         |          |                     |

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| Comment # | Page     | Section/<br>Paragraph | Comment<br>(November 30, 2017)  | C,D,<br>E or<br>X <sup>1</sup> | Response<br>(December 8, 2017)   | A or<br>D <sup>2</sup> | Comment | C,D,E<br>or X <sup>1</sup> | Response | A or<br>D <sup>2</sup> |
|-----------|----------|-----------------------|---|--------------------------------|--|------------------------|---------|----------------------------|----------|------------------------|
| 18        | Page 7-1 |                       | Page 7-1, Both signatures should be listed as "authorizing" as EPA is the lead oversight agency and has joint remedy selection authority with the Army. | C                              | This change has been made and both signatures are now identified as "Authorizing Signature". |                        |         |                            |          |                        |
|           |          |                       | <b>END of EPA Comments</b>  |                                |  |                        |         |                            |          |                        |