

FINAL

RECORD OF DECISION

LAAP-009 Soil Sites

Louisiana Army Ammunition Plant

LA0213820533

EPA OU-04

Contract Number GS-10F-0048J

Work Order Number W911S0-04-F-0020

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Prepared for:



U.S. Army Environmental Center
Building E4460
Aberdeen Proving Ground, Maryland
21010-5401

Prepared by:



Shaw® Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, Louisiana 70809

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Acronyms and Abbreviations

AEC	Army Environmental Center
AMCCOM	Army Armament, Munitions, and Chemical Command
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Effects and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Chemical of concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CPG	Central Proving Ground
CTE	Central tendency exposure
EBS	Environmental Baseline Survey
ECAO	USEPAC's Environmental Criteria and Assessment Office
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FI	Follow-on Remedial Investigation
FOSET	Finding of Suitability for Early Transfer
FOST	Finding of Suitability for Transfer
HEAST	USEPA's Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	Hazard index
HQ	Hazard quotient
IRIS	Integrated Risk Information System
LAAP	Louisiana Army Ammunition Plant
LAP	Load/Assemble/Pack
LDEQ	Louisiana Department of Environmental Quality
LOAEL	Low Observed Adverse Effect Level
LUC	Land Use Controls
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effect Level

NPL	National Priority List
O&M	Operations and Maintenance
OU	Operable Unit
PMC	PMC Environmental, Inc
RAGS	Risk Assessment for Superfund
RBSL	Risk Based Screening Level
RI	Remedial Investigation
RME	Reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
Shaw	Shaw Environmental, Inc.
SVOC	Semi-volatile organic compounds
TRC	Technical Review Committee
VOC	Volatile organic compound

1.0 Declaration

1.1 Site Name and Location

LAAP-009 Soil Sites, EPA Operable Unit 04

Louisiana Army Ammunition Plant

LA0213820533

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) presents the No-Action decision for LAAP-009 Soil Sites at the Louisiana Army Ammunition Plant (LAAP, EPA No. LA0213820533, EPA Superfund Operable Unit 04), Doyline, Louisiana (Figures 1 and 2). The response decision in this ROD was made in consideration of all applicable requirements to protect human health and the environment from potential releases of hazardous substances from the sites. This decision has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or “Superfund”), as amended by Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this site.

The U.S. Department of the Army (Army) has investigated the LAAP-009 Soil Sites in accordance with CERCLA and the NCP. The results of these investigations, including the human health and ecological risk assessments, support a No Action decision [as described below] for the LAAP 009 Soil Sites under CERCLA because there are no unacceptable risks to human health and the environment in the LAAP 009 Soil Sites that are attributable to Army releases of hazardous substances.

This No Action decision is selected by the Army, the lead Agency for the response action at LAAP-009 Soil Sites (EPA OU-04). The United States Environmental Protection Agency (U.S. EPA) and the State of Louisiana Department of Environmental Quality (LDEQ) have reviewed the Administrative Record for the LAAP-009 Soil Sites and concur with the selected remedy.

1.3 No-Action Decision

Based on the results of the Remedial Investigation, including the Baseline Human Health and Ecological Risk Assessments, the Army has determined that No CERCLA Remedial Action is necessary to protect human health or the environment for the LAAP 009 Soil Sites because there are no unacceptable risks to human health and the environment in the LAAP 009 Soil Sites that

are attributable to Army releases of hazardous substances. This Record of Decision (ROD) sets forth the No Action decision under CERCLA for the LAAP 009 Soil Sites. As a result, the Army will cease CERCLA activity at this portion of the LAAP CERCLA site, and upon completion of the RODs for all operable units a Final Close Out report will be developed as per CERCLA guidance to move the LAAP site into the NPL Deletion process. Because this selected no-action remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure (uu/ue), a statutory review will be conducted within five years after initiation of the no-action remedy to ensure that the remedy is protective of human health and the environment. The No Action decision is also based on the future anticipated and deed restricted potential uses for commercial/industrial and military purposes. Use restrictions consistent with these purposes have been imposed through deeds of transfer to support Congressional intent for the property transfer and to further ensure that land use remains protective of human health and the environment

1.4 Record of Decision Data Certification Checklist

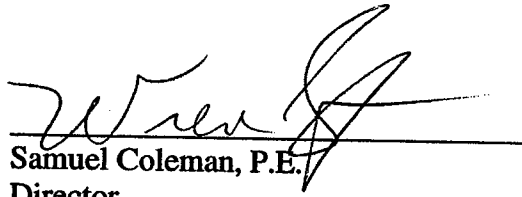
The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for LAAP-009.

- Chemicals of concern (COCs) and their respective concentrations
- Baseline risk represented by COCs
- Current and reasonably anticipated future land use is used in the baseline risk assessment and ROD.
- Potential land use will be available at the site as a result of the selected remedy.
- LAAP-009 Soil Sites does not contain “principle threat waste,” that is highly toxic waste that cannot be reliably contained or would pose a significant threat to human health or the environment if containment failed. Accordingly, the ROD does not discuss a remedy for principal threat waste.

1.5 Signature and Agency Concurrence on the Decision

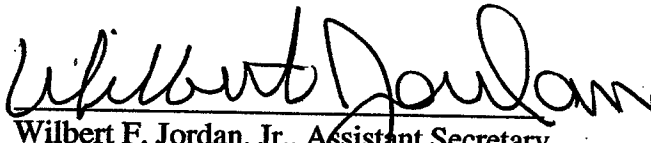
This ROD documents that No Action under CERCLA is necessary to ensure the protection of human health and the environment at the LAAP-009 Soil Sites (EPA OU-04). This decision was selected by the Army and, having reviewed the Administrative Record, is concurred with by the U.S. EPA and the LDEQ.

The undersigned hereby concur and recommend immediate implementation of No Action for the LAAP-009 Soil Sites (EPA OU-4) under CERCLA.




Samuel Coleman, P.E.
Director
U.S. EPA Region 6 Superfund Division

7/3/06
Date
JUL 3 2006



Wilbert F. Jordan, Jr., Assistant Secretary
LDEQ - Office of Environmental Assessment

7/12/06
Date



Tony R. Francis
Colonel, US Army
Commanding

13 June 2006
Date

2.0 Decision Summary

2.1 Site Name, Location, and Description

LAAP is located in the northwestern portion of the State of Louisiana in Webster and Bossier Parishes. The cities of Shreveport and Bossier City are located approximately 22 miles west of LAAP and the town of Minden is located about two miles northeast of LAAP. Haughton is located within two miles of the western boundary of LAAP. The community of Doyline is located on US Highway 164 on the southern boundary and the community of Goodwill is located on US Highway 80 on the northern boundary. A site location map is shown on Figure 1.

The installation consists of 14,974 acres of land in a rectangular area stretching approximately nine miles east to west and three miles north to south. Administrative and residential facilities occupy approximately 74 acres, while 2,970 acres were devoted to production lines and mission support facilities and 11,930 acres are woodlands. A layout of the LAAP facility is shown on Figure 2. The plant is bounded by US Highway 80 to the north, US Highway 164 to the south, Dorcheat Bayou to the east and by Clarke Bayou to the west.

LAAP was placed on the National Priorities List (NPL) in March 1989 due to contamination caused by past disposal of explosive-laden wastewater into unlined surface impoundments in Area P (Figure 2). An Interagency Agreement (Three-Way Federal Facility Agreement) was signed in January 1989. The National Superfund electronic database identification number assigned to LAAP is No. LA0213820533.

2.2 Previous Investigations

2.2.1 Site Evaluation Report RDX Production Facilities

After an explosion destroyed much of Line F of LAAP in 1968, the Fort Worth District of the U.S. Army Corps of Engineers (USACE 1986) conducted a site evaluation and damage assessment. A soil testing program was established. Of the 617 soil samples collected, 458 were analyzed for explosive compounds. This report concluded that the concentrations found in the soil did not pose a threat to human health. Removal of the soil was not recommended. However, during the removal of several sumps, some soil staining was noted at depths between 8 and 10 feet bgs. Stained soil was removed as part of the cleanup process.

2.2.2 Draft Final Remedial Investigation and Risk Assessment Report (RI) for Load/Assembly/Pack Line C

A complete RI and human health risk assessment (HHRA) were conducted by IT Corporation (IT 1999) at Line C to evaluate the area-wide distribution of constituents originating in the soils, ground water, and surface water and their associated health risks associated with human

receptors. In addition, an initial data screening step and revised assumptions step associated with the ecological risk assessment (ERA) process were completed for Line C. Preliminary habitat characterizations were completed at all other production lines to determine the potential ecological exposure pathways operable in those areas. Additionally, confirmatory sampling was conducted at Lines D and S, and discretionary soil sampling was conducted at Lines E and S.

At Line C, surface soils were found to contain detectable levels of explosives, semi-volatile organic compounds (SVOCs) and inorganic constituents that originated from the source buildings. Most of the explosives and inorganic constituents did not appear to have been transported far from their sources.

2.2.3 Draft Follow-on Remedial Investigation (FI) For Sale and The Site- Wide Groundwater Operable Unit

A second round of soil sampling was conducted by PMC in 2002 (PMC 2003) to obtain soil data at specific AOCs not investigated previously and to supplement existing soil data at specific AOCs. These activities were completed to satisfy the requests of the EPA and The LDEQ and to provide sufficiently sized sample populations for statistical analysis at each AOC. These additional soil sampling activities were conducted at Line G, Line H, Line J, Line K, T-6, T-7, CPG, and Area B. The Draft FI was completed and submitted to agency review

A baseline human health risk assessment (HHRA) and an ecological risk assessment (ERA) were also completed using all available data.

2.2.4 Final Follow-on Remedial Investigation (FI) For Soils and The Site-Wide Groundwater Operable Unit

In 2004 and 2005 Comments on the FI, HHRA, and ERA were addressed by Shaw Environmental, INC. (Shaw 2005b). Additional groundwater samples were collected during this period; however, no additional soil samples were collected. A geochemical evaluation of metals in CPOC and background samples was performed to better understand the existence of on-site metals. Additional lines of evidence were reviewed to quantify the uncertainties in the HHRA and the ERA to provide additional information for risk management decision making.

2.3 Site History and Regulatory Oversight Activities

The primary function of LAAP as a U.S. Army Armament, Munitions, and Chemical Command (AMCCOM) installation was to load, assemble, and pack ammunition items. Under contract with Silas Mason, Co., plant operations began in 1942 with eight ammunition lines and one ammonium nitrate graining plant. Ammunition production ceased in August 1945 at the close of World War II and the facility was placed in standby status. Under contract to Remington Rand Inc, the facility was reactivated in February 1951 to support the Korean conflict. All ammunitions loading lines were operational as was the metals forging and machining plant. The

installation was again placed in standby status in February 1958. The plant was reactivated in September 1962 in support of the Vietnam conflict with Sperry Rand Corporation as the operating contractor. Four production areas were reactivated for classified ammunition items. In 1975, Thiokol Corporation assumed the contract from Sperry Rand Corporation. In October 1994, all ammunition production ceased.

Operable Unit LAAP-009 was defined as the soil at Load/Assemble/Pack (LAP) Lines and Test Areas when the site was proposed for the NPL in 1984. Subsequently, Area B was added to the LAAP-009 sites. Thirteen areas of concern (AOC) are now included in the LAAP-009 Soil Sites including nine LAP Lines (C, D, E, F, G, H, J, K, and S), three Test Areas [T-6, T-7, and Central Proving Grounds (CPG)], and one support service area (Area B) (Figure 2). Records of Decision (ROD) have been issued by the EPA for all other soil sites at LAAP (LAAP-001 through LAAP-008). A ROD was issued for soil at LAAP-001 through LAAP-007 in March 1997. A separate ROD for soil at LAAP-008 was issued in May 2000. The selected remedy for soil at all eight areas was No Further Action.

In 2004, legislation was proposed to authorize the U.S. Army to convey LAAP to the State of Louisiana provided at least 13,500 acres of the property is used for the purpose of military training. An additional 1,284 acres of LAAP property was transferred to the State. The State assumed the rights and responsibilities of the Army under the ARMS agreement between the Army and the facility use contractor, in accordance with the terms of such agreement in effect at the time of conveyance. Under the legislation and accompanying deed language, the State will continue to use the majority of the LAAP property for military training and the remaining property for commercial/industrial activities. The property was transferred to the State in January 2005 and renamed Camp Minden.

The ARMS program commercial/industrial property includes all LAAP-009 sites, as well as others:

	Acres	Buildings
(1) Area A - Admin Area	54	33
(2) Area B - Shop Area	58	43
(3) Areas C, D, E, G, H, J, K and S	565	312
(4) Areas L, M - Storage facilities	238	246
(5) Area Y and N - Mpts operations	110	43
(6) Misc Areas - Areas O, P, W, & STP	122	13
(7) Test Areas – CPG, T-7, EWI	28	6
(8) BG-5, 8, DA-9 – Burning grounds	102	7
(9) Landfills (3)	<u>7</u>	<u>0</u>
Total	1,284	703

2.4 Community Participation

LAAP community participation consists of a Technical Review Committee (TRC), public meetings, and public notices. The TRC has held meetings, on an as-needed basis, of community members, the EPA, LDEQ, and the Army with open public participation. A Community Involvement Plan Update (Shaw 2005a) for LAAP provides detailed information on community participation for the installation restoration program. The information repositories for public access to the administrative record files for LAAP are at the Army Environmental Center and at Camp Minden.

In accordance with Sections 113 and 117 of CERCLA, the Army provided a public comment period from November 17 through December 16, 2005, for the proposed decision described in the Proposed Plan for LAAP-009. Copies of the Proposed Plan were available through the Administrative Record maintained at LAAP, Camp Minden, 2629 York Avenue, Minden, LA 71005. A public meeting to present the Proposed Plan for LAAP-009 at City Court Room at the Minden Civic Center, Minden, Louisiana, on December 6, 2005. Public notice of the meeting and availability of documents was placed in the Shreveport Times newspaper on November 17, 2005 and the Minden Press-Herald newspaper on November 17 and 29, 2005. No one from the public attended the meeting on December 6, 2005 and no written comments, concerns, or questions were received by the Army, the EPA, or the State of Louisiana during the public comment period. Comments from the EPA were received on December 7, 2005. The response to these comments and the Public Meeting Responsiveness are presented in Section 3.0 Responsiveness Summary.

2.5 Scope and Role of Response Action

This ROD presents the no-action decision for soil at LAAP-009 sites. The studies undertaken at LAAP have shown that no potential human health or environmental risks are associated with the

current or future use scenarios for the soil exposure pathways at the various LAAP-009 sites. Potential human health or environmental risks from groundwater under these areas will be addressed under the installation-wide groundwater operable unit (LAAP-010) in a separate Proposed Plan and ROD.

Based on the Remedial Investigation, the Follow-on Remedial Investigation, and the risk assessments contained therein, the response action for the LAAP-009 sites is No Action necessary to protect human health and the environment. The current and future reasonably anticipated uses are consistent with uses proscribed in the deed of transfer documents for commercial / industrial and military purposes.

CERCLA Section 120(h)(3)(B) requires that if the property is sold or transferred, each deed contain covenant language stating that any necessary remedial action to protect human health and the environment has been taken before the date of property transfer. In addition, Louisiana State Statute LSA R.S. 30:2039 requires that a notice of hazardous waste shall be recorded into the mortgage and conveyance records of each parish where the property is located. However, the EPA Administrator, with the concurrence of the State Governor, has approved the deferral of the CERCLA covenant for federal property that is listed on the NPL in accordance with 42 U.S.C. §9620(h)(3)(A) and (C) and in accordance with the conditions as stated in the EPA letter approval letter dated December 7, 2004. Specifically, an Environmental Baseline Survey (EBS) was required as a condition of the December 7, 2004 approval of the property transfer. The Department of Army is in the process of developing an EBS to provide a good base of information on which to determine if future land use activities are protective of human health and the environment. The final EBS will reference any sampling activities associated with the various areas of the site that were conducted as part of the RI.

A Finding of Suitability for Early Transfer (FOSET) was provided with the information necessary to allow the EPA Region VI Administrator and the Governor of Louisiana to make a determination regarding the deferral of the CERCLA Covenant requirement and the transfer of LAAP prior to completion of all remedial action.

2.6 Nature and Extent of Contamination

2.6.1 Investigative Strategy

There were three major investigations that occurred for LAAP-009. Line F was investigated by the Fort Worth District (USACE 1986), and found that no further action was needed at Line F. This report concluded that the concentrations found in the soil did not pose a threat to human health. Removal of the soil was not recommended. The Remedial Investigation (RI) (IT, 1999) extensively investigated Line C, with some confirmatory work at Lines D and S, and

discretionary soil samples at Lines E, S, and Test Areas T-6, T-7, and CPG. Each sampling location was chosen in conjunction with the Army Environmental Center (AEC) and EPA.

The initial phase of the soils investigation included RI of Load/Assemble/Pack Line C, a confirmatory soils sampling program at Lines D and S and the three test areas in 1996 (IT, 1999). The confirmatory sampling program was designed to collect soil samples at Lines D and S to test the contaminant distribution hypothesis developed at Line C. Additionally, discretionary soil samples were collected at Lines E and S and Test Areas T-6, T-7, and CPG. Environmental characterization and other site-specific information collected during the remedial investigation were utilized in the development of the Follow-on Remedial Investigation (FI) conducted by PMC Environmental (PMC) in 1999, with guidance provided by the EPA and LDEQ (Shaw 2005b). The FI included sampling at Lines G, H, J, K, and Area B.

Line C was selected as the RI model site at the LAAP facility since this line had a wider variety of processes, more potential sources, more types of explosive compounds, was one of the facilities operated over a longer time period, and had little potential for contaminant interference from other source areas. The objective of the remedial investigation at Line C was to characterize potential source areas with regard to types and concentrations of contamination; determine the distribution of contamination present in soil, surface water, stream sediment, and groundwater; evaluate contaminant transport pathways via surface and subsurface migration; and to collect analytical data of sufficient quantity and quality such that a human health risk assessment (HHRA) and ecological risk assessment (ERA) could be completed for Line C.

As discussed with USEPA and LDEQ representatives, the need for finite delineation of contamination was not required. The FI soil sampling consisted of two phases and was directed toward previously uninvestigated potential source areas. The first FI phase consisted of discretionary sampling from the areas thought to have the greatest likelihood of past releases of contaminants. Samples were collected from the surface (0 to 1.0 feet bgs) and shallow subsurface (2 to 3 feet bgs). The second FI phase consisted of biased random sampling to satisfy the requests of the USEPA and the LDEQ to provide sufficient sample populations for statistical analysis at each AOC. The biased-random sampling strategy involved the designation of sampling areas based on the location of the process building (biased selection), followed by collecting surface soil samples (0 to 0.5 feet bgs) from within a 10-foot grid around the buildings. The USEPA, LDEQ, and the Army agreed that a set of six to twelve random samples from around the process buildings where contamination was most likely were required for risk assessment purposes.

The FI determined that the constituents at the LAAP lines and test areas did not appear to be significant enough in terms of concentration and frequency of detection to present a contributing source to groundwater or surface water contamination at the installation.

2.6.2 Site Investigation Summary

The Chemicals of Potential Concern (COPCs) were disposed in facilities or areas such as landfills, burning areas, treatment plants, and lagoons. Some were deposited from floor wash waters that ran outside the buildings during past cleaning operations.

In relation to the reported presence of arsenic above screening levels, the Follow-on Remedial Investigation (FI), the Human Health Risk Assessment (HHRA), and the Ecological Risk Assessment (ERA) reported the following findings.

- Arsenic was found in several samples, but is not necessarily a Chemical of Concern (COC) related to the load/assembly/pack facilities and the operations at the site.
- Within the FI, geochemical evaluations were done for several metals, in particular, evaluations at Line E showed arsenic concentrations that were consistent with naturally occurring levels.
- Arsenic is attributable to past practices of using pesticides and herbicides in grasses near the buildings.
- Sampling was conducted collecting samples at low points and at bias locations of where contaminants could have migrated (worst case scenario).
- The exceedance in one sample is not necessarily representative of an entire area, and an exceedance in one sample is not necessarily present in the next nearby sample.
- While one sample and one concentration may exceed an industrial screening level, further site specific studies were conducted during the FI in the form of the HHRA and ERA.
- There are no exceedances of site contaminants of concern above the National Contingency Plan (NCP) acceptable ranges for the anticipated present and future land use.
- Arsenic was reported in some samples, but is not a COC.
- The Department of Army uses a term of approved pesticide use, which means the approved Operation and Maintenance (O&M) of the grasses and lawns around the manufacturing buildings, where pesticides and herbicides were applied as needed. This facility was in operation since the times of World War II, and even when it was kept in stand by, the lawns were kept in good conditions through O&M.

2.6.2.1 Line C

Findings from the remedial investigation activities at Line C indicate that highest concentrations of contaminants in the soils were located near buildings that handled or managed explosives materials in forms that allowed for easier release or discharge. Based on the previous data, PMC (PMC 2001, Shaw 2005b) concluded that soil contamination from explosives in the Line C area

was not wide-spread, but distributed in rather small pockets adjacent to certain operations such as melt/pour, pelleting, and screening that utilized large quantities of explosive materials. PMC concluded that overall contamination detected at Line C did not appear to pose an imminent threat to human health or the environment; however, because constituents were detected above the screening criteria, the next step would be to complete a more comprehensive human health and ecological risk assessment. Contaminant trends and patterns at the other load/assemble/pack lines are similar to those reported at Line C.

The nature and extent of contamination was characterized by collecting and testing 185 samples around Line C. Explosive compounds were confined to small areas around process buildings and no reported concentrations were greater than the industrial screening levels. No volatile organic compounds (VOC) exceeded industrial screening levels. Semi-volatile organic compounds (SVOC) were detected in surface soil, but no pattern of contamination could be established. Subsurface detections of SVOC did not exceed industrial screening levels. Arsenic was detected greater than industrial screening levels around buildings, but is thought to be a remnant of approved pesticide use around the buildings. Lead was only detected in three samples at concentrations greater than industrial screening levels.

2.6.2.2 Line D

The nature and extent of contamination was characterized by collecting and testing 103 samples around Line D. Contaminant trends at Line D were consistent with trends at Line C. Explosive contaminants were confined to small areas around process buildings. Only one VOC constituent exceeded industrial screening level. No SVOC were detected greater than industrial screening levels. Arsenic concentrations above industrial screening levels appeared to be remnants of approved pesticide use.

2.6.2.3 Line E

The nature and extent of contamination was characterized by collecting and testing 34 samples around Line E. Explosives, VOC, SVOC, and all inorganic constituent concentrations, except arsenic, were less than industrial screening levels. Arsenic was not a site-related contaminant of concern and that which was found was attributable to past practices of using pesticides and herbicides. Geochemical evaluations have shown that arsenic concentrations are consistent with naturally occurring levels (FI, Volume III, Human Health Risk Assessment Table 6.6-1 and Appendix L).

2.6.2.4 Line F

Line F was in operation until August 1968 when an explosion and fire badly damaged the line, which was never rebuilt. The U.S. Army Corps of Engineers (USACE 1986), Fort Worth District, completed a site evaluation and assessment of the damaged facilities. A total of 617 samples were collected and 458 were analyzed for explosive compounds. The resulting report

concluded that the concentrations in soils did not pose a threat to human health. Removal of soils was not recommended as part of the cleanup at Line F. Thus no additional samples were collected in 1999 and no evaluation was completed as part of the RI or FI.

2.6.2.5 Line G

No soil samples were collected during the initial 1996 or follow-on 1999 investigation. Eighteen samples from this line were collected in 2002. Arsenic was the primary constituent that exceeded the industrial screening level in the soil samples at Line G; attributable to approved pesticide usage and not process related impacts. Lead was only detected in one sample at a concentration greater than the industrial screening level and could also be attributable to the use of approved pesticides.

2.6.2.6 Line H

The nature and extent of contamination was characterized by collecting and testing 14 samples around Line H. No explosives were detected in soil at Line H. Arsenic was detected in all samples, however only one concentration exceeded the industrial screening level. Arsenic concentrations were attributed to approved pesticide usage and not process-related impacts.

2.6.2.7 Line J

The nature and extent of contamination was characterized by collecting and testing 14 samples around Line J. Explosives detected at Line J were less than industrial screening levels. Arsenic was detected in all samples, however only one concentration exceeded the industrial screening level. Arsenic concentrations were attributed to approved pesticide usage and not process-related impacts.

2.6.2.8 Line K

The nature and extent of contamination was characterized by collecting and testing 26 samples around Line K. Explosives detected at Line K were less than industrial screening levels. Arsenic was detected in all samples, however only one concentration exceeded the industrial screening level. Arsenic concentrations were attributed to approved pesticide usage and not process-related impacts.

2.6.2.9 Line S

The nature and extent of contamination was characterized by collecting and testing 107 samples around Line S. Explosives detected in surface samples at Line S were greater than industrial screening levels. Explosives detected subsurface samples at Line S were less than industrial screening levels. VOC were not detected at concentrations greater than industrial screening levels. SVOC were detected in one sample at concentrations greater than industrial screening levels. Arsenic was detected in surface and subsurface samples at concentrations exceeding the

industrial screening level. Arsenic concentrations were attributed to approved pesticide usage and not process-related impacts.

2.6.2.10 Test Area 6

The primary sources of contamination at the test areas are the locations where munitions and devices were tested, detonated or burned. Similar to the LAP lines, the test areas have several constituent that exceeded the industrial screening levels.

The nature and extent of contamination was characterized by collecting and testing 14 samples around Test Area 6. Explosives detected in several surface samples at T-6; however, only one concentration was greater than industrial screening levels. No explosives were detected in subsurface samples at T-6. No VOC or SVOC constituents were detected greater than industrial screening levels. Arsenic and lead detections were less than industrial screening levels.

2.6.2.11 Test Area 7

The nature and extent of contamination was characterized by collecting and testing 14 samples around Test Area 7. No explosives or VOC constituents were detected at T-7. Several SVOC, arsenic and lead were detected, but all concentrations were less than industrial screening levels.

2.6.2.12 Central Proving Ground

The nature and extent of contamination was characterized by collecting and testing 11 samples around CPG. No explosives were detected at the CPG (11 soil samples tested). Several VOC and SVOC constituents, arsenic and lead were detected but all concentrations were less than industrial screening levels.

2.6.2.13 Area B

The nature and extent of contamination was characterized by collecting and testing 45 samples around Area B. No explosives constituents were detected in Area B soils. VOCs were detected in soil, but the concentrations did not exceed screening standards. Some SVOCs, pesticides, arsenic, and lead were detected at concentrations greater than industrial screening standards. For Semi Volatile Organic Compound (SVOC), pesticide and other contaminant was above an industrial screening level, a site specific risk assessment was conducted. Exposure of an industrial worker or a trespasser to surface soils is within the acceptable risk range under Reasonable Maximum Exposure (RME) conditions and under the acceptable risk range under Central Tendency Exposure (CTE) conditions (as shown in the FI, Volume III, Human Health Risk Assessment Table 6.6-1). Arsenic concentrations were attributed to approved pesticide usage and not process-related impacts.

2.7 Current and Potential Future Site and Resources Uses

Currently, the site is used primarily for military training by the Louisiana National Guard (13,500 acres) while the LAP lines that make up OU-009 (approximately 650 acres) and additional areas within the ARMS program (634 acres) are used by commercial/industrial operations. The potential future uses are limited by the conditions of the transfer of the property as documented in the Finding of Suitability for Early Transfer (FOSET) for LAAP which states, "The Department of the Army has undertaken careful environmental study of LAAP Property and concluded that the highest and best use of the LAAP Property is limited by its environmental condition to commercial/industrial uses or military training activities." The following restrictions concerning soils (covering all soil sites) have been placed in the deeds of transfer for LAAP Property. The following restrictions benefit both the lands retained by the Grantor and the general public welfare and are consistent with the State of Louisiana and Federal environmental statutes and Congressional legislative intent:

- With the exception of Area A, LAAP Property will be used solely for commercial/industrial purposes or military training activities and not for residential purposes, the LAAP Property having been remediated only for commercial/industrial purposes. Commercial and industrial uses include, but are not limited to, administrative, manufacturing, warehousing, restaurants, hotels, and retail activities. Military training activities include, but are not limited to, heavy equipment transport training, armor tank crew maneuver and gunnery training, and other field exercises. Residential use includes, but is not limited to, housing, day care facilities, schools (excluding facilities for persons over 18 years), and assisted living facilities.
- The Grantee, its successors and assigns, shall not conduct or permit others to conduct any excavation, digging, drilling, or other disturbance of soil or ground activities on the LAAP Early Transfer Property without the prior written approval of the Army unless the soil is returned to the excavation site. This excavation restriction will be modified as appropriate upon completion of the Army remediation program.

2.8 Site Risk Summary

EPA and LDEQ submitted additional risk assessment comments to Shaw during the finalization of the Draft FI Report for LAAP-009 soil and LAAP-010 groundwater (PMC 2003). These comments resulted in further definition of risks and hazards at the site, resulting in no unacceptable risk, thus removing the requirement to complete the soil feasibility study (Shaw, 2005).

A baseline risk assessment and an expanded risk assessment were performed to evaluate the potential threat to human health and the environment in the absence of any remedial action. It also provides the basis for determining whether or not remedial action is necessary and the justification for performing remedial actions.

The human health risk assessment process was comprised of the following four components:

- Identification of Constituents of Potential Concern;
- Exposure Assessment;
- Toxicity Assessment; and
- Risk Characterization.

2.8.1 Identification of Constituents of Potential Concern

As part of the human health risk assessment, the maximum concentration of each detected constituent in each medium was compared to criteria to select the Contaminants of Potential Concern (COPC). If the maximum concentration of a constituent exceeded the criteria, the constituent was selected as a COPC. Constituents detected in each medium were selected or eliminated as COPC based on comparison with EPA Risk-Based Screening Levels (RBSL). Once COPC were identified, risk assessment procedures following EPA Guidance were performed resulting in a list of Contaminants of Concern (COC).

A similar process is applied in the preparation of screening level ecological risk assessments. Positively detected constituents are compared to the EPA screening levels. Constituents that exceed these screening criteria are considered contaminants of potential ecological concern (COPEC). Table 2.8-1 lists the constituents considered for both the human health risk assessment and the ecological risk assessment.

2.8.2 Exposure Assessment

The exposure assessment was performed to identify actual or potential exposure pathways, characterize the potentially exposed populations, and determine the extent of the exposure from contaminants at LAAP-009 Soil Sites. Detailed guidance on conducting exposure assessments is provided in the RAGS (U.S. EPA, 1989a), the U.S. EPA's Guidelines For Exposure Assessment (1992) and the Exposure Factors Handbook (U.S. EPA, 1989b).

The human health risk assessment performed for the RI at Line C assessed both current and future use scenarios. Current use scenarios included on-site industrial worker, on-site trespasser, and off-site residential. Future use scenarios included on-site residential and on-site construction worker.

The human health risk assessment for prepared for the FI evaluated the carcinogenic and non-carcinogenic risk from current and future exposure to constituents at 26 areas of concern at LAAP (PMC, 2003 and Shaw, 2005). Scenarios evaluated for surface soil included on-site industrial worker, on-site resident adult, on-site resident child, and on-site trespasser for both reasonable maximum exposure (RME) and central tendency exposure (CTE) scenarios.

Subsurface soils were evaluated for the construction worker for both the RME and CTE exposures.

The identified complete pathways that are applicable at LAAP-009 are described below.

2.8.2.1 Surface Soil Exposure Pathways

The potential for exposures to contaminants in soil is greatest for soil layers comprising the 0 to 6-inch soil horizon (i.e., surface soils). Potential exposures to chemicals in soils can result from incidental ingestion, dermal contact, or inhalation of airborne particulate matter.

Ingestion of, dermal contact with, and inhalation of contaminated surface soils were evaluated as potentially complete exposure pathways for current and future Industrial Worker, hypothetical On-Site Resident Adults, hypothetical On-Site Resident, and Trespassers at LAAP-009 sites. Additionally, ingestion of, dermal contact with, and inhalation of contaminated sub-surface soils were evaluated as potentially complete exposure pathways for Construction Worker at LAAP-009 sites.

2.8.2.2 Air Exposure Pathways

Potential exposure pathways involving air generally involve chemical releases either through fugitive dust emissions or the direct release of organic compounds from soils as gaseous emissions. Inhalation of fugitive dust emissions (particulates) from soils is considered a potentially complete pathway for on-site workers and residents.

As indicated above, inhalation of contaminated surface soils was evaluated as potentially complete exposure pathways for current and future Industrial Worker, hypothetical On-Site Resident Adults, hypothetical On-Site Resident Child, and Trespassers at LAAP-009 sites. Additionally, ingestion of, dermal contact with, and inhalation of contaminated sub-surface soils were evaluated as potentially complete exposure pathways for Construction Worker at LAAP-009 sites.

2.8.2.3 Ecological Exposure Pathways

A wide variety of wildlife lives on or frequents the LAAP-009 Soil Sites. These animals are exposed to site-related contamination directly by exposure to contaminated soil. The ecological risk assessment evaluated both direct and indirect exposure scenarios. Direct soil exposure routes may include ingestion, dermal absorption, and inhalation of particulates and/or vapors. Indirect exposure to site-related contaminants occurs through the ingestion of contaminated plants and animals.

Birds at the site are exposed by ingesting soil-living insects and earthworms, and by dust bathing. Piscivorous birds and animals may also be exposed to site-related contaminants if fish residing in the ditches and Unnamed Ditch are bioaccumulating contaminants. Small

mammals such as voles may ingest contaminated soils when grooming and/or burrowing into deeper soils. In addition to on-site animals, plants on the site can be exposed to chemicals in the soil and surface water.

Six feeding guild representatives (indicator species) have been identified as being characteristic of exposures to COPECs in soils. These species are surrogate representatives of the various feeding guilds that are expected to occur at the AOCs. Eastern cottontail was selected to represent the small herbivores and the whitetail deer was selected to represent large herbivores. The American woodcock was selected to represent invertivores, and thus exposure to soil invertebrates. The whitefooted mouse was selected to represent small omnivores in the upland areas; they too, are assumed to ingest soil invertebrates. The red fox was selected to represent large omnivores, and the red-tailed hawk was selected to represent carnivores.

2.8.3 Toxicity Assessment

The toxicity assessment considered: (1) the types of adverse health or environmental effects associated with individual and multiple chemical exposure; (2) the relationship between magnitude of exposures and adverse effects; and (3) related uncertainties such as the weight of evidence for a chemical's potential carcinogenicity in humans. Detailed guidance for conducting toxicity assessments is provided in RAGS (U.S. EPA, 1989a).

This process relied on existing toxicity information and did not involve the development of new data on toxicity or dose-response relationships. Available information on the many chemicals that have already been evaluated and summarized by various EPA program offices were utilized to provide the needed toxicity and dose-response information to allow both qualitative and quantitative estimates of risks associated with many of the chemicals found at this site.

The primary source of toxicological data used in this analysis was the most current of the following sources: (1) Integrated Risk Information System (IRIS), (2) the U.S. EPA's Health Effects Assessment Summary Tables (HEAST), (3) other sources such as toxicological profiles prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), and (4) Air and Water Quality Criteria Documents. In addition, toxicity information will be gathered from site-specific documents such as Assessment of Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs) for Louisiana Army Ammunition Plant, (USATHAMA, 1992) or other relevant sources such as Risk Assessment of Munitions Chemicals to Develop Drinking Water Health Advisories (U.S. EPA, 1991) and Toxicity and Metabolism of Explosives (Yinon, 1990). Before using references other than those cited in IRIS and HEAST, the EPA's Environmental Criteria and Assessment Office (ECAO) will be consulted to see if more current information is available. Similarly, for the ecological risk assessment, benchmark values for direct contact evaluation and NOAEL and LOAEL based toxicity information for bioaccumulative COPEC were selected for the indicator species.

2.8.4 Risk Characterization

In this section, toxicity values for chemicals of concern were used in conjunction with the estimated intakes to evaluate potential carcinogenic and non-carcinogenic health hazards.

Human health risks are based on a conservative estimate of the potential carcinogenic risk or potential non-carcinogenic health effects. Risk to ecological receptors is based on the potential for adverse effects to animals which may inhabit or traverse the site. Risks to human and ecological receptors were evaluated as part of the risk assessment; three factors were considered: (1) nature and extent of contamination at the site, (2) the pathways through which human and ecological receptors are or may be exposed to those contaminants at the site, and (3) potential toxic effects of those contaminants.

2.8.4.1 Carcinogenic Risk

Carcinogenic risk is defined as the upper bound incremental probability of an individual developing cancer over a lifetime as a result of exposure to potential carcinogen. Assuming the linear multistage model for carcinogenesis, the numerical estimate of excess lifetime cancer risk is calculated by multiplying the daily chemical intake by risk per unit dose of carcinogen or carcinogenic SF:

$$\text{Risk} = \text{CI} \times \text{SF}$$

Where: Risk = the unitless probability of an individual developing cancer
CI = daily chemical intake (mg/kg/day)
SF = carcinogenic slope factor (mg/kg/day)⁻¹

EPA uses the 10⁻⁴ to 10⁻⁶ risk range as a “target range” to manage risks as part of a Superfund Cleanup. “For site where the cumulative site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10⁻⁴, action generally is not warranted, but may be warranted if a chemical specific standard that defines acceptable risk is violated or unless there are non-carcinogenic effects or an adverse environmental impact that warrants action“ (USEPA, 1991)

EPA guidance for the evaluation of carcinogenic risks associated with simultaneous exposure to multiple carcinogens assumes that incremental cancer risks are additive (USEPA, 1989a). If these assumptions are incorrect, over or under-estimation of the actual risk could result (USEPA, 1989a). The total cancer risk is estimated as follows:

$$\text{Risk}_T = \sum \text{Risk}_I$$

Where: Risk_T = total cancer risk
Risk_I = that carcinogenic risk estimate for the ith toxicant

Where a given receptor may be exposed to chemicals of concern via multiple pathways (e.g., inhalation of particles, soil ingestion, and dermal contact with soil), the risk from each pathway is also summed.

2.8.4.2 Hazard Index for Non-Carcinogenic Effects

To evaluate potential non-carcinogenic health hazards posed by simultaneous exposure to multiple chemical, the hazard quotients for each chemical of concern within a given exposure pathway are summed. The resulting value is referred to as the hazard index (HI). The summation of hazard quotients to obtain a hazard indexes assumes additivity of toxic effects and is appropriate only for chemicals with similar toxic endpoints (e.g., liver toxicity). In this risk assessment, hazard quotients for all non-carcinogens have been summed, regardless of toxic endpoints or mechanism of action. The HI is expressed as follows:

$$HI = E_1/RfD_1 + E_2/RfD_2 + \dots + E_i/RfD_i$$

Where: E_i = chemical intake for the i^{th} toxicant
 RfD_i = reference dose for the i^{th} toxicant.

Where a given receptor may be exposed to chemicals of concern via multiple pathways (e.g., inhalation of particles, soil ingestion, and dermal contact with soil), the HI from each pathway are also summed. If the cumulative hazard index is less than one, there is no cause for concern for adverse non-carcinogenic health effects. If the sum is greater than one, a more detailed and critical evaluation of potential non-carcinogenic health effects may be warranted. Such additional evaluations may include the consideration of the specific target organ(s) and mechanism(s) of action for significant chemical of concern and consideration of exposure assumptions and expose concentrations used to estimate risk.

2.8.4.3 Ecological Risk Characterization

A similar process is applied in the preparation of screening level ecological risk assessments. COPEC are then evaluated for direct and indirect adverse effects and an ecological hazard quotient (HQ) is calculated. Hazard quotients, in addition to site-specific information, are used to determine whether remedial action is warranted.

Potential risks to ecological concern are evaluated by comparing actual or expected chemical intakes (for terrestrial animals) or exposure point concentration (for direct exposure of plants or aquatic life) to acceptable intakes/concentrations to produce an HQ as follows:

$$HQ = I/TBC_I \text{ or } EC/TBC_C$$

where: EC = exposure point concentration (mg/kg)
 I = intake of chemical (mk/kg/day)
 TBC_C = chemical concentration to be considered as “safe” (mg/kg)
 TBC_I = intake to be considered as a “safe dose” (mg/kg/day).

As in the case of HIs, HQs in excess of 1.0 represent potential unacceptable risks to the environment (e.g., land plants, water plants, and animals).

2.8.5 Risk Characterization Results

2.8.5.1 Human Health Risk Assessment

The HHRA performed for the FI concluded that the calculated cumulative carcinogenic risks for the current and future use scenarios were all within the acceptable risk management range of 10^{-6} to 10^{-4} (Table 2.8-2).

The HHRA performed for the FI concluded that for non-carcinogenic hazards only the potential exposure scenario of an on-site child resident exposed to surface soil under the RME scenario has a non-carcinogenic hazard in excess of 1.0 resulting from exposure at Line C, Line D, Line S, Test Area 6, CPG, and Area B (Table 2.8-2). The hazard indices are less than 1 for all these areas under the CTE scenario, indicating no unacceptable non-carcinogenic hazard at these areas. Based on the reasonably anticipated future use of this site for military training by the Louisiana Army National Guard and commercial/industrial activities consistent with deed restrictions implemented pursuant to Congressional legislative intent, LAAP-009 surface soils do not require a response or continued risk management.

The HHRA also evaluated exposure to subsurface soil and concluded that no areas exceed a carcinogenic risk or non-carcinogenic hazard standard for either the RME or CTE scenarios (Table 2.8-2). Based on the reasonably anticipated future use of this site for military training by the Louisiana Army National Guard and commercial/industrial activities consistent with deed restrictions implemented pursuant to Congressional legislative intent, LAAP-009 subsurface soils are also recommended for no action and no risk management at this time.

2.8.5.2 Ecological Risk Assessment

A Tier I and Tier II ecological risk assessment was performed according to processes outline by the EPA guidance for Superfund sites. The Tier I performance included a screening-level assessment, while the Tier II included further risk characterization, analysis, and management (the Tier II evaluation is still a screening level assessment). A primary objective of the Tier II assessment is to reduce the uncertainties inherent in the Tier I process by incorporating site-specific data and more reasonable/realistic receptor and exposure parameters. Results of the Tier I assessment indicate that terrestrial receptors are exposed to direct contact and indirect food web contact ecological hazard quotients greater than 1.0 at several LAAP-009 sites. Results of the Tier II assessment also showed direct and indirect contact hazards greater than 1.0 at several LAAP-009 lines and test areas (Table 2.8-3).

In order to evaluate conservative assumptions in the risk evaluation process and provide additional information to facilitate the most informed risk management decisions, additional line

of evidence were scrutinized at each LAAP-009 area of concern (Shaw, 2005b). The additional lines of evidence included the following:

- Geochemical evaluation of site data compared to background data
- Frequency of detection at elevated concentrations
- Magnitude of the calculated HQ values
- Comparison to alternative ecological screening values
- Available ecological habitat type and quality
- Future land use and its effect on ecological habitat

Based on the evaluation of the additional lines of evidence, none of the COPEC initially identified in the FI would be expected to pose significant risk to ecological receptors at LAAP (Table 2.8-4). One rationale for reducing the risk posed by the identified COPEC was that most constituents were only sporadically detected and were not pervasive throughout the LAAP-009 areas. Due to the sporadic nature, actual ecological exposures for most receptor groups are expected to be much lower than those estimated in the Follow-On Remedial Investigation. A second rationale for reducing the estimated risks is the fact that the plant will be used for commercial/industrial uses and by the Louisiana Army National Guard for military training activities. These training activities will likely result in making large areas undesirable habitat and most species will naturally prefer undisturbed areas and avoid the LAAP-009 areas. This natural avoidance behavior will effectively reduce the possibility and or frequency of exposure for many ecological receptors. Based on these additional lines of evidence, remedial action for LAAP-009 soils is not warranted for the protection of ecological receptors and LAAP-009 surface soils do not require a response or risk management.

2.9 Description of No Action Decision

Risk assessments were performed to determine the potential risk to human health or the environment. The risk assessment evaluation performed for the FI (Shaw, 2005b) concluded that no unacceptable risk to human health or the environment was present at LAAP-009 sites based on future potential uses. Furthermore, the use restrictions imposed through the deeds of transfer pursuant to Congressional legislative intent will ensure the use of LAAP property remains consistent with the intended use for commercial/ industrial and military purposes and protective of human health and the environment. Based on the risk assessment conclusions and intended future use of the site, no remedial alternatives were evaluated for LAAP-009 soils. Therefore, no CERCLA action is necessary for LAAP-009 soils sites.

Community acceptance of the No Action recommendation was evaluated after the public comment period. As indicated in Section 2.4, there were no comments from the public on the No Action recommendation.

2.10 Documentation of Significant Changes

The Selected Remedy was the preferred alternative and was presented at the public meeting held on December 6, 2005. No significant changes were made to the preferred alternative presented in the Proposed Plan.

3.0 *Responsiveness Summary*

3.1 *Public Meeting*

There was no one in attendance at the public meeting held on December 6, 2005. The Army did not receive any written comments from the public during the public comment period, November 17, 2005 through December 16, 2005.

3.2 *EPA Comments on Proposed Plan*

The USEPA commented on the Proposed Plan via a letter dated December 7, 2005. These comments and the Army's responses are presented below:

Comment No. 1

The Chemicals of Potential Concern (COPCs) were disposed in facilities or areas such as landfills, burning areas, treatment plants, and lagoons. Some were deposited from floor wash waters that ran outside the buildings during past cleaning operations.

In relation to the reported presence of arsenic above screening levels, the Follow-on Remedial Investigation (RI), the Human Health Risk Assessment (HHRA), and the Ecological Risk Assessment (ERA) reported the following findings.

- Arsenic was found in several samples, but is not necessarily a Chemical of Concern (COC) related to the load/assembly/pack facilities and the operations at the site.
- Within the RI, geochemical evaluations were done for several metals, in particular, evaluations at Line E showed arsenic concentrations that were consistent with naturally occurring levels.
- Arsenic is attributable to past practices of using pesticides and herbicides in grasses near the buildings.
- Sampling was conducted collecting samples at low points and at bias locations of where contaminants could have migrated (worst case scenario).
- The exceedance in one sample is not necessarily representative of an entire area, and an exceedance in one sample is not necessarily present in the next nearby sample.
- While one sample and one concentration may exceed an industrial screening level, further site specific studies were conducted during the RI in the form of the HHRA and ERA.
- There are no exceedances of site contaminants of concern above the National Contingency Plan (NCP) acceptable ranges for the anticipated present and future land use.

- Arsenic was reported in some samples, but is not a COC.
- The Department of Army uses a term of approved pesticide use, and what it means is the approved Operation and Maintenance (O&M) of the grasses and lawns around the manufacturing buildings, where pesticides and herbicides were applied as needed. This facility was in operation since the times of World War II, and even when it was kept in stand by, the lawns were kept in good conditions through O&M.

Response No. 1 - The Army concurs with Comment No. 1 and has added this language to this ROD in Section 2.8.

Comment No. 2

For Line F, the statement that contamination was addressed during a clean-up in 1968 doesn't indicate if there is a threat to human health. The proposed plan, or at least the responsiveness summary, should clarify that the U.S. Army Corps of Engineers (USACE), Fort Worth District, completed a site evaluation and assessment of the damaged facilities. A total of 617 samples were collected and 458 were analyzed for explosive compounds. The resulting report concluded that the concentrations in soils did not pose a threat to human health. Removal of soils was not recommended as part of the cleanup at Line F. Thus no additional samples were collected in 1999 and no evaluation was completed as part of the Superfund remedial investigation for soils. Please add the USACE report to the Administrative Record.

Response No. 2 - The Army concurs and the USACE report is added to the Administrative Record. Discussions from this report also have been added in this ROD in Sections 2.2.1 and 2.6.2.4.

Comment No. 3

For Line E, clarify that in addition to not being a site related contaminant of concern, arsenic is attributable to past practices of using pesticides and herbicides. Also note that geochemical evaluations have shown that arsenic concentrations are consistent with naturally occurring levels. (as shown in the Final Follow-On Remedial Investigation for Soils and the Site-wide Ground Water Operable Unit, Volume III, Human Health Risk Assessment Table 6.6-1 and Appendix L)

Response No. 3 - The Army concurs that arsenic is attributable to past practices and this language has been added in this ROD in section 2.6.2.3.

Comment No. 4

For Area B, if a Semi Volatile Organic Compound (SVOC), pesticide and other contaminant is above an industrial screening level. Clarify that a site specific risk assessment was conducted.

Exposure of an industrial worker or a trespasser to surface soils is within the acceptable risk range under Reasonable Maximum Exposure (RME) conditions and under the acceptable risk range under Central Tendency (CT) conditions (as shown in the Final Follow-On Remedial Investigation for Soils and the Site-wide Ground Water Operable Unit, Volume III, Human Health Risk Assessment Table 6.6-1).

Response No. 4 - The Army concurs that a site specific risk assessment was conducted and exposure is within the acceptable risk range under RME and CT. Language has been added in this ROD in Section 2.6.2.13.

Comment No. 5

With respect to the language on pp. 5-6, note the language concerning the approved Feasibility of Suitability for Early Transfer (FOSET). This language should be more specific and identify the Agency's December 7, 2004 approval, which included environmental commitments and assurances under 120(h)(3)(C). See the top of page 6.

The EPA approval was conditioned by commitments on the part of Department of Army as evidenced by the EPA December 7, 2004, approval letter; not just information provided.

Even though there was no compelling information to block the transfer of the property, it was recognized that various issues related to the nature/extent of contamination, the intended land use during the deferral period, results from a risk assessment, etc. carried enough uncertainty that an Environmental Baseline Survey (EBS) was needed and was indeed a condition of the December 7, 2004 approval of the property transfer. The EPA wants to make it clear that we anticipate that the Department of Army will fulfill the condition of the development of an EBS that will provide a good base of information on which to determine if future land use activities are protective of human health and the environment.

Response No. 5 – The Department of the Army intends to fulfill the condition of the development of an EBS and the conditions of the stated EPA Letter. Phase I of the EBS has been completed. Phase II is pending approval of funding. Language, consistent with these conditions, have been incorporated in this ROD in section 2.5.

Comment No. 6

The final EBS should reference any sampling activities associated with the various areas of the site that were conducted as part of the Remedial Investigation.

Response No. 6 – The Department of the Army will reference sampling activities that were conducted as part of the RI in the EBS. Language has been added to this ROD in Section 2.5.

4.0 References

- Shaw 2005a. Community Involvement Plan Update, Shaw Environmental, Inc, January 2005.
- Shaw 2005b. Final Follow-on Remedial Investigation for Soils and the Site-Wide Groundwater Operable Unit Volumes I-VI, Shaw Environmental, Inc, September 2005.
- PMC 2003. Draft Follow-on Remedial Investigation for Soils and The Site-Wide Groundwater Operable Unit, Volume III, PMC Environmental, September 2003.
- PMC 2001. Draft Follow-on Remedial Investigation for Soils and The Site-Wide Groundwater Operable Unit, Volume I, PMC Environmental, May 2001.
- IT 1999. Remedial Investigation Report for the Remedial Investigation/Risk Assessment at Load/Assemble/Pack Line C, the Louisiana Army Ammunition Plant, IT Corporation, September 1999.
- USACE 1985. Site Evaluation Report RDX Production Facilities, Louisiana Army Ammunition Plant. Fort Worth District, U.S. Army Corps of Engineers.
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- U.S. EPA, 1992, Guidelines for Exposure Assessment. Office of Health and Environmental Assessment. Washington, DC.
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- U.S. EPA, 1989b, Exposure Factors Handbook. Office of Health and Environmental Assessment, EPA/600/8-89/043,. Washington, DC.
- Yinon, J., 1990. Toxicity and Metabolism of Explosives, CRC Press, Boca Raton, FL. 33431

TABLE

TABLE 2.8-1

**LIST OF CHEMICALS OF POTENTIAL CONCERN
LOUISIANA ARMY AMMUNITION PLANT
DOYLINE, LOUISIANA**

Chemical	Media	Fraction	Area B	Line C	Line D	Line E	Line F	Line G	Line H	Line J	Line K	Line S	T-6	T-7	CPG
1,3,5-Trinitrobenzene	Surface Soil	Explosive		X		X						X	X		
2,4,6-Trinitrotoluene	Surface Soil	Explosive		X	X					X		X	X		
2-Amino-4,6-Dinitrotoluene	Surface Soil	Explosive		X	X							X	X		
4-Amino-2,6-dinitrotoluene	Surface Soil	Explosive										X	X	X	
HMX	Surface Soil	Explosive		X	X			X	X			X	X		
RDX	Surface Soil	Explosive		X	X	X		X	X			X	X		
Tetryl	Surface Soil	Explosive		X											
Arsenic	Surface Soil	Metal	X	X	X	X		X	X	X	X	X	X		X
Cadmium	Surface Soil	Metal											X		
Chromium	Surface Soil	Metal	X												
Iron	Surface Soil	Metal	X	X	X	X							X		X
Lead	Surface Soil	Metal	X	X	X			X	X		X				
Manganese	Surface Soil	Metal		X											
Mercury	Surface Soil	Metal		X	X										X
Thallium	Surface Soil	Metal		X											
Aldrin	Surface Soil	Pesticide	X												
Dieldrin	Surface Soil	Pesticide	X												
Heptachlor	Surface Soil	Pesticide	X												
Heptachlor Epoxide	Surface Soil	Pesticide	X												
Benzo(a)anthracene	Surface Soil	SVOC	X	X	X							X			
Benzo(a)pyrene	Surface Soil	SVOC	X	X	X							X		X	
Benzo(b)fluoranthene	Surface Soil	SVOC	X	X	X							X		X	
Benzo(k)fluoranthene	Surface Soil	SVOC	X												
Dibenz(a,h)anthracene	Surface Soil	SVOC	X	X	X										
Indeno(1,2,3-cd)pyrene	Surface Soil	SVOC	X	X								X			
N-Nitrosodi-n-propylamine	Surface Soil	SVOC		X											

TABLE 2.8-1

**LIST OF CHEMICALS OF POTENTIAL CONCERN
LOUISIANA ARMY AMMUNITION PLANT
DOYLINE, LOUISIANA**

Chemical	Media	Fraction	Area B	Line C	Line D	Line E	Line F	Line G	Line H	Line J	Line K	Line S	T-6	T-7	CPG
1,3,5-Trinitrobenzene	Sub-Soil	Explosive		X		X						X	X		
2,4,6-Trinitrotoluene	Sub-Soil	Explosive		X	X	X				X		X	X		
2-Amino-4,6-Dinitrotoluene	Sub-Soil	Explosive		X	X							X	X		
HMX	Sub-Soil	Explosive		X	X			X	X			X	X		
RDX	Sub-Soil	Explosive		X	X	X		X	X			X			
Tetryl	Sub-Soil	Explosive		X							X				
Arsenic	Sub-Soil	Metal	X	X	X	X		X	X	X	X	X	X	X	
Cadmium	Sub-Soil	Metal											X		X
Chromium	Sub-Soil	Metal	X												
Iron	Sub-Soil	Metal	X	X	X	X			X			X	X		
Lead	Sub-Soil	Metal	X	X	X			X	X		X				X
Manganese	Sub-Soil	Metal		X											
Mercury	Sub-Soil	Metal		X	X										
Thallium	Sub-Soil	Metal		X											X
Aldrin	Sub-Soil	Pesticide	X												
Dieldrin	Sub-Soil	Pesticide	X												
Heptachlor	Sub-Soil	Pesticide	X												
Heptachlor Epoxide	Sub-Soil	Pesticide	X												
Benzo(a)anthracene	Sub-Soil	SVOC	X	X	X							X			
Benzo(a)pyrene	Sub-Soil	SVOC	X	X	X							X		X	
Benzo(b)fluoranthene	Sub-Soil	SVOC	X	X	X							X		X	
Benzo(k)fluoranthene	Sub-Soil	SVOC	X												
Dibenz(a,h)anthracene	Sub-Soil	SVOC	X	X	X							X			
Indeno(1,2,3-cd)pyrene	Sub-Soil	SVOC	X	X								X			
N-Nitrosodi-n-propylamine	Sub-Soil	SVOC		X											

**TABLE 2.8-2
SUMMARY OF RISKS and HAZARDS
LOUISIANA ARMY AMMUNITION PLANT
DOYLINE, LOUISIANA**

Receptor	Industrial Worker - RME		On-Site Resident Adult-RME		On-Site Resident Child-RME		Trespasser-RME		Construction Worker-RME	
	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SUB-S (Risk)	SUB-S (Hazard)
Media										
Study Area										
Area B	2E-05	0.05	2E-05	0.11	5.1E-05	1.00	6E-06	0.06	6E-07	0.06
Line C	7E-06	0.30	1E-05	0.53	2.4E-05	4.41	3E-06	0.50	2E-07	0.20
Line D	1E-05	0.16	2E-05	0.31	4.7E-05	2.62	6E-06	0.25	3E-07	0.11
Line E	7E-07	0.03	1E-06	0.07	3.3E-06	0.64	2E-07	0.03	4E-08	0.04
Line F										
Line G	2E-06	0.01	4E-06	0.03	8.7E-06	0.23	6E-07	0.02	9E-08	0.01
Line H	2E-06	0.01	3E-06	0.02	7.6E-06	0.20	5E-07	0.01	7E-08	0.06
Line J	1E-06	0.01	3E-06	0.02	6.4E-06	0.17	4E-07	0.01	6E-08	0.01
Line K	6E-07	0.00	1E-06	0.01	3.1E-06	0.08	2E-07	0.01	3E-08	0.00
Line S	8E-06	0.19	1E-05	0.33	2.5E-05	2.77	3E-06	0.31	2E-07	0.11
Test Area 6	5E-06	0.39	8E-06	0.70	1.8E-05	5.84	2E-06	0.64	1E-07	0.17
Test Area 7	2E-06	0.01	3E-06	0.01	7.0E-06	0.12	7E-07	0.01	1E-07	0.02
Central Proving Ground	1E-06	0.18	2E-06	0.50	5.0E-06	4.67	3E-07	0.19	5E-08	0.28

Receptor	Industrial Worker - CT		On-Site Resident Adult-CT		On-Site Resident Child-CT		Trespasser-CT		Construction Worker-CT	
	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SURF-S (Risk)	SURF-S (Hazard)	SUB-S (Risk)	SUB-S (Hazard)
Media										
Study Area										
Area B	4E-07	0.01	3E-07	0.01	1.6E-06	0.05	6E-07	0.02	4E-08	0.00
Line C	2E-07	0.02	2E-07	0.01	8.3E-07	0.10	3E-07	0.03	2E-08	0.01
Line D	4E-07	0.01	3E-07	0.01	1.6E-06	0.07	6E-07	0.03	3E-08	0.01
Line E	3E-08	0.00	3E-08	0.00	1.7E-07	0.03	6E-08	0.01	3E-09	0.00
Line F										
Line G	9E-08	0.00	7E-08	0.00	4.2E-07	0.01	1E-07	0.00	8E-09	0.00
Line H	7E-08	0.00	6E-08	0.00	3.5E-07	0.01	1E-07	0.00	6E-09	0.00
Line J	6E-08	0.00	5E-08	0.00	3.1E-07	0.01	1E-07	0.00	5E-09	0.00
Line K	3E-08	0.00	3E-08	0.00	1.6E-07	0.00	6E-08	0.00	3E-09	0.00
Line S	2E-07	0.01	2E-07	0.01	8.6E-07	0.08	3E-07	0.03	2E-08	0.01
Test Area 6	1E-07	0.01	9E-08	0.01	5.0E-07	0.10	2E-07	0.04	9E-09	0.01
Test Area 7	8E-08	0.00	6E-08	0.00	3.3E-07	0.00	1E-07	0.00	8E-09	0.00
Central Proving Ground	3E-08	0.01	2E-08	0.01	1.3E-07	0.06	5E-08	0.02	3E-09	0.00

Definitions of Media

Acronyms:

SURF-S: Surface soil
SUB-S: Subsurface soil

Risk > E2 or HQ > 100
Risk > E3 but < E2 or HQ > 10 but < 100
Risk > E4 but < E3 or HQ > 1 but < 10
Risk > E5 but < E4
Risk > E6 but < E5

Adapted From MACTEC, 2004

TABLE 2.8-3
NOAEL and LOAEL Based Hazard Indices
Louisiana Army Ammunition Plant
Doyline, Louisiana

	Direct Contact NOAEL-Based Hazard Quotients		Food Web NOAEL-Based Hazard Indices					
	Phytotoxicity	Invertebrate	Eastern Cottontail	White-footed Mouse	White-tailed Deer	American Woodcock	Red Fox	Red Tailed Hawk
Study Area								
Area B	1.58E+02	1.08E+02	3.73E-01	3.49E+03	1.81E-03	2.04E+03	4.26E-03	3.54E-03
Line C	1.30E+02	1.90E+01	1.61E-01	1.91E-01	6.35E-03	3.16E+00	3.23E-03	6.75E-03
Line D	1.32E+02	1.19E+02	3.70E+00	2.85E+00	2.18E-01	6.93E+00	1.15E-02	4.48E-02
Line E	1.91E+02	5.43E+01	7.84E-02	1.52E+00	1.41E-03	7.80E-01	7.19E-04	1.50E-03
Line F	Not Sampled							
Line G	1.85E+02	1.57E+01	2.04E-01	5.49E-01	2.15E-03	1.07E+00	1.09E-03	2.28E-03
Line H	3.20E+02	5.55E+01	1.83E-01	4.92E-01	1.51E-03	7.53E-01	7.71E-04	1.61E-03
Line J	2.02E+02	1.21E+01	1.53E-01	4.12E-01	5.17E-04	2.36E-01	2.80E-04	8.04E-04
Line K	1.96E+02	5.83E+01	3.37E-01	4.00E-01	4.45E-03	2.21E+00	2.27E-03	4.73E-03
Line S	1.21E+02	2.33E+00	1.48E+00	3.43E+00	8.12E-02	4.72E+00	8.80E-03	1.27E-03
Test Area 6	2.38E+02	4.15E+01	2.84E+00	6.65E+00	7.10E-02	2.28E+00	7.69E-03	1.12E-03
Test Area 7	1.96E+02	2.87E+01	1.15E+00	1.38E+00	5.24E-03	2.88E-01	2.34E-03	6.29E-04
Central Proving Ground	4.16E+02	8.50E+02	1.08E+00	1.58E+00	8.40E-03	1.84E+00	3.76E-03	4.88E-02

	Direct Contact NOAEL-Based Hazard Quotients		Food Web LOAEL-Based Hazard Indices					
	Phytotoxicity	Invertebrate	Eastern Cottontail	White-footed Mouse	White-tailed Deer	American Woodcock	Red Fox	Red Tailed Hawk
Study Area								
Area B	1.58E+02	1.08E+02	3.73E-02	4.02E+02	3.00E+00	2.04E+02	4.91E-04	3.54E-04
Line C	1.30E+02	1.90E+03	1.61E-02	1.91E-02	6.35E-04	3.16E-01	3.23E-04	6.75E-04
Line D	3.97E+02	1.19E+02	2.71E-01	2.19E-01	1.59E-02	8.41E-01	9.76E-04	2.24E-02
Line E	1.91E+02	5.43E+01	7.84E-03	1.52E-01	2.40E-04	7.80E-02	1.07E-04	1.72E-04
Line F	Not Sampled							
Line G	1.85E+02	1.57E+01	2.04E-02	5.49E-02	2.15E-04	1.07E-01	1.09E-04	6.74E-04
Line H	Not Evaluated Due to HI for NOAELS <1.0							
Line J	Not Evaluated Due to HI for NOAELS <1.0							
Line K	1.96E+02	5.83E+01	3.37E-02	4.00E-02	4.45E-04	2.21E-01	2.27E-04	4.73E-04
Line S	1.21E+02	5.24E+00	5.13E-02	6.07E-02	2.53E-03	4.72E-01	1.13E-03	4.25E-04
Test Area 6	2.38E+02	4.15E+01	5.48E-02	8.17E-02	1.22E-03	2.70E-01	5.46E-04	7.42E-04
Test Area 7	1.96E+02	2.87E+01	8.72E-01	1.03E+00	3.98E-03	1.62E-01	1.78E-03	4.79E-04
Central Proving Ground	4.16E+02	8.50E+02	8.22E-01	9.73E-01	6.38E-03	9.18E-01	2.85E-03	2.44E-02

HQ > 100
HQ >10 but < 100
HQ >1 but < 10

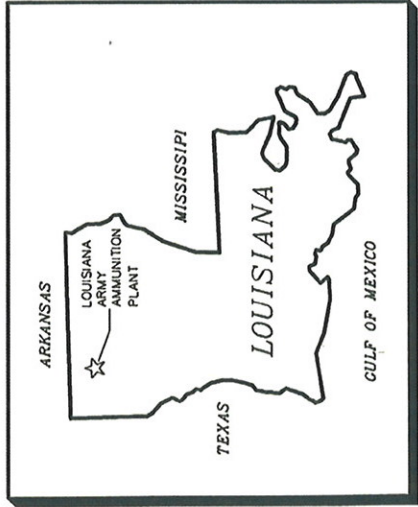
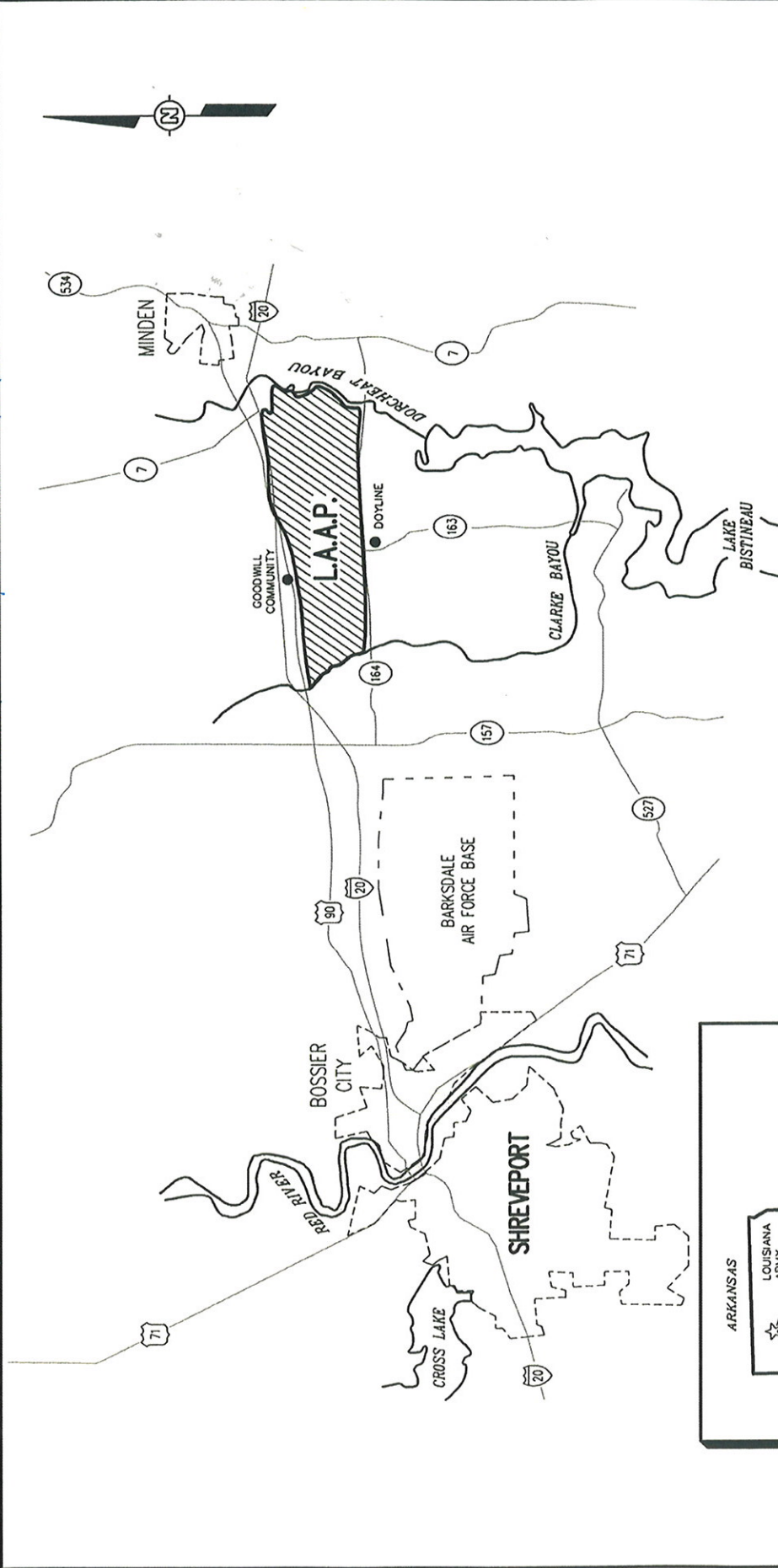
TABLE 2.8-4
SUMMARY OF SOIL COPECS
Louisiana Army Ammunition Plant
Doyline, Louisiana

COPEC	Area of Concern																							
	Area B		CPG		Line C		Line D		Line E		Line G		Line H		Line J		Line K		Line S		T-6		T-7	
	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic	Direct	Trophic
aldrin		○																						
alpha-chlordane		○																						
aluminum	○		○		○		○		○		○		○		○		○		○		○		○	
antimony									○															
arsenic										○														
bis(2-ethylhexyl)phthalate		○				○			○											○				
cadmium			○																					
chromium	○		○						○					○				○			○		○	
copper			○	○															○		○		○	○
dieldrin		○																						
di-n-butyl phthalate						○			○											○		○		
endrin	○	○																						
fluoranthene	○																							
fluorene		○																						
gamma-chlordane		○																						
HMX									○															
lead	○		○		○	○	○	○	○		○	○	○		○		○	○		○		○		○
mercury			○	○	○		○	○		○		○		○		○		○		○				
methoxychlor		○																						
nickel			○																					
pentachlorophenol		○																						
RDX							○	○																
silver					○																			
2,4,6-TNT																			○	○	○	○		
thallium					○		○																	
phenanthrene	○	○																		○				
zinc	○		○	○							○		○		○		○				○			

NOTES :
X - Identified as a COPEC.
○ - Eliminated as a COPEC through various lines of evidence (see text).
Direct risks based on comparison to screening levels for phytotoxicity and toxicity to soil invertebrates
Trophic risks based on food web interactions and NOAEL-based toxicity reference values.
Trophic risks based on LOAEL-based toxicity reference values result in HQ < 1.0 for all areas except Area B and T-6.

FIGURES

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	BTR	B. HOLT	ARR	ARR	108923-A23
			9/17/04	5/23/06	5/23/06	




Shaw



LOUISIANA ARMY AMMUNITION PLANT
DOYLINE, LOUISIANA

FIGURE 1
SITE LOCATION MAP
LAAP-009 SOIL SITE RECORD OF DECISION
GFPR/PBC NO. GS-10F-0048J
WORK ORDER NO. W911S0-04-F0020

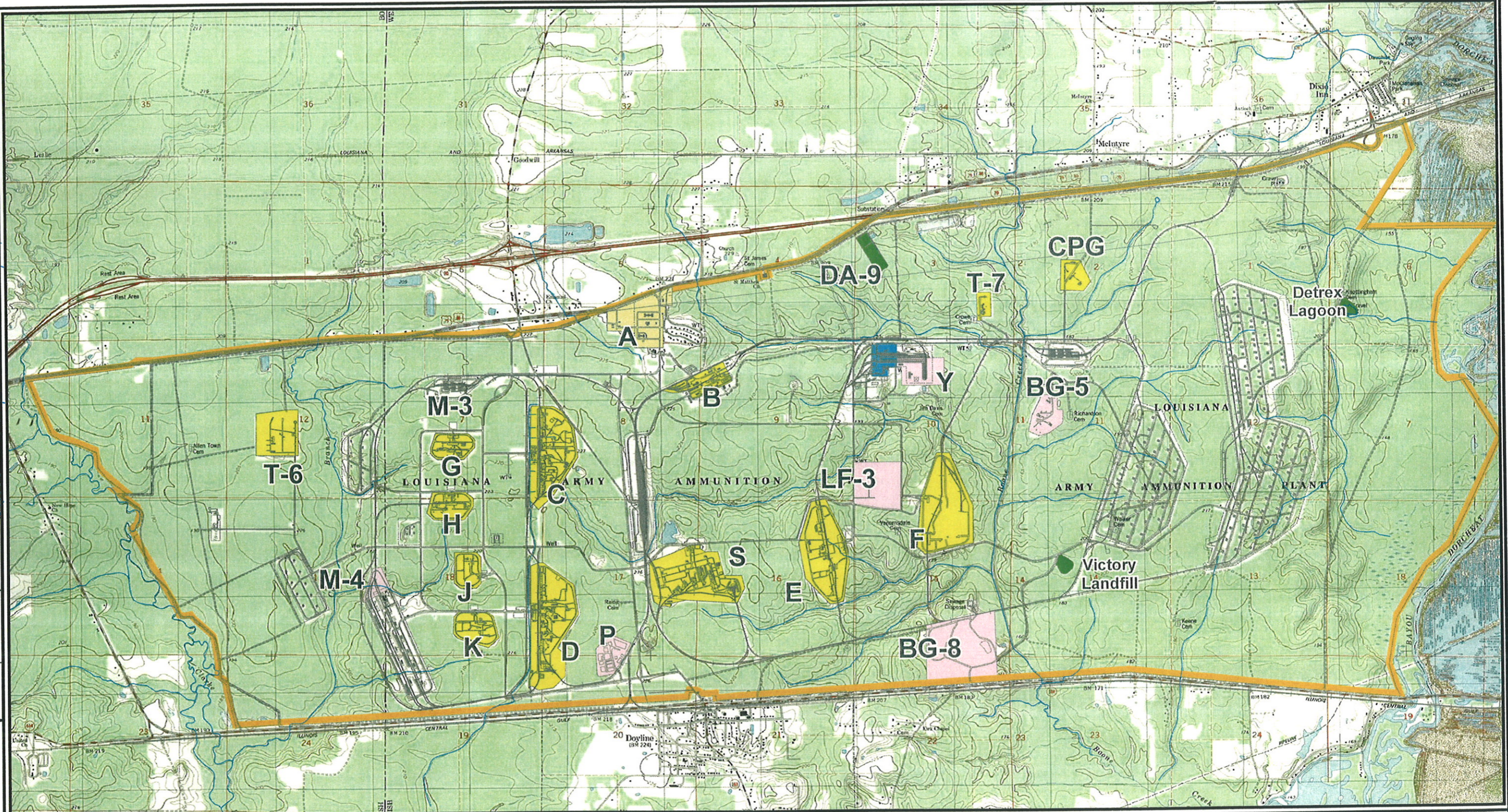
DRAWING NUMBER
108923_AV-43

APPROVED BY
ARF 5/23/06

CHECKED BY
ARF 5/23/06

DRAWN BY
B. Holt 1/2/05

OFFICE
BTR



Areas of Concern

- LAAP-001 Area P Pink Water Lagoons
- LAAP-002 Burning Ground 5
- LAAP-003 M-4 Lagoon
- LAAP-004 Burning Ground 8 Landfill
- LAAP-005 Landfill 3
- LAAP-006 Oily Waste Landform (Y Line)
- LAAP-007 Burning Ground 8 Pink Water Lagoons

EPA Superfund ROD
May 19, 2000
Soils at Y-Line Facility
OU # 8

PBC NO.
GS-10F-0048J

- LAAP-008 Area Y Chromic Acid Etching Facility
- LAAP-009 Soil Sites: (9) Load/Assemble/Pack Lines, (3) Test Areas and Area B
- LAAP-010 Installation-wide Groundwater
- 3 Other Groundwater AOCs
- Area A (Non-CERCLA Unit)

EPA Superfund ROD
March 4, 1997
Soil/Source Operable Units
OU #s 1 - 7



1,500 750 0 1,500 3,000
Feet



FIGURE 2

LAAP FACILITY LAYOUT AND CERCLA OPERABLE UNITS

LAAP-009 SOIL SITES RECORD OF DECISION
GFPR/PBC NO. GS-10F-0048J
WORK ORDER NO. W911S0-04-F0020

Appendix A
Concurrence Memorandum from USEPA Region VI



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

July 3, 2006

MEMORANDUM

SUBJECT: Concurrence with the Record of Decision for Louisiana Army Ammunition Plant LAAP-009 Soil Sites. EPA ID# LA0213820533, AI No. 8993,

FROM: Bartolome J. Cañellas
Remedial Project Manager (6SF-LP) *Bartolome J. Cañellas*

THROUGH: Wren Stenger, Chief
LA/NM Branch (6SF)

TO: Sam Coleman, P.E., Director
Superfund Division (6SF)

This memorandum recommends the United States Environmental Protection Agency (EPA) concurrence with the U.S. Army's Record of Decision (ROD) for the Louisiana Army Ammunition Plant (LAAP) LAAP-009 Soil Sites. The decision was made in consideration of all applicable requirements to protect human health and the environment from potential releases of hazardous substances.

Summary of Review Findings

The no-action decision was selected by the Army, the lead Agency for the response action at LAAP-009 Soil Sites (EPA Operable Unit (OU)-04). The EPA and the State of Louisiana Department of Environmental Quality (LDEQ) have reviewed the Administrative Record for the LAAP-009 Soil Sites and concur with the selected remedy.

Federal and state regulators reviewed the proposed plan and the draft ROD. In accordance with Sections 113 and 117 of CERCLA, the Army provided a public comment period for the proposed decision. A public notice was placed in a local newspaper and a public meeting was held on December 6, 2005.

Operable Unit LAAP-009 was defined as the soil at Load/Assemble/Pack (LAP) Lines and Test Areas when the site was proposed for the NPL in 1984. Subsequently, Area B was added to the LAAP-009 sites. Thirteen Areas Of Concern (AOC) are now included in the LAAP-009 Soil Sites including nine LAP Lines (C, D, E, F, G, H, J, K, and S), three Test Areas [T-6, T-7, and Central Proving Grounds (CPG)], and one support service area (Area B)

This ROD presents the no-action decision. The studies undertaken at LAAP have shown that no potential human health or environmental risks are associated with the current or future use scenarios for the soil exposure pathways at the various sites. Potential risks from

groundwater under these areas will be addressed under the installation-wide groundwater operable unit (LAAP-010) in a separate Proposed Plan and ROD.

Because this selected no-action remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure (uu/ue), a statutory review will be conducted within five years after initiation of the no-action remedy to ensure that the remedy is protective of human health and the environment.

The no-action decision is also based on the future anticipated and deed restricted potential uses for commercial/industrial and military purposes. Use restrictions consistent with these purposes have been imposed through deeds of transfer to support Congressional intent for the property transfer and to further ensure that land use remains protective of human health and the environment.

Other Comments

The site was transferred from the U.S. Army to the State of Louisiana as per a Finding Of Suitability for Early Transfer (FOSET), and it is now called Camp Minden. Under the terms of the FOSET, the Army will continue its responsibilities of evaluating and maintaining operable units, reaching decisions, implementing the necessary remedial activities and continue conducting Five-Year Reviews in coordination with the State of Louisiana.

Concurrence

EPA concurs with the U.S. Army's findings in the Final ROD LAAP-009 Soil Sites by signing the approval concurrence page that is part of the ROD. LDEQ has no further comments and has agreed to also sign in the approval concurrence page.

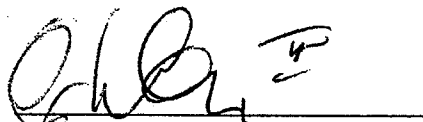
CONCURRENCES
RECORD OF DECISION - LAAP-009 SOIL SITES
for
Louisiana Army Ammunition Plant
Doyline
Bossier and Webster Parishes, Louisiana
EPA ID# LA0213820533

Document reviewed by:
EPA Region 6
Remedial Project Manager:


Bartolome J. Cañellas (6SF-LP)


6/7/06
Date

Concur By:
EPA Region 6
Site Attorney:


George Malone (6RC-S)

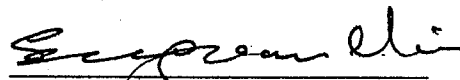
6/20/06
Date

Concur By:
EPA Region 6
Superfund Branch Chief, Office of
Regional Counsel:


Mark A. Peycke (6RC-S)

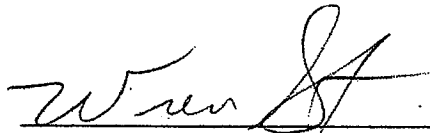
06/29/06
Date

Concur By:
EPA Region 6
LA/OK Section Chief


Sing Chia (6SF-LP)


6/30/06
Date

Concur By
EPA Region 6
LA/OK/NM Branch Chief:


Wren Stenger (6SF-L)

July 3, 2006
Date

Concur By
EPA Region 6
Deputy Director, Superfund Division Pam Phillips (6SF-)


Pam Phillips (6SF-)

7/3/06
Date