LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 18 of 19

2010

Bate Stamp Numbers
00097695 – 00098590

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976 – 2010

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
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A. Title: Report – (Continued) Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, April 2010
Author(s): US Army Corps of Engineers
Recipient: USEPA
Date: April 30, 2010
Bate Stamp: 00097695 – 00098178

B. Title: Memorandum – Errata to Final Data Evaluation Report, Chemical Concentrations in Soil Samples Associated with LHAAP-35/36 Sumps, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: USACE, Aaron Williams
Date: May 4, 2010
Bate Stamp: 00098179 – 00098213

C. Title: Meeting Minutes – Longhorn AAP Monthly Manager's Meeting
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: May 13, 2010
Bate Stamp: 00098214 – 00098222

D. Title: Report – Final Proposed Plan for LHAAP-17 Burning Ground No. 2/Flashing Area, Group 2, Longhorn Army Ammunition Plant
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: May 21, 2010
Bate Stamp: 00098223 – 00098247

E. Title: Public Notice – Media Release for Proposed Plan for LHAAP-17, Burning Ground No. 2/Flashing Area, Longhorn Army Ammunition Plant
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: Public
Date: May 26, 2010
Bate Stamp: 00098248 – 00098253

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F. Title: Public Notice – Proof of Publication Marshall News Messenger Notice for LHAAP-17, Burning Ground No.2/Flashing Area, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): U.S. Army
Recipient: Public
Date: May 27, 2010
Bate Stamp: 00098254 – 00098255

G. Title: Public Notice – Proof of Publication The Shreveport Times Newspaper Notice for LHAAP-17, Burning Ground No.2/Flashing Area, Longhorn Army Ammunition Plant
Author(s): U.S. Army
Recipient: Public
Date: May 27, 2010
Bate Stamp: 00098256 – 00098257

H. Title: Meeting Minutes – Longhorn AAP Monthly Manager's Meeting
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: June 10, 2010
Bate Stamp: 00098258 – 00098268

I. Title: Meeting Minutes – LHAAP Restoration Advisory Board (RAB) Meeting
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: June 10, 2010
Bate Stamp: 00098269 – 00098311

J. Title: Public Meeting – Transcript for June 29, 2010 Public Meeting for LHAAP-17, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): U.S. Army
Recipient: Public
Date: June 29, 2010
Bate Stamp: 00098312 – 00098315

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K. Title: Meeting Minutes – Final Minutes, LHAAP-47, Onboard Meeting, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: July 20, 2010
Bate Stamp: 00098316 – 00098320

L. Title: Meeting Minutes – Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: July 20, 2010
Bate Stamp: 00098321 – 00098325

M. Title: Meeting Minutes – Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: August 17, 2010
Bate Stamp: 00098326 – 00098337

N. Title: Meeting Minutes – LHAAP Restoration Advisory Board (RAB) Meeting
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: August 17, 2010
Bate Stamp: 00098338 – 00098353

O. Title: Report – Final Record of Decision, LHAAP-35B(37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm, Longhorn Army Ammunition Plant
Author(s): U.S. Army
Recipient: All Stakeholders
Date: August 20, 2010
Bate Stamp: 00098354 – 00098451

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P. Title: Letter – Concurrence to Record of Decision for LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): TCEQ
Recipient: USACE
Date: September 14, 2010
Bate Stamp: 00098452 – 00098452

Q. Title: Letter – Concurrence to Record of Decision for Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): TCEQ
Recipient: USACE
Date: September 14, 2010
Bate Stamp: 00098453 – 00098453

R. Title: Report – Final Decision Document for LHAAP-02, Vacuum Truck Overnight Parking Storage Area, Longhorn Army Ammunition Plant
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: September 21, 2010
Bate Stamp: 00098454 – 00098470

S. Title: Report – Final Proposed Plan for LHAAP-16, Landfill 16, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): U.S. Army
Recipient: All Stakeholders
Date: September 21, 2010
Bate Stamp: 00098471 – 00098503

T. Title: Report – Final Record of Decision for LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: Public
Date: September 23, 2010
Bate Stamp: 00098504 – 00098535

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U. Title: Report – Record of Decision Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: Public
Date: September 23, 2010
Bate Stamp: 00098536 – 00098571

V. Title: Response to Comments – Draft Record of Decision for LHAAP-49, Former Acid Storage Area, (August, 2010), Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: USEPA
Date: September 23, 2010
Bate Stamp: 00098572 – 00098573

W. Title: Public Notice - Media Release for October 19, 2010, Public Meeting for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: Public
Date: October 19, 2010
Bate Stamp: 00098574 – 00098579

X. Title: Meeting Minutes, Longhorn AAP Monthly Manager's Meeting
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: October 19, 2010
Bate Stamp: 00098580 – 00098586

Y. Title: Public Notice – Proof of Publication Marshall New Messenger Notice for Proposed Plan for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): U.S. Army
Recipient: Public
Date: September 26, 2010
Bate Stamp: 00098587 – 00098588

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Z.	Title:	Public Notice – Proof of Publication The Shreveport Times Newspaper Notice for Proposed Plan for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas
	Author(s):	U.S. Army
	Recipient:	Public
	Date:	September 26, 2010
	Bate Stamp:	00098589 – 00098590

156 Starlite Drive, Marietta, OH 45750 ● TEL 740-373-4071 ● FAX 740-373-4835 ● http://www.kemron.com

Laboratory Report Number: L0609126

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box bleow at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Debra Elliott - Team Leader
delliott@kemron-lab.com

Amanda Fickiesen - Client Services Specialist
afickiesen@kemron-lab.com

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Stephanie Mossburg - Team Chemist/Data Specialist
smossburg@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist
kalbertson@kemron-lab.com

This report was reviewed on September 15, 2006.

Stephanie Mossburg

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on September 15, 2006.

David E. Vandenberg

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 47 pages.

Protecting Our Environmental Future

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0609126

CHAIN OF CUSTODY: The chain of custody number was 10500.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 6 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 11-SEP-06
Stephanie Mossburg

Laboratory Data Package Cover Page

00097697

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;

✓R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
b) dilution factors,
c) preparation methods,
d) Cleanup methods, and
e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and
b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,
b) Calculated %R for each analyte, and
c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %R and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

✓R10 Other problems or anomalies.

✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [✓] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MIKE D. ALBERTSON		Volatiles Lab Supervisor	September 15, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609126
Project Name:	798-LONGHORN
Method:	8260B
Prep Batch Number(s):	221917, 222027
Reviewer Name:	MIKE D. ALBERTSON
LRC Date:	September 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?	✓				
Were ion abundance data within the method-required QC limits?	✓				
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?	✓				
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?	✓				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

00097699

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097700

EXCEPTIONS REPORT

ER# - Description

Footnotes:

(1) NA = Not applicable to method or project

(2) NR = Not reviewed

(3) ER# = Exception report number

LABORATORY REPORT

L0609126

00097701

09/15/06 14:16

Submitted By

KEMRON Environmental Services
156 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark
Houston, TX 77042
Attention: Diane Mever

Account Number: 2773
Work ID: LHAAP

P.O. Number: 200328

Sample Summary

Client ID	Lab ID	Date Collected	Date Received
29WW40 (01)	L0609126-01	06-SEP-06	07-SEP-06

Report Number: **L0609126**
Report Date : **September 15, 2006**

00097702

Sample Number: **L0609126-01**
Client ID: **29WW40 (01)**
Matrix: **Soil**
Workgroup Number: **WG222027**
Collect Date: **09/06/2006 09:15**
Sample Tag: **02**

PrePrep Method: **NONE**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **1**
Units: **ug/kg**

Instrument: **HPMS9**
Prep Date: **09/12/2006 12:30**
Cal Date: **09/05/2006 13:49**
Run Date: **09/12/2006 12:30**
File ID: **9M48501**
Percent Solid: **73.8**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Acetone	67-64-1		U	10.9	5.46
Benzene	71-43-2		U	5.46	0.546
Bromobenzene	108-86-1		U	5.46	0.546
Bromochloromethane	74-97-5		U	5.46	0.546
Bromodichloromethane	75-27-4		U	5.46	0.546
Bromoform	75-25-2		U	5.46	0.546
Bromomethane	74-83-9		U	10.9	1.09
2-Butanone	78-93-3		U	10.9	2.73
n-Butylbenzene	104-51-8		U	5.46	0.546
sec-Butylbenzene	135-98-8		U	5.46	0.546
tert-Butylbenzene	98-06-6		U	5.46	0.546
Carbon disulfide	75-15-0		U	5.46	0.546
Carbon tetrachloride	56-23-5		U	5.46	0.546
Chlorobenzene	108-90-7		U	5.46	0.546
Chlorodibromomethane	124-48-1		U	5.46	0.546
Chloroethane	75-00-3		U	10.9	1.09
2-Chloroethyl vinyl ether	110-75-8		U	10.9	2.18
Chloroform	67-66-3		U	5.46	0.546
Chloromethane	74-87-3		U	10.9	2.18
2-Chlorotoluene	95-49-8		U	5.46	0.546
4-Chlorotoluene	106-43-4		U	5.46	0.546
1,2-Dibromo-3-chloropropane	96-12-8		U	5.46	2.18
1,2-Dibromoethane	106-93-4		U	5.46	0.546
Dibromomethane	74-95-3		U	5.46	0.546
1,2-Dichlorobenzene	95-50-1		U	5.46	0.546
1,3-Dichlorobenzene	541-73-1		U	5.46	0.546
1,4-Dichlorobenzene	106-46-7		U	5.46	0.546
Dichlorodifluoromethane	75-71-8		U	10.9	1.09
1,1-Dichloroethane	75-34-3		U	5.46	1.09
1,2-Dichloroethane	107-06-2		U	5.46	0.546
1,1-Dichloroethene	75-35-4		U	5.46	0.546
cis-1,2-Dichloroethene	156-59-2		U	5.46	0.546
trans-1,2-Dichloroethene	156-60-5		U	5.46	0.546
1,2-Dichloropropane	78-87-5		U	5.46	0.546
1,3-Dichloropropane	142-28-9		U	5.46	0.546
2,2-Dichloropropane	594-20-7		U	5.46	0.546
cis-1,3-Dichloropropene	10061-01-5		U	5.46	0.546
trans-1,3-Dichloropropene	10061-02-6		U	5.46	0.546
1,1-Dichloropropene	563-58-6		U	5.46	0.546
Ethylbenzene	100-41-4		U	5.46	0.546
2-Hexanone	591-78-6		U	10.9	2.73
Hexachlorobutadiene	87-68-3		U	5.46	0.546
Isopropylbenzene	98-82-8		U	5.46	0.546
p-Isopropyltoluene	99-87-6		U	5.46	0.546
4-Methyl-2-pentanone	108-10-1		U	10.9	2.73
Methylene chloride	75-09-2	33.0		5.46	1.09
Naphthalene	91-20-3		U	10.9	0.546
n-Propylbenzene	103-65-1		U	5.46	0.546

Sample Number: **L0609126-01**
Client ID: **29WW40 (01)**
Matrix: **Soil**
Workgroup Number: **WG222027**
Collect Date: **09/06/2006 09:15**
Sample Tag: **02**

PrePrep Method: **NONE**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **1**
Units: **ug/kg**

Instrument: **HPMS9**
Prep Date: **09/12/2006 12:30**
Cal Date: **09/05/2006 13:49**
Run Date: **09/12/2006 12:30**
File ID: **9M48501**
Percent Solid: **73.8**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Styrene	100-42-5		U	5.46	0.546
1,1,1,2-Tetrachloroethane	630-20-6		U	5.46	0.546
1,1,2,2-Tetrachloroethane	79-34-5		U	5.46	0.546
Tetrachloroethene	127-18-4		U	5.46	0.546
Toluene	108-88-3		U	5.46	0.546
1,2,3-Trichlorobenzene	87-61-6		U	5.46	0.546
1,2,4-Trichlorobenzene	120-82-1		U	5.46	0.546
1,1,1-Trichloroethane	71-55-6		U	5.46	0.546
1,1,2-Trichloroethane	79-00-5		U	5.46	0.546
Trichloroethene	79-01-6		U	5.46	0.546
Trichlorofluoromethane	75-69-4		U	10.9	1.09
1,2,3-Trichloropropane	96-18-4		U	5.46	1.09
1,2,4-Trimethylbenzene	95-63-6		U	5.46	0.546
1,3,5-Trimethylbenzene	108-67-8		U	5.46	0.546
Vinyl acetate	108-05-4		U	10.9	1.09
Vinyl chloride	75-01-4		U	10.9	1.09
o-Xylene	95-47-6		U	5.46	0.546
m-,p-Xylene	136777-61-2		U	5.46	0.546

Surrogate	% Recovery	Lower	Upper	Qual
Dibromofluoromethane	108	80	120	
1,2-Dichloroethane-d4	110	80	120	
Toluene-d8	104	81	117	
4-Bromofluorobenzene	103	74	121	

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609126-01**
Client ID: **29WW40 (01)**
Matrix: **Soil**
Workgroup Number: **WG221881**
Collect Date: **09/06/2006 09:15**

PrePrep Method: **NONE**
Prep Method: **D2216-90**
Analytical Method: **D2216-90**
Analyst: **TMM**
Dilution: **1**
Units: **weight %**

Instrument: **OVEN**
Prep Date: **09/09/2006 12:00**
Cal Date:
Run Date: **09/09/2006 12:00**
File ID: **OV.0609091200-20**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	73.8		1.00	1.00

WORKGROUP SUMMARY BY METHOD

WORKGROUP SUMMARY BY METHOD

Analysis: Percent Solids
Analytical Method: D2216-90
Workgroup: WG221881

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609126-01	29WW40 (01)			09/09/06 12:00		OVEN	TMM

Analysis: Volatile Organics
Extraction Method: 5030B
Workgroup: WG221917

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609126-01	29WW40 (01)				221917	HPMS9	MES

Analysis: Volatile Organics
Analytical Method: 8260B
Workgroup: WG222027

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609126-01	29WW40 (01)			09/12/06 12:30	02	HPMS9	MES

Analysis: Volatile Organics
Extraction Method: 5030B
Workgroup: WG222027

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609126-01	29WW40 (01)				222027	HPMS9	MES

Kemron Environmental Services
Analyst Listing
September 15, 2006

AJF - AMANDA J. FICKIESEN
ALB - ANNIE L. BOCK
ALT - ANN L. THAYER
ARA - ADRIAN R. ACHTERMANN
BRG - BRENDA R. GREGORY
CAA - CASSIE A. AUGENSTEIN
CAF - CHERYL A. FLOWERS
CAK - CHERYL A. KOELSCH
CEB - CHAD E. BARNES
CFB - CHAD F. BOOK
CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER
CLW - CHARISSA L. WINTERS
CM - CHARLIE MARTIN
CMS - CRYSTAL M. STEPHENS
CPD - CHAD P. DAVIS
CRC - CARLA R. COCHRAN
CSA - LUCINDA S. ARNOLD
CSH - CHRIS S. HILL
DAS - DALLAS A. SULLIVAN
DD - DIANE M. DENNIS
DDE - DEBRA D. ELLIOTT
DEL - DON E. LIGHTFRITZ
DEV - DAVID E. VANDENBERG
DGB - DOUGLAS G. BUTCHER
DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER
DLP - DOROTHY L. PAYNE
DLR - DIANNA L. RAUCH
DR - DEANNA ROBERTS
DRP - DAVE R. PITZER
DSM - DAVID S. MOSSOR
DST - DENNIS S. TEPE
ECL - ERIC C. LAWSON
ED - EMILY E. DECKER
FJB - FRANCES J. BOLDEN
HAV - HEMA VILASAGAR
JAL - JOHN A. LENT
JKT - JANE K. THOMPSON
JLS - JANICE L. SCHIMMEL
JNB - JOSHUA N. BOOTH
JS - JENNIFER L. SOUTHALL
JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES
JYH - JI Y. HU
KCZ - KEVIN C. ZUMBRO
KEB - KATHRYN E. BARNES
KHR - KIM H. RHODES
KRA - KATHY R. ALBERTSON
LKN - LINDA K. NEDEFF
LSB - LESLIE S. BUCINA
MDA - MIKE D. ALBERTSON
MDC - MICHAEL D. COCHRAN
MES - MARY E. SCHILLING
MKZ - MARILYN K. ZUMBRO
MLR - MARY L. ROCHOTTE
MLS - MICHAEL L. SCHIMMEL
MMB - MAREN M. BEERY
MSW - MATT S. WILSON
NJB - NATALIE J. BOOTH
PAS - PATRICK A. STREET
PJM - PAUL J. MILLER
RB - ROBERT BUCHANAN
RDC - REBECCA D. CUTLIP
REK - ROBERT E. KYER
RNP - RICK N. PETTY
RWC - RODNEY W. CAMPBELL
SCM - SUSAN C. MOELLENDICK
SLM - STEPHANIE L. MOSSBURG
SLP - SHERI L. PFALZGRAF
SMH - SHAUNA M. HYDE
SRM - SAMUEL R. MCFEE
TMB - TIFFANY M. BAILEY
TMM - TAMMY M. MORRIS
VC - VICKI COLLIER
WFM - WALTER F. MARTIN

KEMRON Environmental Services

List of Valid Qualifiers

September 15, 2006

00097707

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
FL	Free Liquid
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	ESTIMATE & COLUMNS DON'T AGREE TO WITHIN 40%
L	Sample reporting limits elevated due to matrix interference
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
Z	Cannot be resolved from isomer - see below

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

Organic QA/QC

KEMRON Environmental Services
Data Checklist

00097709

Date: 05-SEP-2006
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS9
Curve Workgroup: NA
Runlog ID: 12115
Analytical Workgroups: WG221444

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	NA
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	NA
TCL's	NA
Surrogates	NA
LCS (Laboratory Control Sample)	NA
Recoveries	NA
Surrogates	NA
MS/MSD/Duplicates	NA
Samples	NA
TCL Hits	NA
Spectra of TCL Hits	NA
Surrogates	NA
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	X
Case Narrative	NA
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	MES
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
06-SEP-2006

Secondary Reviewer:
07-SEP-2006

Generated: SEP-07-2006 15:45:41

KEMRON Environmental Services
Data Checklist

00097710

Date: 12-SEP-2006
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS9
Curve Workgroup: NA
Runlog ID: 12260
Analytical Workgroups: WG222027

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	MES
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
14-SEP-2006

Secondary Reviewer:
15-SEP-2006

Generated: SEP-15-2006 08:33:27

00097711

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS9 Dataset: 090506
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 15500

Internal Standard: STD14737 Surrogate Standard: STD14802
CCV: STD14825 LCS: STD14634 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG221444

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	9M48296	WG221444-01 BFB 50ng STD 8260	NA	7	1	STD14237	09/05/06 08:29
2	9M48297	WG221444-02 0.5ug/Kg SOIL STD 8260	NA	7	1	STD14775	09/05/06 08:57
3	9M48298	WG221444-03 2 ug/Kg SOIL STD 8260	NA	7	1	STD14775	09/05/06 09:38
4	9M48299	WG221444-04 5 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 10:10
5	9M48300	WG221444-05 10 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 10:41
6	9M48301	WG221444-06 20 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 11:12
7	9M48302	WG221444-07 50 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 11:43
8	9M48303	WG221444-08 100 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 12:15
9	9M48304	WG221444-09 200 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 12:46
10	9M48305	SYSTEM BLANK	NA	7	1		09/05/06 13:17
11	9M48306	WG221444-02 0.5 ug/Kg SOIL STD 8260	NA	7	1	STD14825	09/05/06 13:49
12	9M48307	WG221444-10 20ug/Kg ALT SOURCE	NA	7	1	STD14634	09/05/06 14:27
13	9M48308	STD CHECK	NA	7	1		09/05/06 15:42
14	9M48309	SYSTEM BLANK	NA	7	1		09/05/06 16:33
15	9M48310	SYSTEM BLANK	NA	7	1		09/05/06 17:04
16	9M48311	SYSTEM BLANK	NA	7	1		09/05/06 17:36
17	9M48312	SYSTEM BLANK	NA	7	1		09/05/06 18:07
18	9M48313	STD CHECK	NA	7	1		09/05/06 18:38
19	9M48314	STD CHECK	NA	7	1		09/05/06 19:10
20	9M48315	L0609019-01 GC CONF	NA	7	1		09/05/06 19:41

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 9M48297				
Do not report.				

Approved: September 07, 2006

00097712

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS9 Dataset: 091206
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 15642

Internal Standard: STD14996 Surrogate Standard: STD15001
CCV: STD14929 LCS: STD14925 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG222027

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	9M48493	WG222026-01 50NG BFB STD 8260	NA	7	1	STD14811	09/12/06 08:28
2	9M48494	WG222026-02 50ug/Kg SOIL STD 8260	NA	7	1	STD14929	09/12/06 08:54
3	9M48495	WG222027-01 VBLK0912 BLANK 8260	NA	7	1		09/12/06 09:24
4	9M48496	WG222027-02 20ug/Kg LCS 8260	NA	7	1	STD14925	09/12/06 09:55
5	9M48497	WG222026-03 100ug/Kg APPIX/FOO STD	NA	7	1	STD14848	09/12/06 10:26
6	9M48498	WG222027-01 VBLK0912 BLANK 8260	NA	7	1		09/12/06 10:57
7	9M48499	WG222027-02 20ug/Kg LCS 8260	NA	7	1	STD14925/STD14849	09/12/06 11:28
8	9M48500	WG222027-03 20ug/Kg LCSDUP 8260	NA	7	1	STD14925/STD14849	09/12/06 11:58
9	9M48501	L0609126-01 B 0.8X 8260	NA	7	1		09/12/06 12:30
10	9M48502	L0609112-08 B 0.9X 826-SPE	NA	7	1		09/12/06 13:00
11	9M48503	L0609112-13 D 1X 826-SPE	NA	7	1		09/12/06 13:31
12	9M48504	L0609124-02 8260A	NA	7	1		09/12/06 14:02
13	9M48505	L0609124-03 8260A	NA	7	1		09/12/06 14:32
14	9M48506	L0609124-05 8260A	NA	7	1		09/12/06 15:04
15	9M48507	L0609124-06 8260A	NA	7	1		09/12/06 15:34
16	9M48508	L0609124-07 8260A	NA	7	1		09/12/06 16:05
17	9M48509	L0609124-08 8260A	NA	7	1		09/12/06 16:36
18	9M48510	L0609179-01 8260	NA	7	1		09/12/06 17:07
19	9M48511	L0609179-02 8260	NA	7	1		09/12/06 17:38
20	9M48512	L0609168-10 A 0.9X 826-SPE	NA	7	1		09/12/06 18:08
21	9M48513	L0609168-11 A 0.9X 826-SPE	NA	7	1		09/12/06 18:39
22	9M48514	L0609168-13 A 0.9X 826-SPE	NA	7	1		09/12/06 19:10
23	9M48515	L0609168-23 A 0.9X 826-SPE	NA	7	1		09/12/06 19:41
24	9M48516	L0609225-01 A 0.7X 8260	NA	7	1		09/12/06 20:12
25	9M48517	SYSTEM BLANK	NA	7	1		09/12/06 20:44
26	9M48518	5035 BLANK A 9/7/06	NA	7	1		09/12/06 21:14

Comments

Seq.	Rerun	Dil.	Reason	Analytes
3				
File ID: 9M48495				

Approved: September 15, 2006

KEMRON Environmental Services

Instrument Run Log

00097713

Instrument: HPMS9 Dataset: 091206

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 15642

Internal Standard: STD14996 Surrogate Standard: STD15001

CCV: STD14929 LCS: STD14925 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG222027

Comments

Seq.	Rerun	Dil.	Reason	Analytes
			Do not report-forgot to run APPIX std.	
4				
File ID: 9M48496				
			Do not report-forgot to run APPIX std.	
14	X	5	Internal standard and surrogate standard failure	
File ID: 9M48506				
15				
File ID: 9M48507				
			Do not report-instrument is not purging.	
16				
File ID: 9M48508				
			Do not report-instrument is not purging.	
17				
File ID: 9M48509				
			Do not report-instrument is not purging.	
18				
File ID: 9M48510				
			Do not report-instrument is not purging.	
19				
File ID: 9M48511				
			Do not report-instrument is not purging. See maintenance log.	

Approved: September 15, 2006

Kemron ENVIRONMENTAL SERVICES

VOA Preservation and Extraction Log

Analyst: MEJ Date Preserved: 9/7/06 Method: 8260

Client	Sample #	Fraction ID	Date Collected	Time Collected	Time Preserved	Tare Wt. (g)	Total Wt. (g)	Sample Wt. (g)	Water Vol. (mL)	Methanol Vol. (mL)	Comments	Team Notified
Etech 582	LO609121-09	A	9/5/06	1325	0916	NA	NA	4.05	5	–	5	
	-09	B		⊥	⊥			5.35	⊥	–		
	-09	C		⊥	⊥			6.05	–	10		
	-10	A		1040	0910			5.71	5	–		
	-10	B			⊥			5.15	⊥	–		
	-10	C			⊥			4.82	–	10		
	-11	A			0913			5.21	5	–		
	-11	B			⊥			4.55	⊥	–		
	-11	C		⊥	⊥			5.90	–	10		
⊥	Blank	A	–	–	0905			5.00	5	–		
	⊥	B	–	–	⊥			⊥	⊥	–		
		C	–	–	⊥			⊥	–	10	⊥	
Etech. 582	LO609121-10	A	9/5/06	1040	1110	NA	NA	5.68	5	–	5 Samples from CC- so it is in hold	
⊥	-10	B	⊥	⊥	⊥			5.72	⊥	–		
	-10	C			⊥			5.64	–	10	⊥	
Shaw-Alliance	LO609126-01	A	9/6/06	0915	1117			5.70	5	–	5	
⊥	-01	B	⊥	⊥	⊥			6.21	⊥	–	⊥	
	-01	C			⊥			6.00	–	10		
PPG-093	LO609025-01	NA	8/30/06	–	–			4.96	5	–		
⊥	LO609028-01	⊥	⊥	NA	NA			0.95	⊥	NA		
URS-246	LO609118-01	NA	8/28/06			NA	NA	0.97	5			
	-02							4.68				
	-03							4.60				
⊥	-04	⊥	⊥	⊥	⊥	⊥	⊥	4.79	⊥	⊥		

Lab was given wrong sample to prep. Do not use this encore. mj 9/7/06

Comments:
1 = improperly sealed cap
2 = preserved out of hold (past 48 hours from time of collection)
3 = effervesced
4 = preserved with NaHSO4 (sodium bisulfate)
5 = preserved by freezing

Methanol (Manufacturer, Lot #) B&J CQ038

NaHSO4 (Manufacturer, Lot #) NA

Reviewed by: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097715

Analytical Method: 8260B AAB#: WG222027

Login Number: L0609126

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
29WW40 (01)	09/06/06	09/07/06	09/12/06	14	6.14	09/12/06	14	6.14	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 566947
Report generated 09/15/2006 13:00

SURROGATE STANDARDS

00097716

Login Number: L0609126
Instrument Id: HPMS9
Workgroup (AAB#): WG222027

Method: 8260
CAL ID: HPMS9-05-SEP-06
Matrix: SOLID

Sample Number	Dilution	Tag	1	2	3	4
L0609126-01	1.00	02	110	108	103	104
WG222027-01	1.00	01	104	106	102	105
WG222027-02	1.00	01	105	107	104	106
WG222027-03	1.00	01	104	107	104	106

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	80	-	120
2 - Dibromofluoromethane	80	-	120
3 - 4-Bromofluorobenzene	74	-	121
4 - Toluene-d8	81	-	117

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 04/18/2006
Version 1.5 PDF File ID: 566957
Report generated 09/15/2006 13:00

METHOD BLANK SUMMARY

00097717

Login Number: L0609126
Work Group: WG222027
Blank File ID: 9M48498
Blank Sample ID: WG222027-01
Date Analyzed: 09/12/06
Instrument ID: HPMS9
Time Analyzed: 10:57
Method: 8260B
Analyst: MES

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG222027-02	9M48499	09/12/06 11:28	01
LCS2	WG222027-03	9M48500	09/12/06 11:58	01
29WW40 (01)	L0609126-01	9M48501	09/12/06 12:30	02

METHOD BLANK REPORT

Login Number: L0609126 Run Date: 09/12/2006 Sample ID: WG222027-01
Instrument ID: HPMS9 Run Time: 10:57 Prep Method: 5030B
File ID: 9M48498 Analyst: MES Method: 8260B
Workgroup (AAB#): WG222027 Matrix: Solid Units: ug/kg
Contract #: DACA56-94-D-0020 Cal ID: HPMS9-05-SEP-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Acetone	5.00	10.0	5.00	1	U
Benzene	0.500	5.00	0.500	1	U
Bromobenzene	0.500	5.00	0.500	1	U
Bromochloromethane	0.500	5.00	0.500	1	U
Bromodichloromethane	0.500	5.00	0.500	1	U
Bromoform	0.500	5.00	0.500	1	U
Bromomethane	1.00	10.0	1.00	1	U
2-Butanone	2.50	10.0	2.50	1	U
n-Butylbenzene	0.500	5.00	0.500	1	U
sec-Butylbenzene	0.500	5.00	0.500	1	U
tert-Butylbenzene	0.500	5.00	0.500	1	U
Carbon disulfide	0.500	5.00	0.500	1	U
Carbon tetrachloride	0.500	5.00	0.500	1	U
Chlorobenzene	0.500	5.00	0.500	1	U
Chlorodibromomethane	0.500	5.00	0.500	1	U
Chloroethane	1.00	10.0	1.00	1	U
2-Chloroethyl vinyl ether	2.00	10.0	2.00	1	U
Chloroform	0.500	5.00	0.500	1	U
Chloromethane	2.00	10.0	2.00	1	U
2-Chlorotoluene	0.500	5.00	0.500	1	U
4-Chlorotoluene	0.500	5.00	0.500	1	U
1,2-Dibromo-3-chloropropane	2.00	5.00	2.00	1	U
1,2-Dibromoethane	0.500	5.00	0.500	1	U
Dibromomethane	0.500	5.00	0.500	1	U
1,2-Dichlorobenzene	0.500	5.00	0.500	1	U
1,3-Dichlorobenzene	0.500	5.00	0.500	1	U
1,4-Dichlorobenzene	0.500	5.00	0.500	1	U
Dichlorodifluoromethane	1.00	10.0	1.00	1	U
1,1-Dichloroethane	1.00	5.00	1.00	1	U
1,2-Dichloroethane	0.500	5.00	0.500	1	U
1,1-Dichloroethene	0.500	5.00	0.500	1	U
cis-1,2-Dichloroethene	0.500	5.00	0.500	1	U
trans-1,2-Dichloroethene	0.500	5.00	0.500	1	U
1,2-Dichloropropane	0.500	5.00	0.500	1	U
1,3-Dichloropropane	0.500	5.00	0.500	1	U
2,2-Dichloropropane	0.500	5.00	0.500	1	U
cis-1,3-Dichloropropene	0.500	5.00	0.500	1	U
trans-1,3-Dichloropropene	0.500	5.00	0.500	1	U
1,1-Dichloropropene	0.500	5.00	0.500	1	U
Ethylbenzene	0.500	5.00	0.500	1	U
2-Hexanone	2.50	10.0	2.50	1	U
Hexachlorobutadiene	0.500	5.00	0.500	1	U

KEMRON FORMS - Modified 07/21/2006
Version 1.5 PDF File ID: 566949
Report generated 09/15/2006 13:00

KEMRON Environmental Services

METHOD BLANK REPORT

00097719

Login Number: L0609126 Run Date: 09/12/2006 Sample ID: WG222027-01
Instrument ID: HPMS9 Run Time: 10:57 Prep Method: 5030B
File ID: 9M48498 Analyst: MES Method: 8260B
Workgroup (AAB#): WG222027 Matrix: Solid Units: ug/kg
Contract #: DACA56-94-D-0020 Cal ID: HPMS9-05-SEP-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Isopropylbenzene	0.500	5.00	0.500	1	U
p-Isopropyltoluene	0.500	5.00	0.500	1	U
4-Methyl-2-pentanone	2.50	10.0	2.50	1	U
Methylene chloride	1.00	5.00	1.00	1	U
Naphthalene	0.500	10.0	0.500	1	U
n-Propylbenzene	0.500	5.00	0.500	1	U
Styrene	0.500	5.00	0.500	1	U
1,1,1,2-Tetrachloroethane	0.500	5.00	0.500	1	U
1,1,2,2-Tetrachloroethane	0.500	5.00	0.500	1	U
Tetrachloroethene	0.500	5.00	0.500	1	U
Toluene	0.500	5.00	0.500	1	U
1,2,3-Trichlorobenzene	0.500	5.00	0.500	1	U
1,2,4-Trichlorobenzene	0.500	5.00	0.500	1	U
1,1,1-Trichloroethane	0.500	5.00	0.500	1	U
1,1,2-Trichloroethane	0.500	5.00	0.500	1	U
Trichloroethene	0.500	5.00	0.500	1	U
Trichlorofluoromethane	1.00	10.0	1.00	1	U
1,2,3-Trichloropropane	1.00	5.00	1.00	1	U
1,2,4-Trimethylbenzene	0.500	5.00	0.500	1	U
1,3,5-Trimethylbenzene	0.500	5.00	0.500	1	U
Vinyl acetate	1.00	10.0	1.00	1	U
Vinyl chloride	1.00	10.0	1.00	1	U
o-Xylene	0.500	5.00	0.500	1	U
m-,p-Xylene	0.500	5.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	106	80 - 120	PASS
1,2-Dichloroethane-d4	104	80 - 120	PASS
Toluene-d8	105	81 - 117	PASS
4-Bromofluorobenzene	102	74 - 121	PASS

MDL Method Detection Limit
RL Reporting/quantitation Limit

* Analyte concentration > RL

KEMRON FORMS - Modified 07/21/2006
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KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097720

Login Number:L0609126 Analyst:MES Prep Method:5030B
Instrument ID:HPMS9 Matrix:Soil Method:8260B
Workgroup (AAB#):WG222027 Units:ug/kg
Sample ID:WG222027-02 LCS File ID:9M48499 Run Date:09/12/2006 11:28
Sample ID:WG222027-03 LCS2 File ID:9M48500 Run Date:09/12/2006 11:58

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Acetone	20.0	15.7	78.3	20.0	13.3	66.6	16.2	20 - 160	30	
Benzene	20.0	17.5	87.7	20.0	17.5	87.7	0.0884	70 - 139	30	
Bromobenzene	20.0	18.0	89.9	20.0	17.6	88.0	2.19	72 - 131	30	
Bromochloromethane	20.0	18.8	93.8	20.0	18.1	90.3	3.78	70 - 130	30	
Bromodichloromethane	20.0	19.1	95.7	20.0	19.1	95.4	0.334	72 - 137	30	
Bromoform	20.0	16.3	81.3	20.0	16.6	82.8	1.84	49 - 136	30	
Bromomethane	20.0	18.9	94.6	20.0	18.8	94.2	0.464	37 - 143	30	
2-Butanone	20.0	17.9	89.6	20.0	16.7	83.3	7.28	37 - 172	30	
n-Butylbenzene	20.0	17.6	87.8	20.0	17.4	87.1	0.803	70 - 136	30	
sec-Butylbenzene	20.0	18.1	90.6	20.0	18.0	90.1	0.590	71 - 132	30	
tert-Butylbenzene	20.0	17.9	89.3	20.0	17.8	89.1	0.235	72 - 130	30	
Carbon disulfide	20.0	18.8	93.8	20.0	17.9	89.6	4.52	39 - 139	30	
Carbon tetrachloride	20.0	18.3	91.5	20.0	18.2	91.1	0.400	59 - 136	30	
Chlorobenzene	20.0	18.1	90.6	20.0	18.2	90.9	0.395	70 - 130	30	
Chlorodibromomethane	20.0	18.5	92.4	20.0	18.2	90.9	1.66	59 - 136	30	
Chloroethane	20.0	16.4	81.9	20.0	16.5	82.6	0.910	52 - 135	30	
2-Chloroethyl vinyl ether	20.0	17.3	86.3	20.0	15.8	78.8	9.16	35 - 154	30	
Chloroform	20.0	18.4	92.2	20.0	18.7	93.3	1.18	74 - 129	30	
Chloromethane	20.0	19.0	94.9	20.0	18.6	92.8	2.20	30 - 131	30	
2-Chlorotoluene	20.0	17.9	89.6	20.0	17.9	89.4	0.226	63 - 147	30	
4-Chlorotoluene	20.0	17.5	87.5	20.0	17.7	88.4	1.04	70 - 138	30	
1,2-Dibromo-3-chloropropane	20.0	15.6	78.2	20.0	15.2	76.1	2.81	40 - 135	30	
1,2-Dibromoethane	20.0	18.2	91.2	20.0	17.8	88.8	2.59	69 - 130	30	
Dibromomethane	20.0	18.1	90.6	20.0	19.0	94.8	4.52	59 - 137	30	
1,2-Dichlorobenzene	20.0	16.8	84.1	20.0	16.8	84.0	0.167	70 - 130	30	
1,3-Dichlorobenzene	20.0	17.1	85.5	20.0	17.1	85.7	0.266	70 - 130	30	
1,4-Dichlorobenzene	20.0	16.8	84.2	20.0	16.7	83.7	0.574	70 - 130	30	
Dichlorodifluoromethane	20.0	16.1	80.3	20.0	15.4	77.2	3.82	25 - 130	30	
1,1-Dichloroethane	20.0	18.5	92.3	20.0	18.5	92.7	0.479	75 - 125	30	
1,2-Dichloroethane	20.0	18.1	90.3	20.0	18.2	91.1	0.969	63 - 133	30	
1,1-Dichloroethene	20.0	18.4	91.8	20.0	18.5	92.6	0.823	65 - 135	30	
cis-1,2-Dichloroethene	20.0	18.2	91.1	20.0	18.2	91.0	0.0582	65 - 135	30	
trans-1,2-Dichloroethene	20.0	18.3	91.4	20.0	17.9	89.5	2.08	65 - 139	30	
1,2-Dichloropropane	20.0	18.5	92.5	20.0	18.6	93.0	0.505	70 - 130	30	
1,3-Dichloropropane	20.0	19.0	94.9	20.0	18.4	92.1	2.93	65 - 128	30	
2,2-Dichloropropane	20.0	16.9	84.4	20.0	16.8	84.1	0.334	66 - 135	30	
cis-1,3-Dichloropropene	20.0	18.0	90.1	20.0	18.0	90.1	0.0135	70 - 142	30	
trans-1,3-Dichloropropene	20.0	16.6	82.8	20.0	16.6	82.9	0.0784	56 - 135	30	
1,1-Dichloropropene	20.0	19.5	97.4	20.0	19.5	97.6	0.231	57 - 138	30	
Ethylbenzene	20.0	17.8	89.0	20.0	17.8	89.0	0.0656	70 - 130	30	
2-Hexanone	20.0	15.7	78.4	20.0	15.1	75.6	3.63	45 - 145	30	
Hexachlorobutadiene	20.0	16.1	80.7	20.0	16.8	83.8	3.84	65 - 135	30	

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Report generated 09/15/2006 13:00

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097721

Login Number:L0609126 Analyst:MES Prep Method:5030B
Instrument ID:HPMS9 Matrix:Soil Method:8260B
Workgroup (AAB#):WG222027 Units:ug/kg
Sample ID:WG222027-02 LCS File ID:9M48499 Run Date:09/12/2006 11:28
Sample ID:WG222027-03 LCS2 File ID:9M48500 Run Date:09/12/2006 11:58

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Isopropylbenzene	20.0	16.9	84.6	20.0	16.7	83.7	1.05	68 - 129	30	
p-Isopropyltoluene	20.0	17.1	85.3	20.0	16.9	84.6	0.878	72 - 128	30	
4-Methyl-2-pentanone	20.0	17.1	85.7	20.0	16.3	81.5	4.97	47 - 146	30	
Methylene chloride	20.0	18.1	90.4	20.0	18.1	90.3	0.0895	74 - 128	30	
Naphthalene	20.0	13.8	68.8	20.0	14.3	71.6	4.00	50 - 146	30	
n-Propylbenzene	20.0	17.9	89.3	20.0	17.5	87.7	1.78	72 - 136	30	
Styrene	20.0	18.6	93.2	20.0	18.6	93.0	0.241	74 - 130	30	
1,1,1,2-Tetrachloroethane	20.0	18.4	92.1	20.0	18.2	91.1	1.08	71 - 137	30	
1,1,2,2-Tetrachloroethane	20.0	17.1	85.7	20.0	16.5	82.4	3.93	55 - 130	30	
Tetrachloroethene	20.0	19.4	96.8	20.0	18.8	94.2	2.74	72 - 130	30	
Toluene	20.0	18.8	93.9	20.0	18.8	94.0	0.125	77 - 126	30	
1,2,3-Trichlorobenzene	20.0	14.1	70.4	20.0	14.7	73.6	4.40	60 - 135	30	
1,2,4-Trichlorobenzene	20.0	14.5	72.7	20.0	14.9	74.4	2.37	65 - 130	30	
1,1,1-Trichloroethane	20.0	18.6	92.8	20.0	18.5	92.6	0.220	70 - 135	30	
1,1,2-Trichloroethane	20.0	18.5	92.7	20.0	18.8	94.0	1.39	60 - 125	30	
Trichloroethene	20.0	18.6	93.2	20.0	18.5	92.5	0.721	72 - 126	30	
Trichlorofluoromethane	20.0	16.4	81.9	20.0	16.0	80.2	2.04	48 - 154	30	
1,2,3-Trichloropropane	20.0	17.2	86.1	20.0	16.4	82.0	4.79	65 - 130	30	
1,2,4-Trimethylbenzene	20.0	16.9	84.4	20.0	16.5	82.7	2.07	75 - 132	30	
1,3,5-Trimethylbenzene	20.0	17.8	89.2	20.0	17.5	87.6	1.78	74 - 133	30	
Vinyl acetate	20.0	12.4	62.1	20.0	11.8	59.2	4.82	10 - 150	30	
Vinyl chloride	20.0	17.6	88.2	20.0	17.5	87.3	0.999	25 - 130	30	
o-Xylene	20.0	17.9	89.3	20.0	17.6	88.0	1.47	70 - 130	30	
m-,p-Xylene	40.0	36.6	91.4	40.0	36.4	90.9	0.493	70 - 130	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
Dibromofluoromethane	107	107	80 - 120	PASS
1,2-Dichloroethane-d4	105	104	80 - 120	PASS
Toluene-d8	106	106	81 - 117	PASS
4-Bromofluorobenzene	104	104	74 - 121	PASS

* FAILS %REC LIMIT

\# FAILS RPD LIMIT

KEMRON FORMS - Modified 07/13/2006
Version 1.5 PDF File ID:566950
Report generated 09/15/2006 13:00

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0609126 **Tune ID:** WG221444-01
Instrument: HPMS9 **Run Date:** 09/05/2006
Analyst: MES **Run Time:** 08:29
Workgroup: WG221444 **File ID:** 9M48296
Cal ID: HPMS9-05-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	17.5	4318	PASS
75.0	95.0	30.0	60.0	46.2	11422	PASS
95.0	95.0	100	100	100	24698	PASS
96.0	95.0	5.00	9.00	6.81	1682	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	84.1	20765	PASS
175	174	5.00	9.00	7.52	1561	PASS
176	174	95.0	101	96.8	20101	PASS
177	176	5.00	9.00	6.84	1375	PASS

This check relates to the following samples, MS, MSD:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG221444-10	SSCV-S	01	09/05/2006 14:27	
WG221444-02	STD-S	01	09/05/2006 13:49	
WG221444-09	STD-S	01	09/05/2006 12:46	
WG221444-08	STD-S	01	09/05/2006 12:15	
WG221444-07	STD-CCV-S	01	09/05/2006 11:43	
WG221444-06	STD-S	01	09/05/2006 11:12	
WG221444-05	STD-S	01	09/05/2006 10:41	
WG221444-04	STD-S	01	09/05/2006 10:10	
WG221444-03	STD-S	01	09/05/2006 09:38	

*** Sample past 12 hour tune limit**

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0609126 Tune ID: WG222026-01
Instrument: HPMS9 Run Date: 09/12/2006
Analyst: MES Run Time: 08:28
Workgroup: WG222026 File ID: 9M48493
Cal ID: HPMS9 -05-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	17.8	3308	PASS
75.0	95.0	30.0	60.0	43.1	7994	PASS
95.0	95.0	100	100	100	18546	PASS
96.0	95.0	5.00	9.00	6.78	1258	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	79.9	14818	PASS
175	174	5.00	9.00	7.50	1111	PASS
176	174	95.0	101	100	14827	PASS
177	176	5.00	9.00	5.98	887	PASS

This check relates to the following CCV:

Lab ID	Client ID	Date Analyzed	
WG222026-02	CCV	09/12/2006 08:54	

This check relates to the following samples & batch QC:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG222027-01	BLANK	01	09/12/2006 10:57	
WG222027-02	LCS	01	09/12/2006 11:28	
WG222027-03	LCS2	01	09/12/2006 11:58	
L0609126-01	29WW40 (01)	02	09/12/2006 12:30	

*** Sample past 12 hour tune limit**

KEMRON FORMS - Modified 07/27/2006
Version 1.3 PDF File ID: 566954
Report generated 09/15/2006 13:00

INITIAL CALIBRATION SUMMARY

00097724

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

ICAL Workgroup: WG221444 **Column ID:** F

Analyte		AVG RF	% RSD	LINEAR	QUAD
1,1-Dichloroethene	CCC	0.2147	12.3		
1,2-Dichloropropane	CCC	0.1980	7.89		
Chloroform	CCC	0.4013	7.06		
Ethylbenzene	CCC	0.4965	13.8		
Toluene	CCC	1.259	15.7	0.999	
Vinyl Chloride	CCC	0.1321	15.6		0.999
1,1,2,2-Tetrachloroethane	SPCC	0.6031	9.57		
1,1-Dichloroethane	SPCC	0.3925	7.32		
Bromoform	SPCC	0.1714	13.2		
Chlorobenzene	SPCC	0.8532	7.87		
Chloromethane	SPCC	0.1797	7.75		
1,1,1,2-Tetrachloroethane		0.2878	10.2		
1,1,1-Trichloroethane		0.3752	9.46		
1,1,2-Trichloroethane		0.2318	7.84		
1,1-Dichloropropene		0.3047	10.8		
1,2,3-Trichlorobenzene		0.8045	11.0		
1,2,3-Trichloropropane		0.2160	10.4		
1,2,4-Trichlorobenzene		0.8650	12.6		
1,2,4-Trimethylbenzene		2.619	12.6		
1,2-Dibromo-3-Chloropropane		0.1532	16.2	0.996	
1,2-Dibromoethane		0.2619	8.10		
1,2-Dichlorobenzene		1.285	10.2		
1,2-Dichloroethane		0.3065	6.44		
1,3,5-Trimethylbenzene		2.454	10.4		
1,3-Dichlorobenzene		1.384	10.3		
1,3-Dichloropropane		0.3893	7.31		
1,4-Dichlorobenzene		1.416	10.2		
2,2-Dichloropropane		0.3529	8.38		
2-Butanone		0.08460	9.10		
2-Chloroethyl Vinyl Ether		0.1107	10.6		
2-Chlorotoluene		2.181	11.3		
2-Hexanone		0.1544	9.94		
4-Chlorotoluene		1.917	10.6		
4-Methyl-2-Pentanone		0.07600	11.8		
Acetone		0.07988	28.6	0.998	
Benzene		0.9015	13.9		
Bromobenzene		0.7032	10.3		
Bromochloromethane		0.1239	8.16		
Bromodichloromethane		0.2678	11.1		
Bromomethane		0.1144	11.4		
Carbon Disulfide		0.6486	7.86		
Carbon Tetrachloride		0.3489	11.9		
Chloroethane		0.1779	8.30		
Dibromochloromethane		0.2733	13.6		
Dibromomethane		0.1343	6.53		

KEMRON FORMS - Modified 08/31/2006
Version 1.5 PDF File ID: 566951
Report generated 09/15/2006 13:00

INITIAL CALIBRATION SUMMARY

00097725

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

ICAL Workgroup: WG221444 **Column ID:** F

Analyte		AVG RF	% RSD	LINEAR	QUAD
Dichlorodifluoromethane		0.3091	5.27		
Hexachlorobutadiene		0.3924	14.3		
Isopropylbenzene		1.404	8.41		
Methylene Chloride		0.2260	6.27		
Naphthalene		2.360	10.7		
Styrene		0.8972	10.7		
Tetrachloroethene		0.2404	8.11		
Trichloroethene		0.2629	8.37		
Trichlorofluoromethane		0.5014	9.52		
Vinyl Acetate		0.2940	9.62		
cis-1,2-Dichloroethene		0.2462	8.46		
cis-1,3-Dichloropropene		0.3244	11.8		
m-,p-Xylene		0.6322	16.1	0.998	
n-Butylbenzene		2.346	12.0		
n-Propylbenzene		3.263	11.0		
o-Xylene		0.5682	8.02		
p-Isopropyltoluene		2.718	12.4		
sec-Butylbenzene		3.145	13.0		
tert-Butylbenzene		0.5211	12.4		
trans-1,2-Dichloroethene		0.2364	8.68		
trans-1,3-Dichloropropene		0.3837	10.9		

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00097726

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

Column ID: F

Analyte	WG221444-02			WG221444-03			WG221444-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	NA	NA	NA	2.00	3526.00000	0.1685	5.00	10560.0000	0.2187
1,2-Dichloropropane	NA	NA	NA	2.00	3836.00000	0.1834	5.00	9575.00000	0.1983
Chloroform	NA	NA	NA	2.00	7861.00000	0.3758	5.00	20294.0000	0.4203
Ethylbenzene	0.500	2393.00000	0.6460	2.00	7821.00000	0.4756	5.00	19220.0000	0.5062
Toluene	0.500	6257.00000	1.689	2.00	20237.0000	1.231	5.00	50132.0000	1.320
Vinyl Chloride	NA	NA	NA	2.00	2745.00000	0.1312	5.00	7799.00000	0.1615
1,1,2,2-Tetrachloroethane	NA	NA	NA	2.00	4582.00000	0.5438	5.00	11939.0000	0.6092
1,1-Dichloroethane	NA	NA	NA	2.00	7710.00000	0.3685	5.00	19266.0000	0.3990
Bromoform	NA	NA	NA	NA	NA	NA	5.00	5614.00000	0.1479
Chlorobenzene	NA	NA	NA	2.00	13376.0000	0.8135	5.00	34067.0000	0.8973
Chloromethane	NA	NA	NA	NA	NA	NA	5.00	9695.00000	0.2008
1,1,1,2-Tetrachloroethane	NA	NA	NA	2.00	3975.00000	0.2417	5.00	11047.0000	0.2910
1,1,1-Trichloroethane	NA	NA	NA	2.00	6669.00000	0.3188	5.00	18504.0000	0.3832
1,1,2-Trichloroethane	NA	NA	NA	2.00	3648.00000	0.2219	5.00	9431.00000	0.2484
1,1-Dichloropropene	NA	NA	NA	2.00	5172.00000	0.2472	5.00	15075.0000	0.3122
1,2,3-Trichlorobenzene	NA	NA	NA	2.00	5952.00000	0.7064	5.00	16218.0000	0.8276
1,2,3-Trichloropropane	NA	NA	NA	2.00	1598.00000	0.1896	5.00	4268.00000	0.2178
1,2,4-Trichlorobenzene	NA	NA	NA	2.00	6183.00000	0.7338	5.00	17014.0000	0.8682
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	5.00	57351.0000	2.927
1,2-Dibromo-3-Chloropropane	NA	NA	NA	NA	NA	NA	5.00	2462.00000	0.1256
1,2-Dibromoethane	NA	NA	NA	2.00	3869.00000	0.2353	5.00	10072.0000	0.2653
1,2-Dichlorobenzene	NA	NA	NA	2.00	10013.0000	1.188	5.00	25867.0000	1.320
1,2-Dichloroethane	NA	NA	NA	2.00	5961.00000	0.2849	5.00	15830.0000	0.3278
1,3,5-Trimethylbenzene	NA	NA	NA	2.00	20110.0000	2.387	5.00	48511.0000	2.476
1,3-Dichlorobenzene	NA	NA	NA	2.00	10953.0000	1.300	5.00	27638.0000	1.410
1,3-Dichloropropane	NA	NA	NA	2.00	6042.00000	0.3674	5.00	15741.0000	0.4146
1,4-Dichlorobenzene	NA	NA	NA	2.00	11599.0000	1.377	5.00	29338.0000	1.497
2,2-Dichloropropane	NA	NA	NA	NA	NA	NA	5.00	17006.0000	0.3522
2-Butanone	NA	NA	NA	NA	NA	NA	5.00	4544.00000	0.09410
2-Chloroethyl Vinyl Ether	NA	NA	NA	2.00	2185.00000	0.1044	5.00	4751.00000	0.09840
2-Chlorotoluene	NA	NA	NA	2.00	16763.0000	1.989	5.00	44692.0000	2.281
2-Hexanone	NA	NA	NA	NA	NA	NA	5.00	5897.00000	0.1553
4-Chlorotoluene	NA	NA	NA	2.00	14564.0000	1.728	5.00	38213.0000	1.950
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA	5.00	3266.00000	0.06760
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	0.500	5546.00000	1.188	2.00	17358.0000	0.8297	5.00	43919.0000	0.9096
Bromobenzene	NA	NA	NA	2.00	5618.00000	0.6667	5.00	14166.0000	0.7229
Bromochloromethane	NA	NA	NA	2.00	2340.00000	0.1119	5.00	6201.00000	0.1284
Bromodichloromethane	NA	NA	NA	2.00	4637.00000	0.2217	5.00	12961.0000	0.2684
Bromomethane	NA	NA	NA	NA	NA	NA	5.00	6104.00000	0.1264
Carbon Disulfide	NA	NA	NA	2.00	13048.0000	0.6237	5.00	29447.0000	0.6098
Carbon Tetrachloride	NA	NA	NA	2.00	5892.00000	0.2816	5.00	16960.0000	0.3512

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 566951
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INITIAL CALIBRATION DATA

00097727

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

Column ID: F

Analyte	WG221444-05			WG221444-06			WG221444-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	10.0	20501.0000	0.2064	20.0	40580.0000	0.1967	50.0	118047.000	0.2340
1,2-Dichloropropane	10.0	19574.0000	0.1970	20.0	35572.0000	0.1725	50.0	104400.000	0.2069
Chloroform	10.0	39517.0000	0.3978	20.0	72642.0000	0.3522	50.0	207097.000	0.4105
Ethylbenzene	10.0	37320.0000	0.5037	20.0	68507.0000	0.4035	50.0	196002.000	0.4676
Toluene	10.0	93007.0000	1.255	20.0	169437.000	0.9980	50.0	485740.000	1.159
Vinyl Chloride	10.0	14638.0000	0.1474	20.0	25615.0000	0.1242	50.0	68973.0000	0.1367
1,1,2,2-Tetrachloroethane	10.0	23100.0000	0.6437	20.0	48583.0000	0.5341	50.0	121724.000	0.5603
1,1-Dichloroethane	10.0	38857.0000	0.3912	20.0	70523.0000	0.3419	50.0	205621.000	0.4075
Bromoform	10.0	12030.0000	0.1624	20.0	25262.0000	0.1488	50.0	72909.0000	0.1739
Chlorobenzene	10.0	68006.0000	0.9178	20.0	123133.000	0.7253	50.0	354178.000	0.8450
Chloromethane	10.0	17926.0000	0.1805	20.0	32350.0000	0.1568	50.0	91101.0000	0.1806
1,1,1,2-Tetrachloroethane	10.0	22134.0000	0.2987	20.0	43106.0000	0.2539	50.0	123837.000	0.2954
1,1,1-Trichloroethane	10.0	37241.0000	0.3749	20.0	69241.0000	0.3357	50.0	202023.000	0.4004
1,1,2-Trichloroethane	10.0	18434.0000	0.2488	20.0	33974.0000	0.2001	50.0	92847.0000	0.2215
1,1-Dichloropropene	10.0	30266.0000	0.3047	20.0	56765.0000	0.2752	50.0	165744.000	0.3285
1,2,3-Trichlorobenzene	10.0	30116.0000	0.8392	20.0	63179.0000	0.6945	50.0	165329.000	0.7611
1,2,3-Trichloropropane	10.0	8705.00000	0.2426	20.0	17587.0000	0.1933	50.0	43150.0000	0.1986
1,2,4-Trichlorobenzene	10.0	33044.0000	0.9208	20.0	66404.0000	0.7300	50.0	180439.000	0.8306
1,2,4-Trimethylbenzene	10.0	104354.000	2.908	20.0	189001.000	2.078	50.0	528170.000	2.431
1,2-Dibromo-3-Chloropropane	10.0	5282.00000	0.1472	20.0	12497.0000	0.1374	50.0	30709.0000	0.1414
1,2-Dibromoethane	10.0	20603.0000	0.2781	20.0	39616.0000	0.2333	50.0	107533.000	0.2565
1,2-Dichlorobenzene	10.0	50969.0000	1.420	20.0	97357.0000	1.070	50.0	264567.000	1.218
1,2-Dichloroethane	10.0	31188.0000	0.3140	20.0	56592.0000	0.2744	50.0	155981.000	0.3092
1,3,5-Trimethylbenzene	10.0	95516.0000	2.662	20.0	179024.000	1.968	50.0	515562.000	2.373
1,3-Dichlorobenzene	10.0	55215.0000	1.539	20.0	103711.000	1.140	50.0	288340.000	1.327
1,3-Dichloropropane	10.0	30624.0000	0.4133	20.0	58040.0000	0.3419	50.0	156880.000	0.3743
1,4-Dichlorobenzene	10.0	56417.0000	1.572	20.0	105379.000	1.159	50.0	287121.000	1.322
2,2-Dichloropropane	10.0	33459.0000	0.3368	20.0	62468.0000	0.3029	50.0	185569.000	0.3678
2-Butanone	10.0	8367.00000	0.08420	20.0	15685.0000	0.07600	50.0	38072.0000	0.07550
2-Chloroethyl Vinyl Ether	10.0	10174.0000	0.1024	20.0	22651.0000	0.1098	50.0	53139.0000	0.1053
2-Chlorotoluene	10.0	86861.0000	2.421	20.0	159235.000	1.751	50.0	466003.000	2.145
2-Hexanone	10.0	11706.0000	0.1580	20.0	22454.0000	0.1323	50.0	59432.0000	0.1418
4-Chlorotoluene	10.0	76469.0000	2.131	20.0	146299.000	1.608	50.0	401325.000	1.847
4-Methyl-2-Pentanone	10.0	7001.00000	0.07050	20.0	14207.0000	0.06890	50.0	37823.0000	0.07500
Acetone	10.0	11707.0000	0.1179	20.0	17447.0000	0.08460	50.0	32950.0000	0.06530
Benzene	10.0	85757.0000	0.8633	20.0	157122.000	0.7617	50.0	448956.000	0.8898
Bromobenzene	10.0	28308.0000	0.7889	20.0	52388.0000	0.5759	50.0	146277.000	0.6734
Bromochloromethane	10.0	12383.0000	0.1247	20.0	22274.0000	0.1080	50.0	65101.0000	0.1290
Bromodichloromethane	10.0	26011.0000	0.2618	20.0	49189.0000	0.2385	50.0	143808.000	0.2850
Bromomethane	10.0	10538.0000	0.1061	20.0	19220.0000	0.09320	50.0	58399.0000	0.1157
Carbon Disulfide	10.0	63077.0000	0.6350	20.0	119109.000	0.5775	50.0	345920.000	0.6856
Carbon Tetrachloride	10.0	33348.0000	0.3357	20.0	64689.0000	0.3136	50.0	191949.000	0.3804

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 566951
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INITIAL CALIBRATION DATA

00097728

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

Column ID: F

Analyte	WG221444-08			WG221444-09		
	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	100	236973.000	0.2436	200	489139.000	0.2352
1,2-Dichloropropane	100	210155.000	0.2160	200	440730.000	0.2119
Chloroform	100	419682.000	0.4314	200	875925.000	0.4211
Ethylbenzene	100	388235.000	0.4960	200	789975.000	0.4737
Toluene	100	965959.000	1.234	200	1972068.00	1.183
Vinyl Chloride	100	124786.000	0.1283	200	198314.000	0.09530
1,1,2,2-Tetrachloroethane	100	256211.000	0.6802	200	521100.000	0.6506
1,1-Dichloroethane	100	414582.000	0.4262	200	858859.000	0.4129
Bromoform	100	158089.000	0.2020	200	322473.000	0.1934
Chlorobenzene	100	708172.000	0.9047	200	1448823.00	0.8687
Chloromethane	100	174369.000	0.1792	200	375212.000	0.1804
1,1,1,2-Tetrachloroethane	100	251731.000	0.3216	200	520246.000	0.3120
1,1,1-Trichloroethane	100	403542.000	0.4148	200	829383.000	0.3987
1,1,2-Trichloroethane	100	191931.000	0.2452	200	395308.000	0.2370
1,1-Dichloropropene	100	330048.000	0.3393	200	677890.000	0.3259
1,2,3-Trichlorobenzene	100	354719.000	0.9417	200	689642.000	0.8610
1,2,3-Trichloropropane	100	90847.0000	0.2412	200	183566.000	0.2292
1,2,4-Trichlorobenzene	100	385481.000	1.023	200	759692.000	0.9485
1,2,4-Trimethylbenzene	100	1054139.00	2.799	200	2060180.00	2.572
1,2-Dibromo-3-Chloropropane	100	70635.0000	0.1875	200	144032.000	0.1798
1,2-Dibromoethane	100	224512.000	0.2868	200	463269.000	0.2778
1,2-Dichlorobenzene	100	536595.000	1.425	200	1081448.00	1.350
1,2-Dichloroethane	100	314855.000	0.3236	200	648132.000	0.3116
1,3,5-Trimethylbenzene	100	1038463.00	2.757	200	2047838.00	2.557
1,3-Dichlorobenzene	100	579999.000	1.540	200	1148368.00	1.434
1,3-Dichloropropane	100	323241.000	0.4130	200	668122.000	0.4006
1,4-Dichlorobenzene	100	580583.000	1.541	200	1156299.00	1.444
2,2-Dichloropropane	100	373300.000	0.3837	200	777278.000	0.3737
2-Butanone	100	88868.0000	0.09130	200	180019.000	0.08650
2-Chloroethyl Vinyl Ether	100	124161.000	0.1276	200	263558.000	0.1267
2-Chlorotoluene	100	919024.000	2.440	200	1796688.00	2.243
2-Hexanone	100	136747.000	0.1747	200	274343.000	0.1645
4-Chlorotoluene	100	815124.000	2.164	200	1592939.00	1.989
4-Methyl-2-Pentanone	100	86376.0000	0.08880	200	177137.000	0.08520
Acetone	100	67141.0000	0.06900	200	130274.000	0.06260
Benzene	100	881897.000	0.9065	200	1797489.00	0.8642
Bromobenzene	100	291543.000	0.7740	200	577188.000	0.7206
Bromochloromethane	100	131699.000	0.1354	200	270118.000	0.1299
Bromodichloromethane	100	292831.000	0.3010	200	619660.000	0.2979
Bromomethane	100	124108.000	0.1276	200	244434.000	0.1175
Carbon Disulfide	100	703174.000	0.7228	200	1425877.00	0.6855
Carbon Tetrachloride	100	384508.000	0.3952	200	799687.000	0.3845

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 566951
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INITIAL CALIBRATION DATA

00097729

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

Column ID: F

Analyte	WG221444-02			WG221444-03			WG221444-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloroethane	NA	NA	NA	NA	NA	NA	5.00	9625.00000	0.1993
Dibromochloromethane	NA	NA	NA	2.00	3587.00000	0.2181	5.00	10033.0000	0.2643
Dibromomethane	NA	NA	NA	2.00	2643.00000	0.1263	5.00	6647.00000	0.1377
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	5.00	14950.0000	0.3096
Hexachlorobutadiene	NA	NA	NA	2.00	2697.00000	0.3201	5.00	7516.00000	0.3835
Isopropylbenzene	NA	NA	NA	2.00	20801.0000	1.265	5.00	54336.0000	1.431
Methylene Chloride	NA	NA	NA	2.00	4562.00000	0.2181	5.00	11268.0000	0.2334
Naphthalene	NA	NA	NA	2.00	17446.0000	2.070	5.00	46036.0000	2.349
Styrene	NA	NA	NA	2.00	12289.0000	0.7474	5.00	34146.0000	0.8994
Tetrachloroethene	NA	NA	NA	2.00	3526.00000	0.2144	5.00	9655.00000	0.2543
Trichloroethene	NA	NA	NA	2.00	4837.00000	0.2312	5.00	13380.0000	0.2771
Trichlorofluoromethane	NA	NA	NA	2.00	8751.00000	0.4183	5.00	24374.0000	0.5048
Vinyl Acetate	NA	NA	NA	NA	NA	NA	5.00	13795.0000	0.2857
cis-1,2-Dichloroethene	NA	NA	NA	2.00	4571.00000	0.2185	5.00	12306.0000	0.2549
cis-1,3-Dichloropropene	NA	NA	NA	2.00	5526.00000	0.2642	5.00	15725.0000	0.3257
m-,p-Xylene	1.00	6341.00000	0.8559	4.00	21449.0000	0.6522	10.0	48306.0000	0.6362
n-Butylbenzene	NA	NA	NA	2.00	17053.0000	2.024	5.00	46589.0000	2.377
n-Propylbenzene	NA	NA	NA	2.00	25207.0000	2.992	5.00	64524.0000	3.293
o-Xylene	0.500	2313.00000	0.6244	2.00	9348.00000	0.5685	5.00	22037.0000	0.5804
p-Isopropyltoluene	NA	NA	NA	2.00	19677.0000	2.335	5.00	53461.0000	2.728
sec-Butylbenzene	NA	NA	NA	2.00	21972.0000	2.608	5.00	62207.0000	3.174
tert-Butylbenzene	NA	NA	NA	2.00	3630.00000	0.4308	5.00	10456.0000	0.5336
trans-1,2-Dichloroethene	NA	NA	NA	2.00	4386.00000	0.2097	5.00	11965.0000	0.2478
trans-1,3-Dichloropropene	NA	NA	NA	2.00	5389.00000	0.3277	5.00	14313.0000	0.3770

INITIAL CALIBRATION DATA

00097730

Login Number: L0609126 **Instrument ID:** HPMS9

Analytical Method: 8260B **Initial Calibration Date:** 05-SEP-06 13:49

Column ID: F

Analyte	WG221444-05			WG221444-06			WG221444-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloroethane	10.0	17591.0000	0.1771	20.0	32097.0000	0.1556	50.0	90244.0000	0.1789
Dibromochloromethane	10.0	20757.0000	0.2801	20.0	40195.0000	0.2368	50.0	117504.000	0.2803
Dibromomethane	10.0	13311.0000	0.1340	20.0	24739.0000	0.1199	50.0	68654.0000	0.1361
Dichlorodifluoromethane	10.0	30277.0000	0.3048	20.0	58775.0000	0.2849	50.0	162937.000	0.3229
Hexachlorobutadiene	10.0	15390.0000	0.4289	20.0	29470.0000	0.3240	50.0	84284.0000	0.3880
Isopropylbenzene	10.0	109290.000	1.475	20.0	207029.000	1.219	50.0	599874.000	1.431
Methylene Chloride	10.0	22518.0000	0.2267	20.0	40880.0000	0.1982	50.0	117012.000	0.2319
Naphthalene	10.0	85548.0000	2.384	20.0	194646.000	2.140	50.0	482345.000	2.220
Styrene	10.0	69979.0000	0.9445	20.0	133721.000	0.7876	50.0	390035.000	0.9305
Tetrachloroethene	10.0	18936.0000	0.2556	20.0	35962.0000	0.2118	50.0	101345.000	0.2418
Trichloroethene	10.0	25939.0000	0.2611	20.0	48210.0000	0.2337	50.0	140135.000	0.2777
Trichlorofluoromethane	10.0	50032.0000	0.5037	20.0	95215.0000	0.4616	50.0	270737.000	0.5366
Vinyl Acetate	10.0	27991.0000	0.2818	20.0	52709.0000	0.2555	50.0	144562.000	0.2865
cis-1,2-Dichloroethene	10.0	24217.0000	0.2438	20.0	44955.0000	0.2179	50.0	128714.000	0.2551
cis-1,3-Dichloropropene	10.0	31610.0000	0.3182	20.0	59264.0000	0.2873	50.0	174412.000	0.3457
m-,p-Xylene	20.0	93794.0000	0.6329	40.0	171458.000	0.5050	100	486079.000	0.5798
n-Butylbenzene	10.0	91157.0000	2.540	20.0	175762.000	1.932	50.0	503466.000	2.318
n-Propylbenzene	10.0	127904.000	3.564	20.0	240733.000	2.647	50.0	695907.000	3.204
o-Xylene	10.0	43481.0000	0.5868	20.0	79518.0000	0.4684	50.0	232074.000	0.5537
p-Isopropyltoluene	10.0	105833.000	2.949	20.0	202820.000	2.230	50.0	583821.000	2.688
sec-Butylbenzene	10.0	122133.000	3.404	20.0	236647.000	2.602	50.0	683346.000	3.146
tert-Butylbenzene	10.0	20694.0000	0.5767	20.0	39873.0000	0.4383	50.0	112180.000	0.5164
trans-1,2-Dichloroethene	10.0	22830.0000	0.2298	20.0	43088.0000	0.2089	50.0	125441.000	0.2486
trans-1,3-Dichloropropene	10.0	29043.0000	0.3920	20.0	56668.0000	0.3338	50.0	164544.000	0.3925

INITIAL CALIBRATION DATA

00097731

Login Number: L0609126
Instrument ID: HPMS9
Analytical Method: 8260B
Initial Calibration Date: 05-SEP-06 13:49
Column ID: F

Analyte	WG221444-08			WG221444-09		
	CONC	RESP	RF	CONC	RESP	RF
Chloroethane	100	181465.000	0.1865	200	354054.000	0.1702
Dibromochloromethane	100	249252.000	0.3184	200	525125.000	0.3149
Dibromomethane	100	142316.000	0.1463	200	291372.000	0.1401
Dichlorodifluoromethane	100	321811.000	0.3308	200	626692.000	0.3013
Hexachlorobutadiene	100	176166.000	0.4677	200	348079.000	0.4346
Isopropylbenzene	100	1211287.00	1.548	200	2436725.00	1.461
Methylene Chloride	100	234922.000	0.2415	200	483344.000	0.2324
Naphthalene	100	1054878.00	2.801	200	2044662.00	2.553
Styrene	100	792039.000	1.012	200	1600089.00	0.9594
Tetrachloroethene	100	202374.000	0.2585	200	411040.000	0.2465
Trichloroethene	100	276989.000	0.2847	200	572083.000	0.2750
Trichlorofluoromethane	100	543777.000	0.5590	200	1093943.00	0.5259
Vinyl Acetate	100	321870.000	0.3309	200	673470.000	0.3238
cis-1,2-Dichloroethene	100	264042.000	0.2714	200	544621.000	0.2618
cis-1,3-Dichloropropene	100	358490.000	0.3685	200	750657.000	0.3609
m-,p-Xylene	200	970354.000	0.6198	400	1919440.00	0.5755
n-Butylbenzene	100	1020541.00	2.709	200	2017839.00	2.519
n-Propylbenzene	100	1395867.00	3.706	200	2753667.00	3.438
o-Xylene	100	465598.000	0.5948	200	947639.000	0.5682
p-Isopropyltoluene	100	1186738.00	3.151	200	2359209.00	2.946
sec-Butylbenzene	100	1379778.00	3.663	200	2740028.00	3.421
tert-Butylbenzene	100	224137.000	0.5950	200	446118.000	0.5570
trans-1,2-Dichloroethene	100	252269.000	0.2593	200	521497.000	0.2507
trans-1,3-Dichloropropene	100	343039.000	0.4383	200	708529.000	0.4248

KEMRON Environmental Services

ALTERNATE SOURCE CALIBRATION REPORT

00097732

Login Number: L0609126 Run Date: 09/05/2006 Sample ID: WG221444-10

Instrument ID: HPMS9 Run Time: 14:27 Method: 8260B

File ID: 9M48307 Analyst: MES

ICal Workgroup: WG221444 Cal ID: HPMS9 - 05-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
Chloroform	CCC	20	21.2	0.426	6.1	ug/kg	
1,1-Dichloroethene	CCC	20	22.6	0.242	12.9	ug/kg	
1,2-Dichloropropane	CCC	20	21.9	0.216	9.3	ug/kg	
Ethylbenzene	CCC	20	19.9	0.494	.5	ug/kg	
Toluene	CCC	20	21.1	1.25	5.5	ug/kg	
Vinyl Chloride	CCC	20	18.6	0.134	6.8	ug/kg	
Bromoform	SPCC	20	19.3	0.165	3.6	ug/kg	
Chlorobenzene	SPCC	20	20.7	0.881	3.3	ug/kg	
Chloromethane	SPCC	20	20.8	0.187	4.1	ug/kg	
1,1-Dichloroethane	SPCC	20	21.4	0.420	7.1	ug/kg	
1,1,2,2-Tetrachloroethane	SPCC	20	18.6	0.561	7	ug/kg	
Acetone		20	22.7	0.0943	13.7	ug/kg	
Benzene		20	20.8	0.936	3.8	ug/kg	
Bromobenzene		20	19.4	0.681	3.2	ug/kg	
Bromochloromethane		20	21.5	0.133	7.3	ug/kg	
Bromodichloromethane		20	22.1	0.296	10.6	ug/kg	
Bromomethane		20	18.9	0.108	5.4	ug/kg	
2-Butanone		20	22.1	0.0936	10.6	ug/kg	
n-Butylbenzene		20	19.6	2.30	1.8	ug/kg	
sec-Butylbenzene		20	19.5	3.07	2.4	ug/kg	
tert-Butylbenzene		20	19.3	0.502	3.7	ug/kg	
Carbon Disulfide		20	21.3	0.691	6.6	ug/kg	
Carbon Tetrachloride		20	21.8	0.380	8.8	ug/kg	
Dibromochloromethane		20	20.7	0.283	3.5	ug/kg	
Chloroethane		20	19.9	0.177	.5	ug/kg	
2-Chloroethyl Vinyl Ether		20	19.0	0.105	5	ug/kg	
2-Chlorotoluene		20	19.4	2.12	2.9	ug/kg	
4-Chlorotoluene		20	19.1	1.83	4.7	ug/kg	
1,2-Dibromo-3-Chloropropane		20	18.3	0.132	8.7	ug/kg	
1,2-Dibromoethane		20	20.5	0.268	2.4	ug/kg	
Dibromomethane		20	21.3	0.143	6.7	ug/kg	
1,2-Dichlorobenzene		20	18.6	1.20	6.8	ug/kg	
1,3-Dichlorobenzene		20	18.9	1.31	5.4	ug/kg	
1,4-Dichlorobenzene		20	18.7	1.32	6.4	ug/kg	
Dichlorodifluoromethane		20	18.6	0.287	7.1	ug/kg	
1,2-Dichloroethane		20	21.5	0.329	7.5	ug/kg	
cis-1,2-Dichloroethene		20	21.4	0.263	6.9	ug/kg	
trans-1,2-Dichloroethene		20	21.6	0.255	7.9	ug/kg	
1,3-Dichloropropane		20	20.9	0.406	4.4	ug/kg	
2,2-Dichloropropane		20	20.8	0.368	4.2	ug/kg	
cis-1,3-Dichloropropene		20	21.4	0.347	6.8	ug/kg	
trans-1,3-Dichloropropene		20	18.9	0.362	5.6	ug/kg	

KEMRON FORMS - Modified 07/26/2006
Version 1.5 PDF File ID: 566952
Report generated 09/15/2006 13:00

KEMRON Environmental Services

ALTERNATE SOURCE CALIBRATION REPORT

00097733

Login Number: L0609126 Run Date: 09/05/2006 Sample ID: WG221444-10
Instrument ID: HPMS9 Run Time: 14:27 Method: 8260B
File ID: 9M48307 Analyst: MES
ICal Workgroup: WG221444 Cal ID: HPMS9 - 05-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
1,1-Dichloropropene		20	22.8	0.348	14.1	ug/kg	
2-Hexanone		20	18.6	0.144	6.8	ug/kg	
Hexachlorobutadiene		20	19.9	0.390	.6	ug/kg	
Isopropylbenzene		20	19.3	1.35	3.6	ug/kg	
p-Isopropyltoluene		20	18.9	2.56	5.7	ug/kg	
4-Methyl-2-Pentanone		20	20.5	0.0780	2.6	ug/kg	
Methylene Chloride		20	21.5	0.243	7.6	ug/kg	
Naphthalene		20	17.7	2.09	11.5	ug/kg	
n-Propylbenzene		20	18.8	3.07	5.9	ug/kg	
Styrene		20	21.2	0.952	6.1	ug/kg	
1,1,1,2-Tetrachloroethane		20	20.8	0.299	3.8	ug/kg	
Tetrachloroethene		20	21.7	0.261	8.7	ug/kg	
1,2,3-Trichlorobenzene		20	18.1	0.727	9.6	ug/kg	
1,2,4-Trichlorobenzene		20	18.3	0.793	8.3	ug/kg	
1,1,1-Trichloroethane		20	22.2	0.416	10.9	ug/kg	
1,1,2-Trichloroethane		20	20.9	0.243	4.7	ug/kg	
Trichloroethene		20	22.7	0.298	13.4	ug/kg	
Trichlorofluoromethane		20	18.9	0.474	5.5	ug/kg	
1,2,3-Trichloropropane		20	19.2	0.208	3.9	ug/kg	
1,2,4-Trimethylbenzene		20	18.4	2.40	8.2	ug/kg	
1,3,5-Trimethylbenzene		20	19.0	2.33	4.9	ug/kg	
Vinyl Acetate		20	12.6	0.185	37.1	ug/kg	*
o-Xylene		20	20.2	0.573	.8	ug/kg	
m-,p-Xylene		40	41.2	0.612	3	ug/kg	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 07/26/2006
Version 1.5 PDF File ID: 566952
Report generated 09/15/2006 13:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00097734

Login Number: L0609126 Run Date: 09/12/2006 Sample ID: WG222026-02
Instrument ID: HPMS9 Run Time: 08:54 Method: 8260B
File ID: 9M48494 Analyst: MES
Workgroup (AAB#): WG222027 Cal ID: HPMS9 - 05-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
Chloroform	CCC	50.0	47.8	0.384	4.30	ug/kg	
1,1-Dichloroethene	CCC	50.0	49.6	0.213	0.800	ug/kg	
1,2-Dichloropropane	CCC	50.0	46.4	0.184	7.30	ug/kg	
Ethylbenzene	CCC	50.0	44.1	0.438	11.9	ug/kg	
Toluene	CCC	50.0	46.2	1.10	7.60	ug/kg	
Vinyl Chloride	CCC	50.0	46.5	0.131	7.10	ug/kg	
Bromoform	SPCC	50.0	48.8	0.167	2.50	ug/kg	
Chlorobenzene	SPCC	50.0	46.6	0.795	6.90	ug/kg	
Chloromethane	SPCC	50.0	45.5	0.164	8.90	ug/kg	
1,1-Dichloroethane	SPCC	50.0	47.0	0.369	6.00	ug/kg	
1,1,2,2-Tetrachloroethane	SPCC	50.0	44.0	0.531	12.0	ug/kg	
Acetone		50.0	32.5	0.0495	35.0	ug/kg	
Benzene		50.0	44.2	0.797	11.6	ug/kg	
Bromobenzene		50.0	45.4	0.639	9.10	ug/kg	
Bromochloromethane		50.0	48.2	0.119	3.70	ug/kg	
Bromodichloromethane		50.0	48.5	0.260	3.00	ug/kg	
Bromomethane		50.0	49.2	0.113	1.60	ug/kg	
2-Butanone		50.0	37.6	0.0637	24.7	ug/kg	
n-Butylbenzene		50.0	46.0	2.16	7.90	ug/kg	
sec-Butylbenzene		50.0	47.0	2.95	6.10	ug/kg	
tert-Butylbenzene		50.0	47.1	0.491	5.80	ug/kg	
Carbon Disulfide		50.0	41.3	0.536	17.4	ug/kg	
Carbon Tetrachloride		50.0	49.9	0.348	0.200	ug/kg	
Dibromochloromethane		50.0	50.0	0.273	0.100	ug/kg	
Chloroethane		50.0	42.9	0.153	14.2	ug/kg	
2-Chloroethyl Vinyl Ether		50.0	41.9	0.0927	16.2	ug/kg	
2-Chlorotoluene		50.0	45.3	1.98	9.30	ug/kg	
4-Chlorotoluene		50.0	47.5	1.82	5.10	ug/kg	
1,2-Dibromo-3-Chloropropane		50.0	37.8	0.125	24.4	ug/kg	
1,2-Dibromoethane		50.0	46.7	0.244	6.70	ug/kg	
Dibromomethane		50.0	48.9	0.131	2.20	ug/kg	
1,2-Dichlorobenzene		50.0	44.4	1.14	11.2	ug/kg	
1,3-Dichlorobenzene		50.0	44.8	1.24	10.5	ug/kg	
1,4-Dichlorobenzene		50.0	43.6	1.23	12.8	ug/kg	
Dichlorodifluoromethane		50.0	45.9	0.284	8.20	ug/kg	
1,2-Dichloroethane		50.0	46.4	0.284	7.30	ug/kg	
cis-1,2-Dichloroethene		50.0	47.2	0.232	5.70	ug/kg	
trans-1,2-Dichloroethene		50.0	47.9	0.227	4.20	ug/kg	
1,3-Dichloropropane		50.0	45.6	0.355	8.80	ug/kg	
2,2-Dichloropropane		50.0	46.0	0.325	8.00	ug/kg	
cis-1,3-Dichloropropene		50.0	47.2	0.306	5.70	ug/kg	
trans-1,3-Dichloropropene		50.0	48.6	0.373	2.80	ug/kg	

KEMRON FORMS - Modified 09/06/2006
Version 1.3 PDF File ID: 566955
Report generated 09/15/2006 13:00

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097735

Login Number: L0609126 Run Date: 09/12/2006 Sample ID: WG222026-02
Instrument ID: HPMS9 Run Time: 08:54 Method: 8260B
File ID: 9M48494 Analyst: MES
Workgroup (AAB#): WG222027 Cal ID: HPMS9 - 05-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
1,1-Dichloropropene		50.0	48.7	0.297	2.70	ug/kg	
2-Hexanone		50.0	41.9	0.129	16.3	ug/kg	
Hexachlorobutadiene		50.0	44.3	0.348	11.4	ug/kg	
Isopropylbenzene		50.0	47.8	1.34	4.40	ug/kg	
p-Isopropyltoluene		50.0	46.3	2.51	7.50	ug/kg	
4-Methyl-2-Pentanone		50.0	42.7	0.0649	14.6	ug/kg	
Methylene Chloride		50.0	46.2	0.209	7.70	ug/kg	
Naphthalene		50.0	40.6	1.92	18.7	ug/kg	
n-Propylbenzene		50.0	46.2	3.01	7.70	ug/kg	
Styrene		50.0	48.4	0.868	3.30	ug/kg	
1,1,1,2-Tetrachloroethane		50.0	49.4	0.284	1.20	ug/kg	
Tetrachloroethene		50.0	48.2	0.232	3.70	ug/kg	
1,2,3-Trichlorobenzene		50.0	41.6	0.669	16.9	ug/kg	
1,2,4-Trichlorobenzene		50.0	42.2	0.731	15.5	ug/kg	
1,1,1-Trichloroethane		50.0	48.9	0.367	2.30	ug/kg	
1,1,2-Trichloroethane		50.0	45.5	0.211	9.00	ug/kg	
Trichloroethene		50.0	47.5	0.250	5.00	ug/kg	
Trichlorofluoromethane		50.0	47.7	0.478	4.60	ug/kg	
1,2,3-Trichloropropane		50.0	44.0	0.190	12.0	ug/kg	
1,2,4-Trimethylbenzene		50.0	43.6	2.29	12.7	ug/kg	
1,3,5-Trimethylbenzene		50.0	45.9	2.25	8.20	ug/kg	
Vinyl Acetate		50.0	45.1	0.266	9.70	ug/kg	
o-Xylene		50.0	45.4	0.515	9.30	ug/kg	
m-,p-Xylene		100	92.4	0.542	7.60	ug/kg	
Xylenes		150	138	0.529	8.20	ug/kg	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2006
Version 1.3 PDF File ID: 566955
Report generated 09/15/2006 13:00

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

00097736

Login Number: L0609126
Instrument ID: HPMS9
Workgroup (AAB#): WG222027

CCV Number: WG222026-02
CAL ID: HPMS9-05-SEP-06
Matrix: SOLID

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG222026-02	NA	NA	201945	395181	505369
Upper Limit	NA	NA	403890	790362	1010738
Lower Limit	NA	NA	100973	197591	252685
L0609126-01	1.00	02	194007	379753	492448
WG222027-01	1.00	01	185338	359638	473282
WG222027-02	1.00	01	180282	357738	471095
WG222027-03	1.00	01	187885	364578	477370

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 566956
Report generated 09/15/2006 13:00

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

00097737

Login Number: L0609126 **CCV Number:** WG222026-02
Instrument ID: HPMS9 **CAL ID:** HPMS9-05-SEP-06
Workgroup (AAB#): WG222027 **Matrix:** SOLID

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG222026-02	NA	NA	15.33	12.36	8.51
Upper Limit	NA	NA	15.83	12.86	9.01
Lower Limit	NA	NA	14.83	11.86	8.01
L0609126-01	1.00	02	15.34	12.36	8.51
WG222027-01	1.00	01	15.33	12.36	8.51
WG222027-02	1.00	01	15.33	12.36	8.51
WG222027-03	1.00	01	15.34	12.36	8.51

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 566958
Report generated 09/15/2006 13:00

KEMRON Environmental Services
Data Checklist

00097738

Date: 09-SEP-2006
Analyst: TMM
Analyst: NA
Method: PCT-S
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG221881

Calibration/Linearity	09/09/06
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	
LCS/LCS Dup	
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	TMM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
11-SEP-2006

Secondary Reviewer:
13-SEP-2006

Generated: SEP-13-2006 07:59:31

Shaw® Shaw Environmental, Inc.
3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

CHAIN-OF-CUSTODY Site 29

No. 10500

Laboratory Name: Kemron Address: Marietta OH Contact:

Project Name LHAAP Project Location Karnack, Tx

Project No. Project Contact Li Duty Project Telephone No. 832-364-0173

Point of contact: Project Manager/Supervisor:

Telephone No.

Item No.	Sample Number	Date	Time	Comp	Grab	Matrix	Sample Description, Location	Number of Containers	VOC						Remarks
1	29WW40-01	9/6	915				78.5' bgs	4	X						
2															
3															
4															
5															
6															
7															
8															
9															
10															

Analysis and Method Desired (Indicate separate containers)

Transfers Relinquished By (Signature)	Date/Time	Transfers Accepted By (Signature)	Date/Time
Larry W. Duty	9/6/06 1700	Fed-X	
		Jennifer Denthall	9/7/06 0935 UPS
		Laboratory	

Special Instructions

FedEx Airbill No.: 1Z401663220055401

Sampler's Signature

TAT: ____ Standard ____ Rush Due: ___ Seals Intact? ___Y ___N Received Good Condition ___Y ___N ___Cold c/c Dedad DXD intact JLD

White - Lab Copy Canary - Field Copy Pink - File Copy

B2850 00097740

SAMPLE RECEIPT FORM

Longhorn

Date: 9-7-06 Client: Shaw E&I

Shipped By: ( ) Fed-Ex (~~)~~UPS ( )DHL ( ) KEMRON ( ) Client ( ) Other 9:25

Opened By:

Logged By: Login # L06 9-126

IR Temp Gun: ( ) D ~~(X)~~

B2850

156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	514	6	124016632210055401	10500	
2					
3					
4					
5					
6					

Were all coolers sealed?	(Y)	N	N/A
Were custody seals used on all coolers?	(Y)	N	N/A
Were custody seals intact?	(Y)	N	N/A
Was visible ice present?	(Y)	N	N/A
Were all coolers in the temperature range of 2-6C? (>6C*)	(Y)	N	N/A
Were the samples frozen?*	Y	(N)	N/A
Were COC papers provided?	(Y)	N	N/A
Were all sample containers intact?*	(Y)	N	N/A
Were all sample labels intact?	(Y)	N	N/A
Were all sample labels legible?*	(Y)	N	N/A
Did all sample labels match the COC?*	(Y)	N	N/A
Was the label information complete?*	(Y)	N	N/A
Were the correct containers used?*	(Y)	N	N/A
Were the correct preservatives added to water samples?*	Y	N	(N/A)
Was the pH tested on preserved water samples?	Y	N	(N/A)
Were pH ranges acceptable?*	Y	N	(N/A)
Was sufficient amount of sample provided?*	(Y)	N	N/A
Were bubbles present in VOA samples?*	Y	N	(N/A)
Were COC's signed and dated?	(Y)	N	N/A
Did samples arrive before hold time expired?*	(Y)	N	N/A
Are discrepancy forms attached?	Y	N	(N/A)

**Requires a discrepancy form*

Comments:

CRF #1
Revised 8/22/03

KEMRON Environmental Services
Internal Chain of Custody Report

00097741

Login: L0609126
Account: 2773
Project: 2773.025
Samples: 1
Due Date: 18-SEP-2006

Samplenum	Container ID	Products
L0609126-01	271719	PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	
2	ANALYZ	W1	WET	09-SEP-2006 10:59	TMM	BRG
3	STORE	WET	A1	13-SEP-2006 11:22	BRG	TMM

Samplenum	Container ID	Products
L0609126-01	271720	G-40-T2

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	
2	ANALYZ	L1	VOAY	07-SEP-2006 11:05	CMS	JS

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	
2	ANALYZ	L1	VOAY	07-SEP-2006 11:05	CMS	JS

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	
2	ANALYZ	L1	VOAY	07-SEP-2006 11:05	CMS	JS

Samplenum	Container ID	Products
L0609126-01	271721	ENCORE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			07-SEP-2006 10:45	JS	

KEMRON
ENVIRONMENTAL SERVICES

00097742

156 Starlite Drive, Marietta, OH 45750 * TEL 740-373-4071 * FAX 740-373-4835 * http://www.kemron.com

Laboratory Report Number: L0609593

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact our team member noted in the Reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

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kalbertson@kemron-lab.com

This report was reviewed on 13-OCT-06.

Stephanie Mossburg

STEPHANIE MOSSBURG

I certify that all test results meet all of the requirments of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on an 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on 13-OCT-06.

David E. Vandenberg

DAVID VANDENBERG

FL DOH NELAP ID: E8755

This report contains a total of 183 pages.

Protecting Our Environmental Future

LABORATORY REPORT

L0609593

00097743

10/11/06 08:38

Submitted By

KEMRON Environmental Services
156 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark
Houston, TX 77042
Attention: Diane Mever

Account Number: 2773
Work ID: LHAAP

P.O. Number: 200328

Sample Summary

Client ID	Lab ID	Date Collected	Date Received
RO#4	L0609593-01	22-SEP-06	23-SEP-06
RO#3	L0609593-02	22-SEP-06	23-SEP-06
RO#2	L0609593-03	22-SEP-06	23-SEP-06
RO#1	L0609593-04	22-SEP-06	23-SEP-06
29WW36-CONF	L0609593-05	22-SEP-06	23-SEP-06
29WW38-CONF	L0609593-06	22-SEP-06	23-SEP-06
29WW35-CONF	L0609593-07	22-SEP-06	23-SEP-06

Laboratory Data Package Cover Page

00097744

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

MAREN M. BEERY	Maren Beery		October 2, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG223731
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 02, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <RL?	✓				
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	✓				
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG223731
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 02, 2006

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097749

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

MAREN M. BEERY	Maren Beery		October 4, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG223735
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 04, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <RL?	✓				
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?	✓				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	✓				
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG223735
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 04, 2006

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097754

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	October 6, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	PH
Prep Batch Number(s):	WG223203
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	PH
Prep Batch Number(s):	WG223203
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097759

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	October 6, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

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KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG223862
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG223862
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097764

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	October 6, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

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KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	REACTIVITY
Prep Batch Number(s):	WG223871, WG223929
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓		✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	REACTIVITY
Prep Batch Number(s):	WG223871, WG223929
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 06, 2006

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097769

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

MICHAEL D. COCHRAN		Semivolatiles Lab Supervisor	October 6, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	8270
Prep Batch Number(s):	WG223870
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?		✓			1
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		

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KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	8270
Prep Batch Number(s):	WG223870
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?	✓				
Were ion abundance data within the method-required QC limits?	✓				
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?	✓				
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?	✓				

Checklist ID: **10903**

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	8270
Prep Batch Number(s):	WG223870
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 06, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	8270
Prep Batch Number(s):	WG223870
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 06, 2006

EXCEPTIONS REPORT
ER# - Description
1. The LCS yielded a low recovery for pyridine.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097775

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;

✓R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

✓R10 Other problems or anomalies.

✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [✓] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MIKE D. ALBERTSON		Volatiles Lab Supervisor	October 10, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0609593
Project Name:	798-LONGHORN
Method:	8260B
Prep Batch Number(s):	224197
Reviewer Name:	MIKE D. ALBERTSON
LRC Date:	October 10, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?	✓				
Were ion abundance data within the method-required QC limits?	✓				
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?	✓				
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?	✓				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

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EXCEPTIONS REPORT
ER# - Description
There were no exceptions.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Report Number: **L0609593**
Report Date : **October 11, 2006**

00097779

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Soil**
Workgroup Number: **WG223862**
Collect Date: **09/22/2006 12:05**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **DIH**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **10/02/2006 10:30**
Cal Date:
Run Date: **10/02/2006 10:30**
File ID: **PR06100313451201**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		67.0	>		

> Result is greater than the associated numerical value.

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 12:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date **10/03/2006 20:09**
File ID: **IR.100306.200900**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.505	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 12:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date **10/02/2006 11:56**
File ID: **HY.100206.115606**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 12:05**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 00:52**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 00:52**
File ID: **8M330656**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500

Report Number: **L0609593**
Report Date : **October 11, 2006**

00097780

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 12:05**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 00:52**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 00:52**
File ID: **8M330656**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	102	86	118
1,2-Dichloroethane-d4	105	80	120
Toluene-d8	101	88	110
4-Bromofluorobenzene	93.2	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01**
Client ID: **RO#4**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 12:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 16:15**
File ID: **12M13635**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	27.8	21	100
Phenol-d5	18.4	10	94
Nitrobenzene-d5	50.4	35	114
2-Fluorobiphenyl	63.4	43	116
2,4,6-Tribromophenol	96.1	10	123
p-Terphenyl-d14	102	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01** | PrePrep Method: **NONE** | Instrument: **BURET**
Client ID: **RO#4** | Prep Method: **SW-846** | Prep Date: **10/02/2006 09:00**
Matrix: **Soil** | Analytical Method: **SW-846** | Cal Date:
Workgroup Number: **WG223871** | Analyst: **TMB** | Run Date: **10/02/2006 09:00**
Collect Date: **09/22/2006 12:05** | Dilution: **1** | File ID: **BU06100313435201**
Units: **mg/kg**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	**18496-25-8**		**U**	**100**	**50.0**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01** | PrePrep Method: **NONE** | Instrument: **UV-120-1V**
Client ID: **RO#4** | Prep Method: **SW-846** | Prep Date: **10/02/2006 09:00**
Matrix: **Soil** | Analytical Method: **SW-846** | Cal Date:
Workgroup Number: **WG223929** | Analyst: **DLP** | Run Date: **10/02/2006 09:00**
Collect Date: **09/22/2006 12:05** | Dilution: **1** | File ID: **U206100616244901**
Units: **mg/kg**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	**57-12-5**		**U**	**10.0**	**5.00**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-01** | PrePrep Method: **NONE** | Instrument: **ORION-710A**
Client ID: **RO#4** | Prep Method: **9045C** | Prep Date: **09/25/2006 15:20**
Matrix: **Soil** | Analytical Method: **9045C** | Cal Date:
Workgroup Number: **WG223203** | Analyst: **TMB** | Run Date: **09/25/2006 15:20**
Collect Date: **09/22/2006 12:05** | Dilution: **1** | File ID: **OR06092610251314**
Units: **UNITS**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		**7.60**			

Sample Number: **L0609593-02** | PrePrep Method: **NONE** | Instrument: **PRECISION**
Client ID: **RO#3** | Prep Method: **1010** | Prep Date: **10/02/2006 10:30**
Matrix: **Soil** | Analytical Method: **1010** | Cal Date:
Workgroup Number: **WG223862** | Analyst: **DIH** | Run Date: **10/02/2006 10:30**
Collect Date: **09/22/2006 13:05** | Dilution: **1** | File ID: **PR06100313451202**
Units: **Degrees C**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		**67.0**	**>**		

> Result is greater than the associated numerical value.

Report Number: **L0609593**
Report Date : **October 11, 2006**

00097782

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 13:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 20:27**
File ID: **IR.100306.202700**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.315	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 13:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 11:59**
File ID: **HY.100206.115926**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 13:05**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 01:23**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 01:23**
File ID: **8M330657**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	103	86	118
1,2-Dichloroethane-d4	109	80	120
Toluene-d8	99.6	88	110
4-Bromofluorobenzene	92.6	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 13:05**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 16:48**
File ID: **12M13636**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	32.5	21	100
Phenol-d5	21.8	10	94
Nitrobenzene-d5	49.6	35	114
2-Fluorobiphenyl	56.4	43	116
2,4,6-Tribromophenol	87.6	10	123
p-Terphenyl-d14	86.0	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Soil**
Workgroup Number: **WG223871**
Collect Date: **09/22/2006 13:05**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **TMB**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **BU06100313435202**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	18496-25-8		U	100	50.0

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Soil**
Workgroup Number: **WG223929**
Collect Date: **09/22/2006 13:05**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **DLP**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **U206100616244902**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	57-12-5		U	10.0	5.00

U Not detected at or above adjusted sample detection limit

Report Number: **L0609593**
Report Date : **October 11, 2006**

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Sample Number: **L0609593-02**
Client ID: **RO#3**
Matrix: **Soil**
Workgroup Number: **WG223203**
Collect Date: **09/22/2006 13:05**

PrePrep Method: **NONE**
Prep Method: **9045C**
Analytical Method: **9045C**
Analyst: **TMB**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-710A**
Prep Date: **09/25/2006 15:20**
Cal Date:
Run Date: **09/25/2006 15:20**
File ID: **OR06092610251315**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		11.7			

Sample Number: **L0609593-03**
Client ID: **RO#2**
Matrix: **Soil**
Workgroup Number: **WG223862**
Collect Date: **09/22/2006 12:50**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **DIH**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **10/02/2006 10:30**
Cal Date:
Run Date: **10/02/2006 10:30**
File ID: **PR06100313451203**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		62.0	>		

> **Result is greater than the associated numerical value.**

Sample Number: **L0609593-03**
Client ID: **RO#2**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 12:50**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 20:45**
File ID: **IR.100306.204500**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.581	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J **The analyte was positively identified, but the quantitation was below the RL**
U **Not detected at or above adjusted sample detection limit**

Sample Number: **L0609593-03**
Client ID: **RO#2**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 12:50**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 12:01**
File ID: **HY.100206.120106**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U **Not detected at or above adjusted sample detection limit**

Sample Number: **L0609593-03**
Client ID: **RO#2**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 12:50**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 01:53**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 01:53**
File ID: **8M330658**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6	6.36	J	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	103	86	118
1,2-Dichloroethane-d4	108	80	120
Toluene-d8	100	88	110
4-Bromofluorobenzene	92.3	86	115

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-03**
Client ID: **RO#2**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 12:50**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 17:21**
File ID: **12M13637**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	25.2	21	100
Phenol-d5	17.1	10	94
Nitrobenzene-d5	41.8	35	114
2-Fluorobiphenyl	51.3	43	116
2,4,6-Tribromophenol	87.3	10	123
p-Terphenyl-d14	87.5	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-03** | PrePrep Method: **NONE** | Instrument: **BURET**
Client ID: **RO#2** | Prep Method: **SW-846** | Prep Date: **10/02/2006 09:00**
Matrix: **Soil** | Analytical Method: **SW-846** | Cal Date:
Workgroup Number: **WG223871** | Analyst: **TMB** | Run Date: **10/02/2006 09:00**
Collect Date: **09/22/2006 12:50** | Dilution: **1** | File ID: **BU06100313435203**
Units: **mg/kg**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	18496-25-8		U	100	50.0

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-03** | PrePrep Method: **NONE** | Instrument: **UV-120-1V**
Client ID: **RO#2** | Prep Method: **SW-846** | Prep Date: **10/02/2006 09:00**
Matrix: **Soil** | Analytical Method: **SW-846** | Cal Date:
Workgroup Number: **WG223929** | Analyst: **DLP** | Run Date: **10/02/2006 09:00**
Collect Date: **09/22/2006 12:50** | Dilution: **1** | File ID: **U206100616244903**
Units: **mg/kg**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	57-12-5		U	10.0	5.00

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-03** | PrePrep Method: **NONE** | Instrument: **ORION-710A**
Client ID: **RO#2** | Prep Method: **9045C** | Prep Date: **09/25/2006 15:20**
Matrix: **Soil** | Analytical Method: **9045C** | Cal Date:
Workgroup Number: **WG223203** | Analyst: **TMB** | Run Date: **09/25/2006 15:20**
Collect Date: **09/22/2006 12:50** | Dilution: **1** | File ID: **OR06092610251316**
Units: **UNITS**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		7.69			

Sample Number: **L0609593-04** | PrePrep Method: **NONE** | Instrument: **PRECISION**
Client ID: **RO#1** | Prep Method: **1010** | Prep Date: **10/02/2006 10:30**
Matrix: **Soil** | Analytical Method: **1010** | Cal Date:
Workgroup Number: **WG223862** | Analyst: **DIH** | Run Date: **10/02/2006 10:30**
Collect Date: **09/22/2006 11:20** | Dilution: **1** | File ID: **PR06100313451204**
Units: **Degrees C**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		64.0	>		

> Result is greater than the associated numerical value.

Report Number: **L0609593**
Report Date : **October 11, 2006**

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Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 11:20**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 21:03**
File ID: **IR.100306.210300**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.434	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 11:20**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 12:02**
File ID: **HY.100206.120248**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 11:20**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 02:23**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 02:23**
File ID: **8M330659**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	103	86	118
1,2-Dichloroethane-d4	107	80	120
Toluene-d8	100	88	110
4-Bromofluorobenzene	93.7	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 11:20**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 17:55**
File ID: **12M13638**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	28.0	21	100
Phenol-d5	18.5	10	94
Nitrobenzene-d5	49.4	35	114
2-Fluorobiphenyl	60.4	43	116
2,4,6-Tribromophenol	85.2	10	123
p-Terphenyl-d14	79.9	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Soil**
Workgroup Number: **WG223871**
Collect Date: **09/22/2006 11:20**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **TMB**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **BU06100313435204**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	18496-25-8		U	100	50.0

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Soil**
Workgroup Number: **WG223929**
Collect Date: **09/22/2006 11:20**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **DLP**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **U206100616244904**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	57-12-5		U	10.0	5.00

U Not detected at or above adjusted sample detection limit

Report Number: **L0609593**
Report Date : **October 11, 2006**

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Sample Number: **L0609593-04**
Client ID: **RO#1**
Matrix: **Soil**
Workgroup Number: **WG223203**
Collect Date: **09/22/2006 11:20**

PrePrep Method: **NONE**
Prep Method: **9045C**
Analytical Method: **9045C**
Analyst: **TMB**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-710A**
Prep Date: **09/25/2006 15:20**
Cal Date:
Run Date: **09/25/2006 15:20**
File ID: **OR06092610251317**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		8.42			

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Soil**
Workgroup Number: **WG223862**
Collect Date: **09/22/2006 11:35**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **DIH**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **10/02/2006 10:30**
Cal Date:
Run Date: **10/02/2006 10:30**
File ID: **PR06100313451205**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		65.0	>		

> **Result is greater than the associated numerical value.**

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 11:35**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 21:10**
File ID: **IR.100306.211000**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.327	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J **The analyte was positively identified, but the quantitation was below the RL**
U **Not detected at or above adjusted sample detection limit**

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 11:35**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 12:09**
File ID: **HY.100206.120951**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U **Not detected at or above adjusted sample detection limit**

Report Number: **L0609593**
Report Date : **October 11, 2006**

00097790

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 11:35**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 02:53**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 02:53**
File ID: **8M330660**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	103	86	118
1,2-Dichloroethane-d4	106	80	120
Toluene-d8	100	88	110
4-Bromofluorobenzene	93.2	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 11:35**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 18:28**
File ID: **12M13639**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	30.3	21	100
Phenol-d5	20.0	10	94
Nitrobenzene-d5	50.9	35	114
2-Fluorobiphenyl	60.1	43	116
2,4,6-Tribromophenol	103	10	123
p-Terphenyl-d14	103	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Soil**
Workgroup Number: **WG223871**
Collect Date: **09/22/2006 11:35**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **TMB**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **BU06100313435205**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	**18496-25-8**		**U**	**100**	**50.0**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Soil**
Workgroup Number: **WG223929**
Collect Date: **09/22/2006 11:35**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **DLP**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **U206100616244905**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	**57-12-5**		**U**	**10.0**	**5.00**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-05**
Client ID: **29WW36-CONF**
Matrix: **Soil**
Workgroup Number: **WG223203**
Collect Date: **09/22/2006 11:35**

PrePrep Method: **NONE**
Prep Method: **9045C**
Analytical Method: **9045C**
Analyst: **TMB**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-710A**
Prep Date: **09/25/2006 15:20**
Cal Date:
Run Date: **09/25/2006 15:20**
File ID: **OR06092610251318**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		**8.43**			

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Soil**
Workgroup Number: **WG223862**
Collect Date: **09/22/2006 12:15**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **DIH**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **10/02/2006 10:30**
Cal Date:
Run Date: **10/02/2006 10:30**
File ID: **PR06100313451206**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		**64.0**	**>**		

> Result is greater than the associated numerical value.

Report Number: **L0609593**
Report Date : **October 11, 2006**

00097792

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 12:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 21:16**
File ID: **IR.100306.211600**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	7440-22-4		U	.1	.05	D011	5
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.573	J	5	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.5	D010	1

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 12:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 12:11**
File ID: **HY.100206.121130**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	7439-97-6		U	.005	.001	D009	0.2

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 12:15**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 03:24**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 03:24**
File ID: **8M330661**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	104	86	118
1,2-Dichloroethane-d4	110	80	120
Toluene-d8	100	88	110
4-Bromofluorobenzene	92.4	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 12:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 19:01**
File ID: **12M13640**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	29.3	21	100
Phenol-d5	19.6	10	94
Nitrobenzene-d5	50.9	35	114
2-Fluorobiphenyl	61.6	43	116
2,4,6-Tribromophenol	94.3	10	123
p-Terphenyl-d14	74.8	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Soil**
Workgroup Number: **WG223871**
Collect Date: **09/22/2006 12:15**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **TMB**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **BU06100313435206**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	18496-25-8		U	100	50.0

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Soil**
Workgroup Number: **WG223929**
Collect Date: **09/22/2006 12:15**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **DLP**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **U206100616244906**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	57-12-5		U	10.0	5.00

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-06**
Client ID: **29WW38-CONF**
Matrix: **Soil**
Workgroup Number: **WG223203**
Collect Date: **09/22/2006 12:15**

PrePrep Method: **NONE**
Prep Method: **9045C**
Analytical Method: **9045C**
Analyst: **TMB**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-710A**
Prep Date: **09/25/2006 15:20**
Cal Date:
Run Date: **09/25/2006 15:20**
File ID: **OR06092610251319**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		**7.00**			

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Soil**
Workgroup Number: **WG223862**
Collect Date: **09/22/2006 13:15**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **DIH**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **10/02/2006 10:30**
Cal Date:
Run Date: **10/02/2006 10:30**
File ID: **PR06100313451207**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Ignitability		**64.0**	**>**		

> Result is greater than the associated numerical value.

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223879**
Collect Date: **09/22/2006 13:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **SLP**
Dilution: **1**
Units: **mg/L**

Instrument: **IRIS-ICP**
Prep Date: **09/29/2006 10:00**
Cal Date: **10/03/2006 09:37**
Run Date: **10/03/2006 21:22**
File ID: **IR.100306.212200**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Silver, TCLP	**7440-22-4**		**U**	**.1**	**.05**	**D011**	**5**
Arsenic, TCLP	**7440-38-2**		**U**	**1**	**.1**	**D004**	**5**
Barium, TCLP	**7440-39-3**	**0.872**	**J**	**5**	**.025**	**D005**	**100**
Cadmium, TCLP	**7440-43-9**		**U**	**.1**	**.025**	**D006**	**1**
Chromium, TCLP	**7440-47-3**		**U**	**.2**	**.025**	**D007**	**5**
Lead, TCLP	**7439-92-1**		**U**	**1**	**.1**	**D008**	**5**
Selenium, TCLP	**7782-49-2**		**U**	**.8**	**.5**	**D010**	**1**

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Leachate**
Workgroup Number: **WG223913**
Collect Date: **09/22/2006 13:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **METHOD**
Analytical Method: **7470A**
Analyst: **MMB**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **09/29/2006 10:40**
Cal Date: **10/02/2006 11:16**
Run Date: **10/02/2006 12:13**
File ID: **HY.100206.121308**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Mercury, TCLP	**7439-97-6**		**U**	**.005**	**.001**	**D009**	**0.2**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224197**
Collect Date: **09/22/2006 13:15**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS8**
Prep Date: **10/05/2006 03:54**
Cal Date: **09/29/2006 18:51**
Run Date: **10/05/2006 03:54**
File ID: **8M330662**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6	73.4		50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	104	86	118
1,2-Dichloroethane-d4	111	80	120
Toluene-d8	100	88	110
4-Bromofluorobenzene	93.8	86	115

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Leachate**
Workgroup Number: **WG224237**
Collect Date: **09/22/2006 13:15**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3510C**
Analytical Method: **8270C**
Analyst: **ALT**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS12**
Prep Date: **10/02/2006 11:30**
Cal Date: **09/28/2006 13:03**
Run Date: **10/04/2006 19:34**
File ID: **12M13641**

Analyte	CAS.Number	Result	Qual	PQL	SQL	EPA HW#	Reg. Limit
o-Cresol	95-48-7		U	50	25	D023	200000
m-,p-Cresol	106-44-5		U	50	25	D025	200000
1,4-Dichlorobenzene	106-46-7		U	50	25	D027	7500
2,4-Dinitrotoluene	121-14-2		U	50	25	D030	130
Hexachlorobenzene	118-74-1		U	50	25	D032	130
Hexachlorobutadiene	87-68-3		U	50	25	D033	500
Hexachloroethane	67-72-1		U	50	25	D034	3000
Nitrobenzene	98-95-3		U	50	25	D036	2000
Pentachlorophenol	87-86-5		U	250	25	D037	100000
Pyridine	110-86-1		U	500	250	D038	5000
2,4,5-Trichlorophenol	95-95-4		U	250	25	D041	400000
2,4,6-Trichlorophenol	88-06-2		U	50	25	D042	2000

Surrogate	% Recovery	Lower	Upper
2-Fluorophenol	29.7	21	100
Phenol-d5	19.3	10	94
Nitrobenzene-d5	51.1	35	114
2-Fluorobiphenyl	60.3	43	116
2,4,6-Tribromophenol	98.5	10	123
p-Terphenyl-d14	107	33	141

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Soil**
Workgroup Number: **WG223871**
Collect Date: **09/22/2006 13:15**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **TMB**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **BU06100313435207**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Sulfide	**18496-25-8**		**U**	**100**	**50.0**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Soil**
Workgroup Number: **WG223929**
Collect Date: **09/22/2006 13:15**

PrePrep Method: **NONE**
Prep Method: **SW-846**
Analytical Method: **SW-846**
Analyst: **DLP**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **10/02/2006 09:00**
Cal Date:
Run Date: **10/02/2006 09:00**
File ID: **U206100616244907**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Reactivity, Cyanide	**57-12-5**		**U**	**10.0**	**5.00**

U Not detected at or above adjusted sample detection limit

Sample Number: **L0609593-07**
Client ID: **29WW35-CONF**
Matrix: **Soil**
Workgroup Number: **WG223203**
Collect Date: **09/22/2006 13:15**

PrePrep Method: **NONE**
Prep Method: **9045C**
Analytical Method: **9045C**
Analyst: **TMB**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-710A**
Prep Date: **09/25/2006 15:20**
Cal Date:
Run Date: **09/25/2006 15:20**
File ID: **OR06092610251320**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Corrosivity pH		**7.21**			

WORKGROUP SUMMARY BY METHOD

Analysis: Corrosivity pH
Analytical Method: 9045C
Workgroup: WG223203

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4			09/25/06 15:20		ORION-710A	TMB
L0609593-02	RO#3			09/25/06 15:20		ORION-710A	TMB
L0609593-03	RO#2			09/25/06 15:20		ORION-710A	TMB
L0609593-04	RO#1			09/25/06 15:20		ORION-710A	TMB
L0609593-05	29WW36-CONF			09/25/06 15:20		ORION-710A	TMB
L0609593-06	29WW38-CONF			09/25/06 15:20		ORION-710A	TMB
L0609593-07	29WW35-CONF			09/25/06 15:20		ORION-710A	TMB

Analysis: Mercury, TCLP
Extraction Method: METHOD
Workgroup: WG223731

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4		09/29/06 10:40			HOT BLOCK	REK
L0609593-02	RO#3		09/29/06 10:40			HOT BLOCK	REK
L0609593-03	RO#2		09/29/06 10:40			HOT BLOCK	REK
L0609593-04	RO#1		09/29/06 10:40			HOT BLOCK	REK
L0609593-05	29WW36-CONF		09/29/06 10:40			HOT BLOCK	REK
L0609593-06	29WW38-CONF		09/29/06 10:40			HOT BLOCK	REK
L0609593-07	29WW35-CONF		09/29/06 10:40			HOT BLOCK	REK

Analysis: Metals Analysis
Extraction Method: 3015
Workgroup: WG223735

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4		09/29/06 10:00			MICROWAVE	VC
L0609593-02	RO#3		09/29/06 10:00			MICROWAVE	VC
L0609593-03	RO#2		09/29/06 10:00			MICROWAVE	VC
L0609593-04	RO#1		09/29/06 10:00			MICROWAVE	VC
L0609593-05	29WW36-CONF		09/29/06 10:00			MICROWAVE	VC
L0609593-06	29WW38-CONF		09/29/06 10:00			MICROWAVE	VC
L0609593-07	29WW35-CONF		09/29/06 10:00			MICROWAVE	VC

Analysis:Ignitability
Analytical Method:1010
Workgroup:WG223862

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4			10/02/06 10:30		PRECISION	DIH
L0609593-02	RO#3			10/02/06 10:30		PRECISION	DIH
L0609593-03	RO#2			10/02/06 10:30		PRECISION	DIH
L0609593-04	RO#1			10/02/06 10:30		PRECISION	DIH
L0609593-05	29WW36-CONF			10/02/06 10:30		PRECISION	DIH
L0609593-06	29WW38-CONF			10/02/06 10:30		PRECISION	DIH
L0609593-07	29WW35-CONF			10/02/06 10:30		PRECISION	DIH

Analysis:Semivolatle Organics - TCLP
Extraction Method:3510C
Workgroup:WG223870

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-01	RO#4		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-02	RO#3		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-02	RO#3		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-03	RO#2		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-03	RO#2		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-04	RO#1		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-04	RO#1		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-05	29WW36-CONF		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-05	29WW36-CONF		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-06	29WW38-CONF		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-06	29WW38-CONF		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-07	29WW35-CONF		10/02/06 11:30			SEP-FUNNEL	CAF
L0609593-07	29WW35-CONF		10/02/06 11:30			SEP-FUNNEL	CAF

Analysis:Reactivity, Sulfide
Analytical Method:SW-846
Workgroup:WG223871

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4			10/02/06 09:00		BURET	TMB
L0609593-02	RO#3			10/02/06 09:00		BURET	TMB
L0609593-03	RO#2			10/02/06 09:00		BURET	TMB
L0609593-04	RO#1			10/02/06 09:00		BURET	TMB
L0609593-05	29WW36-CONF			10/02/06 09:00		BURET	TMB
L0609593-06	29WW38-CONF			10/02/06 09:00		BURET	TMB
L0609593-07	29WW35-CONF			10/02/06 09:00		BURET	TMB

Analysis: Metals Analysis
Analytical Method: 6010B
Workgroup: WG223879

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4		09/29/06 10:00	10/03/06 20:09	01	IRIS-ICP	SLP
L0609593-02	RO#3		09/29/06 10:00	10/03/06 20:27	01	IRIS-ICP	SLP
L0609593-03	RO#2		09/29/06 10:00	10/03/06 20:45	01	IRIS-ICP	SLP
L0609593-04	RO#1		09/29/06 10:00	10/03/06 21:03	01	IRIS-ICP	SLP
L0609593-05	29WW36-CONF		09/29/06 10:00	10/03/06 21:10	01	IRIS-ICP	SLP
L0609593-06	29WW38-CONF		09/29/06 10:00	10/03/06 21:16	01	IRIS-ICP	SLP
L0609593-07	29WW35-CONF		09/29/06 10:00	10/03/06 21:22	01	IRIS-ICP	SLP

Analysis: Mercury, TCLP
Analytical Method: 7470A
Workgroup: WG223913

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4		09/29/06 10:40	10/02/06 11:56	01	HYDRA	MMB
L0609593-02	RO#3		09/29/06 10:40	10/02/06 11:59	01	HYDRA	MMB
L0609593-03	RO#2		09/29/06 10:40	10/02/06 12:01	01	HYDRA	MMB
L0609593-04	RO#1		09/29/06 10:40	10/02/06 12:02	01	HYDRA	MMB
L0609593-05	29WW36-CONF		09/29/06 10:40	10/02/06 12:09	01	HYDRA	MMB
L0609593-06	29WW38-CONF		09/29/06 10:40	10/02/06 12:11	01	HYDRA	MMB
L0609593-07	29WW35-CONF		09/29/06 10:40	10/02/06 12:13	01	HYDRA	MMB

Analysis: Reactivity, Cyanide
Analytical Method: SW-846
Workgroup: WG223929

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4			10/02/06 09:00		UV-120-1V	DLP
L0609593-02	RO#3			10/02/06 09:00		UV-120-1V	DLP
L0609593-03	RO#2			10/02/06 09:00		UV-120-1V	DLP
L0609593-04	RO#1			10/02/06 09:00		UV-120-1V	DLP
L0609593-05	29WW36-CONF			10/02/06 09:00		UV-120-1V	DLP
L0609593-06	29WW38-CONF			10/02/06 09:00		UV-120-1V	DLP
L0609593-07	29WW35-CONF			10/02/06 09:00		UV-120-1V	DLP

Analysis:
Analytical Method:8260B
Workgroup:WG224197

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4	09/28/06 15:00		10/05/06 00:52	DL01	HPMS8	MES
L0609593-01	RO#4	09/28/06 15:00		10/05/06 00:52	DL01	HPMS8	MES
L0609593-02	RO#3	09/28/06 15:00		10/05/06 01:23	DL01	HPMS8	MES
L0609593-02	RO#3	09/28/06 15:00		10/05/06 01:23	DL01	HPMS8	MES
L0609593-03	RO#2	09/28/06 15:00		10/05/06 01:53	DL01	HPMS8	MES
L0609593-03	RO#2	09/28/06 15:00		10/05/06 01:53	DL01	HPMS8	MES
L0609593-04	RO#1	09/28/06 15:00		10/05/06 02:23	DL01	HPMS8	MES
L0609593-04	RO#1	09/28/06 15:00		10/05/06 02:23	DL01	HPMS8	MES
L0609593-05	29WW36-CONF	09/28/06 15:00		10/05/06 02:53	DL01	HPMS8	MES
L0609593-05	29WW36-CONF	09/28/06 15:00		10/05/06 02:53	DL01	HPMS8	MES
L0609593-06	29WW38-CONF	09/28/06 15:00		10/05/06 03:24	DL01	HPMS8	MES
L0609593-06	29WW38-CONF	09/28/06 15:00		10/05/06 03:24	DL01	HPMS8	MES
L0609593-07	29WW35-CONF	09/28/06 15:00		10/05/06 03:54	DL01	HPMS8	MES
L0609593-07	29WW35-CONF	09/28/06 15:00		10/05/06 03:54	DL01	HPMS8	MES

Analysis:
Extraction Method:5030B
Workgroup:WG224197

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4				224197	HPMS8	CMS
L0609593-01	RO#4				224197	HPMS8	CMS
L0609593-02	RO#3				224197	HPMS8	CMS
L0609593-02	RO#3				224197	HPMS8	CMS
L0609593-03	RO#2				224197	HPMS8	CMS
L0609593-03	RO#2				224197	HPMS8	CMS
L0609593-04	RO#1				224197	HPMS8	CMS
L0609593-04	RO#1				224197	HPMS8	CMS
L0609593-05	29WW36-CONF				224197	HPMS8	CMS
L0609593-05	29WW36-CONF				224197	HPMS8	CMS
L0609593-06	29WW38-CONF				224197	HPMS8	CMS
L0609593-06	29WW38-CONF				224197	HPMS8	CMS
L0609593-07	29WW35-CONF				224197	HPMS8	CMS
L0609593-07	29WW35-CONF				224197	HPMS8	CMS

WORKGROUP SUMMARY BY METHOD

00097802

Analysis: Semivolatle Organics - TCLP
Analytical Method: 8270C
Workgroup: WG224237

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0609593-01	RO#4	09/28/06 15:00	10/02/06 11:30	10/04/06 16:15	01	HPMS12	ALT
L0609593-01	RO#4	09/28/06 15:00	10/02/06 11:30	10/04/06 16:15	01	HPMS12	ALT
L0609593-02	RO#3	09/28/06 15:00	10/02/06 11:30	10/04/06 16:48	01	HPMS12	ALT
L0609593-02	RO#3	09/28/06 15:00	10/02/06 11:30	10/04/06 16:48	01	HPMS12	ALT
L0609593-03	RO#2	09/28/06 15:00	10/02/06 11:30	10/04/06 17:21	01	HPMS12	ALT
L0609593-03	RO#2	09/28/06 15:00	10/02/06 11:30	10/04/06 17:21	01	HPMS12	ALT
L0609593-04	RO#1	09/28/06 15:00	10/02/06 11:30	10/04/06 17:55	01	HPMS12	ALT
L0609593-04	RO#1	09/28/06 15:00	10/02/06 11:30	10/04/06 17:55	01	HPMS12	ALT
L0609593-05	29WW36-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 18:28	01	HPMS12	ALT
L0609593-05	29WW36-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 18:28	01	HPMS12	ALT
L0609593-06	29WW38-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 19:01	01	HPMS12	ALT
L0609593-06	29WW38-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 19:01	01	HPMS12	ALT
L0609593-07	29WW35-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 19:34	01	HPMS12	ALT
L0609593-07	29WW35-CONF	09/28/06 15:00	10/02/06 11:30	10/04/06 19:34	01	HPMS12	ALT

Kemron Environmental Services
Analyst Listing
October 11, 2006

AJF – AMANDA J. FICKIESEN
ALB – ANNIE L. BOCK
ALT – ANN L. THAYER
ARA – ADRIAN R. ACHTERMANN
BRG – BRENDA R. GREGORY
CAA – CASSIE A. AUGENSTEIN
CAF – CHERYL A. FLOWERS
CAK – CHERYL A. KOELSCH
CEB – CHAD E. BARNES
CFB – CHAD F. BOOK
CLC – CHRYS L. CRAWFORD
CLS – CARA L. STRICKLER
CLW – CHARISSA L. WINTERS
CM – CHARLIE MARTIN
CMS – CRYSTAL M. STEPHENS
CPD – CHAD P. DAVIS
CSA – LUCINDA S. ARNOLD
CSH – CHRIS S. HILL
DAS – DALLAS A. SULLIVAN
DD – DIANE M. DENNIS
DDE – DEBRA D. ELLIOTT
DEL – DON E. LIGHTFRITZ
DEV – DAVID E. VANDENBERG
DGB – DOUGLAS G. BUTCHER
DIH – DEANNA I. HESSON
DJ – DONGPING JIANG
DLB – DAVID L. BUMGARNER
DLP – DOROTHY L. PAYNE
DLR – DIANNA L. RAUCH
DR – DEANNA ROBERTS
DRP – DAVE R. PITZER
DSM – DAVID S. MOSSOR
DST – DENNIS S. TEPE
ECL – ERIC C. LAWSON
ED – EMILY E. DECKER
FJB – FRANCES J. BOLDEN
HAV – HEMA VILASAGAR
JAL – JOHN A. LENT
JKT – JANE K. THOMPSON
JLS – JANICE L. SCHIMMEL
JNB – JOSHUA N. BOOTH
JS – JENNIFER L. SOUTHALL
JWR – JOHN W. RICHARDS
JWS – JACK W. SHEAVES
JYH – JI Y. HU
KCZ – KEVIN C. ZUMBRO
KEB – KATHRYN E. BARNES
KHR – KIM H. RHODES
KRA – KATHY R. ALBERTSON
LKN – LINDA K. NEDEFF
LSB – LESLIE S. BUCINA
MDA – MIKE D. ALBERTSON
MDC – MICHAEL D. COCHRAN
MES – MARY E. SCHILLING
MKZ – MARILYN K. ZUMBRO
MLR – MARY L. ROCHOTTE
MLS – MICHAEL L. SCHIMMEL
MMB – MAREN M. BEERY
MSW – MATT S. WILSON
NJB – NATALIE J. BOOTH
PAS – PATRICK A. STREET
PJM – PAUL J. MILLER
RB – ROBERT BUCHANAN
RDC – REBECCA D. CUTLIP
REK – ROBERT E. KYER
RNP – RICK N. PETTY
RWC – RODNEY W. CAMPBELL
SCM – SUSAN C. MOELLENDICK
SLM – STEPHANIE L. MOSSBURG
SLP – SHERI L. PFALZGRAF
SMH – SHAUNA M. HYDE
SRM – SAMUEL R. MCFEE
TMB – TIFFANY M. BAILEY
TMM – TAMMY M. MORRIS
VC – VICKI COLLIER
WFM – WALTER F. MARTIN

KEMRON Environmental Services

List of Valid Qualifiers

October 11, 2006

00097804

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
FL	Free Liquid
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	ESTIMATE & COLUMNS DON'T AGREE TO WITHIN 40%
L	Sample reporting limits elevated due to matrix interference
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
Z	Cannot be resolved from isomer - see below

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

Organic QA/QC

KEMRON Environmental Services
Data Checklist

00097806

Date: 29-SEP-2006
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 12578
Analytical Workgroups: WG223682

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	NA
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	NA
TCL's	NA
Surrogates	NA
LCS (Laboratory Control Sample)	NA
Recoveries	NA
Surrogates	NA
MS/MSD/Duplicates	NA
Samples	NA
TCL Hits	NA
Spectra of TCL Hits	NA
Surrogates	NA
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	X
Case Narrative	NA
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	MES
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
02-OCT-2006

Secondary Reviewer:
02-OCT-2006

Generated: OCT-02-2006 22:14:36

00097807

KEMRON Environmental Services
Data Checklist

Date: 04-OCT-2006
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 12650
Analytical Workgroups: WG224092,WG224197

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	MES
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
05-OCT-2006

Secondary Reviewer:
10-OCT-2006

Generated: OCT-10-2006 13:04:47

00097808

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS8 Dataset: 092906
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 15950

Internal Standard: STD15408 Surrogate Standard: STD15082
CCV: STD15356 LCS: STD15325 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG223682

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M330425	SYSTEM BLANK	NA	1	1		09/29/06 07:13
2	8M330426	SYSTEM BLANK	NA	1	1		09/29/06 07:43
3	8M330427	WG223682-01 BFB 50ng STD 8260	NA	1	1	STD14811	09/29/06 08:17
4	8M330428	WG223682-02 0.30ug/L STD 8260	NA	1	1	STD15356	09/29/06 08:49
5	8M330429	WG223682-03 0.40ug/L STD 8260	NA	1	1	STD15356	09/29/06 09:21
6	8M330430	WG223682-04 1ug/L STD 8260	NA	1	1	STD15356	09/29/06 09:51
7	8M330431	WG223682-05 2ug/L STD 8260	NA	1	1	STD15356	09/29/06 10:21
8	8M330432	WG223682-06 5ug/L STD 8260	NA	1	1	STD15356	09/29/06 10:51
9	8M330433	WG223682-07 20ug/L STD 8260	NA	1	1	STD15356	09/29/06 11:21
10	8M330434	WG223682-08 50ug/L STD 8260	NA	1	1	STD15356	09/29/06 11:52
11	8M330435	WG223682-09 100ug/L STD 8260	NA	1	1	STD15356	09/29/06 12:23
12	8M330436	WG223682-10 200ug/L STD 8260	NA	1	1	STD15356	09/29/06 12:53
13	8M330437	SYSTEM BLANK	NA	1	1		09/29/06 13:23
14	8M330438	SYSTEM BLANK	NA	1	1		09/29/06 13:54
15	8M330439	WG223682-01 BFB 50ng STD 8260	NA	1	1	STD14811	09/29/06 14:22
16	8M330440	WG223682-02 0.30ug/L STD 8260	NA	1	1	STD15356	09/29/06 14:49
17	8M330441	WG223682-03 0.40ug/L STD 8260	NA	1	1	STD15356	09/29/06 15:19
18	8M330442	WG223682-04 1ug/L STD 8260	NA	1	1	STD15356	09/29/06 15:49
19	8M330443	WG223682-05 2ug/L STD 8260	NA	1	1	STD15356	09/29/06 16:19
20	8M330444	WG223682-06 5ug/L STD 8260	NA	1	1	STD15356	09/29/06 16:50
21	8M330445	WG223682-07 20ug/L STD 8260	NA	1	1	STD15356	09/29/06 17:20
22	8M330446	WG223682-08 50ug/L STD 8260	NA	1	1	STD15356	09/29/06 17:50
23	8M330447	WG223682-09 100ug/L STD 8260	NA	1	1	STD15356	09/29/06 18:20
24	8M330448	WG223682-10 200ug/L STD 8260	NA	1	1	STD15356	09/29/06 18:51
25	8M330449	SYSTEM BLANK	NA	1	1		09/29/06 19:22
26	8M330450	SYSTEM BLANK	NA	1	1		09/29/06 19:52
27	8M330451	WG223682-11 20ug/L ALT SOURCE STD 8	NA	1	1	STD15325	09/29/06 20:24

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12				

Approved: October 02, 2006

KEMRON Environmental Services

Instrument Run Log

00097809

Instrument: HPMS8 Dataset: 092906

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 15950

Internal Standard: STD15408 Surrogate Standard: STD15082

CCV: STD15356 LCS: STD15325 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG223682

Comments

Seq.	Rerun	Dil.	Reason	Analytes
File ID: 8M330436				
Reanalyzing curve-compounds are saturating the detector. Lowering the voltage.				

Approved: October 02, 2006

00097810

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS8 Dataset: 100406

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 16015

Internal Standard: STD15408 Surrogate Standard: STD15463

CCV: STD15096,STD15521 LCS: STD15165,STD15360 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG224092,WG224197

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M330626	WG224092-01 BFB 50ng STD 8260	NA	1	1	STD14811	10/04/06 08:28
2	8M330627	SYSTEM BLANK	NA	1	1		10/04/06 08:56
3	8M330628	SYSTEM BLANK	NA	1	1		10/04/06 09:29
4	8M330629	WG224092-02 5ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 10:18
5	8M330630	WG224092-03 10ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 10:48
6	8M330631	WG224092-04 20ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 11:18
7	8M330632	WG224092-05 50ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 11:49
8	8M330633	WG224092-06 100ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 12:19
9	8M330634	WG224092-07 200ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 12:49
10	8M330635	SYSTEM BLANK	NA	1	1		10/04/06 13:19
11	8M330636	SYSTEM BLANK	NA	1	1		10/04/06 13:50
12	8M330637	WG224092-02 2ug/L 1,4-DIOXANE STD	NA	1	1	STD15096	10/04/06 14:23
13	8M330638	WG224092-08 10ug/L 1,4-DIOXANE ALT S	NA	1	1	STD15165	10/04/06 14:54
14	8M330639	WG224092-08 10ug/L 1,4-DIOXANE ALT S	NA	1	1	STD15165	10/04/06 15:31
15	8M330640	WG224196-01 50NG BFB STD 8260	NA	1	1	STD14811	10/04/06 17:00
41	8M330641	WG224196-02 50ug/L WATER STD 8260	NA	1	1	STD15521	10/04/06 17:23
16	8M330642	WG224197-01 VBLK1004 BLANK 8260	NA	1	1		10/04/06 17:53
17	8M330643	WG224197-02 20ug/L LCS 8260	NA	1	1	STD15360	10/04/06 18:23
18	8M330644	WG224197-03 20ug/L LCSDUP 8260	NA	1	1	STD15360	10/04/06 18:53
19	8M330645	L0609792-20 A 826-SPE	<2	1	1		10/04/06 19:22
20	8M330646	L0609792-03 A 5X 826-SPE	<2	1	5		10/04/06 19:52
21	8M330647	L0609792-04 A 500X 826-SPE	<2	1	500		10/04/06 20:22
22	8M330648	L0609792-05 A 10X 826-SPE	<2	1	10		10/04/06 20:51
23	8M330649	L0609792-06 A 25X 826-SPE	<2	1	25		10/04/06 21:21
24	8M330650	L0609792-07 A 50X 826-SPE	<2	1	50		10/04/06 21:51
25	8M330651	L0609792-08 A 10X 826-SPE	<2	1	10		10/04/06 22:22
26	8M330652	L0609792-09 A 10X 826-SPE	<2	1	10		10/04/06 22:52
27	8M330653	L0609792-10 A 826-SPE	<2	1	1		10/04/06 23:22
28	8M330654	L0609792-21 A 50X 826-SPE	<2	1	50		10/04/06 23:52
29	8M330655	L0609792-23 A 10X 826-SPE	<2	1	10		10/05/06 00:22
30	8M330656	L0609593-01 A 10X 826-TC	NA	17	10		10/05/06 00:52
31	8M330657	L0609593-02 A 10X 826-TC	NA	17	10		10/05/06 01:23

Approved: October 10, 2006

00097811

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS8 Dataset: 100406
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 16015

Internal Standard: STD15408 Surrogate Standard: STD15463
CCV: STD15096,STD15521 LCS: STD15165,STD15360 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG224092,WG224197

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
32	8M330658	L0609593-03 A 10X 826-TC	NA	17	10		10/05/06 01:53
33	8M330659	L0609593-04 A 10X 826-TC	NA	17	10		10/05/06 02:23
34	8M330660	L0609593-05 A 10X 826-TC	NA	17	10		10/05/06 02:53
35	8M330661	L0609593-06 A 10X 826-TC	NA	17	10		10/05/06 03:24
36	8M330662	L0609593-07 A 10X 826-TC	NA	17	10		10/05/06 03:54
37	8M330663	L0609671-01 A 10X 826-TC	NA	17	10		10/05/06 04:25
38	8M330664	WG224197-04 624 BLANK	NA	2	1		10/05/06 04:55
39	8M330665	L0610055-02 A 624-SPE	=5	2	1		10/05/06 05:24
40	8M330666	SYSTEM CHECK	NA	2	1		10/05/06 05:55

Comments

Seq.	Rerun	Dil.	Reason	Analytes
4				
File ID: 8M330629				
	Not needed-do not report.			
13				
File ID: 8M330638				
	RR-no surrogate added.			
21	X	50	Analyzed too dilute	
File ID: 8M330647				
	DNR			
22	X	5	Analyzed too dilute	
File ID: 8M330648				
	DNR			
25	X	5	Analyzed too dilute	
File ID: 8M330651				
	DNR			
26	X	100	Over Linear Range	
File ID: 8M330652				
27	X		Carry-over contamination	
File ID: 8M330653				
	DNR			
28	X	20	Over Calibration Range	

Approved: October 10, 2006

KEMRON Environmental Services

Instrument Run Log

00097812

Instrument: HPMS8 Dataset: 100406

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 16015

Internal Standard: STD15408 Surrogate Standard: STD15463

CCV: STD15096,STD15521 LCS: STD15165,STD15360 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG224092,WG224197

Comments

Seq.	Rerun	Dil.	Reason	Analytes
File ID: 8M330654				
DNR				

Approved: October 10, 2006

TCLP Volatile

Analyst(s): RWC

Date: 9-28-06

Analyst/Date		Analyst/Date	
RWC 9-28-06		RWC 9-29-06	
Time On	Temp On °C	Time Off	Temp Off °C
1500	22	0800	21

ZHE	Sample #	Tests	PSI ON	PSI OFF	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
A	09-59301	VOA	10	10	1311	FI-607	S/S	100		✓	25.03	500
B	02	"	"	"	"	"	"	"		✓	25.02	"
C	03	"	"	"	"	"	"	"		✓	25.00	"
D	04	"	"	"	"	"	"	"		✓	25.00	"
E	05	"	"	"	"	"	"	"		✓	25.01	"
F	06	"	"	"	"	"	"	"		✓	25.05	"
G	07	"	"	"	"	"	"	"		✓	25.03	"
H	09-671-01	"	"	"	"	"	S	"		✓	25.02	"
I												
J	09-70201	VOA	10	10	1311	FI-607	S/S	100		✓	25.05	500
K												
L												
M												
N												
O												
P												
Q												
R												
S												
N/A	EBLK	VOA	N/A	N/A	1311	FI-607	N/A	N/A		✓	40	40

RWC

*Matrix Code = (S-solid)(SS-sand, soil or sludge)(P-paint)(O-organic or waste)(W-water)

Comments: _____

Peer Review By: _____ Supervisor Review: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097814

Analytical Method: 8260B AAB#: WG224197

Login Number: L0609593

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
RO#4	09/22/06	09/23/06	10/05/06	20.1	12.5	10/05/06	14	12.5	
RO#3	09/22/06	09/23/06	10/05/06	20.1	12.5	10/05/06	14	12.5	
RO#2	09/22/06	09/23/06	10/05/06	20.1	12.5	10/05/06	14	12.5	
RO#1	09/22/06	09/23/06	10/05/06	20.2	12.6	10/05/06	14	12.6	
29WW36-CONF	09/22/06	09/23/06	10/05/06	20.1	12.6	10/05/06	14	12.6	
29WW38-CONF	09/22/06	09/23/06	10/05/06	20.1	12.6	10/05/06	14	12.6	
29WW35-CONF	09/22/06	09/23/06	10/05/06	20.1	12.6	10/05/06	14	12.6	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 591823
Report generated 10/10/2006 14:15

SURROGATE STANDARDS

00097815

Login Number: L0609593
Instrument Id: HPMS8
Workgroup (AAB#): WG224197

Method: 8260
CAL ID: HPMS8-29-SEP-06
Matrix: Leachate

Sample Number	Dilution	Tag	1	2	3	4
L0609593-01	10.0	DL01	105	102	93.2	101
L0609593-02	10.0	DL01	109	103	92.6	99.6
L0609593-03	10.0	DL01	108	103	92.3	100
L0609593-04	10.0	DL01	107	103	93.7	100
L0609593-05	10.0	DL01	106	103	93.2	100
L0609593-06	10.0	DL01	110	104	92.4	100
L0609593-07	10.0	DL01	111	104	93.8	100
WG224197-01	1.00	01	92.9	96.9	90.8	97.3
WG224197-02	1.00	01	95.2	100	89.0	97.6
WG224197-03	1.00	01	92.9	97.6	89.0	97.4
WG224197-04	1.00	01	108	103	93.2	101

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	80	-	120
2 - Dibromofluoromethane	86	-	118
3 - 4-Bromofluorobenzene	86	-	115
4 - Toluene-d8	88	-	110

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 591832
Report generated 10/10/2006 14:18

KEMRON Environmental Services

00097816

METHOD BLANK SUMMARY

Login Number: L0609593
Work Group: WG224197
Blank File ID: 8M330642
Blank Sample ID: WG224197-01
Date Analyzed: 10/04/06
Instrument ID: HPMS8
Time Analyzed: 17:53
Method: 8260B
Analyst: MES

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG224197-02	8M330643	10/04/06 18:23	01
LCS2	WG224197-03	8M330644	10/04/06 18:53	01
RO#4	L0609593-01	8M330656	10/05/06 00:52	DL01
RO#3	L0609593-02	8M330657	10/05/06 01:23	DL01
RO#2	L0609593-03	8M330658	10/05/06 01:53	DL01
RO#1	L0609593-04	8M330659	10/05/06 02:23	DL01
29WW36-CONF	L0609593-05	8M330660	10/05/06 02:53	DL01
29WW38-CONF	L0609593-06	8M330661	10/05/06 03:24	DL01
29WW35-CONF	L0609593-07	8M330662	10/05/06 03:54	DL01
BLANK2	WG224197-04	8M330664	10/05/06 04:55	01

KEMRON FORMS - Modified 03/06/2006
Version 1.5 PDF File ID: 591824
Report generated 10/10/2006 14:15

KEMRON Environmental Services

METHOD BLANK REPORT

00097817

Login Number: L0609593 Run Date: 10/04/2006 Sample ID: WG224197-01
Instrument ID: HPMS8 Run Time: 17:53 Prep Method: 5030B
File ID: 8M330642 Analyst: MES Method: 8260B
Workgroup (AAB#): WG224197 Matrix: Leachate Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS8-29-SEP-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Benzene	0.125	5.00	0.125	1	U
Carbon tetrachloride	0.250	5.00	0.250	1	U
Chlorobenzene	0.125	5.00	0.125	1	U
Chloroform	0.125	5.00	0.125	1	U
1,2-Dichloroethane	0.250	5.00	0.250	1	U
1,1-Dichloroethene	0.500	5.00	0.500	1	U
Methyl Ethyl Ketone	2.50	10.0	2.50	1	U
Tetrachloroethene	0.250	5.00	0.250	1	U
Trichloroethene	0.250	5.00	0.250	1	U
Vinyl chloride	0.250	10.0	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	96.9	86 - 118	PASS
1,2-Dichloroethane-d4	92.9	80 - 120	PASS
Toluene-d8	97.3	88 - 110	PASS
4-Bromofluorobenzene	90.8	86 - 115	PASS

MDL Method Detection Limit
RL Reporting/quantitation Limit

* Analyte concentration > RL

KEMRON FORMS - Modified 10/10/2006
Version 1.5 PDF File ID: 591825
Report generated 10/10/2006 14:15

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097818

Login Number: L0609593 Analyst: MES Prep Method: 5030B
Instrument ID: HPMS8 Matrix: Leachate Method: 8260B
Workgroup (AAB#): WG224197 Units: ug/L
Sample ID: WG224197-02 LCS File ID: 8M330643 Run Date: 10/04/2006 18:23
Sample ID: WG224197-03 LCS2 File ID: 8M330644 Run Date: 10/04/2006 18:53

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Benzene	20.0	21.6	108	20.0	20.7	103	4.35	80 - 121	20	
Carbon tetrachloride	20.0	25.7	128	20.0	24.3	122	5.43	65 - 140	20	
Chlorobenzene	20.0	21.6	108	20.0	21.1	105	2.50	80 - 120	20	
Chloroform	20.0	22.7	113	20.0	21.8	109	4.03	80 - 125	20	
1,2-Dichloroethane	20.0	22.6	113	20.0	21.9	109	3.18	80 - 129	20	
1,1-Dichloroethene	20.0	23.2	116	20.0	22.0	110	5.38	80 - 132	20	
Methyl Ethyl Ketone	20.0	17.6	88.2	20.0	16.2	81.1	8.45	30 - 150	20	
Tetrachloroethene	20.0	23.1	116	20.0	22.1	110	4.49	80 - 124	20	
Trichloroethene	20.0	23.3	116	20.0	22.4	112	4.02	80 - 122	20	
Vinyl chloride	20.0	23.4	117	20.0	21.4	107	8.82	65 - 140	20	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
Dibromofluoromethane	100	97.6	86 - 118	PASS
1,2-Dichloroethane-d4	95.2	92.9	80 - 120	PASS
Toluene-d8	97.6	97.4	88 - 110	PASS
4-Bromofluorobenzene	89.0	89.0	86 - 115	PASS

* FAILS %REC LIMIT

\# FAILS RPD LIMIT

KEMRON FORMS - Modified 07/13/2006
Version 1.5 PDF File ID: 591822
Report generated 10/10/2006 14:15

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0609593 Tune ID: WG223682-01
Instrument: HPMS8 Run Date: 09/29/2006
Analyst: CMS Run Time: 14:22
Workgroup: WG223682 File ID: 8M330439
Cal ID: HPMS8-29-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	17.4	29306	PASS
75.0	95.0	30.0	60.0	43.2	72894	PASS
95.0	95.0	100	100	100	168746	PASS
96.0	95.0	5.00	9.00	6.62	11165	PASS
173	174	0	2.00	0.645	863	PASS
174	95.0	50.0	100	79.3	133893	PASS
175	174	5.00	9.00	7.39	9888	PASS
176	174	95.0	101	97.5	130480	PASS
177	176	5.00	9.00	6.46	8425	PASS

This check relates to the following samples, MS, MSD:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG223682-11	SSCV	01	09/29/2006 20:24	
WG223682-10	STD	01	09/29/2006 18:51	
WG223682-09	STD	01	09/29/2006 18:20	
WG223682-08	STD-CCV	01	09/29/2006 17:50	
WG223682-07	STD	01	09/29/2006 17:20	
WG223682-06	STD	01	09/29/2006 16:50	
WG223682-05	STD	01	09/29/2006 16:19	
WG223682-04	STD	01	09/29/2006 15:49	
WG223682-03	STD	01	09/29/2006 15:19	
WG223682-02	STD	01	09/29/2006 14:49	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 07/26/2006
Version 1.3 PDF File ID: 591828
Report generated 10/10/2006 14:15

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0609593 Tune ID: WG224196-01
Instrument: HPMS8 Run Date: 10/04/2006
Analyst: MES Run Time: 17:00
Workgroup: WG224196 File ID: 8M330640
Cal ID: HPMS8 -29-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	16.3	22032	PASS
75.0	95.0	30.0	60.0	43.7	59210	PASS
95.0	95.0	100	100	100	135477	PASS
96.0	95.0	5.00	9.00	6.65	9014	PASS
173	174	0	2.00	0.529	567	PASS
174	95.0	50.0	100	79.2	107274	PASS
175	174	5.00	9.00	7.36	7897	PASS
176	174	95.0	101	99.3	106501	PASS
177	176	5.00	9.00	6.76	7199	PASS

This check relates to the following CCV:

Lab ID	Client ID	Date Analyzed	
WG224196-02	CCV	10/04/2006 17:23	

This check relates to the following samples & batch QC:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG224197-01	BLANK	01	10/04/2006 17:53	
WG224197-02	LCS	01	10/04/2006 18:23	
WG224197-03	LCS2	01	10/04/2006 18:53	
L0609593-01	RO#4	DL01	10/05/2006 00:52	
L0609593-02	RO#3	DL01	10/05/2006 01:23	
L0609593-03	RO#2	DL01	10/05/2006 01:53	
L0609593-04	RO#1	DL01	10/05/2006 02:23	
L0609593-05	29WW36-CONF	DL01	10/05/2006 02:53	
L0609593-06	29WW38-CONF	DL01	10/05/2006 03:24	
L0609593-07	29WW35-CONF	DL01	10/05/2006 03:54	
WG224197-04	BLANK2	01	10/05/2006 04:55	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 07/27/2006
Version 1.3 PDF File ID: 591829
Report generated 10/10/2006 14:15

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

00097821

Login Number: L0609593 **Instrument ID:** HPMS8

Analytical Method: 8260B **Initial Calibration Date:** 29-SEP-06 18:51

ICAL Workgroup: WG223682 **Column ID:** F

Analyte		AVG RF	% RSD	LINEAR	QUAD
1,1-Dichloroethene	CCC	0.4204	9.92		
Chloroform	CCC	0.5012	4.94		
Vinyl Chloride	CCC	0.1664	15.6		1.00
1,1,2,2-Tetrachloroethane	SPCC	0.5718	13.7		
1,1-Dichloroethane	SPCC	0.5371	4.34		
Bromoform	SPCC	0.1759	11.7		
Chlorobenzene	SPCC	1.114	13.0		
Chloromethane	SPCC	0.2058	9.81		
1,2-Dichloroethane		0.3117	3.88		
2-Butanone		0.06384	5.18		
Benzene		1.214	9.22		
Carbon Tetrachloride		0.3666	13.1		
Tetrachloroethene		0.3312	12.5		
Trichloroethene		0.3114	4.62		

INITIAL CALIBRATION DATA

00097822

Login Number: L0609593 **Instrument ID:** HPMS8

Analytical Method: 8260B **Initial Calibration Date:** 29-SEP-06 18:51

Column ID: F

Analyte	WG223682-02			WG223682-03			WG223682-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	NA	NA	NA	0.400	2366.00000	0.3216	1.00	8307.00000	0.4531
Chloroform	0.300	2517.00000	0.4574	0.400	3598.00000	0.4890	1.00	9915.00000	0.5409
Vinyl Chloride	NA	NA	NA	NA	NA	NA	1.00	3721.00000	0.2030
1,1,2,2-Tetrachloroethane	NA	NA	NA	0.400	2263.00000	0.7621	1.00	4200.00000	0.5578
1,1-Dichloroethane	NA	NA	NA	0.400	3677.00000	0.4998	1.00	10515.0000	0.5736
Bromoform	NA	NA	NA	NA	NA	NA	1.00	2155.00000	0.1575
Chlorobenzene	NA	NA	NA	0.400	6836.00000	1.247	1.00	17312.0000	1.265
Chloromethane	NA	NA	NA	NA	NA	NA	1.00	4388.00000	0.2394
1,2-Dichloroethane	NA	NA	NA	0.400	2225.00000	0.3024	1.00	6102.00000	0.3329
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	0.400	9854.00000	1.339	1.00	24245.0000	1.323
Carbon Tetrachloride	NA	NA	NA	0.400	1853.00000	0.2519	1.00	6732.00000	0.3672
Tetrachloroethene	NA	NA	NA	0.400	1337.00000	0.2439	1.00	5097.00000	0.3724
Trichloroethene	NA	NA	NA	0.400	2103.00000	0.2858	1.00	5974.00000	0.3259

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00097823

Login Number: L0609593
Instrument ID: HPMS8
Analytical Method: 8260B
Initial Calibration Date: 29-SEP-06 18:51
Column ID: F

Analyte	WG223682-05			WG223682-06			WG223682-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	2.00	15801.0000	0.4303	5.00	40411.0000	0.4407	20.0	158910.000	0.4360
Chloroform	2.00	18621.0000	0.5071	5.00	46761.0000	0.5100	20.0	188921.000	0.5184
Vinyl Chloride	2.00	7013.00000	0.1910	5.00	16317.0000	0.1780	20.0	59152.0000	0.1623
1,1,2,2-Tetrachloroethane	2.00	7953.00000	0.5248	5.00	19118.0000	0.5258	20.0	79922.0000	0.5480
1,1-Dichloroethane	2.00	19980.0000	0.5441	5.00	50280.0000	0.5484	20.0	199193.000	0.5465
Bromoform	2.00	4262.00000	0.1550	5.00	10399.0000	0.1530	20.0	48160.0000	0.1770
Chlorobenzene	2.00	31958.0000	1.162	5.00	79294.0000	1.166	20.0	311900.000	1.146
Chloromethane	2.00	8384.00000	0.2283	5.00	18469.0000	0.2014	20.0	71518.0000	0.1962
1,2-Dichloroethane	2.00	11437.0000	0.3114	5.00	28285.0000	0.3085	20.0	116191.000	0.3188
2-Butanone	NA	NA	NA	5.00	5376.00000	0.05860	20.0	22743.0000	0.06240
Benzene	2.00	46152.0000	1.257	5.00	113799.000	1.241	20.0	447929.000	1.229
Carbon Tetrachloride	2.00	13492.0000	0.3674	5.00	35017.0000	0.3819	20.0	143290.000	0.3932
Tetrachloroethene	2.00	9508.00000	0.3458	5.00	24187.0000	0.3558	20.0	96883.0000	0.3561
Trichloroethene	2.00	11577.0000	0.3152	5.00	29197.0000	0.3184	20.0	117464.000	0.3223

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 591826
Report generated 10/10/2006 14:15

INITIAL CALIBRATION DATA

00097824

Login Number: L0609593 **Instrument ID:** HPMS8

Analytical Method: 8260B **Initial Calibration Date:** 29-SEP-06 18:51

Column ID: F

Analyte	WG223682-08			WG223682-09			WG223682-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	50.0	388340.000	0.4373	100	731895.000	0.4342	200	1318939.00	0.4099
Chloroform	50.0	455169.000	0.5126	100	845037.000	0.5013	200	1526317.00	0.4743
Vinyl Chloride	50.0	137144.000	0.1544	100	248879.000	0.1476	200	412576.000	0.1282
1,1,2,2-Tetrachloroethane	50.0	204971.000	0.5673	100	391356.000	0.5527	200	725475.000	0.5361
1,1-Dichloroethane	50.0	481124.000	0.5418	100	898835.000	0.5332	200	1638963.00	0.5094
Bromoform	50.0	132195.000	0.1971	100	260128.000	0.1971	200	488866.000	0.1948
Chlorobenzene	50.0	742079.000	1.106	100	1317284.00	0.9980	200	2055750.00	0.8191
Chloromethane	50.0	170962.000	0.1925	100	309878.000	0.1838	200	640536.000	0.1991
1,2-Dichloroethane	50.0	282796.000	0.3185	100	520533.000	0.3088	200	940859.000	0.2924
2-Butanone	50.0	58657.0000	0.06610	100	111061.000	0.06590	200	212945.000	0.06620
Benzene	50.0	1066299.00	1.201	100	1905292.00	1.130	200	3184925.00	0.9898
Carbon Tetrachloride	50.0	354142.000	0.3988	100	669150.000	0.3969	200	1207047.00	0.3751
Tetrachloroethene	50.0	232072.000	0.3460	100	435468.000	0.3299	200	751401.000	0.2994
Trichloroethene	50.0	282741.000	0.3184	100	526773.000	0.3125	200	941762.000	0.2927

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 591826
Report generated 10/10/2006 14:15

KEMRON Environmental Services

ALTERNATE SOURCE CALIBRATION REPORT

00097825

Login Number: L0609593 Run Date: 09/29/2006 Sample ID: WG223682-11
Instrument ID: HPMS8 Run Time: 20:24 Method: 8260B
File ID: 8M330451 Analyst: CMS
ICal Workgroup: WG223682 Cal ID: HPMS8 - 29-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
Chloroform	CCC	20	21.7	0.543	8.4	ug/L	
1,1-Dichloroethene	CCC	20	22.5	0.473	12.6	ug/L	
Vinyl Chloride	CCC	20	20.7	0.168	3.3	ug/L	
Chlorobenzene	SPCC	20	21.4	1.19	6.8	ug/L	
Chloromethane	SPCC	20	21.4	0.220	6.9	ug/L	
1,1-Dichloroethane	SPCC	20	21.6	0.580	7.9	ug/L	
Bromoform	SPCC	20	22.2	0.195	11.1	ug/L	
1,1,2,2-Tetrachloroethane	SPCC	20	20.5	0.585	2.3	ug/L	
Benzene		20	21.3	1.29	6.4	ug/L	
Carbon Tetrachloride		20	23.1	0.423	15.3	ug/L	
1,2-Dichloroethane		20	22.0	0.343	9.9	ug/L	
2-Butanone		20	23.2	0.0739	15.8	ug/L	
Tetrachloroethene		20	22.6	0.374	12.8	ug/L	
Trichloroethene		20	22.0	0.343	10	ug/L	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 07/26/2006
Version 1.5 PDF File ID: 591827
Report generated 10/10/2006 14:15

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097826

Login Number: L0609593 Run Date: 10/04/2006 Sample ID: WG224196-02
Instrument ID: HPMS8 Run Time: 17:23 Method: 8260B
File ID: 8M330641 Analyst: MES
Workgroup (AAB#): WG224197 Cal ID: HPMS8 - 29-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
Chloroform	CCC	50.0	53.7	0.538	7.30	ug/L	
1,1-Dichloroethene	CCC	50.0	55.1	0.463	10.1	ug/L	
Vinyl Chloride	CCC	50.0	48.4	0.152	3.20	ug/L	
1,2-Dichloropropane	CCC	50.0	51.6	0.312	3.20	ug/L	
Ethylbenzene	CCC	50.0	51.8	0.644	3.60	ug/L	
Toluene	CCC	50.0	50.8	1.70	1.50	ug/L	
Chlorobenzene	SPCC	50.0	50.7	1.13	1.50	ug/L	
Bromoform	SPCC	50.0	55.2	0.194	10.4	ug/L	
Chloromethane	SPCC	50.0	45.1	0.186	9.90	ug/L	
1,1,2,2-Tetrachloroethane	SPCC	50.0	44.4	0.508	11.3	ug/L	
1,1-Dichloroethane	SPCC	50.0	53.2	0.571	6.40	ug/L	
Benzene		50.0	51.1	1.24	2.10	ug/L	
Carbon Tetrachloride		50.0	60.3	0.442	20.5	ug/L	
1,2-Dichloroethane		50.0	51.6	0.322	3.30	ug/L	
2-Butanone		50.0	41.9	0.0535	16.2	ug/L	
Tetrachloroethene		50.0	54.4	0.360	8.80	ug/L	
Trichloroethene		50.0	54.7	0.341	9.40	ug/L	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2006
Version 1.3 PDF File ID: 591830
Report generated 10/10/2006 14:16

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

00097827

Login Number: L0609593
Instrument ID: HPMS8
Workgroup (AAB#): WG224197

CCV Number: WG224196-02
CAL ID: HPMS8-29-SEP-06
Matrix: TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG224196-02	NA	NA	155339	287951	371260
Upper Limit	NA	NA	310678	575902	742520
Lower Limit	NA	NA	77670	143976	185630
L0609593-01	10.0	DL01	115230	211312	282837
L0609593-02	10.0	DL01	115327	210161	277803
L0609593-03	10.0	DL01	114903	208599	278483
L0609593-04	10.0	DL01	111970	206605	275129
L0609593-05	10.0	DL01	110681	204642	271859
L0609593-06	10.0	DL01	111570	205420	271373
L0609593-07	10.0	DL01	109663	201573	267038
WG224197-01	1.00	01	151304	274975	361466
WG224197-02	1.00	01	148130	264335	345761
WG224197-03	1.00	01	145335	262018	345002

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 591831
Report generated 10/10/2006 14:18

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

00097828

Login Number:L0609593
Instrument ID:HPMS8
Workgroup (AAB#):WG224197

CCV Number:WG224196-02
CAL ID: HPMS8-29-SEP-06
Matrix:TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG224196-02	NA	NA	17.99	14.97	11.1
Upper Limit	NA	NA	18.49	15.47	11.6
Lower Limit	NA	NA	17.49	14.47	10.6
L0609593-01	10.0	DL01	18	14.97	11.1
L0609593-02	10.0	DL01	18	14.97	11.09
L0609593-03	10.0	DL01	18	14.97	11.1
L0609593-04	10.0	DL01	18	14.97	11.1
L0609593-05	10.0	DL01	18	14.97	11.09
L0609593-06	10.0	DL01	18	14.98	11.1
L0609593-07	10.0	DL01	17.99	14.97	11.1
WG224197-01	1.00	01	17.99	14.97	11.09
WG224197-02	1.00	01	17.99	14.97	11.09
WG224197-03	1.00	01	17.99	14.97	11.09

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 591833
Report generated 10/10/2006 14:19

KEMRON Environmental Services
Data Checklist

00097829

Date: 28-SEP-2006
Analyst: ALT
Analyst: NA
Method: 8270
Instrument: HPMS12
Curve Workgroup: WG223464
Runlog ID: 12544
Analytical Workgroups: L0609396, L0609490, L0609501, L0609587

System Performance Check:	X
DFTPP	X
Endrin/DDT Breakdown	X
Initial Calibration:	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks:	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample):	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples:	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	NA
Dilutions Run	X
Reruns	NA
Manual Integrations	X
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ALT
Secondary Reviewer	HAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Check the reasonableness of the results	X
Comments:	
L0609201-06 and 07 need rerun at further dilutions	

Primary Reviewer:
29-SEP-2006

Secondary Reviewer:
29-SEP-2006

Generated: SEP-29-2006 13:33:31

00097830

KEMRON Environmental Services
Data Checklist

Date: 04-OCT-2006
Analyst: ALT
Analyst: NA
Method: 8270
Instrument: HPMS12
Curve Workgroup: NA
Runlog ID: 12637
Analytical Workgroups: L0609593, L609614, L0609671, L0609686

System Performance Check:	X
DFTPP	X
Endrin/DDT Breakdown	X
Initial Calibration:	NA
Average RF	NA
Linear Reg or Higher Order Curve	NA
Second Source standard % Difference	NA
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks:	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample):	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples:	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	NA
Dilutions Run	X
Reruns	NA
Manual Integrations	X
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ALT
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X
Comments:	
L0609671-01 was sent for re-extraction	
L0609634-09 needs rerun, not reported	
L0609689-09 @ 50x - needs rerun, not reported	

Primary Reviewer:
05-OCT-2006

Secondary Reviewer:
06-OCT-2006

Generated: OCT-06-2006 10:44:07

00097831

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS12 Dataset: 092806

Analyst1: ALT Analyst2: NA

Method: 8270C SOP: MSS01 Rev: 14

Method: 625 SOP: MSS02 Rev: 8

Maintenance Log ID: 15918

Column 1 ID: DB-5MS Column 2 ID: NA

Workgroups: WG223701

Internal STD: STD13351 Surrogate STD: NA Calibration STD

Comments: 12M13488-12M13493 - samples diluted due to extract appearance. Yielded high concentrations of non-target compounds.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	12M13462	WG223464-01 50PPM DFTPP	1	1	STD15094	09/28/06 08:34
2	12M13463	WG223464-02 50PPM BNA STD	1	1	STD15238	09/28/06 08:52
3	12M13464	WG223464-03 3PPM BNA STD	1	1	STD15238	09/28/06 09:24
4	12M13465	WG223464-04 15PPM BNA STD	1	1	STD15238	09/28/06 09:58
5	12M13466	WG223464-05 25PPM BNA STD	1	1	STD15238	09/28/06 10:31
6	12M13467	WG223464-06 80PPM BNA STD	1	1	STD15238	09/28/06 11:04
7	12M13468	WG223464-07 100PPM BNA STD	1	1	STD15238	09/28/06 11:37
8	12M13469	WG223464-08 120PPM BNA STD	1	1	STD15238	09/28/06 12:11
9	12M13470	WG223464-04 15PPM BNA STD	1	1	STD15238	09/28/06 13:03
10	12M13471	WG223464-09 50PPM Alt Source BNA STD	1	1	STD12496	09/28/06 13:36
11	12M13472	WG223630-01 50PPM DFTPP	1	1	STD15094	09/28/06 14:04
12	12M13473	WG223630-02 50PPM BNA STD	1	1	STD15238	09/28/06 14:23
13	12M13474	WG223385-01 BLK 9/26 EP266P173	1	1		09/28/06 14:56
14	12M13475	WG223385-02 LCS 9/26 EP266P173	1	1		09/28/06 15:30
15	12M13476	WG223385-03 LCSDUP 9/26 EP266P173	1	1		09/28/06 16:03
16	12M13477	WG223315-01 SPLP BLK 9/25 EP266P173	18	1	SPLP	09/28/06 16:36
17	12M13478	WG223317-01 FBLK 9/25 EP266P173	17	1		09/28/06 17:10
18	12M13479	L0609490-02 TCLP	17	1		09/28/06 17:43
19	12M13480	L0609490-03 TCLP	17	1		09/28/06 18:17
20	12M13481	L0609490-04 TCLP	17	1		09/28/06 18:50
21	12M13482	L0609490-05 TCLP	17	1		09/28/06 19:23
22	12M13483	L0609490-06 TCLP	17	1		09/28/06 19:57
23	12M13484	L0609396-06 TCLP	17	1		09/28/06 20:30
24	12M13485	L0609490-01 TCLP	17	1		09/28/06 21:03
25	12M13486	L0609490-07 TCLP	17	1		09/28/06 21:37
26	12M13487	L0609587-12	1	1		09/28/06 22:10
27	12M13488	L0609490-11 10X TCLP	17	10		09/28/06 22:44
28	12M13489	L0609490-09 10X TCLP	17	10		09/28/06 23:18
29	12M13490	L0609396-05 10X TCLP	17	10		09/28/06 23:51
30	12M13491	L0609501-06 10X SPLP	18	10	SPLP	09/29/06 00:25
31	12M13492	L0609501-07 10X SPLP	18	10	SPLP	09/29/06 00:59
32	12M13493	L0609490-08 20X TCLP	17	20		09/29/06 01:33
33	12M13494	BAKE OUT	1	1		09/29/06 02:06
34	12M13495	BAKE OUT	1	1		09/29/06 02:40
35	12M13496	BAKE OUT	1	1		09/29/06 03:13

Approved: 29-SEP-06

KEMRON Environmental Services

Instrument Run Log

00097832

Instrument: HPMS12 Dataset: 092806

Analyst1: ALT Analyst2: NA

Method: 8270C SOP: MSS01 Rev: 14

Method: 625 SOP: MSS02 Rev: 8

Maintenance Log ID: 15918

Column 1 ID: DB-5MS Column 2 ID: NA

Workgroups: WG223701

Internal STD: STD13351 Surrogate STD: NA

Comments

Seq.	Rerun	Dil.	Reason	Analytes
4				
	WG223464-04 15PPM BNA STD - NR; reran to verify and used second analysis in Ical			
10				
	WG223464-09 50PPM Alt Source BNA STD - 3,3'-dichlorobenzidine > 25% biased low			
13				
	WG223385-01 BLK - SS 2 low, Sharp criteria			
14				
	WG223385-02 LCS - SS 2 low and 3 compounds < LCL for Sharp criteria plus 2-chloronaphthalene < LCL standard criteria			
15				
	WG223385-03 LCSDUP - SS 2 low and 3 compounds < LCL for Sharp criteria plus 2-chloronaphthalene < LCL standard criteria			
26				
	L0609587-12 - SS 2 low for Sharp criteria, but passes standard limits.Sample out of hold for re-extraction			
30	X		Over Calibration Range	
	L0609501-06 10X SPLP - needs 100x for benzoic acid and 1000x for 1,2-dichlorobenzene			
31	X		Over Calibration Range	
	L0609501-07 10X SPLP - needs 100x for benzoic acid and 1000x for 1,2-dichlorobenzene			
32				
	L0609490-08 20X TCLP - SS DL			

Page: 2 of 2 Approved: 29-SEP-06

Hema Velasquez

KEMRON Environmental Services

Instrument Run Log

00097833

Instrument: HPMS12 Dataset: 100406

Analyst1: ALT Analyst2: NA

Method: 8270C SOP: MSS01 Rev: 14

Method: 625 SOP: MSS02 Rev: 8

Maintenance Log ID: 16008

Column 1 ID: DB-5MS Column 2 ID: NA

Workgroups: WG223931, WG224237, WG224239

Internal STD: STD13351 Surrogate STD: NA Calibration STD

Comments: 12M13623-12M13625 and 12M13627, not required not reported

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	12M13623	WG224110-01 50PPM DFTPP	1	1	STD15094	10/04/06 09:21
2	12M13624	WG224110-02 50PPM BNA STD	1	1	STD15238	10/04/06 09:39
3	12M13625	WG224110-01 50PPM DFTPP	1	1	STD15094	10/04/06 10:32
4	12M13626	WG224110-01 50PPM DFTPP	1	1	STD15094	10/04/06 10:50
5	12M13627	WG224110-02 50PPM BNA STD	1	1	STD15238	10/04/06 11:09
6	12M13628	WG224110-02 50PPM BNA STD	1	1	STD15238	10/04/06 11:52
7	12M13629	WG223870-01 BLK 10/2 EP268P3	1	1		10/04/06 12:43
8	12M13630	WG223870-02 LCS 10/2 EP268P3	1	1		10/04/06 13:16
9	12M13631	WG223870-03 LCSDUP 10/2 EP268P3	1	1		10/04/06 13:49
10	12M13632	WG223520-03 BLK 9/27 EP266P183	1	1		10/04/06 14:22
11	12M13633	WG223520-04 LCS 9/27 EP266P183	1	1		10/04/06 14:55
12	12M13634	WG223676-01 FBLK 10/1 EP268P3	17	1		10/04/06 15:28
13	12M13635	L0609593-01 TCLP	17	1		10/04/06 16:15
14	12M13636	L0609593-02 TCLP	17	1		10/04/06 16:48
15	12M13637	L0609593-03 TCLP	17	1		10/04/06 17:21
16	12M13638	L0609593-04 TCLP	17	1		10/04/06 17:55
17	12M13639	L0609593-05 TCLP	17	1		10/04/06 18:28
18	12M13640	L0609593-06 TCLP	17	1		10/04/06 19:01
19	12M13641	L0609593-07 TCLP	17	1		10/04/06 19:34
20	12M13642	L0609671-01 TCLP	17	1		10/04/06 20:07
21	12M13643	L0609614-01	1	1		10/04/06 20:40
22	12M13644	L0609634-09 1X	1	1		10/04/06 21:13
23	12M13645	L0609686-09 1000X	1	1000		10/04/06 21:46
24	12M13646	L0609686-07 10X	1	10		10/04/06 22:19
25	12M13647	L0609686-09 50X	1	50		10/04/06 22:53

Comments

Seq.	Rerun	Dil.	Reason	Analytes
5				
	WG224110-02 50PPM BNA STD - CCC pentachlorophenol > 20% biased high, rerun to verify			
6				
	WG224110-02 50PPM BNA STD - 6 compounds > 20% biased low, all CCC compound pass			
8				
	WG223870-02 LCS - pyiride and 2-(chloroethoxy)methane < LCL			
9				

Page: 1 of 2 Approved: 06-OCT-06

KEMRON Environmental Services

Instrument Run Log

00097834

Instrument: HPMS12 Dataset: 100406

Analyst1: ALT Analyst2: NA

Method: 8270C SOP: MSS01 Rev: 14

Method: 625 SOP: MSS02 Rev: 8

Maintenance Log ID: 16008

Column 1 ID: DB-5MS Column 2 ID: NA

Workgroups: WG223931, WG224237, WG224239

Internal STD: STD13351 Surrogate STD: NA

Comments

Seq.	Rerun	Dil.	Reason	Analytes
	WG223870-03 LCSDUP - pyiride < LCL			
11	X			
	WG223520-04 LCS - ISTD was double spiked, remix and rerun			
20				
	Re-extract: L0609671-01 TCLP - SS 1,2 and 5 < 10%, SS 6 low			
22	X			
	L0609634-09 1X - no ISTD added, remix and rerun			
25	X		Missed Tune	
	L0609686-09 50X - dilution good for benzoic acid and 1,4 - dichlorobenzene			

Page: 2 of 2 Approved: 06-OCT-06

Sample Extract Log Sheet R1119232

KAMAN ENVIRONMENTAL SERVICES 0[illegible]35

Parameter: BNA H2O SOP #: EXB08 Revision #: 11
Extraction Analyst(s): CAF, EDCP TV/KD Analyst(s): CAF
Date/Time Extracted: 10-02-06@1130 Date TV/KD: 10-02-06
Spike/Surrogate Analyst: CAF Witness: CDD
Surrogate #: STD15266 Earliest Hold Date: 10/2
Spike #: A = STD15265 Spike #: B = —

Extraction Work Group WG 223870

Extract Relinquished By: CSH
Extract Received By & Date: HV 10/3/06

	Sample ID	Test Code	pH / <2	pH / N	pH / >12	Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions / A	Emulsions / BN	Emulsions / N	Comments
1	Blank		✓		✓	1000ml	500µl		1ml	T				WG 223870-01
2	LCS		✓		✓			500µl		C				WG -02
3	LCSDup		✓		✓			1		C				-03
4	09-782-01	8270	✓		✓					C				
5	-02		✓		✓					C				
6	-03		✓		✓					C				
7	-04		✓		✓					C				
8	-05		✓		✓					C				
9	FBLK	827-TC	✓		✓	100				T				WG223676-01
10	09-593-01		✓		✓					C				
11	-02		✓		✓					T				
12	-03		✓		✓					T				
13	-04		✓		✓					T				
14	-05		✓		✓					T				
15	-06		✓		✓					T				
16	-07		✓		✓					T				
17	09-671-01		✓		✓					T				
18	09-702-01		✓		✓					T				
19														
20														
21														
22														
23														
24														

CAF 10-02-06

Methylene Chloride Lot #: C27E07
Hexane Lot #: —
Ether Lot #: —
Methanol Lot #: —
Solvent: — Lot #: —
Reagent: — Lot #: —
Reagent: FeCl Soln Lot #: RGT10649
Reagent: 10N-NaOH Lot #: RGT10704
Acid: 1:1 H_2SO_4 Lot #: RGT10553
Florisil Lot #: —
Silica Gel Lot #: —
IR Analyst / Date / Time: —
Dried Na_2SO_4 Lot #: C15600

Color Code
T = Transparent
C = Colored
O = Opaque

SW-846 Method			On	Off	On	Off
Continuous	3520C					
Soxhlet	3540C					
ASE*	3545					
Sep Funnel	3510C	✓				
Sonication	3550B					
Waste	3580A					

* Accelerated Solvent Extractor (ASE)

Clean-ups			
Florisil 3620B		GPC 3640A	
Silica Gel 3630C		Other	
Acid 3665A		N/A	✓
Sulfur 3660B			

Peer Reviewed By: Cheryl Flowers Date: 10-02-06

Extraction Notes For Volume # 268 Page # 3

General Comments: None

Extraction Anomalies: None

Concentration Anomalies: None

Clean-Up Anomalies: N/A

Supervisor Review: _____ Date: _____

TCLP Non-Volatile

Analyst(s): RWC
Date: 9-28-06

Analyst/Date		Analyst/Date	
RWC 9-28-06		RWC 9-29-06	
Time On	Temp On °C	Time Off	Temp Off °C
1500	22	0800	21

Jug #	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
G8	09-59301	ME SV	1311	FI-607	S/S	100		✓	100.00	2000
G12	02	" "	"	"	"	"		"	100.05	"
G7	03	" "	"	"	"	"		"	100.05	"
G6	04	" "	"	"	"	"		"	100.04	"
G14	05	" "	"	"	"	"		"	100.02	"
G28	06	" "	"	"	"	"		"	100.05	"
G20	07	" "	"	"	"	"		"	100.00	"
G13	09-671-01	" "	"	"	S	"		"	100.01	"
G29	09-681-01	Pest Herb	"	"	S	"		"	100.02	"
G19	09-702-01	ME " "	"	"	S/S	"		"	100.01	"
N/A	FBLK	" "	"	"	N/A	N/A		"	2000	"

RWC 9-28-06

*Matrix Code = (S-solid)(SS-sand, soil or sludge)(P-paint)(O-organic or waste)(W-water)

Comments: _____

Peer Review By: _____ Supervisor Review: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097838

Analytical Method: 8270C AAB#: WG224237

Login Number: L0609593

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
RO#4	09/22/06	09/23/06	10/02/06	13.1	9.98	10/04/06	40	2.20	
RO#3	09/22/06	09/23/06	10/02/06	13.1	9.93	10/04/06	40	2.22	
RO#2	09/22/06	09/23/06	10/02/06	13.1	9.94	10/04/06	40	2.24	
RO#1	09/22/06	09/23/06	10/02/06	13.2	10.0	10/04/06	40	2.27	
29WW36-CONF	09/22/06	09/23/06	10/02/06	13.1	10.0	10/04/06	40	2.29	
29WW38-CONF	09/22/06	09/23/06	10/02/06	13.1	9.97	10/04/06	40	2.31	
29WW35-CONF	09/22/06	09/23/06	10/02/06	13.1	9.93	10/04/06	40	2.34	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 587853
Report generated 10/06/2006 12:02

SURROGATE STANDARDS

00097839

Login Number: L0609593
Instrument Id: HPMS12
Workgroup (AAB#): WG224237

Method: 8270
CAL ID: HPMS12-28-SEP-06
Matrix: Leachate

Sample Number	Dilution	Tag	1	2	3	4	5	6
L0609593-01	1.00	01	96.1	63.4	27.8	50.4	102	18.4
L0609593-02	1.00	01	87.6	56.4	32.5	49.6	86.0	21.8
L0609593-03	1.00	01	87.3	51.3	25.2	41.8	87.5	17.1
L0609593-04	1.00	01	85.2	60.4	28.0	49.4	79.9	18.5
L0609593-05	1.00	01	103	60.1	30.3	50.9	103	20.0
L0609593-06	1.00	01	94.3	61.6	29.3	50.9	74.8	19.6
L0609593-07	1.00	01	98.5	60.3	29.7	51.1	107	19.3
WG223870-01	1.00	01	88.4	68.3	30.1	56.5	94.6	18.9
WG223870-02	1.00	01	94.4	66.6	25.2	39.2	70.2	18.0
WG223870-03	1.00	01	112	73.3	29.4	41.4	84.2	20.5

Surrogates	Surrogate Limits		
1 - 2,4,6-Tribromophenol	10	-	123
2 - 2-Fluorobiphenyl	43	-	116
3 - 2-Fluorophenol	21	-	100
4 - Nitrobenzene-d5	35	-	114
5 - p-Terphenyl-d14	33	-	141
6 - Phenol-d5	10	-	94

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 586407
Report generated 10/06/2006 12:03

METHOD BLANK SUMMARY

00097840

Login Number: L0609593
Blank File ID: 12M13629
Date Analyzed: 10/04/06
Time Analyzed: 12:43
Analyst: ALT

Work Group: WG224237
Blank Sample ID: WG223870-01
Instrument ID: HPMS12
Method: 8270C

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG223870-02	12M13630	10/04/06 13:16	01
LCS2	WG223870-03	12M13631	10/04/06 13:49	01
RO#4	L0609593-01	12M13635	10/04/06 16:15	01
RO#3	L0609593-02	12M13636	10/04/06 16:48	01
RO#2	L0609593-03	12M13637	10/04/06 17:21	01
RO#1	L0609593-04	12M13638	10/04/06 17:55	01
29WW36-CONF	L0609593-05	12M13639	10/04/06 18:28	01
29WW38-CONF	L0609593-06	12M13640	10/04/06 19:01	01
29WW35-CONF	L0609593-07	12M13641	10/04/06 19:34	01

KEMRON FORMS - Modified 03/06/2006
Version 1.5 PDF File ID: 587854
Report generated 10/06/2006 12:02

KEMRON Environmental Services

METHOD BLANK REPORT

00097841

Login Number: L0609593 Run Date: 10/04/2006 Sample ID: WG223870-01
Instrument ID: HPMS12 Run Time: 12:43 Prep Method: 3510C
File ID: 12M13629 Analyst: ALT Method: 8270C
Workgroup (AAB#): WG224237 Matrix: Leachate Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS12-28-SEP-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
o-Cresol	25.0	50.0	25.0	1	U
m-,p-Cresol	25.0	50.0	25.0	1	U
1,4-Dichlorobenzene	25.0	50.0	25.0	1	U
2,4-Dinitrotoluene	25.0	50.0	25.0	1	U
Hexachlorobenzene	25.0	50.0	25.0	1	U
Hexachlorobutadiene	25.0	50.0	25.0	1	U
Hexachloroethane	25.0	50.0	25.0	1	U
Nitrobenzene	25.0	50.0	25.0	1	U
Pentachlorophenol	25.0	250	25.0	1	U
Pyridine	250	500	250	1	U
2,4,5-Trichlorophenol	25.0	250	25.0	1	U
2,4,6-Trichlorophenol	25.0	50.0	25.0	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2-Fluorophenol	30.1	21 - 100	PASS
Phenol-d5	18.9	10 - 94	PASS
Nitrobenzene-d5	56.5	35 - 114	PASS
2-Fluorobiphenyl	68.3	43 - 116	PASS
2,4,6-Tribromophenol	88.4	10 - 123	PASS
p-Terphenyl-d14	94.6	33 - 141	PASS

MDL Method Detection Limit
RL Reporting/quantitation Limit

* Analyte concentration > RL

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 586404
Report generated 10/06/2006 12:02

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097842

Login Number: L0609593 Run Date: 10/04/2006 Sample ID: WG223870-02
Instrument ID: HPMS12 Run Time: 13:16 Prep Method: 3510C
File ID: 12M13630 Analyst: ALT Method: 8270C
Workgroup (AAB#): WG224237 Matrix: Water Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS12-28-SEP-06

Analytes	Expected	Found	% Rec	LCS Limits	Q
o-Cresol	50.0	19.8	39.5	34 - 120	
m-,p-Cresol	50.0	20.4	40.7	30 - 110	
1,4-Dichlorobenzene	50.0	24.8	49.7	30 - 110	
2,4-Dinitrotoluene	50.0	35.8	71.7	50 - 139	
Hexachlorobenzene	50.0	38.2	76.4	50 - 130	
Hexachlorobutadiene	50.0	26.2	52.5	30 - 120	
Hexachloroethane	50.0	24.2	48.3	30 - 95	
Nitrobenzene	50.0	20.0	40.0	40 - 110	
Pentachlorophenol	50.0	46.2	92.5	40 - 140	
Pyridine	50.0	4.01	8.01	10 - 120	*
2,4,5-Trichlorophenol	50.0	33.8	67.6	48 - 132	
2,4,6-Trichlorophenol	50.0	37.4	74.8	50 - 135	

Surrogates	% Recovery	Surrogate Limits	Qualifier
2-Fluorophenol	25.2	21 - 100	PASS
Phenol-d5	18.0	10 - 94	PASS
Nitrobenzene-d5	39.2	35 - 114	PASS
2-Fluorobiphenyl	66.6	43 - 116	PASS
2,4,6-Tribromophenol	94.4	10 - 123	PASS
p-Terphenyl-d14	70.2	33 - 141	PASS

* FAILS %REC LIMIT

KEMRON FORMS - Modified 07/06/2006
Version 1.5 PDF File ID: 586405
Report generated 10/05/2006 14:47

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097843

Login Number: L0609593 Analyst: ALT Prep Method: 3510C
Instrument ID: HPMS12 Matrix: Leachate Method: 8270C
Workgroup (AAB#): WG224237 Units: ug/L
Sample ID: WG223870-02 LCS File ID: 12M13630 Run Date: 10/04/2006 13:16
Sample ID: WG223870-03 LCS2 File ID: 12M13631 Run Date: 10/04/2006 13:49

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
o-Cresol	50.0	19.8	39.5	50.0	25.5	50.9	25.2	34 - 120	50	
m-,p-Cresol	50.0	20.4	40.7	50.0	26.4	52.8	25.8	30 - 110	35	
1,4-Dichlorobenzene	50.0	24.8	49.7	50.0	27.6	55.2	10.6	30 - 110	37	
2,4-Dinitrotoluene	50.0	35.8	71.7	50.0	40.6	81.1	12.4	50 - 139	56	
Hexachlorobenzene	50.0	38.2	76.4	50.0	44.7	89.4	15.7	50 - 130	55	
Hexachlorobutadiene	50.0	26.2	52.5	50.0	29.1	58.3	10.5	30 - 120	59	
Hexachloroethane	50.0	24.2	48.3	50.0	27.2	54.5	12.0	30 - 95	47	
Nitrobenzene	50.0	20.0	40.0	50.0	21.7	43.4	8.16	40 - 110	45	
Pentachlorophenol	50.0	46.2	92.5	50.0	54.7	109	16.8	40 - 140	60	
Pyridine	50.0	4.01	8.01	50.0	5.54	11.1	32.2	10 - 120	60	*
2,4,5-Trichlorophenol	50.0	33.8	67.6	50.0	43.8	87.7	25.9	48 - 132	62	
2,4,6-Trichlorophenol	50.0	37.4	74.8	50.0	46.5	93.0	21.7	50 - 135	60	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
2-Fluorophenol	25.2	29.4	21 - 100	PASS
Phenol-d5	18.0	20.5	10 - 94	PASS
Nitrobenzene-d5	39.2	41.4	35 - 114	PASS
2-Fluorobiphenyl	66.6	73.3	43 - 116	PASS
2,4,6-Tribromophenol	94.4	112	10 - 123	PASS
p-Terphenyl-d14	70.2	84.2	33 - 141	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

KEMRON FORMS - Modified 07/13/2006
Version 1.5 PDF File ID: 586537
Report generated 10/06/2006 12:02

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L0609593
Instrument: HPMS12
Analyst: ALT
Workgroup: WG223464

Tune ID: WG223464-01
Run Date: 09/28/2006
Run Time: 08:34
File ID: 12M13462
Cal ID: HPMS12-28-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
51.0	198	30.0	60.0	40.6	253354	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	35.7	222741	PASS
70.0	69.0	0	2.00	0.578	1288	PASS
127	198	40.0	60.0	46.1	287253	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	623402	PASS
199	198	5.00	9.00	6.66	41517	PASS
275	198	10.0	30.0	26.6	165909	PASS
365	198	1.00	100	2.82	17572	PASS
441	443	0.0100	100	80.0	75834	PASS
442	198	40.0	100	79.1	493376	PASS
443	442	17.0	23.0	19.2	94765	PASS

This check relates to the following samples, MS, MSD:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG223464-09	SSCV	01	09/28/2006 13:36	
WG223464-04	STD	01	09/28/2006 13:03	
WG223464-08	STD	01	09/28/2006 12:11	
WG223464-07	STD	01	09/28/2006 11:37	
WG223464-06	STD	01	09/28/2006 11:04	
WG223464-05	STD	01	09/28/2006 10:31	
WG223464-03	STD	01	09/28/2006 09:24	
WG223464-02	STD-CCV	01	09/28/2006 08:52	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 07/26/2006
Version 1.3 PDF File ID: 587857
Report generated 10/06/2006 12:03

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L0609593
Instrument: HPMS12
Analyst: ALT
Workgroup: WG224110

Tune ID: WG224110-01
Run Date: 10/04/2006
Run Time: 10:50
File ID: 12M13626
Cal ID: HPMS12 -28-SEP-06

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
51.0	198	30.0	60.0	32.9	213090	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	30.6	198018	PASS
70.0	69.0	0	2.00	0.536	1062	PASS
127	198	40.0	60.0	43.6	282389	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	647744	PASS
199	198	5.00	9.00	6.71	43458	PASS
275	198	10.0	30.0	26.5	171968	PASS
365	198	1.00	100	3.09	20034	PASS
441	443	0.0100	100	86.6	82629	PASS
442	198	40.0	100	75.3	487488	PASS
443	442	17.0	23.0	19.6	95362	PASS

This check relates to the following CCV:

Lab ID	Client ID	Date Analyzed	
WG224110-02	CCV	10/04/2006 11:52	

This check relates to the following samples & batch QC:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG223870-01	BLANK	01	10/04/2006 12:43	
WG223870-02	LCS	01	10/04/2006 13:16	
WG223870-03	LCS2	01	10/04/2006 13:49	
L0609593-01	RO#4	01	10/04/2006 16:15	
L0609593-02	RO#3	01	10/04/2006 16:48	
L0609593-03	RO#2	01	10/04/2006 17:21	
L0609593-04	RO#1	01	10/04/2006 17:55	
L0609593-05	29WW36-CONF	01	10/04/2006 18:28	
L0609593-06	29WW38-CONF	01	10/04/2006 19:01	
L0609593-07	29WW35-CONF	01	10/04/2006 19:34	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 07/27/2006
Version 1.3 PDF File ID: 587858
Report generated 10/06/2006 12:03

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

00097846

Login Number: L0609593 **Instrument ID:** HPMS12

Analytical Method: 8270C **Initial Calibration Date:** 28-SEP-06 13:03

ICAL Workgroup: WG223464 **Column ID:** F

Analyte		AVG RF	% RSD	LINEAR	QUAD
1,4-Dichlorobenzene	CCC	1.646	5.11		
2,4,6-Trichlorophenol	CCC	0.3944	14.5		
Hexachlorobutadiene	CCC	0.2400	5.11		
Pentachlorophenol	CCC	0.1528	21.1	0.998	
2,4-Dinitrophenol	SPCC	0.1228	53.1		0.997
4-Nitrophenol	SPCC	0.2524	15.1	0.999	
Hexachlorocyclopentadiene	SPCC	0.2460	33.4	0.998	
n-Nitrosodipropylamine	SPCC	1.152	3.46		
2,4,5-Trichlorophenol		0.4133	13.4		
2,4-Dinitrotoluene		0.4309	14.5		
2-Methylphenol		1.111	4.18		
3-,4-Methylphenol		1.522	7.76		
Hexachlorobenzene		0.2783	7.71		
Hexachloroethane		0.6436	3.39		
Nitrobenzene		0.4275	3.30		
Pyridine		1.360	3.78		

INITIAL CALIBRATION DATA

00097847

Login Number: L0609593 **Instrument ID:** HPMS12

Analytical Method: 8270C **Initial Calibration Date:** 28-SEP-06 13:03

Column ID: F

Analyte	WG223464-02			WG223464-03			WG223464-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dichlorobenzene	50.0	1089184.00	1.625	3.00	59509.0000	1.724	15.0	262396.000	1.513
2,4,6-Trichlorophenol	50.0	640683.000	0.4147	3.00	23077.0000	0.2978	15.0	135913.000	0.3424
Hexachlorobutadiene	50.0	580868.000	0.2318	3.00	33529.0000	0.2617	15.0	147266.000	0.2270
Pentachlorophenol	50.0	376509.000	0.1498	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	50.0	212376.000	0.1375	NA	NA	NA	15.0	10954.0000	0.02760
4-Nitrophenol	50.0	404791.000	0.2620	NA	NA	NA	15.0	73321.0000	0.1847
Hexachlorocyclopentadiene	50.0	449252.000	0.2908	3.00	7347.00000	0.09480	15.0	72373.0000	0.1823
n-Nitrosodipropylamine	50.0	787790.000	1.176	3.00	39134.0000	1.134	15.0	186843.000	1.077
2,4,5-Trichlorophenol	50.0	663774.000	0.4297	3.00	25024.0000	0.3230	15.0	142168.000	0.3582
2,4-Dinitrotoluene	50.0	693620.000	0.4490	3.00	24696.0000	0.3187	15.0	153508.000	0.3868
2-Methylphenol	50.0	747624.000	1.116	3.00	37377.0000	1.083	15.0	179802.000	1.037
3-,4-Methylphenol	50.0	1044354.00	1.558	3.00	47541.0000	1.377	15.0	236995.000	1.366
Hexachlorobenzene	50.0	687939.000	0.2737	3.00	34110.0000	0.2704	15.0	161965.000	0.2462
Hexachloroethane	50.0	434968.000	0.6490	3.00	22670.0000	0.6568	15.0	104490.000	0.6024
Nitrobenzene	50.0	1078448.00	0.4303	3.00	55515.0000	0.4333	15.0	262859.000	0.4053
Pyridine	50.0	911526.000	1.360	NA	NA	NA	15.0	221694.000	1.278

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00097848

Login Number: L0609593 **Instrument ID:** HPMS12

Analytical Method: 8270C **Initial Calibration Date:** 28-SEP-06 13:03

Column ID: F

Analyte	WG223464-05			WG223464-06			WG223464-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dichlorobenzene	25.0	447300.000	1.577	80.0	1536312.00	1.643	100	1978819.00	1.687
2,4,6-Trichlorophenol	25.0	248194.000	0.3829	80.0	908332.000	0.4240	100	1180738.00	0.4406
Hexachlorobutadiene	25.0	246912.000	0.2319	80.0	826356.000	0.2375	100	1045031.00	0.2389
Pentachlorophenol	25.0	104936.000	0.09900	80.0	576461.000	0.1631	100	756343.000	0.1708
2,4-Dinitrophenol	25.0	38044.0000	0.05870	80.0	319209.000	0.1490	100	460040.000	0.1717
4-Nitrophenol	25.0	150250.000	0.2318	80.0	581754.000	0.2715	100	738799.000	0.2757
Hexachlorocyclopentadiene	25.0	150983.000	0.2329	80.0	641242.000	0.2993	100	816357.000	0.3047
n-Nitrosodipropylamine	25.0	322514.000	1.137	80.0	1096813.00	1.173	100	1375502.00	1.173
2,4,5-Trichlorophenol	25.0	263205.000	0.4061	80.0	949318.000	0.4431	100	1218307.00	0.4547
2,4-Dinitrotoluene	25.0	269489.000	0.4158	80.0	1003014.00	0.4682	100	1282621.00	0.4787
2-Methylphenol	25.0	312333.000	1.101	80.0	1039640.00	1.112	100	1337238.00	1.140
3-,4-Methylphenol	25.0	421451.000	1.485	80.0	1472955.00	1.575	100	1888332.00	1.610
Hexachlorobenzene	25.0	280007.000	0.2640	80.0	1014506.00	0.2870	100	1311873.00	0.2962
Hexachloroethane	25.0	179578.000	0.6329	80.0	601291.000	0.6430	100	760846.000	0.6487
Nitrobenzene	25.0	441789.000	0.4150	80.0	1488265.00	0.4278	100	1886444.00	0.4312
Pyridine	25.0	377191.000	1.329	80.0	1284599.00	1.374	100	1632977.00	1.392

KEMRON FORMS - Modified 09/06/2006
Version 1.6 PDF File ID: 587855
Report generated 10/06/2006 12:02

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00097849

Login Number: L0609593 **Instrument ID:** HPMS12

Analytical Method: 8270C **Initial Calibration Date:** 28-SEP-06 13:03

Column ID: F

Analyte	WG223464-08		
	CONC	RESP	RF
1,4-Dichlorobenzene	120	2418441.00	1.754
2,4,6-Trichlorophenol	120	1448615.00	0.4587
Hexachlorobutadiene	120	1275857.00	0.2511
Pentachlorophenol	120	937202.000	0.1811
2,4-Dinitrophenol	120	606821.000	0.1921
4-Nitrophenol	120	911297.000	0.2885
Hexachlorocyclopentadiene	120	1002815.00	0.3175
n-Nitrosodipropylamine	120	1648927.00	1.196
2,4,5-Trichlorophenol	120	1510531.00	0.4783
2,4-Dinitrotoluene	120	1575524.00	0.4988
2-Methylphenol	120	1635351.00	1.186
3-,4-Methylphenol	120	2318385.00	1.681
Hexachlorobenzene	120	1608174.00	0.3108
Hexachloroethane	120	926866.000	0.6722
Nitrobenzene	120	2284071.00	0.4495
Pyridine	120	1966125.00	1.426

KEMRON Environmental Services

ALTERNATE SOURCE CALIBRATION REPORT

00097850

Login Number: L0609593 Run Date: 09/28/2006 Sample ID: WG223464-09
Instrument ID: HPMS12 Run Time: 13:36 Method: 8270C
File ID: 12M13471 Analyst: ALT
ICal Workgroup: WG223464 Cal ID: HPMS12 - 28-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
1,4-Dichlorobenzene	CCC	50	47.0	1.55	6.1	ug/mL	
Hexachlorobutadiene	CCC	50	53.1	0.255	6.1	ug/mL	
Pentachlorophenol	CCC	50	42.1	0.116	15.7	ug/mL	
2,4,6-Trichlorophenol	CCC	50	51.1	0.403	2.2	ug/mL	
n-Nitrosodipropylamine	SPCC	50	45.6	1.05	8.9	ug/mL	
4-Nitrophenol	SPCC	50	47.5	0.247	5	ug/mL	
Hexachlorocyclopentadiene	SPCC	50	51.7	0.302	3.4	ug/mL	
2,4-Dinitrophenol	SPCC	50	49.0	0.118	2	ug/mL	
2-Methylphenol		50	49.9	1.11	.1	ug/mL	
3-,4-Methylphenol		50	54.5	1.66	8.9	ug/mL	
2,4-Dinitrotoluene		50	47.2	0.407	5.6	ug/mL	
Hexachlorobenzene		50	45.5	0.254	8.9	ug/mL	
Hexachloroethane		50	48.2	0.621	3.5	ug/mL	
Nitrobenzene		50	48.1	0.411	3.9	ug/mL	
Pyridine		50	50.5	1.37	.9	ug/mL	
2,4,5-Trichlorophenol		50	52.0	0.430	4	ug/mL	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 07/26/2006
Version 1.5 PDF File ID: 587856
Report generated 10/06/2006 12:03

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097851

Login Number: L0609593 Run Date: 10/04/2006 Sample ID: WG224110-02
Instrument ID: HPMS12 Run Time: 11:52 Method: 8270C
File ID: 12M13628 Analyst: ALT
Workgroup (AAB#): WG224237 Cal ID: HPMS12 - 28-SEP-06

Analyte		Expected	Found	RF	%D	UNITS	Q
1,4-Dichlorobenzene	CCC	50000	46800	1.54	6.40	ug/L	
Hexachlorobutadiene	CCC	50000	55000	0.264	10.1	ug/L	
Pentachlorophenol	CCC	50000	53900	0.163	7.90	ug/L	
2,4,6-Trichlorophenol	CCC	50000	51900	0.409	3.80	ug/L	
2,4-Dichlorophenol	CCC	50000	50800	0.327	1.70	ug/L	
Acenaphthene	CCC	50000	49400	1.26	1.20	ug/L	
Benzo[a]pyrene	CCC	50000	47700	1.34	4.60	ug/L	
4-Chloro-3-Methylphenol	CCC	50000	45300	0.329	9.30	ug/L	
2-Nitrophenol	CCC	50000	48500	0.204	3.00	ug/L	
Di-n-Octyl Phthalate	CCC	50000	46800	1.68	6.30	ug/L	
Fluoranthene	CCC	50000	50900	1.49	1.90	ug/L	
Phenol	CCC	50000	40800	1.44	18.3	ug/L	
n-Nitrosodiphenylamine	CCC	50000	48200	0.776	3.60	ug/L	
2,4-Dinitrophenol	SPCC	50000	44700	0.103	10.5	ug/L	
n-Nitrosodipropylamine	SPCC	50000	44700	1.03	10.7	ug/L	
4-Nitrophenol	SPCC	50000	39200	0.198	21.7	ug/L	
Hexachlorocyclopentadiene	SPCC	50000	51800	0.303	3.60	ug/L	
2-Methylphenol		50000	41000	0.911	18.0	ug/L	
3-,4-Methylphenol		50000	46400	1.41	7.30	ug/L	
2,4-Dinitrotoluene		50000	54200	0.467	8.50	ug/L	
Hexachlorobenzene		50000	55500	0.309	10.9	ug/L	
Hexachloroethane		50000	46700	0.601	6.60	ug/L	
Nitrobenzene		50000	41300	0.353	17.3	ug/L	
Pyridine		50000	38200	1.04	23.6	ug/L	
2,4,5-Trichlorophenol		50000	50500	0.417	1.00	ug/L	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2006
Version 1.3 PDF File ID: 587859
Report generated 10/06/2006 12:03

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

00097852

Login Number: L0609593
Instrument ID: HPMS12
Workgroup (AAB#): WG224237

CCV Number: WG224110-02
CAL ID: HPMS12-28-SEP-06
Matrix: TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG224110-02	NA	NA	358572	837372	1846654	1321218	1319972	1382141
Upper Limit	NA	NA	717144	1674744	3693308	2642436	2639944	2764282
Lower Limit	NA	NA	179286	418686	923327	660609	659986	691071
L0609593-01	1.00	01	314799	750244	1415616	1130641	1134037	1284968
L0609593-02	1.00	01	279335	812598	1530679	1155565	1209532	1416795
L0609593-03	1.00	01	342575	836947	1594454	1259519	1285724	1460558
L0609593-04	1.00	01	337340	808068	1492323	1213063	1217535	1353727
L0609593-05	1.00	01	323368	778034	1456676	1174865	1160373	1328977
L0609593-06	1.00	01	323385	783405	1470156	1175783	1159997	1347105
L0609593-07	1.00	01	329227	799802	1491205	1191569	1187201	1363576
WG223870-01	1.00	01	345504	824460	1487621	1235126	1213118	1403571
WG223870-02	1.00	01	355796	822312	1856831	1719766	1331603	1437493
WG223870-03	1.00	01	329852	774036	1764362	1644141	1243557	1329673

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Acenaphthene-d10
IS-3 - Chrysene-d12
IS-4 - Naphthalene-d8
IS-5 - Perylene-d12
IS-6 - Phenanthrene-d10

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 586406
Report generated 10/06/2006 12:03

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

00097853

Login Number:L0609593 CCV Number:WG224110-02
Instrument ID:HPMS12 CAL ID: HPMS12-28-SEP-06
Workgroup (AAB#):WG224237 Matrix:TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG224110-02	NA	NA	9.83	13.58	17.98	11.46	20.12	15.21
Upper Limit	NA	NA	10.33	14.08	18.48	11.96	20.62	15.71
Lower Limit	NA	NA	9.33	13.08	17.48	10.96	19.62	14.71
L0609593-01	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
L0609593-02	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
L0609593-03	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
L0609593-04	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
L0609593-05	1.00	01	9.83	13.58	17.97	11.45	20.11	15.21
L0609593-06	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
L0609593-07	1.00	01	9.83	13.58	17.97	11.45	20.11	15.21
WG223870-01	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
WG223870-02	1.00	01	9.83	13.58	17.97	11.45	20.12	15.21
WG223870-03	1.00	01	9.83	13.58	17.97	11.45	20.11	15.21

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Acenaphthene-d10
IS-3 - Chrysene-d12
IS-4 - Naphthalene-d8
IS-5 - Perylene-d12
IS-6 - Phenanthrene-d10

Underline = Response outside limits

KEMRON FORMS - Modified 04/18/2006
Version 1.3 PDF File ID: 587860
Report generated 10/06/2006 12:03

Inorganic QA/QC

KEMRON Environmental Services
Data Checklist

00097855

Date: 03-OCT-2006
Analyst: SLP
Analyst: NA
Method: 6010B
Instrument: IRIS-ICP
Curve Workgroup: 224050
Runlog ID: 12599
Analytical Workgroups: 223880, 223642, 223643, 223877, 223595, 223879

Calibration/Linearity	X
ICV/CCV	X
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	646, 635, 654, 630, 658, 663, 485, 743, 765, 76
Client Forms	X
Level X	572
Level 3	654, 743, 593, 671
Level 4	646, 635, 630, 658, 769, 773, 702
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	SLP
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
03-OCT-2006
Sheri L. Blakgrove

Secondary Reviewer:
04-OCT-2006
Maren Berry

Generated: OCT-04-2006 16:00:15

KEMRON Environmental Services

Instrument Run Log

00097856

Instrument: IRIS-ICP Dataset: 20061003.1

Analyst1: SLP Analyst2: N/A

Method: 6010B SOP: ME600F Rev: 6

Maintenance Log ID: 15969

Calibration Std: STD15289 ICV/CCV Std: STD15241 Post Spike: STD14577

ICSA: STD15428 ICSAB: STD15429

Workgroups: 223880, 223642, 223643, 223877, 223595, 223879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	IR.100306.090700	WG224050-01	Calibration Point		1		10/03/06 09:07
2	IR.100306.091300	WG224050-02	Calibration Point		1		10/03/06 09:13
3	IR.100306.091900	WG224050-03	Calibration Point		1		10/03/06 09:19
4	IR.100306.092500	WG224050-04	Calibration Point		1		10/03/06 09:25
5	IR.100306.093100	WG224050-05	Calibration Point		1		10/03/06 09:31
6	IR.100306.093700	WG224050-06	Calibration Point		1		10/03/06 09:37
7	IR.100306.094400	WG224050-07	Initial Calibration Verification		1		10/03/06 09:44
8	IR.100306.095000	WG224050-08	Initial Calib Blank		1		10/03/06 09:50
9	IR.100306.095600	WG224050-09	Interference Check		1		10/03/06 09:56
10	IR.100306.100200	WG224050-10	Interference Check		1		10/03/06 10:02
11	IR.100306.100800	WG224050-11	CCV		1		10/03/06 10:08
12	IR.100306.101400	WG224050-12	CCB		1		10/03/06 10:14
13	IR.100306.102000	WG223747-02	Method/Prep Blank	50/50	1		10/03/06 10:20
14	IR.100306.102600	WG223747-03	Laboratory Control S	50/50	1		10/03/06 10:26
15	IR.100306.103200	WG223673-01	Fluid Blank		1		10/03/06 10:32
16	IR.100306.103800	L0609646-01	B-1A 0-3'	5/50	1		10/03/06 10:38
17	IR.100306.104400	WG223880-02	Serial Dilution		5	L0609646-01	10/03/06 10:44
18	IR.100306.105000	WG223880-01	Post Digestion Spike		1	L0609646-01	10/03/06 10:50
19	IR.100306.105600	L0609646-02	B-1B 3-6'	5/50	1		10/03/06 10:56
20	IR.100306.110200	L0609646-03	B-1C 6-9'	5/50	1		10/03/06 11:02
21	IR.100306.110800	L0609646-04	B-1D 9-12'	5/50	1		10/03/06 11:08
22	IR.100306.111400	L0609646-05	B-1E 12-15'	5/50	1		10/03/06 11:14
23	IR.100306.112000	WG224050-13	CCV		1		10/03/06 11:20
24	IR.100306.112600	WG224050-14	CCB		1		10/03/06 11:26
25	IR.100306.113200	L0609646-06	B-1F 15-18'	5/50	1		10/03/06 11:32
26	IR.100306.113800	L0609646-07	B-3A 0-3'	5/50	1		10/03/06 11:38
27	IR.100306.114400	L0609646-08	B-3B 3-6'	5/50	1		10/03/06 11:44
28	IR.100306.115000	L0609646-09	B-3C 6-9'	5/50	1		10/03/06 11:50
29	IR.100306.115600	WG223747-01	Reference Sample		1	L0609646-10	10/03/06 11:56
30	IR.100306.120200	WG223747-04	Matrix Spike	5/50	1		10/03/06 12:02
31	IR.100306.120800	WG223747-05	Matrix Spike Duplica	5/50	1		10/03/06 12:08
32	IR.100306.121400	L0609646-11	B-3E 12-15'	5/50	1		10/03/06 12:14
33	IR.100306.122000	L0609646-12	B-3F 15-18'	5/50	1		10/03/06 12:20
34	IR.100306.122600	L0609646-13	B-4A 0-3'	5/50	1		10/03/06 12:26
35	IR.100306.123200	WG224050-15	CCV		1		10/03/06 12:32
36	IR.100306.123800	WG224050-16	CCB		1		10/03/06 12:38
37	IR.100306.124400	L0609646-14	B-4B 3-6'	5/50	1		10/03/06 12:44

Approved: October 04, 2006

Maren Berry

00097857

KEMRON Environmental Services

Instrument Run Log

Instrument: IRIS-ICP Dataset: 20061003.1
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600F Rev: 6
Maintenance Log ID: 15969

Calibration Std: STD15289 ICV/CCV Std: STD15241 Post Spike: STD14577
ICSA: STD15428 ICSAB: STD15429

Workgroups: 223880, 223642, 223643, 223877, 223595, 223879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	IR.100306.125000	L0609646-15	B-4C 6-9'	5/50	1		10/03/06 12:50
39	IR.100306.125600	L0609646-16	B-4D 9-12'	5/50	1		10/03/06 12:56
40	IR.100306.130200	L0609646-17	B-4E 12-15'	5/50	1		10/03/06 13:02
41	IR.100306.130800	WG224050-17	CCV		1		10/03/06 13:08
42	IR.100306.131400	WG224050-18	CCB		1		10/03/06 13:14
43	IR.100306.133700	L0609635-18	SCF1002-S001-092506	1.41/50	2		10/03/06 13:37
44	IR.100306.134300	L0609654-10	WRS021-SB02-01	1.41/50	10		10/03/06 13:43
45	IR.100306.134900	L0609663-01	410-GRAB	1.3/50	2		10/03/06 13:49
46	IR.100306.135500	WG223643-02	Serial Dilution		125	L0609663-01	10/03/06 13:55
47	IR.100306.140100	WG223643-01	Post Digestion Spike		2	L0609663-01	10/03/06 14:01
48	IR.100306.140700	L0609663-02	29-10		2		10/03/06 14:07
49	IR.100306.141300	L0609663-02	29-10		100		10/03/06 14:13
50	IR.100306.141900	L0609663-03	29-11		100		10/03/06 14:19
51	IR.100306.142900	L0609663-02	29-10	1.45/50	5		10/03/06 14:29
52	IR.100306.143500	L0609663-05	DUP-01	1.46/50	2		10/03/06 14:35
53	IR.100306.144100	WG224050-19	CCV		1		10/03/06 14:41
54	IR.100306.144700	WG224050-20	CCB		1		10/03/06 14:47
55	IR.100306.145300	L0609630-02	MIP-01-SO-01-0906	1.39/50	2		10/03/06 14:53
56	IR.100306.145900	L0609630-03	MIP-10-SO-01-0906	1.32/50	2		10/03/06 14:59
57	IR.100306.150500	L0609658-04	MIP-09-SO-02-0906	1.5/50	2		10/03/06 15:05
58	IR.100306.151100	L0609658-06	MIP-12-SO-02-0906	1.44/50	2		10/03/06 15:11
59	IR.100306.151700	WG224050-21	CCV		1		10/03/06 15:17
60	IR.100306.152300	WG224050-22	CCB		1		10/03/06 15:23
61	IR.100306.153300	WG223786-02	Method/Prep Blank	1/50	1		10/03/06 15:33
62	IR.100306.153900	WG223786-03	Laboratory Control S	1/50	1		10/03/06 15:39
63	IR.100306.154500	L0609485-01	\#059	1.38/50	1		10/03/06 15:45
64	IR.100306.155100	WG223786-01	Reference Sample		1	L0609743-01	10/03/06 15:51
65	IR.100306.155700	WG223786-04	Matrix Spike	1.35/50	1		10/03/06 15:57
66	IR.100306.160300	WG223786-05	Matrix Spike Duplica	1.35/50	1		10/03/06 16:03
67	IR.100306.161200	L0609743-02	55-SB03-3-0'	1.38/50	1		10/03/06 16:12
68	IR.100306.161800	WG223877-02	Serial Dilution		5	L0609743-02	10/03/06 16:18
69	IR.100306.162400	WG223877-02	Serial Dilution		25	L0609743-02	10/03/06 16:24
70	IR.100306.163000	WG223877-01	Post Digestion Spike		1	L0609743-02	10/03/06 16:30
71	IR.100306.163600	WG224050-23	CCV		1		10/03/06 16:36
72	IR.100306.164200	WG224050-24	CCB		1		10/03/06 16:42
73	IR.100306.164800	L0609743-03	55-SB03-CONTENTS	1.41/50	1		10/03/06 16:48
74	IR.100306.165400	L0609743-04	55-SB03-CONTENTS-QC	1.3/50	1		10/03/06 16:54

Approved: October 04, 2006

Maren Berry

KEMRON Environmental Services

Instrument Run Log

00097858

Instrument: IRIS-ICP Dataset: 20061003.1
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600F Rev: 6
Maintenance Log ID: 15969

Calibration Std: STD15289 ICV/CCV Std: STD15241 Post Spike: STD14577
ICSA: STD15428 ICSAB: STD15429

Workgroups: 223880, 223642, 223643, 223877, 223595, 223879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	IR.100306.170000	L0609765-01	28-13	1.39/50	1		10/03/06 17:00
76	IR.100306.170600	L0609765-02	28-14	1.37/50	1		10/03/06 17:06
77	IR.100306.171200	L0609765-03	1402-CF-01	1.41/50	1		10/03/06 17:12
78	IR.100306.171900	L0609765-04	1402-CF-02	1.45/50	1		10/03/06 17:19
79	IR.100306.172500	L0609765-05	1402-CF-03	1.4/50	1		10/03/06 17:25
80	IR.100306.173100	L0609765-06	BLANK 9-27-06	1.4/50	1		10/03/06 17:31
81	IR.100306.173700	L0609769-01	\#1 GBDNAPL (FILL)	1.32/50	1		10/03/06 17:37
82	IR.100306.174300	L0609769-02	\#2 GBDNAPL (SLUDGE)	1.47/50	1		10/03/06 17:43
83	IR.100306.174900	WG224050-25	CCV		1		10/03/06 17:49
84	IR.100306.175500	WG224050-26	CCB		1		10/03/06 17:55
85	IR.100306.180100	L0609772-01	1453 GRAB	1.33/50	1		10/03/06 18:01
86	IR.100306.180700	L0609772-02	1318 GRAB	1.47/50	1		10/03/06 18:07
87	IR.100306.181300	L0609772-03	BLANK 9-28-06	1.3/50	1		10/03/06 18:13
88	IR.100306.181900	L0609773-01	SZ11-67375-GB-0	1.33/50	1		10/03/06 18:19
89	IR.100306.182500	L0609773-02	SZ11-67375B-GB-0	1.33/50	1		10/03/06 18:25
90	IR.100306.183100	WG223643-01	Post Digestion Spike		5	L0609663-01	10/03/06 18:31
91	IR.100306.183700	WG224050-27	CCV		1		10/03/06 18:37
92	IR.100306.184300	WG224050-28	CCB		1		10/03/06 18:43
93	IR.100306.185100	WG223543-01	Method/Prep Blank	.5/50	1		10/03/06 18:51
94	IR.100306.185700	WG223543-02	Laboratory Control S	.5/50	1		10/03/06 18:57
95	IR.100306.190300	WG223543-03	Laboratory Control S	.5/50	1		10/03/06 19:03
96	IR.100306.190900	L0609572-01	EC201	.27/50	1		10/03/06 19:09
97	IR.100306.191500	WG223595-02	Serial Dilution		5	L0609572-01	10/03/06 19:15
98	IR.100306.192100	WG223595-01	Post Digestion Spike		1	L0609572-01	10/03/06 19:21
99	IR.100306.192700	L0609572-02	EC202	.28/50	1		10/03/06 19:27
100	IR.100306.193300	L0609638-01	USED OIL TANK	.25/50	1		10/03/06 19:33
101	IR.100306.193900	WG224050-29	CCV		1		10/03/06 19:39
102	IR.100306.194500	WG224050-30	CCB		1		10/03/06 19:45
103	IR.100306.195100	WG223735-02	Method/Prep Blank	50/50	1		10/03/06 19:51
104	IR.100306.195700	WG223735-03	Laboratory Control S	50/50	1		10/03/06 19:57
105	IR.100306.200300	WG223674-01	Fluid Blank		1		10/03/06 20:03
106	IR.100306.200900	WG223735-01	Reference Sample		1	L0609593-01	10/03/06 20:09
107	IR.100306.201500	WG223735-04	Matrix Spike	5/50	1		10/03/06 20:15
108	IR.100306.202100	WG223735-05	Matrix Spike Duplica	5/50	1		10/03/06 20:21
109	IR.100306.202700	L0609593-02	RO\#3	5/50	1		10/03/06 20:27
110	IR.100306.203300	WG223879-02	Serial Dilution		5	L0609593-02	10/03/06 20:33
111	IR.100306.203900	WG223879-01	Post Digestion Spike		1	L0609593-02	10/03/06 20:39

Approved: October 04, 2006

Maren Berry

KEMRON Environmental Services

Instrument Run Log

00097859

Instrument: IRIS-ICP Dataset: 20061003.1
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600F Rev: 6
Maintenance Log ID: 15969

Calibration Std: STD15289 ICV/CCV Std: STD15241 Post Spike: STD14577
ICSA: STD15428 ICSAB: STD15429

Workgroups: 223880, 223642, 223643, 223877, 223595, 223879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
112	IR.100306.204500	L0609593-03	RO\#2	5/50	1		10/03/06 20:45
113	IR.100306.205100	WG224050-31	CCV		1		10/03/06 20:51
114	IR.100306.205700	WG224050-32	CCB		1		10/03/06 20:57
115	IR.100306.210300	L0609593-04	RO\#1	5/50	1		10/03/06 21:03
116	IR.100306.211000	L0609593-05	29WW36-CONF	5/50	1		10/03/06 21:10
117	IR.100306.211600	L0609593-06	29WW38-CONF	5/50	1		10/03/06 21:16
118	IR.100306.212200	L0609593-07	29WW35-CONF	5/50	1		10/03/06 21:22
119	IR.100306.212800	L0609671-01	LF3PPV0906	5/50	1		10/03/06 21:28
120	IR.100306.213400	L0609702-01	SD02	5/50	1		10/03/06 21:34
121	IR.100306.214000	WG224050-33	CCV		1		10/03/06 21:40
122	IR.100306.214600	WG224050-34	CCB		1		10/03/06 21:46

Comments

Seq.	Rerun	Dil.	Reason	Analytes
48			Se TN; reanalyzed @ greater dil. for Se.	
75			Se TN; needs reanalyzed @ dil. for Se.	
76			Se TN; needs reanalyzed @ dil. for Se.	
79			Se TN; needs reanalyzed @ dil. for Se.	
88			Ag TN, Ca OLR; needs reanalyzed @ dil. for Ag, Ca.	
89			Ca OLR; needs reanalyzed @ dil. for Ca.	

Approved: October 04, 2006

Maren Berry

Microwave Digestion Log

Analyst(s): VC
Date: 9/29/06 10:60
LCS: 5 m/s STD 15239
MS/MSD: 5 m/s STD 15239
Witness: [redacted]
HNO_3 Lot #: RGT 10C72
HCl Lot #:
Earliest Sample Due Date: 10/6
Microwave # MW2

Box: 62 R1118269
Digestion Work Group: WG 223735

ME407 Revision # 9 Method 3015-Water
ME406 Revision # ____ Method 3051-Soil-Oil

Relinquished By: VC
Digest Received By: PAS Date: 9/29/6

	KEMRON #	Initial Wt/Vol	Final Volume	Initial Weight	Final Weight	Comments	Due Date
1	PBW	50 mL	50 mL	26432	26438	62	
2	LCSW	1		263.16	263.14	63	
3	TRBLK 9/28	5		21068	21045	TRW# 223674 15.00	
4	TRG. 593-11			21173	21173	61	10/6
5	01MS			21068	21005	64	
6	01MSD			267.19	267.19	65	
7	02			28.66	28.62		
8	03			268.29	28.26		
9	04			264.60	264.56		
10	05			260.24	210.23		
11	06			211.01	21100		
12	07			28.67	28.63		
13	671-01			210.00	216.01		10/6
14	762-01 *			210.64	2060		10/12
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

VC 9/25/06

Comments: *1 vial 4

Primary Review: Vicki Collins 9/25/06 Secondary Review: 9/29/06

TCLP Non-Volatile

Analyst(s): RWC
Date: 9-28-06

Analyst/Date		Analyst/Date	
RWC 9-28-06		RWC 9-29-06	
Time On	Temp On °C	Time Off	Temp Off °C
1500	22	0800	21

Jug #	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
G8	09-59301	ME SV	1311	FI-607	S/S	100		✓	100.00	2000
G12	02	" "	"	"	"	"		"	100.05	"
G7	03	" "	"	"	"	"		"	100.05	"
G6	04	" "	"	"	"	"		"	100.04	"
G14	05	" "	"	"	"	"		"	100.02	"
G28	06	" "	"	"	"	"		"	100.05	"
G20	07	" "	"	"	"	"		"	100.00	"
G13	09-671-01	" "	"	"	S	"		"	100.01	"
G29	09-681-01	Pest Herb	"	"	S	"		"	100.02	"
G19	09-702-01	ME " "	"	"	S/S	"		"	100.01	"
N/A	FBLK	" "	"	"	N/A	N/A		"	2000	"

RWC 9-28-06

*Matrix Code = (S-solid)(SS-sand, soil or sludge)(P-paint)(O-organic or waste)(W-water)

Comments: _____

Peer Review By: _____ Supervisor Review: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097862

Analytical Method: 6010B AAB#: WG223879
Login Number: L0609593

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
RO#4	09/22/06	09/23/06	09/29/06	180	6.91	10/03/06	180	4.42	
RO#3	09/22/06	09/23/06	09/29/06	180	6.87	10/03/06	180	4.44	
RO#2	09/22/06	09/23/06	09/29/06	180	6.88	10/03/06	180	4.45	
RO#1	09/22/06	09/23/06	09/29/06	180	6.94	10/03/06	180	4.46	
29WW36-CONF	09/22/06	09/23/06	09/29/06	180	6.93	10/03/06	180	4.47	
29WW38-CONF	09/22/06	09/23/06	09/29/06	180	6.91	10/03/06	180	4.47	
29WW35-CONF	09/22/06	09/23/06	09/29/06	180	6.86	10/03/06	180	4.47	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 584888
Report generated 10/04/2006 10:33

METHOD BLANK SUMMARY

00097863

Login Number: L0609593
Work Group: WG223879
Blank File ID: IR.100306.195100
Blank Sample ID: WG223735-02
Date Analyzed: 10/03/06
Instrument ID: IRIS-ICP
Time Analyzed: 19:51
Method: 6010B
Analyst: SLP

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG223735-03	IR.100306.195700	10/03/06 19:57	01
RO#4	L0609593-01	IR.100306.200900	10/03/06 20:09	01
RO#3	L0609593-02	IR.100306.202700	10/03/06 20:27	01
RO#2	L0609593-03	IR.100306.204500	10/03/06 20:45	01
RO#1	L0609593-04	IR.100306.210300	10/03/06 21:03	01
29WW36-CONF	L0609593-05	IR.100306.211000	10/03/06 21:10	01
29WW38-CONF	L0609593-06	IR.100306.211600	10/03/06 21:16	01
29WW35-CONF	L0609593-07	IR.100306.212200	10/03/06 21:22	01

KEMRON FORMS - Modified 03/06/2006
Version 1.5 PDF File ID: 584889
Report generated 10/04/2006 10:33

KEMRON Environmental Services

METHOD BLANK REPORT

00097864

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG223735-02
Instrument ID: IRIS-ICP Run Time: 19:51 Prep Method: 3015
File ID: IR.100306.195100 Analyst: SLP Method: 6010B
Workgroup (AAB#): WG223879 Matrix: Leachate Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: IRIS-I-03-OCT-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Silver, TCLP	0.0500	0.100	0.0500	1	U
Arsenic, TCLP	0.100	1.00	0.100	1	U
Barium, TCLP	0.0250	5.00	0.0250	1	U
Cadmium, TCLP	0.0250	0.100	0.0250	1	U
Chromium, TCLP	0.0250	0.200	0.0250	1	U
Lead, TCLP	0.100	1.00	0.100	1	U
Selenium, TCLP	0.500	0.800	0.500	1	U

MDL Method Detection Limit
RL Reporting/quantitation Limit

* Analyte concentration > RL

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 584890
Report generated 10/04/2006 10:33

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097865

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG223735-03
Instrument ID: IRIS-ICP Run Time: 19:57 Prep Method: 3015
File ID: IR.100306.195700 Analyst: SLP Method: 6010B
Workgroup (AAB#): WG223879 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: IRIS-I-03-OCT-06

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, TCLP	0.200	0.189	94.5	80 - 120	
Arsenic, TCLP	0.200	0.179	89.7	80 - 120	
Barium, TCLP	0.500	0.452	90.5	80 - 120	
Cadmium, TCLP	0.0250	0.0224	89.6	80 - 120	
Chromium, TCLP	0.250	0.227	90.9	80 - 120	
Lead, TCLP	0.250	0.221	88.2	80 - 120	
Selenium, TCLP	0.200	0.165	82.3	80 - 120	

KEMRON FORMS - Modified 07/06/2006
Version 1.5 PDF File ID: 584891
Report generated 10/04/2006 10:33

KEMRON Environmental Services

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00097866

Loginnum:L0609593 Cal ID: IRIS-ICP- Worknum:WG223879
Instrument ID:IRIS-ICP Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG223735-01 File ID:IR.100306.200900 Dil:1 Matrix:TCLP
Sample ID:WG223735-04 MS File ID:IR.100306.201500 Dil:1 Units:mg/L
Sample ID:WG223735-05 MSD File ID:IR.100306.202100 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, TCLP	ND	2.00	1.86	92.9	2.00	1.80	90.1	3.01	75 - 125	20	
Barium, TCLP	0.505	5.00	5.11	92.2	5.00	5.03	90.5	1.71	75 - 125	20	
Cadmium, TCLP	ND	0.250	0.230	91.8	0.250	0.237	94.9	3.30	75 - 125	20	
Chromium, TCLP	ND	2.50	2.32	92.9	2.50	2.29	91.6	1.49	75 - 125	20	
Lead, TCLP	ND	2.50	2.25	89.8	2.50	2.25	90.1	0.276	75 - 125	20	
Selenium, TCLP	ND	2.00	1.69	84.5	2.00	1.72	86.2	1.95	75 - 125	20	
Silver, TCLP	ND	2.00	1.94	96.9	2.00	1.88	94.0	3.05	75 - 125	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 03/16/2006
Version 1.5 PDF File ID: 584892
Report generated 10/04/2006 10:33

KEMRON ENVIRONMENTAL SERVICES
SERIAL DILUTION REPORT

00097867

Sample Login ID:L0609593 Worknum:WG223879
Instrument ID:IRIS-ICP Method:6010B
Sample ID:L0609593-02 File ID:IR.100306.202700 Dil:1 Units:mg/L
Serial Dilution ID:WG223879-02 File ID:IR.100306.203300 Dil:5

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Arsenic	ND	U	0	U		
Barium	0.0315	F	0.0325	F	3.17	
Cadmium	0	U	0	U		
Chromium	0	U	0	U		
Lead	0	U	ND	U		
Selenium	ND	U	ND	U		
Silver	0	U	0	U		

U = Result is below MDL
F = Result is between MDL and RL
X = Result is greater than RL and less than 50 times the MDL
E = %D exceeds control limit of 10% and initial
sample result is greater than or equal to 50 times the MDL

KEMRON FORMS - Modified 02/14/2006
Version 1.3 PDF File ID: 584886
Report generated 10/04/2006 10:33

Sample Login ID: L0609593 Worknum: WG223879
Instrument ID: IRIS-ICP Method: 6010B
Post Spike ID: WG223879-01 File ID: IR.100306.203900 Dil: 1 Units: mg/L
Sample ID: L0609593-02 File ID: IR.100306.202700 Dil: 1 Matrix: Leachate

Analyte	Control Limit %R	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Q
ARSENIC	75 - 125	0.181		ND	U	0.200	90.5	
BARIUM	75 - 125	0.485	F	0.0315	F	0.500	91.3	
CADMIUM	75 - 125	0.0232		0	U	0.0250	92.8	
CHROMIUM	75 - 125	0.229		0	U	0.250	91.6	
LEAD	75 - 125	0.223		0	U	0.250	89.2	
SELENIUM	75 - 125	0.167		ND	U	0.200	83.5	
SILVER	75 - 125	0.190		0	U	0.200	95.0	

N = % Recoverv exceeds control limits of 75% - 125%
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation.

KEMRON FORMS - Modified 09/28/2006
Version 2.0 PDF File ID: 584887
Report generated 10/04/2006 10:33

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

00097869

Login Number: L0609593 Workgroup (AAB#): WG223879

Analytical Method: 6010B Instrument ID: IRIS-ICP

ICAL Worknum: WG224050 Initial Calibration Date: 03-OCT-2006 09:37

Analyte	WG224050-01		WG224050-02		WG224050-03		WG224050-04		WG224050-05		WG224050-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Arsenic	0	-.03937	NA	NA	.008	.00623	.2	.91983	.4	2.0128	.8	4.0577
Barium	0	.76126	.01	5.8989	.02	11.144	.5	252.57	1	530.03	2	1044.3
Cadmium	0	.46288	NA	NA	.001	.54265	.025	2.2259	.05	4.1964	.1	7.8703
Chromium	0	.63972	.005	1.1717	.01	1.7213	.25	28.117	.5	58.516	1	115.4
Lead	0	-.00101	NA	NA	.01	.0949	.25	2.3469	.5	4.975	1	9.9014
Selenium	0	.09961	NA	NA	.008	.10735	.2	.57553	.4	1.2119	.8	2.3991
Silver	0	-.0462	NA	NA	.008	.19583	.2	4.8494	.4	10.234	.8	20.185

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

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Analyte	R	Q
Arsenic	0.999703	
Barium	0.999885	
Cadmium	0.999817	
Chromium	0.999853	
Lead	0.999821	
Selenium	0.997002	
Silver	0.999782	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

KEMRON Environmental Services

INITIAL CALIBRATION BLANK (ICB)

00097871

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-08
Instrument ID: IRIS-ICP Run Time: 09:50 Method: 6010B
File ID: IR.100306.095000 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.00500	0.0100	-.00126	1	U
Arsenic	0.0100	0.100	.00149	1	U
Barium	0.00250	0.500	.0002	1	U
Cadmium	0.00250	0.0100	.00019	1	U
Chromium	0.00250	0.0200	-.00022	1	U
Lead	0.0100	0.100	-.00099	1	U
Selenium	0.0500	0.0800	-.00499	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 10/02/2006
Version 1.5 PDF File ID: 584897
Report generated 10/04/2006 10:33

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097872

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-12
Instrument ID: IRIS-ICP Run Time: 10:14 Method: 6010B
File ID: IR.100306.101400 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.00500	0.0100	-0.00120	1	U
Arsenic	0.0100	0.100	-0.0000400	1	U
Barium	0.00250	0.500	0.000250	1	U
Cadmium	0.00250	0.0100	0.0000300	1	U
Chromium	0.00250	0.0200	0.0000600	1	U
Lead	0.0100	0.100	0.0000800	1	U
Selenium	0.0500	0.0800	-0.00447	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 584900
Report generated 10/04/2006 10:33

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097873

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-30
Instrument ID: IRIS-ICP Run Time: 19:45 Method: 6010B
File ID: IR.100306.194500 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.00500	0.0100	0.00125	1	U
Arsenic	0.0100	0.100	0.00145	1	U
Barium	0.00250	0.500	-0.0000200	1	U
Cadmium	0.00250	0.0100	0.000340	1	U
Chromium	0.00250	0.0200	-0.000140	1	U
Lead	0.0100	0.100	-0.00151	1	U
Selenium	0.0500	0.0800	-0.00538	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
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KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097874

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-32
Instrument ID: IRIS-ICP Run Time: 20:57 Method: 6010B
File ID: IR.100306.205700 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.00500	0.0100	0.00154	1	U
Arsenic	0.0100	0.100	0.000490	1	U
Barium	0.00250	0.500	0.000120	1	U
Cadmium	0.00250	0.0100	0.000360	1	U
Chromium	0.00250	0.0200	0.0000700	1	U
Lead	0.0100	0.100	0.00106	1	U
Selenium	0.0500	0.0800	-0.00361	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 584900
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KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097875

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-34
Instrument ID: IRIS-ICP Run Time: 21:46 Method: 6010B
File ID: IR.100306.214600 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.00500	0.0100	0.00224	1	U
Arsenic	0.0100	0.100	0.0000900	1	U
Barium	0.00250	0.500	0.000240	1	U
Cadmium	0.00250	0.0100	-0.0000100	1	U
Chromium	0.00250	0.0200	-0.0000100	1	U
Lead	0.0100	0.100	-0.000690	1	U
Selenium	0.0500	0.0800	-0.000110	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 584900
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KEMRON Environmental Services

INITIAL CALIBRATION VERIFICATION (ICV)

00097876

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-07
Instrument ID: IRIS-ICP Run Time: 09:44 Method: 6010B
File ID: IR.100306.094400 Analyst: SLP Units: mg/L
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analyte		Expected	Found	%REC	LIMITS	Q
Silver		.4	0.413	103	90 - 110	
Arsenic		.4	0.413	103	90 - 110	
Barium		1	1.00	100	90 - 110	
Cadmium		.05	0.0518	104	90 - 110	
Chromium		.5	0.506	101	90 - 110	
Lead		.5	0.497	99.4	90 - 110	
Selenium		.4	0.411	103	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 03/03/2006
Version 1.3 PDF File ID: 584896
Report generated 10/04/2006 10:33

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097877

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-11
Instrument ID: IRIS-ICP Run Time: 10:08 Method: 6010B
File ID: IR.100306.100800 Analyst: SLP
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Silver		0.400	0.405	101	90 - 110	mg/L	
Arsenic		0.400	0.412	103	90 - 110	mg/L	
Barium		1.00	0.990	99.0	90 - 110	mg/L	
Cadmium		0.0500	0.0519	104	90 - 110	mg/L	
Chromium		0.500	0.498	99.6	90 - 110	mg/L	
Lead		0.500	0.491	98.3	90 - 110	mg/L	
Selenium		0.400	0.404	101	90 - 110	mg/L	

* Exceeds LIMITS Criteria

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Report generated 10/04/2006 10:33

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097878

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-29
Instrument ID: IRIS-ICP Run Time: 19:39 Method: 6010B
File ID: IR.100306.193900 Analyst: SLP
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Silver		0.400	0.402	100	90 - 110	mg/L	
Arsenic		0.400	0.394	98.5	90 - 110	mg/L	
Barium		1.00	0.949	94.9	90 - 110	mg/L	
Cadmium		0.0500	0.0494	98.8	90 - 110	mg/L	
Chromium		0.500	0.491	98.3	90 - 110	mg/L	
Lead		0.500	0.481	96.2	90 - 110	mg/L	
Selenium		0.400	0.387	96.8	90 - 110	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2006
Version 1.3 PDF File ID: 584899
Report generated 10/04/2006 10:33

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097879

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-31
Instrument ID: IRIS-ICP Run Time: 20:51 Method: 6010B
File ID: IR.100306.205100 Analyst: SLP
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Silver		0.400	0.398	99.4	90 - 110	mg/L	
Arsenic		0.400	0.395	98.9	90 - 110	mg/L	
Barium		1.00	0.947	94.7	90 - 110	mg/L	
Cadmium		0.0500	0.0499	99.9	90 - 110	mg/L	
Chromium		0.500	0.492	98.4	90 - 110	mg/L	
Lead		0.500	0.482	96.4	90 - 110	mg/L	
Selenium		0.400	0.391	97.7	90 - 110	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2006
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KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097880

Login Number: L0609593 Run Date: 10/03/2006 Sample ID: WG224050-33
Instrument ID: IRIS-ICP Run Time: 21:40 Method: 6010B
File ID: IR.100306.214000 Analyst: SLP
Workgroup (AAB#): WG223879 Cal ID: IRIS-I - 03-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Silver		0.400	0.403	101	90 - 110	mg/L	
Arsenic		0.400	0.399	99.8	90 - 110	mg/L	
Barium		1.00	0.960	96.0	90 - 110	mg/L	
Cadmium		0.0500	0.0505	101	90 - 110	mg/L	
Chromium		0.500	0.499	99.8	90 - 110	mg/L	
Lead		0.500	0.487	97.3	90 - 110	mg/L	
Selenium		0.400	0.393	98.3	90 - 110	mg/L	

* Exceeds LIMITS Criteria

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KEMRON ENVIRONMENTAL SERVICES
INTERFERENCE CHECK SAMPLES

00097881

Login number: L0609593 **Workgroup (AAB#):** WG223879
Instrument ID: IRIS-ICP **Method:** 6010B
Sol. A : WG224050-09 **File ID:** IR.100306.095600 **Units:** mg/L
Sol. AB : WG224050-10 **File ID:** IR.100306.100200

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Arsenic	NS	-0.00177	NS	0.250	0.242	96.8	
Barium	NS	-0.0000400	NS	0.250	0.234	93.6	
Cadmium	NS	0.000950	NS	0.500	0.478	95.6	
Chromium	NS	0.000190	NS	0.250	0.229	91.6	
Lead	NS	-0.00393	NS	0.500	0.450	90.0	
Selenium	NS	-0.0180	NS	0.250	0.224	89.6	
Silver	NS	-0.0000300	NS	0.500	0.460	92.0	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

KEMRON Environmental Services

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00097882

Login Number: L0609593 **Date:** 06/08/2006

Insturment ID: IRIS-ICP **Method:** 6010B

Analyte	Wave Length	AL	AS	B	BA	BE
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	-0.00000400	-0.00000300	0	0	0
ARSENIC	189.00	0.0000100	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.00	0	0	0	0	0
BORON	249.70	0	0	0	0	0
CADMIUM	228.80	0.00000100	0.0160	0	-0.00181	0
CALCIUM	373.70	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	324.70	0	0	0	0	0
IRON	271.40	0	0	0	0	0
LEAD	220.30	0.000500	0	0	0	0
LITHIUM	670.80	0	0	0	0	0
MAGNESIUM	277.90	0	-0.0432	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0.00830
POTASSIUM	766.40	0	0	0	-0.0660	0
SELENIUM	196.00	0.000156	0	0	0	0
SILICON	251.60	0	0	-0.0157	0	0
SILVER	328.00	0.00000100	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	215.20	0	0	0	0	0
THALLIUM	190.80	-0.0000300	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	334.90	0	0	0	0	0
VANADIUM	310.20	-0.0000260	0	0	0	0.00900
ZINC	213.80	0	0	0	0	0

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KEMRON Environmental Services

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00097883

Login Number: L0609593 **Date:** 06/08/2006

Insturment ID: IRIS-ICP **Method:** 6010B

Analyte	Wave Length	CA	CO	CR	CU	FE
ALUMINUM	308.20	0	-0.00524	0	0	0
ANTIMONY	206.80	0	0	0.0230	0	0.00000500
ARSENIC	189.00	0	0	0.000280	0	-0.000110
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.00	0	0	0	0	0
BORON	249.70	0	0.00160	0	0	0
CADMIUM	228.80	0.00000200	0	0	0	0.00000300
CALCIUM	373.70	0	0	0	0	0.00400
CHROMIUM	267.70	0	0	0	0	-0.0000100
COBALT	228.60	0	0	0.0000450	0	0.0000150
COPPER	324.70	0	0	-0.000150	0	0.0000390
IRON	271.40	0.00160	0.0969	0	0	0
LEAD	220.30	0	-0.000300	-0.000220	0	0.0000170
LITHIUM	670.80	-0.0000500	0	0	0	0
MAGNESIUM	277.90	0	0	-0.00436	0	0
MANGANESE	257.60	0	0	0	0	-0.0000180
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0.000400	0	0	0.00000700
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.00	0	0.00419	0	0	-0.00100
SILICON	251.60	0	0	0	0	0
SILVER	328.00	0	0	-0.0000420	0	0.00000100
SODIUM	589.50	0	0	0	0	0
STRONTIUM	215.20	0	0.0000600	0	0	-0.000392
THALLIUM	190.80	0	0.00649	0.000190	0	-0.0000800
TIN	189.90	0	0	0	0	0
TITANIUM	334.90	-0.0000300	0	0.000300	0	0
VANADIUM	310.20	0	0	-0.000646	0	-0.0000100
ZINC	213.80	0	0	0	0.000250	0.0000600

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KEMRON Environmental Services

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00097884

Login Number: L0609593 **Date:** 06/08/2006

Insturment ID: IRIS-ICP **Method:** 6010B

Analyte	Wave Length	LI	MG	MN	MO	NI
ALUMINUM	308.20	0	0	0.00180	0.0300	0
ANTIMONY	206.80	0	0	0	-0.00800	-0.000100
ARSENIC	189.00	0	0	0	0.00108	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.00	0	0	0	-0.0000500	0
BORON	249.70	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	-0.0000250
CALCIUM	373.70	0	0	0.00160	0	0.00195
CHROMIUM	267.70	0	0	0.000510	0	0
COBALT	228.60	0	0	0	0	0
COPPER	324.70	0	0	0	0	0
IRON	271.40	0	0	-0.000500	-0.00740	0
LEAD	220.30	0	0	0	-0.00300	0.000489
LITHIUM	670.80	0	0	0	0	0
MAGNESIUM	277.90	0	0	0.00132	-0.120	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.00	0	0	0.000260	-0.000660	0
SILICON	251.60	0	0	0	0.00800	0
SILVER	328.00	0	0	0.0000800	-0.000290	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	215.20	0	0	0	-0.0000800	0
THALLIUM	190.80	0	0	0.00130	-0.00710	0
TIN	189.90	0	0	0	0	0
TITANIUM	334.90	-0.00250	0	0	0	0
VANADIUM	310.20	0	-0.00000400	0	0	0
ZINC	213.80	0	0.0000180	0.000279	0	0.00635

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KEMRON Environmental Services

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00097885

Login Number: L0609593 **Date:** 06/08/2006

Insturment ID: IRIS-ICP **Method:** 6010B

Analyte	Wave Length	SB	SN	TI	V	ZN
ALUMINUM	308.20	0	0	-0.00200	0.00930	0
ANTIMONY	206.80	0	0	0.000620	0.0000700	0
ARSENIC	189.00	-0.000420	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.00	0	0	0	0.00120	0
BORON	249.70	0	0	0	0	0
CADMIUM	228.80	0	0	0	0.0000360	0
CALCIUM	373.70	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0.000100	0
COBALT	228.60	0	-0.00339	0.00180	0	-0.00100
COPPER	324.70	0	0	-0.000950	-0.00383	0
IRON	271.40	0	0	0	-0.0430	0
LEAD	220.30	0	0	0	0	0
LITHIUM	670.80	0	0	0	0	0
MAGNESIUM	277.90	0	0	0	0.00570	0
MANGANESE	257.60	0	0	0	-0.0000750	0
MOLYBDENUM	202.03	0	0	0	-0.000247	0.00200
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.00	0	0	0	0	0.0140
SILICON	251.60	0	0	0.00665	0	0
SILVER	328.00	0	0	0.00268	-0.0143	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	215.20	0	0	0	0	0.000768
THALLIUM	190.80	-0.000146	0	0.00180	0.00321	0
TIN	189.90	0	0	0	0	0
TITANIUM	334.90	0	0		0	0
VANADIUM	310.20	0	0	0	0	0
ZINC	213.80	0	0	0	0	0

KEMRON FORMS - Modified 02/14/2006
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LINEAR RANGE (QUARTERLY)

00097886

Login Number: L0609593 **Date:** 09/12/2006

Insturment ID: IRIS-ICP **Method:** 6010B

Analyte	Integration Time (Sec.)	Concentration (mg/L)
Aluminum	10.00	800.0
Antimony	55.00	50.0
Arsenic	55.00	100.0
Barium	10.00	20.0
Beryllium	10.00	4.0
Boron	55.00	100.0
Cadmium	55.00	30.0
Calcium	10.00	500.0
Chromium	55.00	20.0
Cobalt	55.00	100.0
Copper	10.00	50.0
Iron	55.00	900.0
Lead	55.00	200.0
Lithium	10.00	10.0
Magnesium	55.00	1000.0
Manganese	55.00	20.0
Molybdenum	55.00	30.0
Nickel	55.00	100.0
Potassium	10.00	200.0
Selenium	55.00	20.0
Silicon	55.00	50.0
Silver	10.00	10.0
Sodium	10.00	150.0
Strontium	55.00	30.0
Thallium	55.00	20.0
Tin	55.00	30.0
Titanium	10.00	25.0
Vanadium	10.00	100.0
Zinc	55.00	20.0

Comments:

KEMRON Environmental Services
Data Checklist

00097887

Date: 02-OCT-2006
Analyst: MMB
Analyst: NA
Method: 7471A
Instrument: HYDRA
Curve Workgroup: WG223964
Runlog ID: 12583
Analytical Workgroups: WG223913

Calibration/Linearity	X
ICV/CCV	X
ICB/CCB	X
ICSA/ICSAB	
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	
Workgroup Forms	
Case Narrative	09-708, 715, 727, 593, 671, 702
Client Forms	X
Level X	
Level 3	09-727, 593, 671
Level 4	09-708, 715, 702
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	MMB
Secondary Reviewer	LSB
Comments	

Primary Reviewer:
02-OCT-2006

Secondary Reviewer:
03-OCT-2006

Generated: OCT-03-2006 10:24:06

KEMRON Environmental Services

Instrument Run Log

00097888

Instrument: HYDRA Dataset: 100206B.PRN

Analyst1: MMB Analyst2: N/A

Method: 7470A SOP: 404 Rev: 9

Maintenance Log ID: 15943

Calibration Std: STD15417 ICV/CCV Std: STD15411 Post Spike: STD15417

ICSA: N/A ICSAB: N/A

Workgroups: WG223913

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	HY.100206.110558	WG223964-01	Calibration Point		1		10/02/06 11:05
2	HY.100206.110757	WG223964-02	Calibration Point		1		10/02/06 11:07
3	HY.100206.110955	WG223964-03	Calibration Point		1		10/02/06 11:09
4	HY.100206.111134	WG223964-04	Calibration Point		1		10/02/06 11:11
5	HY.100206.111321	WG223964-05	Calibration Point		1		10/02/06 11:13
6	HY.100206.111612	WG223964-06	Calibration Point		1		10/02/06 11:16
7	HY.100206.111925	WG223964-07	Initial Calibration Verification		1		10/02/06 11:19
8	HY.100206.112101	WG223964-08	Initial Calib Blank		1		10/02/06 11:21
9	HY.100206.112239	WG223964-09	CCV		1		10/02/06 11:22
10	HY.100206.112416	WG223964-10	CCB		1		10/02/06 11:24
11	HY.100206.112558	WG223731-02	Method/Prep Blank	40/40	1		10/02/06 11:25
12	HY.100206.112748	WG223731-03	Laboratory Control Sample	40/40	1		10/02/06 11:27
13	HY.100206.112924	L0609708-04	1020-GW-092706	40/40	1		10/02/06 11:29
14	HY.100206.113103	L0609708-05	1020-GW-092706	40/40	1		10/02/06 11:31
15	HY.100206.113241	L0609708-10	1018-GW-092706	40/40	1		10/02/06 11:32
16	HY.100206.113422	L0609708-11	1018-GW-092706	40/40	1		10/02/06 11:34
17	HY.100206.113601	WG223731-01	Reference Sample		1		10/02/06 11:36
18	HY.100206.113748	WG223731-04	Matrix Spike	36/40	1		10/02/06 11:37
19	HY.100206.113926	WG223731-05	Matrix Spike Duplicate	36/40	1		10/02/06 11:39
20	HY.100206.114204	L0609715-02	EB-1-GW-1-0906	40/40	1		10/02/06 11:42
21	HY.100206.114403	WG223964-11	CCV		1		10/02/06 11:44
22	HY.100206.114544	WG223964-12	CCB		1		10/02/06 11:45
23	HY.100206.114725	WG223913-01	Post Digestion Spike		1		10/02/06 11:47
24	HY.100206.114902	L0609715-03	FB-1-SO-1-0906	40/40	1		10/02/06 11:49
25	HY.100206.115040	L0609727-01	QA-1	40/40	1		10/02/06 11:50
26	HY.100206.115222	L0609727-02	QA-2	40/40	1		10/02/06 11:52
27	HY.100206.115429	WG223674-01	Fluid Blank		1		10/02/06 11:54
28	HY.100206.115606	L0609593-01	RO#4	4/40	1		10/02/06 11:56
29	HY.100206.115749	WG223913-02	Post Digestion Spike		1		10/02/06 11:57
30	HY.100206.115926	L0609593-02	RO#3	4/40	1		10/02/06 11:59
31	HY.100206.120106	L0609593-03	RO#2	4/40	1		10/02/06 12:01
32	HY.100206.120248	L0609593-04	RO#1	4/40	1		10/02/06 12:02
33	HY.100206.120615	WG223964-13	CCV		1		10/02/06 12:06
34	HY.100206.120753	WG223964-14	CCB		1		10/02/06 12:07
35	HY.100206.120951	L0609593-05	29WW36-CONF	4/40	1		10/02/06 12:09
36	HY.100206.121130	L0609593-06	29WW38-CONF	4/40	1		10/02/06 12:11
37	HY.100206.121308	L0609593-07	29WW35-CONF	4/40	1		10/02/06 12:13

Approved: October 03, 2006

KEMRON Environmental Services

Instrument Run Log

00097889

Instrument: HYDRA Dataset: 100206B.PRN

Analyst1: MMB Analyst2: N/A

Method: 7470A SOP: 404 Rev: 9

Maintenance Log ID: 15943

Calibration Std: STD15417 ICV/CCV Std: STD15411 Post Spike: STD15417

ICSA: N/A ICSAB: N/A

Workgroups: WG223913

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	HY.100206.121458	L0609671-01	LF3PPV0906	4/40	1		10/02/06 12:14
39	HY.100206.121654	L0609702-01	SD02	4/40	1		10/02/06 12:16
40	HY.100206.121836	WG223964-15	CCV		1		10/02/06 12:18
41	HY.100206.122036	WG223964-16	CCB		1		10/02/06 12:20

Approved: October 03, 2006

Mercury Digestion Log

Analyst(s): MW
Date: 9/29/06
LCS: 4 ml STD 15409
MS/MSD: 4 ml STD 15409
Witness: VC
H_2SO_4 Lot #: AGT 10693
$K2S_2O_8$ Lot #: AGT 10642
$KMNO_4$ Lot #: AGT 10700
HNO_3 Lot #: AGT 10672
Aqua Regia: AR
Earliest Sample Due Date: 10/6
ICV / CCV: STD 15411
Stds: 0, 0.2, 1, 2, 5, 10: STD 15412 STD 15413

Box: 102

MW 9/29
Digestion Work Group: WG ~~223731~~ 223731

ME404 Revision # 9 - Method 7470A-Water
ME405 Revision # ____ - Method 7471A-Soil

Hot Block Temperature at start: 94.0°C 1040
Hot Block Temperature at end: 97.5°C 1240

Relinquished By: MW
Digest Received By: MW Date: 9/29/06

	KEMRON #	Initial Wt/Vol	Final Volume	Comments	Due Date
1	MBW	40 ml	40 ml	-02	
2	LCSW			-03	
3	09-708-04			Level 4	10/12
4	-05				
5	-10				
6	-11				
7	09-715-01			-01	10/12
8	-01 MS	36 ml		-X1	
9	-01 MSD	"		-D	
10	-02	40 ml			
11	-03				
12	09-727-01				10/9
13	-02			*	
14	TCBLK 9/28	4 ml		WG 223674	
15	09-593-01				10/6
16	-02				
17	-03				
18	-04				
19	-05				
20	-06				
21	-07				
22	09-671-01				10/6
23	09-702-01				10/12
24			9/29/06		
25					

Comments: * 09-727-02, Reacted with H_2SO_4

Primary Review: 9/29/06 Secondary Review: Vicki Lilly 9/29/06

TCLP Non-Volatile

Analyst(s): RWC
Date: 9-28-06

Analyst/Date		Analyst/Date	
RWC 9-28-06		RWC 9-29-06	
Time On	Temp On °C	Time Off	Temp Off °C
1500	22	0800	21

Jug #	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
G8	09-59301	ME SV	1311	FI-607	S/S	100		✓	100.00	2000
G12	02	" "	"	"	"	"		"	100.05	"
G7	03	" "	"	"	"	"		"	100.05	"
G6	04	" "	"	"	"	"		"	100.04	"
G14	05	" "	"	"	"	"		"	100.02	"
G28	06	" "	"	"	"	"		"	100.05	"
G20	07	" "	"	"	"	"		"	100.00	"
G13	09-671-01	" "	"	"	S	"		"	100.01	"
G29	09-681-01	Pest Herb	"	"	S	"		"	100.02	"
G19	09-702-01	ME " "	"	"	S/S	"		"	100.01	"
N/A	FBLK	" "	"	"	N/A	N/A		"	2000	"

RWC 9-28-06

*Matrix Code = (S-solid)(SS-sand, soil or sludge)(P-paint)(O-organic or waste)(W-water)

Comments: _____

Peer Review By: _____ Supervisor Review: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097892

Analytical Method: 7470A AAB#: WG223913
Login Number: L0609593

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
RO#4	09/22/06	09/23/06	09/29/06	28	6.94	10/02/06	28	3.05	
RO#3	09/22/06	09/23/06	09/29/06	28	6.90	10/02/06	28	3.06	
RO#2	09/22/06	09/23/06	09/29/06	28	6.91	10/02/06	28	3.06	
RO#1	09/22/06	09/23/06	09/29/06	28	6.97	10/02/06	28	3.06	
29WW36-CONF	09/22/06	09/23/06	09/29/06	28	6.96	10/02/06	28	3.06	
29WW38-CONF	09/22/06	09/23/06	09/29/06	28	6.93	10/02/06	28	3.06	
29WW35-CONF	09/22/06	09/23/06	09/29/06	28	6.89	10/02/06	28	3.06	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 582848
Report generated 10/02/2006 16:33

KEMRON Environmental Services

METHOD BLANK SUMMARY

00097893

Login Number: L0609593
Work Group: WG223913
Blank File ID: HY.100206.112558
Blank Sample ID: WG223731-02
Date Analyzed: 10/02/06
Instrument ID: HYDRA
Time Analyzed: 11:25
Method: 7470A
Analyst: MMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG223731-03	HY.100206.112748	10/02/06 11:27	01
RO#4	L0609593-01	HY.100206.115606	10/02/06 11:56	01
RO#3	L0609593-02	HY.100206.115926	10/02/06 11:59	01
RO#2	L0609593-03	HY.100206.120106	10/02/06 12:01	01
RO#1	L0609593-04	HY.100206.120248	10/02/06 12:02	01
29WW36-CONF	L0609593-05	HY.100206.120951	10/02/06 12:09	01
29WW38-CONF	L0609593-06	HY.100206.121130	10/02/06 12:11	01
29WW35-CONF	L0609593-07	HY.100206.121308	10/02/06 12:13	01

KEMRON FORMS - Modified 03/06/2006
Version 1.5 PDF File ID: 582849
Report generated 10/02/2006 16:33

KEMRON Environmental Services

METHOD BLANK REPORT

00097894

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223731-02
Instrument ID: HYDRA Run Time: 11:25 Prep Method: METHOD
File ID: HY.100206.112558 Analyst: MMB Method: 7470A
Workgroup (AAB#): WG223913 Matrix: Leachate Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: HYDRA-02-OCT-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Mercury, TCLP	0.00100	0.00500	0.00100	1	U

MDL Method Detection Limit
RL Reporting/quantitation Limit

* Analyte concentration > RL

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 582850
Report generated 10/02/2006 16:34

KEMRON Environmental Services

LABORATORY CONTROL SAMPLE (LCS)

00097895

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223731-03
Instrument ID: HYDRA Run Time: 11:27 Prep Method: METHOD
File ID: HY.100206.112748 Analyst: MMB Method: 7470A
Workgroup (AAB#): WG223913 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: HYDRA-02-OCT-06

Analytes	Expected	Found	% Rec	LCS Limits	Q
Mercury, TCLP	0.00400	0.00375	93.8	80 - 120	

KEMRON FORMS - Modified 07/06/2006
Version 1.5 PDF File ID: 582851
Report generated 10/02/2006 16:34

KEMRON Environmental Services

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00097896

Loginnum:L0609593 Cal ID:HYDRA- Worknum:WG223913
Instrument ID:HYDRA Contract #:DACA56-94-D-0020 Method:7470A
Parent ID:WG223731-01 File ID:HY.100206.113601 Dil:1 Matrix:TCLP
Sample ID:WG223731-04 MS File ID:HY.100206.113748 Dil:1 Units:mg/L
Sample ID:WG223731-05 MSD File ID:HY.100206.113926 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Mercury, TCLP	ND	0.00444	0.00439	98.7	0.00444	0.00439	98.7	0	75 - 125	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 03/16/2006
Version 1.5 PDF File ID: 582852
Report generated 10/02/2006 16:34

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

00097897

Sample Login ID:L0609593 Worknum:WG223913
Instrument ID:HYDRA Method:7470A
Post Spike ID: WG223913-02 File ID:HY.100206.115749 Dil:1 Units:ug/L
Sample ID: L0609593-01 File ID:HY.100206.115606 Dil:1 Matrix:Leachate

Analyte	Control Limit %R	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Q
MERCURY	85 - 115	0.956		ND	U	1.00	95.6	

N = % Recoverv exceeds control limits of 85% - 115%
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation.

KEMRON FORMS - Modified 09/28/2006
Version 2.0 PDF File ID: 582847
Report generated 10/02/2006 16:33

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

00097898

Login Number: L0609593
Analytical Method: 7470A

Instrument ID: HYDRA
Initial Calibration Date: 10/02/2006 11:16
Initial Calibration Time: 11:16

Analyte	WG223964-01		WG223964-02		WG223964-03		WG223964-04		WG223964-05		WG223964-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	2290	0.200	13232	1.00	55989	2.00	104573	5.00	266625	10.0	509905

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON FORMS - Modified 03/03/2006
Version 1.5 PDF File ID: 582853
Report generated 10/02/2006 16:34

Analyte	R	Q
Mercury	0.9998	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

KEMRON Environmental Services

INITIAL CALIBRATION BLANK (ICB)

00097900

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-08
Instrument ID: HYDRA Run Time: 11:21 Method: 7470A
File ID: HY.100206.112101 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.500	-.044	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 10/02/2006
Version 1.5 PDF File ID: 582855
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097901

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-10
Instrument ID: HYDRA Run Time: 11:24 Method: 7470A
File ID: HY.100206.112416 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.500	-0.0790	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 582857
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097902

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-12
Instrument ID: HYDRA Run Time: 11:45 Method: 7470A
File ID: HY.100206.114544 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.500	-0.134	1	F

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 582857
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097903

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-14
Instrument ID: HYDRA Run Time: 12:07 Method: 7470A
File ID: HY.100206.120753 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.500	-0.103	1	F

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 582857
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00097904

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-16
Instrument ID: HYDRA Run Time: 12:20 Method: 7470A
File ID: HY.100206.122036 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.500	-0.127	1	F

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 582857
Report generated 10/02/2006 16:34

KEMRON Environmental Services

INITIAL CALIBRATION VERIFICATION (ICV)

00097905

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-07
Instrument ID: HYDRA Run Time: 11:19 Method: 7470A
File ID: HY.100206.111925 Analyst: MMB Units: ug/L
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	2.04	102	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 03/03/2006
Version 1.3 PDF File ID: 582854
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097906

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-09
Instrument ID: HYDRA Run Time: 11:22 Method: 7470A
File ID: HY.100206.112239 Analyst: MMB
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Mercury, Total		0.00200	0.00204	102	80 - 120	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 08/16/2006
Version 1.3 PDF File ID: 582856
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097907

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-11
Instrument ID: HYDRA Run Time: 11:44 Method: 7470A
File ID: HY.100206.114403 Analyst: MMB
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Mercury, Total		0.00200	0.00194	97.0	80 - 120	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 08/16/2006
Version 1.3 PDF File ID: 582856
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097908

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-13
Instrument ID: HYDRA Run Time: 12:06 Method: 7470A
File ID: HY.100206.120615 Analyst: MMB
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Mercury, Total		0.00200	0.00196	98.0	80 - 120	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 08/16/2006
Version 1.3 PDF File ID: 582856
Report generated 10/02/2006 16:34

KEMRON Environmental Services

CONTINUING CALIBRATION VERIFICATION (CCV)

00097909

Login Number: L0609593 Run Date: 10/02/2006 Sample ID: WG223964-15
Instrument ID: HYDRA Run Time: 12:18 Method: 7470A
File ID: HY.100206.121836 Analyst: MMB
Workgroup (AAB#): WG223913 Cal ID: HYDRA - 02-OCT-06

Analyte		Expected	Found	%REC	LIMITS	UNITS	Q
Mercury, Total		0.00200	0.00192	96.0	80 - 120	mg/L	

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 08/16/2006
Version 1.3 PDF File ID: 582856
Report generated 10/02/2006 16:34

KEMRON Environmental Services
Data Checklist

00097910

Date: 02-OCT-2006
Analyst: DIH
Analyst: SRM
Method: FLASH
Instrument: PRECISION
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG223862

Calibration/Linearity	10/02/06
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	
Check the completeness of reported information	
Check the information for the report narrative	
Primary Reviewer	SRM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
02-OCT-2006

Secondary Reviewer:
03-OCT-2006

Generated: OCT-03-2006 10:00:19

KEMRON Environmental Services
Data Checklist

00097911

Date: 25-SEP-2006
Analyst: TMB
Analyst: NA
Method: PH
Instrument: ORION 710A #1
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG223203

Calibration/Linearity	X
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	
Check for compliance with method and project specific requirements	
Check the completeness of reported information	
Check the information for the report narrative	
Primary Reviewer	TMB
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
25-SEP-2006
Tiffany Bailey

Secondary Reviewer:
26-SEP-2006
Dianna Ibsson

Generated: SEP-26-2006 07:06:36

KEMRON Environmental Services
Data Checklist

00097912

Date: 02-OCT-2006
Analyst: TMB
Analyst: DLP
Method: REACTS
Instrument: BURET
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG223871

Calibration/Linearity	
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	
Check for compliance with method and project specific requirements	
Check the completeness of reported information	
Check the information for the report narrative	
Primary Reviewer	TMB
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
02-OCT-2006
Tiffany Bailey

Secondary Reviewer:
03-OCT-2006
Deanna Isson

Generated: OCT-03-2006 10:00:28

KEMRON Environmental Services
Data Checklist

00097913

Date: 02-OCT-2006
Analyst: DLP
Analyst: NA
Method: REACTC
Instrument: UV-120-1V
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG223929

Calibration/Linearity	06-18-06
Second Source Check	X
ICV/CCV (std)	
ICB/CCB	
Blank	
LCS/LCS Dup	
MS/MSD	
Duplicate	X
Upload Results	
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
06-OCT-2006

Secondary Reviewer:
06-OCT-2006

Generated: OCT-06-2006 16:12:04

00097914

B1560

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

CHAIN-OF-CUSTODY

No. 10470

Laboratory Name: Kenvon Address: Marietta, OH Contact: S. Mossberg

Project Name: LHAAP Project Location: Karnack, Tx

Project No.: 117591 Project Contact: L. Dury Project Telephone No.: 832-364-0173

Point of contact: Telephone No. Project Manager/Supervisor:

Item No.	Sample Number	Date	Time	Comp	Grab	Matrix	Sample Description, Location	Number of Containers	TCLP VOC	TCLP SVOC	TCLP Metals	RCI				Remarks
1	RO#4	9/22	1205	X	X	S	N35400	3	X	X	X	X				
2	RO#3	9/22	1305	X	X	S	R2567RT	3	X	X	X	X				
3	RO#2	9/22	1250	X	X	S	N37393	3	X	X	X	X				
4	RO#1	9/22	1120	X	X	S	B-695	3	X	X	X	X				
5	29WW36-Conf	9/22	1135	X	X	S		3	X	X	X	X				
6	29WW38-Conf	9/22	1215	X	X	S		3	X	X	X	X				
7	29WW35-Conf	9/22	1315	X	X	S		3	X	X	X	X				
8																
9																
10																

Transfers Relinquished By (Signature)	Date/Time	Transfers Accepted By (Signature)	Date/Time
[signature]	9/22/06 1700	[signature]	
[signature]	9/22/06 1700	UPS	

Special Instructions: UPS 1Z401663221005 6099

FedEx Airbill No.:

Laboratory: Brenda Gregory 9/23/06 0830

Sampler's Signature: [signature]

TAT: ____ Standard ____ Rush Due: ___ Seals Intact? ____Y ____N Received Good Condition ____Y ____N ____Cold

Iced
Seals intact
Cooler temp 1 deg
Stored in locked cooler over weekend

White - Lab Copy Canary - Field Copy Pink - File Copy

SAMPLE RECEIPT FORM

00097915

156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071

Date: 9-23-06 Client: Shaw

Shipped By: ( ) Fed-Ex (✓) UPS ( )DHL ( ) KEMRON ( ) Client ( ) Other 11:30

Opened By: JLD

Logged By: BLG Login # L06 09593

IR Temp Gun: ( ) D (✓)

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	1141	1	1240116632210056099		
2					
3					
4					
5					
6					

Were all coolers sealed?	(Y)	N	N/A
Were custody seals used on all coolers?	(Y)	N	N/A
Were custody seals intact?	(Y)	N	N/A
Was visible ice present?	(Y)	N	N/A
Were all coolers in the temperature range of 2-6C? (>6C*)	Y	(N)	N/A
Were the samples frozen?*	Y	(N)	N/A
Were COC papers provided?	(Y)	N	N/A
Were all sample containers intact?*	(Y)	N	N/A
Were all sample labels intact?	(Y)	N	N/A
Were all sample labels legible?*	(Y)	N	N/A
Did all sample labels match the COC?*	(Y)	N	N/A
Was the label information complete?*	(Y)	N	N/A
Were the correct containers used?*	(Y)	N	N/A
Were the correct preservatives added to water samples?*	Y	N	(N/A)
Was the pH tested on preserved water samples?	Y	N	(N/A)
Were pH ranges acceptable?*	Y	N	(N/A)
Was sufficient amount of sample provided?*	(Y)	N	N/A
Were bubbles present in VOA samples?*	Y	N	(N/A)
Were COC's signed and dated?	(Y)	N	N/A
Did samples arrive before hold time expired?*	(Y)	N	N/A
Are discrepancy forms attached?	Y	N	(N/A)

Requires a discrepancy form

CRF #1
Revised 8/22/03

Comments:

KEMRON Environmental Services
Internal Chain of Custody Report

00097916

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-01	277138	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:48	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-01	277139	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:48	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-01	277140	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-01	280434	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

Samplenum	Container ID	Products
L0609593-01	280443	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

KEMRON Environmental Services
Internal Chain of Custody Report

00097917

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-01	280452	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Samplenum	Container ID	Products
L0609593-02	277141	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-02	277142	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-02	277143	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-02	280435	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

KEMRON Environmental Services
Internal Chain of Custody Report

00097918

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-02	280444	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Samplenum	Container ID	Products
L0609593-02	280453	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Samplenum	Container ID	Products
L0609593-03	277144	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-03	277145	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-03	277146	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

KEMRON Environmental Services
Internal Chain of Custody Report

00097919

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-03	280436	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

Samplenum	Container ID	Products
L0609593-03	280445	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Samplenum	Container ID	Products
L0609593-03	280454	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Samplenum	Container ID	Products
L0609593-04	277147	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-04	277148	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

KEMRON Environmental Services
Internal Chain of Custody Report

00097920

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-04	277149	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-04	280437	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

Samplenum	Container ID	Products
L0609593-04	280446	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Samplenum	Container ID	Products
L0609593-04	280455	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Samplenum	Container ID	Products
L0609593-05	277150	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

KEMRON Environmental Services
Internal Chain of Custody Report

00097921

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-05	277151	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-05	277152	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-05	280438	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

Samplenum	Container ID	Products
L0609593-05	280447	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Samplenum	Container ID	Products
L0609593-05	280456	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

KEMRON Environmental Services
Internal Chain of Custody Report

00097922

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-06	277153	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-06	277154	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-06	277155	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-06	280439	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

Samplenum	Container ID	Products
L0609593-06	280448	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

KEMRON Environmental Services
Internal Chain of Custody Report

00097923

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-06	280457	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Samplenum	Container ID	Products
L0609593-07	277156	TC-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-07	277157	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	PREP	W1	TCL	27-SEP-2006 14:49	RWC	BRG
3	STORE	TCL	A1	28-SEP-2006 13:59	RWC	BRG

Samplenum	Container ID	Products
L0609593-07	277158	FLASH COR-PH REACTS REACTC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			25-SEP-2006 13:06	BRG	
2	ANALYZ	W1	WET	25-SEP-2006 14:55	TMB	BRG
3	STORE	WET	A1	03-OCT-2006 08:02	JKT	SRM

Samplenum	Container ID	Products
L0609593-07	280440	TC-PB TC-AG TC-AS TC-BA TC-CD TC-CR TC-HG TC-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:13	RWC	

KEMRON Environmental Services
Internal Chain of Custody Report

00097924

Login: L0609593
Account: 2773
Project: 2773.025
Samples: 7
Due Date: 06-OCT-2006

Samplenum	Container ID	Products
L0609593-07	280449	826-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:15	RWC	

Samplenum	Container ID	Products
L0609593-07	280458	827-TC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			29-SEP-2006 07:16	RWC	

Microbac®

158 Starlite Drive, Marietta, OH 45750 • T:740-373-4071 • F:740-373-4835 • http://www.microbac.com

Laboratory Report Number: L09060457

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories.

Review and compilation of your report was completed by Microbac's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

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Annie Brown	*Client Services Specialist*	abrown@microbac.com

This report was reviewed on June 24, 2009.

Stephanie Mossburg - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the accrediting authority listed below. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories.

This report was certified on June 24, 2009.

David Vandenberg - Managing Director

State of origin: Texas
Accrediting authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: Microbac OVD
This report contains a total of 203 pages.

Look closer. Go further. Do more.

Microbac REPORT L09060457
PREPARED FOR Shaw E I, Inc.
WORK ID:

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1.0 Introduction

Microbac Laboratories Inc.
REPORT NARRATIVE

Microbac Login No: L09060457

CHAIN OF CUSTODY: The chain of custody number was 5819

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 3 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 18-JUN-09
Stephanie Mossburg

Laboratory Data Package Cover Page

00097929

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	June 23, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	PH
Prep Batch Number(s):	WG305015
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

00097931

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097932

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	PH
Prep Batch Number(s):	WG305015
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097934

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	June 23, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG305122
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

00097936

00097937

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG305122
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097939

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	June 23, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	PCTSOLIDS
Prep Batch Number(s):	WG305080
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?			✓		
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?			✓		
Were LCSs analyzed at the required frequency?			✓		
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?			✓		
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?			✓		
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	PCTSOLIDS
Prep Batch Number(s):	WG305080
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097944

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna Hesson	Conventional Lab Supervisor	June 23, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

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Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	REACTIVITY
Prep Batch Number(s):	WG305100, WG305101
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓		✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	REACTIVITY
Prep Batch Number(s):	WG305100, WG305101
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 23, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097949

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;

✓R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
b) dilution factors,
c) preparation methods,
d) Cleanup methods, and
e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and
b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,
b) Calculated %R for each analyte, and
c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %R and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

✓R10 Other problems or anomalies.

✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MIKE D. ALBERTSON		Volatiles Lab Supervisor	June 24, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

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Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	8260B
Prep Batch Number(s):	WG305192
Reviewer Name:	MIKE D. ALBERTSON
LRC Date:	June 24, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?	✓				
Were ion abundance data within the method-required QC limits?	✓				
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?	✓				
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?	✓				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

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Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097952

EXCEPTIONS REPORT
ER# - Description
There were no exceptions.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097953

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;

✓R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
b) dilution factors,
c) preparation methods,
d) Cleanup methods, and
e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and
b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,
b) Calculated %R for each analyte, and
c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %R and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

✓R10 Other problems or anomalies.

✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MIKE D. ALBERTSON		Volatiles Lab Supervisor	June 24, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

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Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	GC
Prep Batch Number(s):	305192
Reviewer Name:	MIKE D. ALBERTSON
LRC Date:	June 24, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?	✓				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?	✓				
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

00097955

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097956

EXCEPTIONS REPORT
ER# - Description
There were no exceptions.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097957

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

MAREN M. BEERY	Maren Beery	Metals Supervisor	June 22, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG305154
Reviewer Name:	MAREN M. BEERY
LRC Date:	June 22, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <RL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <RL?	✓				
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	✓				
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

00097959

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097960

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG305154
Reviewer Name:	MAREN M. BEERY
LRC Date:	June 22, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00097962

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

MAREN M. BEERY	Maren Beery	Metals Supervisor	June 22, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002 A1

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG305151
Reviewer Name:	MAREN M. BEERY
LRC Date:	June 22, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <RL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <RL?	✓				
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?	✓				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	✓				
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				

00097964

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

00097965

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060457
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG305151
Reviewer Name:	MAREN M. BEERY
LRC Date:	June 22, 2009

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

LABORATORY REPORT

L09060457

00097970

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	8260B	10	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00097971

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Leachate**
Workgroup Number: **WG305192**
Collect Date: **06/16/2009 08:30**
Sample Tag: **DL01**

PrePrep Method: **1311**
Prep Method: **5030C**
Analytical Method: **8260B**
Analyst: **TMB**
Dilution: **10**
Units: **ug/L**

Instrument: **HPMS10**
Prep Date: **06/19/2009 23:26**
Cal Date: **06/16/2009 16:04**
Run Date: **06/19/2009 23:26**
File ID: **10M73045**

Analyte	CAS.Number	Result	Qual	PQL	SDL	EPA HW#	Reg. Limit
Benzene	71-43-2		U	50	1.25	D018	500
Carbon tetrachloride	56-23-5		U	50	2.5	D019	500
Chlorobenzene	108-90-7		U	50	1.25	D021	100000
Chloroform	67-66-3		U	50	1.25	D022	6000
1,2-Dichloroethane	107-06-2		U	50	2.5	D028	500
1,1-Dichloroethene	75-35-4		U	50	5	D029	700
Methyl Ethyl Ketone	78-93-3		U	100	25	D035	200000
Tetrachloroethene	127-18-4		U	50	2.5	D039	700
Trichloroethene	79-01-6		U	50	2.5	D040	500
Vinyl chloride	75-01-4		U	100	2.5	D043	200

Surrogate	% Recovery	Lower	Upper
Dibromofluoromethane	100	86	118
1,2-Dichloroethane-d4	108	80	120
Toluene-d8	108	88	110
4-Bromofluorobenzene	107	86	115

U Not detected at or above adjusted sample detection limit

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

RF = [(Ax) (Cis)] / [(Ais) (Cx)]

where:

	Example
Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100
RF = Calculated Response Factor	**1.0039**

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]

where:

	Example
Ax = Area of the characteristic ion for the compound being measured	**3122498**
Cis = Concentration of the specific internal standard (ug/L)	**25**
D = Dilution factor for sample as a multiplier (10x = 10)	**1**
Ais = Area of the characteristic ion of the specific internal standard	**611048**
RF = Average RF from the ICAL	**1.004**
Vs = Purge volume of sample (mL)	**10**
Vn = Nominal purge volume of sample (mL) (10.0 mL)	**10**
Cx = Concentration of the compound in the sample being measured (ug/L)	**127.2428**

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]

where:

	Example
Ax = Area of the characteristic ion for the compound being measured	**3122498**
Cis = Concentration of the specific internal standard (ug/L)	**25**
D = Dilution factor for sample as a multiplier (10x = 10)	**1**
Ais = Area of the characteristic ion of the specific internal standard	**611048**
RF = Average RF from the ICAL	**1.004**
Ws = Weight of sample purged (g)	**5**
Wn = Nominal purge weight (g) (5.0 g)	**5**
Cx = Concentration of the compound in the sample being measured (ug/L)	**127.2428**

Dry weight correction:

Percent solids (PCT_S)	**50**
Cd = (Cx) (100)/PCT_S	**254.4856**

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, y = mx + b

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

y = 86550/593147 = 0.1459

Step 3: Solve for x

x = (y - b)/m = [(0.1459 -(- 0.00642)]/ 0.213 = 0.7152

Step 4: Solve for analyte concentration Cx

Cx = Cis (x) = (25.0)(0.7152) = 17.88

Example Spreadsheet Calculation:

Slope from curve, m:	**0.213**
Intercept from curve, b:	**-0.00642**
Area of analyte, Ax:	**86550**
Area of Internal Standard , Ais:	**593147**
Concentration of IS, Cis	**25.00**
Response Ratio:	**0.145917**
Amount Ratio:	**0.715195**
Concentration:	**17.87988**
Units of Internal Standard:	**ug/L**

5.0 Concentration from Quadratic Regression

Step 1 - Retrieve Curve Data from Plot, y = Ax^2 + Bx + C
Where:
Ax^2 + Bx + (C - y) = 0
A, B, C = constants from the ICAL quadratic regression
y = Response ratio = Area of analyte/Area of internal standard (IS)
x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

y = Ax/Ais

Step 3: Solve for x using the quadratic formula
Ax^2 + Bx + C - y = 0

$$x = \frac{b \pm \sqrt{\left(b^2 - 4a(c - y)\right)}}{2a}$$ (Two possible solutions)

Step 4: Solve for analyte concentration Cx

Cx = (Cis)(Amount ratio)

Example Spreadsheet Calculation:

Value of A from plot:	**-0.00629**	
Value of B from plot:	**0.511**	
Value of C from plot:	**-0.0276**	
Area of unknown from quantitation report:	**293821**	
Area of IS from quantiation report:	**784848**	
Response ratio, y:	**0.374367**	
C - y:	**-0.40197**	
Root 1 - Computed amount ratio , X1:	**80.44567**	
Root 2 - Computed amount ratio , X2:	**0.794396**	use this solution
Concentration of IS, Cis:	**25.00**	
Concentration of analyte, Cx:	**19.86**	ug/L

TCLP Volatile

Analyst(s): Ruc
Date: 6-18-09

Analyst/Date		Analyst/Date	
Ruc 6-18-09		Ruc 6-19-09	
Time On	Temp On °C	Time Off	Temp Off °C
1330	24	0630	23

									Size Reduction			
ZHE	Sample #	Tests	PSI ON	PSI OFF	Method	Fluid #	Matrix*	%Solid	Yes	No	Int. Wt. (g)	Fluid Vol. (mL)
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												
K	06-457-01	VOA	10	10	1311	FI-752	S	100		✓	25.08	500
L												
M												
N												
O												
P												
Q												
R												
S												
N/A	EBLK	VOA	N/A	N/A	1311	FI-752	N/A	N/A		✓	40	40

Ruc 6-18-09

*Matrix Code = (S-solid) (SS-sand, soil or sludge) (P-paint) (O-organic) (W-water or waste)
Agitator speed is 30 ± 2 rpm unless otherwise noted.

Comments: _____

Peer Review By: _____ Supervisor Review: _____

Microbac Laboratories Inc.

Instrument Run Log

00097976

Instrument: HPMS10 Dataset: 061609
Analyst1: TMB Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 13
Method: 5030C/5035A SOP: PAT01 Rev: 12

Maintenance Log ID: 29130

Internal Standard: STD33100 Surrogate Standard: STD33145
CCV: STD33415 LCS: STD33316 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG304807

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	10M72949	rinse	NA	1	1		06/16/09 08:54
2	10M72950	WG304807-01 50ng BFB STD 8260	NA	1	1	STD33315	06/16/09 09:27
3	10M72951	WG304807-01 50ng BFB STD 8260	NA	1	1	STD33315	06/16/09 09:40
4	10M72952	WG304807-02 0.3ug/L STD 8260	NA	1	1	STD33415	06/16/09 10:04
5	10M72953	WG304807-03 0.4ug/L STD 8260	NA	1	1	STD33415	06/16/09 10:36
6	10M72954	WG304807-06 5ug/L STD 8260	NA	1	1	STD33415	06/16/09 11:16
7	10M72955	WG304807-05 2ug/L STD 8260	NA	1	1	STD33415	06/16/09 11:48
8	10M72956	WG304807-04 1ug/L STD 8260	NA	1	1	STD33415	06/16/09 12:20
9	10M72957	WG304807-03 0.4ug/L STD 8260	NA	1	1	STD33415	06/16/09 12:51
10	10M72958	WG304807-02 0.3ug/L STD 8260	NA	1	1	STD33415	06/16/09 13:23
11	10M72959	WG304807-07 20ug/L STD 8260	NA	1	1	STD33415	06/16/09 13:54
12	10M72960	WG304807-08 50ug/L STD 8260	NA	1	1	STD33415	06/16/09 14:26
13	10M72961	WG304807-09 100ug/L STD 8260	NA	1	1	STD33415	06/16/09 14:57
14	10M72962	WG304807-10 200ug/L STD 8260	NA	1	1	STD33415	06/16/09 15:32
15	10M72963	WG304807-11 300ug/L STD 8260	NA	1	1	STD33415	06/16/09 16:04
16	10M72964	RINSE	NA	1	1		06/16/09 16:35
17	10M72965	RINSE	NA	1	1		06/16/09 17:07
18	10M72966	WG304807-12 20ug/L ALT SRC STD 8260	NA	1	1	STD33316	06/16/09 17:39
19	10M72967	RINSE	NA	1	1		06/16/09 18:10

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 10M72950				
	Tune failed. DNR.			
4	X			
File ID: 10M72952				
	Late compounds low. DNR.			
5	X			
File ID: 10M72953				
	Late compounds low. DNR.			
18	X		Surrogate standard failure	
File ID: 10M72966				
	DNR.			

Approved: June 17, 2009

Page: 1

Microbac Laboratories Inc.

Instrument Run Log

00097977

Instrument: HPMS10 Dataset: 061809
Analyst1: TMB Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 13
Method: 5030C/5035A SOP: PAT01 Rev: 12

Maintenance Log ID: 29171

Internal Standard: STD33449 Surrogate Standard: STD33442
CCV: STD33415 LCS: STD33452 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG304986

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	10M72983	WG304985-01 50ng BFB STD 8260	NA	1	1	STD33315	06/18/09 09:52
2	10M72984	WG304985-01 50ng BFB STD 8260	NA	1	1	STD33315	06/18/09 10:08
3	10M72985	WG304985-02 50ug/L CCV STD 8260	NA	1	1	STD33415	06/18/09 10:38
4	10M72986	RINSE	NA	1	1		06/18/09 11:20
5	10M72987	WG304986-01 VBLK0618 BLANK STD 826	NA	1	1		06/18/09 11:52
6	10M72988	WG304807-12 20ug/L ALT SRC STD 8260	NA	1	1	STD33452	06/18/09 12:23
7	10M72989	WG304986-02 20ug/L LCS STD 8260	NA	1	1	STD33452	06/18/09 12:55
8	10M72990	WG304986-03 20ug/L LCSDUP STD 8260	NA	1	1	STD33452	06/18/09 13:27
9	10M72991	L09060398-02 50X 8260	NA	12	50		06/18/09 13:58
10	10M72992	L09060398-01 10X 8260	NA	12	10		06/18/09 14:29
11	10M72993	L09060398-03 10X 8260	NA	12	10		06/18/09 15:01
12	10M72994	L09060397-01 10X 8260	NA	12	10		06/18/09 15:33
13	10M72995	L09060462-09 A 826-SPE	<2	1	1		06/18/09 16:04
14	10M72996	L09060484-05 A 826-SPE	<2	1	1		06/18/09 16:36
15	10M72997	L09060462-01 A 826-SPE	<2	1	1		06/18/09 17:07
16	10M72998	L09060462-03 A 826-SPE	<2	1	1		06/18/09 17:39
17	10M72999	L09060462-07 A 826-SPE	<2	1	1		06/18/09 18:10
18	10M73000	L09060462-05 A 826-SPE	<2	1	1		06/18/09 18:42
19	10M73001	L09060484-01 A 826-SPE	<2	1	1		06/18/09 19:13
20	10M73002	L09060484-02 A 826-SPE	<2	1	1		06/18/09 19:45
21	10M73003	L09060484-03 A 826-SPE	<2	1	1		06/18/09 20:16
22	10M73004	L09060484-04 A 826-SPE	<2	1	1		06/18/09 20:48
23	10M73005	L09060420-01 A 826-SPE	<2	1	1		06/18/09 21:20
24	10M73006	L09060420-02 A 826-SPE	<2	1	1		06/18/09 21:51
25	10M73007	L09060424-01 100X 826-SPE	NA	7	50	SCREEN	06/18/09 22:23
26	10M73008	L09060424-02 100X 826-SPE	NA	7	50	SCREEN	06/18/09 22:54
27	10M73009	L09060424-03 100X 826-SPE	NA	7	50	SCREEN	06/18/09 23:26
28	10M73010	L09060424-04 100X 826-SPE	NA	7	50	SCREEN	06/18/09 23:57
29	10M73011	L09060424-05 100X 826-SPE	NA	7	50	SCREEN	06/19/09 00:29
30	10M73012	L09060424-06 100X 826-SPE	NA	7	50	SCREEN	06/19/09 01:00
31	10M73013	L09060424-07 100X 826-SPE	NA	7	50	SCREEN	06/19/09 01:32
32	10M73014	L09060424-08 100X 826-SPE	NA	7	50	SCREEN	06/19/09 02:03
33	10M73015	L09060424-09 100X 826-SPE	NA	7	50	SCREEN	06/19/09 02:35
34	10M73016	L09060424-10 100X 826-SPE	NA	7	50	SCREEN	06/19/09 03:06

Approved: June 19, 2009

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Microbac Laboratories Inc.

Instrument Run Log

00097978

Instrument: HPMS10 Dataset: 061809
Analyst1: TMB Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 13
Method: 5030C/5035A SOP: PAT01 Rev: 12

Maintenance Log ID: 29171

Internal Standard: STD33449 Surrogate Standard: STD33442
CCV: STD33415 LCS: STD33452 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG304986

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
35	10M73017	L09060424-11 100X 826-SPE	NA	7	50	SCREEN	06/19/09 03:38
36	10M73018	L09060424-12 100X 826-SPE	NA	7	50	SCREEN	06/19/09 04:09
37	10M73019	BLANK	NA	7	50	SCREEN	06/19/09 04:41
38	10M73020	BLANK	NA	7	50	SCREEN	06/19/09 05:13
39	10M73021	BLANK	NA	7	50	SCREEN	06/19/09 05:44

Comments

Seq.	Rerun	Dil.	Reason	Analytes
1	X			
File ID: 10M72983				
	Tune failed. DNR.			
4	X	1	Carry-over contamination	
File ID: 10M72986				
	DNR.			

Approved: June 19, 2009

Microbac Laboratories Inc.

Instrument Run Log

00097979

Instrument: HPMS10 Dataset: 061909
Analyst1: TMB Analyst2: WTD
Method: 8260B SOP: MSV01 Rev: 13
Method: 5030C/5035A SOP: PAT01 Rev: 12
Method: 624 SOP: MSV10 Rev: 7
Maintenance Log ID: 29180

Internal Standard: STD33449 Surrogate Standard: STD33442
CCV: STD33415 LCS: STD33452 MS/MSD: STD33452

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: 305192

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	10M73024	BLANK	NA	7	50	SCREEN	06/19/09 11:58
2	10M73025	BLANK	NA	7	50	SCREEN	06/19/09 12:30
3	10M73026	WG305191-01 50ng BFB STD 8260	NA	1	1	STD33315	06/19/09 13:27
4	10M73027	WG305191-02 50ug/L CCV STD 8260	NA	1	1	STD33415	06/19/09 13:53
5	10M73028	RINSE	NA	1	1		06/19/09 14:25
6	10M73029	WG305192-01 VBLK0619 BLANK STD 826	NA	1	1		06/19/09 14:56
7	10M73030	WG305192-02 20ug/L LCS STD 8260	NA	1	1	STD33452	06/19/09 15:28
8	10M73031	L09060485-07 A MS 826-SPE	<2	1	1	STD33452	06/19/09 16:05
9	10M73032	L09060485-08 A MSD 826-SPE	<2	1	1	STD33452	06/19/09 16:36
10	10M73033	WG305192-06 10X FBLK STD 8260	NA	1	10		06/19/09 17:08
11	10M73034	L09060485-13 A 826-SPE	<2	1	1		06/19/09 17:39
12	10M73035	L09060485-12 A 826-SPE	<2	1	1		06/19/09 18:11
13	10M73036	L09060485-01 A 826-SPE	<2	1	1		06/19/09 18:42
14	10M73037	L09060485-02 A 826-SPE	<2	1	1		06/19/09 19:14
15	10M73038	L09060485-03 A 826-SPE	<2	1	1		06/19/09 19:45
16	10M73039	L09060485-05 A 826-SPE	<2	1	1		06/19/09 20:17
17	10M73040	L09060485-06 A 826-SPE	<2	1	1		06/19/09 20:48
18	10M73041	L09060485-09 A 826-SPE	<2	1	1		06/19/09 21:20
19	10M73042	L09060485-10 A 826-SPE	<2	1	1		06/19/09 21:51
20	10M73043	L09060485-11 A 826-SPE	<2	1	1		06/19/09 22:23
21	10M73044	L09060485-04 A 2X 826-SPE	<2	1	2		06/19/09 22:55
22	10M73045	L09060457-01 A 10X 826-TC	<2	17	10		06/19/09 23:26
23	10M73046	L09060501-01 A 826-BETX	<2	1	1		06/19/09 23:58
24	10M73047	RINSE	NA	1	1		06/20/09 00:29
25	10M73048	WG305192-07 624 BLANK	NA	1	1		06/20/09 01:01
26	10M73049	L09060501-04 A 624	<2	2	1		06/20/09 01:33
27	10M73050	RINSE	NA	1	1		06/20/09 02:04
28	10M73051	RINSE	NA	1	1		06/20/09 02:36

Comments

Seq.	Rerun	Dil.	Reason	Analytes
21	X	1	Analyzed too dilute	
File ID: 10M73044				

Approved: June 22, 2009

Microbac

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Microbac Laboratories Inc.

Instrument Run Log

00097980

Instrument: HPMS10 Dataset: 061909

Analyst1: TMB Analyst2: WTD

Method: 8260B SOP: MSV01 Rev: 13

Method: 5030C/5035A SOP: PAT01 Rev: 12

Method: 624 SOP: MSV10 Rev: 7

Maintenance Log ID: 29180

Internal Standard: STD33449 Surrogate Standard: STD33442

CCV: STD33415 LCS: STD33452 MS/MSD: STD33452

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: 305192

Comments:

Comments

Seq.	Rerun	Dil.	Reason	Analytes
23	X	10	Over Calibration Range	benzene
File ID: 10M73046				
26	X	5	Over Calibration Range	tertrachloroethene
File ID: 10M73049				

Approved: June 22, 2009

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Microbac Laboratories Inc.

00097981

Data Checklist

Date: 16-JUN-2009

Analyst: TMB

Analyst: NA

Method: 8260

Instrument: HPMS10

Curve Workgroup: NA

Runlog ID: 28647

Analytical Workgroups: WG304807

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
17-JUN-2009

Tiffany Bailey

Secondary Reviewer:
17-JUN-2009

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-17-2009 15:21:15

Microbac Laboratories Inc.

00097982

Data Checklist

Date: 18-JUN-2009

Analyst: TMB

Analyst: NA

Method: 8260

Instrument: HPMS10

Curve Workgroup: NA

Runlog ID: 28703

Analytical Workgroups: WG304986

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
19-JUN-2009

Tiffany Bailey

Secondary Reviewer:
19-JUN-2009

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-19-2009 16:18:01

Microbac Laboratories Inc.

00097983

Data Checklist

Date: 19-JUN-2009

Analyst: TMB

Analyst: WTD

Method: 8260

Instrument: HPMS10

Curve Workgroup: NA

Runlog ID: 28714

Analytical Workgroups: 305192

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	WTD
Secondary Reviewer	MDA
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
22-JUN-2009

Secondary Reviewer:
22-JUN-2009

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-22-2009 16:21:37

Microbac Laboratories Inc.

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00097984

Analytical Method: 8260B AAB#: WG305192

Login Number: L09060457

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
29ROLLOFFBOX-061609	06/16/09	06/17/09	06/19/09	14	3.62	06/19/09	14	3.62	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 1423330
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.
SURROGATE STANDARDS

00097985

Login Number: L09060457
Instrument Id: HPMS10
Workgroup (AAB#): WG305192

Method: 8260
CAL ID: HPMS10-16-JUN-09
Matrix: Leachate

Sample Number	Dilution	Tag	1	2	3	4
L09060457-01	10.0	DL01	108	100	107	108
WG305192-01	1.00	01	102	98.6	110	107
WG305192-02	1.00	01	102	100	105	107
WG305192-06	10.0	DL01	120	116	132	128
WG305192-07	1.00	01	128	121	133	132

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	80	-	120
2 - Dibromofluoromethane	86	-	118
3 - 4-Bromofluorobenzene	86	-	115
4 - Toluene-d8	88	-	110

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

SURROGATES - Modified 03/06/2008
PDF File ID: 1423339
Report generated: 06/24/2009 08:22

METHOD BLANK SUMMARY

00097986

Login Number: L09060457
Blank File ID: 10M73029
Prep Date: 06/19/09 14:56
Analyzed Date: 06/19/09 14:56
Analyst: TMB

Work Group: WG305192
Blank Sample ID: WG305192-01
Instrument ID: HPMS10
Method: 8260B

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG305192-02	10M73030	06/19/09 15:28	01
FBLK	WG305192-06	10M73033	06/19/09 17:08	DL01
29ROLLOFFBOX-061609	L09060457-01	10M73045	06/19/09 23:26	DL01

Report Name: BLANK_SUMMARY
PDF File ID: 1423331
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.

METHOD BLANK REPORT

00097987

Login Number:L09060457 Prep Date:06/19/09 14:56 Sample ID:WG305192-01
Instrument ID:HPMS10 Run Date:06/19/09 14:56 Prep Method:5030C
File ID:10M73029 Analyst:TMB Method:8260B
Workgroup (AAB#):WG305192 Matrix:Leachate Units:ug/L
Contract #:DACA56-94-D-0020 Cal ID:HPMS10-16-JUN-09

Analytes	SDL	PQL	Concentration	Dilution	Qualifier
Benzene	0.125	5.00	0.125	1	U
Carbon tetrachloride	0.250	5.00	0.250	1	U
Chlorobenzene	0.125	5.00	0.125	1	U
Chloroform	0.125	5.00	0.125	1	U
1,2-Dichloroethane	0.250	5.00	0.250	1	U
1,1-Dichloroethene	0.500	5.00	0.500	1	U
Methyl Ethyl Ketone	2.50	10.0	2.50	1	U
Tetrachloroethene	0.250	5.00	0.250	1	U
Trichloroethene	0.250	5.00	0.250	1	U
Vinyl chloride	0.250	10.0	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	98.6	86 - 118	PASS
1,2-Dichloroethane-d4	102	80 - 120	PASS
Toluene-d8	107	88 - 110	PASS
4-Bromofluorobenzene	110	86 - 115	PASS

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > RL

Report Name:BLANK
PDF ID: 1423332
24-JUN-2009 08:22

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

00097988

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305192-02
Instrument ID: HPMS10 Run Time: 15:28 Prep Method: 5030C
File ID: 10M73030 Analyst: TMB Method: 8260B
Workgroup (AAB#): WG305192 Matrix: Leachate Units: ug/L
QC Key: STD Lot#: STD33316 Cal ID: HPMS10-16-JUN-09

Analytes	Expected	Found	% Rec	LCS Limits	Q
Benzene	20.0	21.6	108	80 - 121	
Carbon tetrachloride	20.0	21.9	110	65 - 140	
Chlorobenzene	20.0	21.1	105	80 - 120	
Chloroform	20.0	21.8	109	80 - 125	
1,2-Dichloroethane	20.0	22.5	112	80 - 129	
1,1-Dichloroethene	20.0	22.2	111	80 - 132	
Methyl Ethyl Ketone	20.0	24.1	121	30 - 150	
Tetrachloroethene	20.0	21.9	109	80 - 124	
Trichloroethene	20.0	20.8	104	80 - 122	
Vinyl chloride	20.0	17.7	88.6	65 - 140	

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	100	86 - 118	PASS
1,2-Dichloroethane-d4	102	80 - 120	PASS
Toluene-d8	107	88 - 110	PASS
4-Bromofluorobenzene	105	86 - 115	PASS

* FAILS %REC LIMIT

LCS - Modified 03/06/2008
PDF File ID: 1423333
Report generated: 06/24/2009 08:22

BFB

Login Number: L09060457
Instrument: HPMS10
Analyst: TMB
Workgroup: WG304807

Tune ID: WG304807-01
Run Date: 06/16/2009
Run Time: 09:40
File ID: 10M72951
Cal ID: HPMS10-16-JUN-09

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	21.6	6171	PASS
75.0	95.0	30.0	60.0	45.8	13089	PASS
95.0	95.0	100	100	100	28585	PASS
96.0	95.0	5.00	9.00	6.81	1948	PASS
173	174	0	2.00	0.756	187	PASS
174	95.0	50.0	100	86.5	24736	PASS
175	174	5.00	9.00	7.31	1808	PASS
176	174	95.0	101	96.4	23845	PASS
177	176	5.00	9.00	7.31	1742	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG304807-06	STD	01	06/16/2009 11:16	
WG304807-05	STD	01	06/16/2009 11:48	
WG304807-04	STD	01	06/16/2009 12:20	
WG304807-03	STD	01	06/16/2009 12:51	
WG304807-02	STD	01	06/16/2009 13:23	
WG304807-07	STD	01	06/16/2009 13:54	
WG304807-08	STD-CCV	01	06/16/2009 14:26	
WG304807-09	STD	01	06/16/2009 14:57	
WG304807-10	STD	01	06/16/2009 15:32	
WG304807-11	STD	01	06/16/2009 16:04	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 1423336
Report generated 06/24/2009 08:22

BFB

Login Number: L09060457
Instrument: HPMS10
Analyst: TMB
Workgroup: WG304985

Tune ID: WG304985-01
Run Date: 06/18/2009
Run Time: 10:08
File ID: 10M72984
Cal ID: HPMS10-16-JUN-09

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	23.5	8462	PASS
75.0	95.0	30.0	60.0	49.2	17738	PASS
95.0	95.0	100	100	100	36069	PASS
96.0	95.0	5.00	9.00	6.95	2508	PASS
173	174	0	2.00	0.435	122	PASS
174	95.0	50.0	100	77.8	28053	PASS
175	174	5.00	9.00	8.22	2307	PASS
176	174	95.0	101	97.8	27445	PASS
177	176	5.00	9.00	7.33	2013	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG304807-12	SSCV	01	06/18/2009 12:23	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 1423336
Report generated 06/24/2009 08:22

BFB

Login Number: L09060457
Instrument: HPMS10
Analyst: TMB
Workgroup: WG305191

Tune ID: WG305191-01
Run Date: 06/19/2009
Run Time: 13:27
File ID: 10M73026
Cal ID: HPMS10-16-JUN-09

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	24.1	6115	PASS
75.0	95.0	30.0	60.0	48.2	12246	PASS
95.0	95.0	100	100	100	25392	PASS
96.0	95.0	5.00	9.00	6.86	1743	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	77.1	19584	PASS
175	174	5.00	9.00	7.23	1416	PASS
176	174	95.0	101	96.3	18852	PASS
177	176	5.00	9.00	6.97	1314	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG305191-02	CCV	01	06/19/2009 13:53	
WG305192-01	BLANK	01	06/19/2009 14:56	
WG305192-02	LCS	01	06/19/2009 15:28	
WG305192-04	MS	01	06/19/2009 16:05	
WG305192-05	MSD	01	06/19/2009 16:36	
WG305192-06	FBLK	DL01	06/19/2009 17:08	
WG305192-03	REF	01	06/19/2009 20:48	
L09060457-01	29ROLLOFFBOX-061609	DL01	06/19/2009 23:26	
WG305192-07	BLANK2	01	06/20/2009 01:01	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 1423336
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

00097992

Login Number: L09060457
Analytical Method: 8260B
ICAL Workgroup: WG304807

Instrument ID: HPMS10
Initial Calibration Date: 16-JUN-09 16:04
Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R^2)	QUAD(R^2)
1,1-Dichloroethene	CCC	0.1754	6.43		
Chloroform	CCC	0.3622	4.91		
Vinyl Chloride	CCC	0.3261	16.5		1.00000
1,1,2,2-Tetrachloroethane	SPCC	0.3600	11.4		
1,1-Dichloroethane	SPCC	0.4451	9.24		
Bromoform	SPCC	0.1312	11.7		
Chlorobenzene	SPCC	0.7483	4.45		
Chloromethane	SPCC	0.4607	6.04		
1,2-Dichloroethane		0.3029	5.69		
2-Butanone		0.06438	4.22		
Benzene		0.7962	4.98		
Carbon Tetrachloride		0.2874	5.88		
Tetrachloroethene		0.2236	3.30		
Trichloroethene		0.2233	6.35		

R = Correlation coefficient; 0.995 minimum
R^2 = Coefficient of determination; 0.99 minimum

If the %RSD is greater than the limit specified by the method or project QAP, then linear or quadratic equations will be used.

INT_CAL - Modified 03/06/2008
PDF File ID: 1423334
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.

INITIAL CALIBRATION DATA

00097993

Login Number: L09060457

Instrument ID: HPMS10

Analytical Method: 8260B

Initial Calibration Date: 16-JUN-09 16:04

Column ID: F

Analyte	WG304807-02			WG304807-03			WG304807-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	NA	NA	NA	0.400	2333.00000	0.1767	1.00	5347.00000	0.1623
Chloroform	0.300	3471.00000	0.3509	0.400	5006.00000	0.3793	1.00	11740.0000	0.3565
Vinyl Chloride	NA	NA	NA	0.400	5145.00000	0.3898	1.00	13436.0000	0.4079
1,1,2,2-Tetrachloroethane	NA	NA	NA	0.400	1484.00000	0.2907	1.00	4122.00000	0.3161
1,1-Dichloroethane	NA	NA	NA	0.400	5173.00000	0.3919	1.00	12589.0000	0.3822
Bromoform	NA	NA	NA	NA	NA	NA	1.00	2791.00000	0.1093
Chlorobenzene	NA	NA	NA	0.400	8014.00000	0.7895	1.00	18660.0000	0.7307
Chloromethane	NA	NA	NA	NA	NA	NA	1.00	16856.0000	0.5118
1,2-Dichloroethane	NA	NA	NA	0.400	3960.00000	0.3000	1.00	9563.00000	0.2904
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	0.400	11075.0000	0.8390	1.00	25279.0000	0.7675
Carbon Tetrachloride	NA	NA	NA	0.400	3738.00000	0.2832	1.00	8760.00000	0.2660
Tetrachloroethene	NA	NA	NA	0.400	2247.00000	0.2214	1.00	5574.00000	0.2183
Trichloroethene	NA	NA	NA	0.400	3207.00000	0.2430	1.00	6943.00000	0.2108

INT_CAL - Modified 03/06/2008

PDF File ID: 1423334

Report generated 06/24/2009 08:22

Login Number: L09060457
Instrument ID: HPMS10
Analytical Method: 8260B
Initial Calibration Date: 16-JUN-09 16:04
Column ID: F

Analyte	WG304807-05			WG304807-06			WG304807-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	2.00	10497.0000	0.1565	5.00	32184.0000	0.1897	20.0	124023.000	0.1852
Chloroform	2.00	22159.0000	0.3304	5.00	64339.0000	0.3793	20.0	256369.000	0.3828
Vinyl Chloride	2.00	21314.0000	0.3178	5.00	53864.0000	0.3176	20.0	197512.000	0.2950
1,1,2,2-Tetrachloroethane	2.00	8958.00000	0.3366	5.00	26379.0000	0.3855	20.0	112209.000	0.4021
1,1-Dichloroethane	2.00	28544.0000	0.4256	5.00	82651.0000	0.4873	20.0	325024.000	0.4854
Bromoform	2.00	5820.00000	0.1120	5.00	16611.0000	0.1259	20.0	74471.0000	0.1418
Chlorobenzene	2.00	36678.0000	0.7058	5.00	104570.000	0.7923	20.0	404949.000	0.7710
Chloromethane	2.00	28804.0000	0.4295	5.00	80322.0000	0.4735	20.0	298224.000	0.4453
1,2-Dichloroethane	2.00	18334.0000	0.2734	5.00	53767.0000	0.3170	20.0	219161.000	0.3273
2-Butanone	NA	NA	NA	5.00	11257.0000	0.06640	20.0	44866.0000	0.06700
Benzene	2.00	50166.0000	0.7480	5.00	142858.000	0.8422	20.0	554439.000	0.8280
Carbon Tetrachloride	2.00	17557.0000	0.2618	5.00	51244.0000	0.3021	20.0	204582.000	0.3055
Tetrachloroethene	2.00	10996.0000	0.2116	5.00	30832.0000	0.2336	20.0	120457.000	0.2294
Trichloroethene	2.00	13901.0000	0.2073	5.00	41222.0000	0.2430	20.0	154108.000	0.2301

INT_CAL - Modified 03/06/2008
PDF File ID: 1423334
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.

INITIAL CALIBRATION DATA

00097995

Login Number: L09060457
Instrument ID: HPMS10
Analytical Method: 8260B
Initial Calibration Date: 16-JUN-09 16:04
Column ID: F

Analyte	WG304807-08			WG304807-09			WG304807-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	50.0	320445.000	0.1830	100	603886.000	0.1755	200	1215117.00	0.1741
Chloroform	50.0	656468.000	0.3749	100	1219808.00	0.3544	200	2450496.00	0.3512
Vinyl Chloride	50.0	516598.000	0.2950	100	893181.000	0.2595	NA	NA	NA
1,1,2,2-Tetrachloroethane	50.0	283725.000	0.4001	100	542474.000	0.3803	200	1057160.00	0.3687
1,1-Dichloroethane	50.0	836289.000	0.4776	100	1572406.00	0.4569	200	3165854.00	0.4537
Bromoform	50.0	195134.000	0.1415	100	385105.000	0.1432	200	777534.000	0.1444
Chlorobenzene	50.0	1038636.00	0.7533	100	1956836.00	0.7277	200	3853817.00	0.7157
Chloromethane	50.0	829127.000	0.4735	100	1516386.00	0.4406	200	3146858.00	0.4510
1,2-Dichloroethane	50.0	555810.000	0.3174	100	1034970.00	0.3007	200	2073162.00	0.2971
2-Butanone	50.0	115106.000	0.06570	100	205872.000	0.05980	200	451942.000	0.06480
Benzene	50.0	1432666.00	0.8182	100	2662108.00	0.7735	200	5254184.00	0.7530
Carbon Tetrachloride	50.0	534015.000	0.3050	100	998331.000	0.2901	200	1993708.00	0.2857
Tetrachloroethene	50.0	318441.000	0.2310	100	590659.000	0.2197	200	1203323.00	0.2235
Trichloroethene	50.0	392136.000	0.2240	100	737347.000	0.2142	200	1492434.00	0.2139

INT_CAL - Modified 03/06/2008
PDF File ID: 1423334
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

00097996

Login Number: L09060457
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 16-JUN-09 16:04
Column ID: F

Analyte	WG304807-11		
	CONC	RESP	RF
1,1-Dichloroethene	NA	NA	NA
Chloroform	NA	NA	NA
Vinyl Chloride	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA
Bromoform	NA	NA	NA
Chlorobenzene	NA	NA	NA
Chloromethane	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA
2-Butanone	300	661670.000	0.06260
Benzene	NA	NA	NA
Carbon Tetrachloride	NA	NA	NA
Tetrachloroethene	NA	NA	NA
Trichloroethene	NA	NA	NA

INT_CAL - Modified 03/06/2008
PDF File ID: 1423334
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

00097997

Login Number: L09060457 Run Date: 06/18/2009 Sample ID: WG304807-12
Instrument ID: HPMS10 Run Time: 12:23 Method: 8260B
File ID: 10M72988 Analyst: TMB QC Key: STD
ICal Workgroup: WG304807 Cal ID: HPMS10 - 16-JUN-09

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Chloroform	CCC	20.0	21.1	ug/L	0.381	5.30	30	
1,1-Dichloroethene	CCC	20.0	21.0	ug/L	0.184	5.00	30	
Vinyl Chloride	CCC	20.0	16.8	ug/L	0.261	16.2	30	
Chlorobenzene	SPCC	20.0	20.3	ug/L	0.761	1.60	30	
Bromoform	SPCC	20.0	20.7	ug/L	0.136	3.60	30	
Chloromethane	SPCC	20.0	19.5	ug/L	0.449	2.60	30	
1,1-Dichloroethane	SPCC	20.0	21.9	ug/L	0.488	9.70	30	
1,1,2,2-Tetrachloroethane	SPCC	20.0	22.4	ug/L	0.403	12.0	30	
Benzene		20.0	20.7	ug/L	0.824	3.50	30	
Carbon Tetrachloride		20.0	20.8	ug/L	0.299	4.10	30	
1,2-Dichloroethane		20.0	21.3	ug/L	0.322	6.40	30	
2-Butanone		20.0	23.7	ug/L	0.0762	18.3	30	
Tetrachloroethene		20.0	20.6	ug/L	0.230	2.90	30	
Trichloroethene		20.0	19.9	ug/L	0.222	0.400	30	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 1423335
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00097998

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305191-02
Instrument ID: HPMS10 Run Time: 13:53 Method: 8260B
File ID: 10M73027 Analyst: TMB QC Key: STD
Workgroup (AAB#): WG305192 Cal ID: HPMS10 - 16-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Chloroform	CCC	50.0	52.5	ug/L	0.380	4.93	20	
1,1-Dichloroethene	CCC	50.0	51.5	ug/L	0.181	3.04	20	
Vinyl Chloride	CCC	50.0	55.8	ug/L	0.321	11.7	20	
1,2-Dichloropropane	CCC	50.0	53.1	ug/L	0.275	6.14	20	
Ethylbenzene	CCC	50.0	54.4	ug/L	0.433	8.82	20	
Toluene	CCC	50.0	54.1	ug/L	1.14	8.16	20	
Chlorobenzene	SPCC	50.0	52.3	ug/L	0.782	4.55	40	
1,1,2,2-Tetrachloroethane	SPCC	50.0	51.1	ug/L	0.368	2.22	40	
1,1-Dichloroethane	SPCC	50.0	55.0	ug/L	0.489	9.91	40	
Bromoform	SPCC	50.0	50.7	ug/L	0.133	1.39	40	
Chloromethane	SPCC	50.0	53.9	ug/L	0.497	7.84	40	
Benzene		50.0	51.4	ug/L	0.819	2.81	40	
Carbon Tetrachloride		50.0	53.7	ug/L	0.309	7.40	40	
1,2-Dichloroethane		50.0	50.9	ug/L	0.308	1.82	40	
2-Butanone		50.0	46.8	ug/L	0.0603	6.41	40	
Tetrachloroethene		50.0	53.5	ug/L	0.239	7.05	40	
Trichloroethene		50.0	50.5	ug/L	0.225	0.954	40	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 1423337
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.

INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

00097999

Login Number: L09060457
Instrument ID: HPMS10
Workgroup (AAB#): WG305192

CCV Number: WG305191-02
CAL ID: HPMS10-16-JUN-09
Matrix: TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG305191-02	NA	NA	327562	644147	858657
Upper Limit	NA	NA	655124	1288294	1717314
Lower Limit	NA	NA	163781	322074	429329
L09060457-01	10.0	DL01	295300	558366	745402
WG305192-01	1.00	01	291958	596687	792063
WG305192-02	1.00	01	322170	626612	828038
WG305192-03	1.00	01	279582	568900	754523
WG305192-04	1.00	01	325055	618466	810669
WG305192-05	1.00	01	328749	621043	808847
WG305192-07	1.00	01	290966	575038	778973

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL_STD - Modified 03/06/2008
PDF File ID: 1423338
Report generated 06/24/2009 08:22

Microbac Laboratories Inc.

INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

00098000

Login Number: L09060457
Instrument ID: HPMS10
Workgroup (AAB#): WG305192

CCV Number: WG305191-02
CAL ID: HPMS10-16-JUN-09
Matrix: TCLP

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG305191-02	NA	NA	17.45	14.44	10.59
Upper Limit	NA	NA	17.95	14.94	11.09
Lower Limit	NA	NA	16.95	13.94	10.09
L09060457-01	10.0	DL01	17.45	14.44	10.59
WG305192-01	1.00	01	17.45	14.44	10.59
WG305192-02	1.00	01	17.45	14.44	10.59
WG305192-03	1.00	01	17.45	14.44	10.59
WG305192-04	1.00	01	17.45	14.44	10.59
WG305192-05	1.00	01	17.45	14.44	10.59
WG305192-07	1.00	01	17.45	14.44	10.58

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL_STD_RT - Modified 03/06/2008
PDF File ID: 1423340
Report generated 06/24/2009 08:22

2.2 Metals Data

2.2.1 Metals I C P Data

2.2.1.1 Summary Data

LABORATORY REPORT

L09060457

00098004

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	6010B	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098005

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Leachate**
Workgroup Number: **WG305228**
Collect Date: **06/16/2009 08:30**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **3015**
Analytical Method: **6010B**
Analyst: **PDM**
Dilution: **1**
Units: **mg/L**

Instrument: **PE-ICP2**
Prep Date: **06/19/2009 07:31**
Cal Date: **06/19/2009 10:05**
Run Date: **06/19/2009 22:23**
File ID: **P2.061909.222304**

Analyte	CAS.Number	Result	Qual	PQL	SDL	EPA HW#	Reg. Limit
Arsenic, TCLP	7440-38-2		U	1	.1	D004	5
Barium, TCLP	7440-39-3	0.294		.1	.025	D005	100
Cadmium, TCLP	7440-43-9		U	.1	.025	D006	1
Chromium, TCLP	7440-47-3		U	.2	.025	D007	5
Lead, TCLP	7439-92-1		U	1	.1	D008	5
Selenium, TCLP	7782-49-2		U	.8	.4	D010	1
Silver, TCLP	7440-22-4		U	.1	.05	D011	5

U Not detected at or above adjusted sample detection limit

2.2.1.2 QC Summary Data

Example 6010 Calculations
Perkin Elmer Optima 4300 DV

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system in ug/mL (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial volume (mL)	50
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/mL (mg/L)	0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (mg/L) (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial weight (g)	1
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/g (mg/kg)	5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:	**Example:**
Cx = Concentration calculated as received (wet basis)	5
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (mg/kg)	6.25

Example 6010 Calculations
Thermo Scientific IRIS Advantage

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system in ug/mL (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial volume (mL)	50
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/mL (mg/L)	0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (mg/L) (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial weight (g)	1
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/g (mg/kg)	5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:	**Example:**
Cx = Concentration calculated as received (wet basis)	5
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (mg/kg)	6.25

Example 6010 Calculations
Thermo Scientific iCAP 6500

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system in ug/mL (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial volume (mL)	50
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/mL (mg/L)	0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (mg/L) (ppm)	0.1
Vf = Final volume (mL)	50
Vi = Initial weight (g)	1
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in ug/g (mg/kg)	5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:	**Example:**
Cx = Concentration calculated as received (wet basis)	5
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (mg/kg)	6.25

TCLP Non-Volatile

Analyst(s): Ruc

Date: 06-18-09

Analyst/Date		Analyst/Date	
Ruc 6/18/09		Ruc 6-19-09	
Time On	Temp On °C	Time Off	Temp Off °C
1330	24	0630	23

Jug #	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
D	06-457-01	ME	1311	FD-256	S/S	100		✓	100.04	2000
D	06-460-02	"	"	FI-752	S	100		✓	100.02	"
N/A	FBLK	"	"	"	N/A	N/A		✓	2000	"
"	06-460-01	" (3PK)	"	Filtered	W	<.5		✓	100	100

RWV 6-18-09

*Matrix Code = (S-solid) (SS-sand, soil or sludge) (P-paint) (O-organic) (W-water or waste)
Agitator speed is 30 ± 2 rpm unless otherwise noted.

Comments: Filtered SY processed @10:00 - Ruc 6-18-09

Peer Review By: _____ Supervisor Review: _____

Microbac Laboratories Inc.
Microwave Digestion Log

00098011

Workgroup: WG305151
Analyst: VC
Spike Analyst: VC
Run Date: 06/19/2009 07:31
Method: 3015

SOP: ME407 Revison 10
Spike Solution: STD27612
Spike Witness: REK
HNO3 Lot #: COA13945
Digest tubes Lot #: COA13926

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG305151-02	BLANK	17	5 mL	50 mL	204.233 g	204.217 g		
2	WG305107-01	FBLK	17	5 mL	50 mL	201.327 g	201.31 g		
3	WG305151-03	LCS	17	5 mL	50 mL	207.734 g	207.724 g	5 mL	
4	L09060457-01	SAMP	17	5 mL	50 mL	210.14 g	210.126 g		06/24/09
5	WG305151-01	REF	17	5 mL	50 mL	209.749 g	209.731 g		
6	L09060460-01	SAMP	17	5 mL	50 mL	209.749 g	209.731 g		06/22/09
7	L09060460-02	SAMP	17	5 mL	50 mL	209.521 g	209.509 g		06/22/09
8	WG305151-04	MS	17	5 mL	50 mL	207.262 g	207.235 g	5 mL	
9	WG305151-05	MSD	17	5 mL	50 mL	209.468 g	209.45 g	5 mL	

Analyst: Vicki Collins

Reviewer:

MW_DIG - Modified 07/02/2008
PDF ID: 1420789
Report generated: 06/19/2009 08:20

Microbac Laboratories Inc.

Instrument Run Log

00098012

Instrument: PE-ICP2 Dataset: 061909H2.CSV

Analyst1: PDM Analyst2: N/A

Method: 6010B SOP: ME660E Rev: 9

Maintenance Log ID: 29168

Calibration Std: STD33163 ICV/CCV Std: STD33465 Post Spike: STD27612

ICSA: STD33438 ICSAB: STD33342 Int. Std: STD32011

Workgroups: 304246,304372 304823,305243,305151,305150,305093

Comments: Sequence 33-42 had to be reanalyzed due to ccv failure for all analytes as a result of the internal standard becoming detached.

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.061909.093649	WG305255-01	Calibration Point		1		06/19/09 09:36
2	P2.061909.094404	WG305255-02	Calibration Point		1		06/19/09 09:44
3	P2.061909.095123	WG305255-03	Calibration Point		1		06/19/09 09:51
4	P2.061909.095832	WG305255-04	Calibration Point		1		06/19/09 09:58
5	P2.061909.100510	WG305255-05	Calibration Point		1		06/19/09 10:05
6	P2.061909.101205	WG305255-06	Initial Calibration Verification		1		06/19/09 10:12
7	P2.061909.101845	WG305255-07	Initial Calib Blank		1		06/19/09 10:18
8	P2.061909.102523	WG305255-08	Interference Check		1		06/19/09 10:25
9	P2.061909.103103	WG305255-09	Interference Check		1		06/19/09 10:31
10	P2.061909.103645	WG305255-10	CCV		1		06/19/09 10:36
11	P2.061909.104325	WG305255-11	CCB		1		06/19/09 10:43
12	P2.061909.105550	L09060397-02	GT090064		2		06/19/09 10:55
13	P2.061909.110227	+1	+1		2		06/19/09 11:02
14	P2.061909.110908	+2	+2		2		06/19/09 11:09
15	P2.061909.111552	+3	+3		2		06/19/09 11:15
16	P2.061909.112227	L09060398-02	GT090061	5/50	2		06/19/09 11:22
17	P2.061909.112916	+1	+1		2		06/19/09 11:29
18	P2.061909.113559	+2	+2		2		06/19/09 11:35
19	P2.061909.114241	+3	+3		2		06/19/09 11:42
20	P2.061909.114918	WG305255-12	CCV		1		06/19/09 11:49
21	P2.061909.115601	WG305255-13	CCB		1		06/19/09 11:56
22	P2.061909.121357	WG305043-02	Method/Prep Blank	5/50	1		06/19/09 12:13
23	P2.061909.122030	WG305043-03	Laboratory Control S	5/50	1		06/19/09 12:20
24	P2.061909.122713	WG305025-01	Fluid Blank		1		06/19/09 12:27
25	P2.061909.123357	WG305043-01	Reference Sample		1	L09060448-01	06/19/09 12:33
26	P2.061909.124036	WG305093-03	Post Digestion Spike		1	L09060448-01	06/19/09 12:40
27	P2.061909.124721	WG305093-04	Serial Dilution		1	L09060448-01	06/19/09 12:47
28	P2.061909.125402	WG305043-04	Matrix Spike	5/50	1	L09060448-01	06/19/09 12:54
29	P2.061909.130040	WG305043-05	Matrix Spike Duplica	5/50	1	L09060448-01	06/19/09 13:00
30	P2.061909.130841	L09060259-03	OUTFALL 009	50/50	1		06/19/09 13:08
31	P2.061909.132118	WG305255-14	CCV		1		06/19/09 13:21
32	P2.061909.132759	WG305255-15	CCB		1		06/19/09 13:27
33	P2.061909.133434	WG305151-02	Method/Prep Blank		1		06/19/09 13:34
34	P2.061909.134114	WG305151-03	Laboratory Control S		1		06/19/09 13:41
35	P2.061909.134751	WG305107-01	Fluid Blank		1		06/19/09 13:47
36	P2.061909.135434	L09060457-01	29ROLLOFFBOX-061609		1		06/19/09 13:54
37	P2.061909.140115	WG305228-01	Post Digestion Spike		1	L09060460-02	06/19/09 14:01

Page: 1 Approved: June 22, 2009

Maren Berry

Microbac

Microbac Laboratories Inc.

Instrument Run Log

00098013

Instrument: PE-ICP2 Dataset: 061909H2.CSV

Analyst1: PDM Analyst2: N/A

Method: 6010B SOP: ME660E Rev: 9

Maintenance Log ID: 29168

Calibration Std: STD33163 ICV/CCV Std: STD33465 Post Spike: STD27612

ICSA: STD33438 ICSAB: STD33342 Int. Std: STD32011

Workgroups: 304246,304372 304823,305243,305151,305150,305093

Comments: Sequence 33-42 had to be reanalyzed due to ccv failure for all analytes as a result of the internal standard becoming detached.

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	P2.061909.140749	WG305228-02	Serial Dilution		5	L09060460-02	06/19/09 14:07
39	P2.061909.141427	WG305151-01	Reference Sample		1	L09060460-01	06/19/09 14:14
40	P2.061909.142109	WG305151-04	Matrix Spike		1	L09060460-01	06/19/09 14:21
41	P2.061909.142743	WG305151-05	Matrix Spike Duplica		1	L09060460-01	06/19/09 14:27
42	P2.061909.143422	L09060460-02	GT090071/BOTTOM		1		06/19/09 14:34
43	P2.061909.144101	WG305255-16	CCV		1		06/19/09 14:41
44	P2.061909.144739	WG305255-17	CCB		1		06/19/09 14:47
45	P2.061909.150311	WG305255-18	CCV		1		06/19/09 15:03
46	P2.061909.150948	WG305255-19	CCB		1		06/19/09 15:09
47	P2.061909.151836	WG304246-03	Louisville Chem Requ		1		06/19/09 15:18
48	P2.061909.152509	L09060060-07	0905GWMSG005-3-U	50/50	1		06/19/09 15:25
49	P2.061909.153149	L09060170-10	SPE-W-SW-04	50/50	20		06/19/09 15:31
50	P2.061909.153829	L09060399-01	AV-GW-ON-B48A-061209	50/50	100		06/19/09 15:38
51	P2.061909.154502	L09060400-03	AV-SUMP-FAB-4-1-061109	50/50	100		06/19/09 15:45
52	P2.061909.155143	L09060400-05	AV-SUMP-FAB-3-061109	50/50	100		06/19/09 15:51
53	P2.061909.160425	L09060400-17	AV-SUMP-SB-4-2-061209	50/50	100		06/19/09 16:04
54	P2.061909.161102	WG305255-20	CCV		1		06/19/09 16:11
55	P2.061909.161746	WG305255-21	CCB		1		06/19/09 16:17
56	P2.061909.162431	WG305148-01	Method/Prep Blank	50/50	1		06/19/09 16:24
57	P2.061909.163104	WG305148-02	Laboratory Control S	50/50	1		06/19/09 16:31
58	P2.061909.163743	WG305148-03	Laboratory Control S	50/50	1		06/19/09 16:37
59	P2.061909.164425	L09060474-01	1	50/50	1		06/19/09 16:44
60	P2.061909.165004	WG305243-01	Post Digestion Spike		1	L09060474-01	06/19/09 16:50
61	P2.061909.165556	WG305243-02	Serial Dilution		5	L09060474-01	06/19/09 16:55
62	P2.061909.170242	L09060474-02	2	50/50	1		06/19/09 17:02
63	P2.061909.170920	L09060475-01	ZIM WS-1	50/50	1		06/19/09 17:09
64	P2.061909.171517	L09060475-04	ZIM WS-2	50/50	1		06/19/09 17:15
65	P2.061909.172103	L09060475-06	ZIM WS-3	50/50	1		06/19/09 17:21
66	P2.061909.172743	WG305255-22	CCV		1		06/19/09 17:27
67	P2.061909.173426	WG305255-23	CCB		1		06/19/09 17:34
68	P2.061909.174109	L09060486-05	0906-ER-SS-41	50/50	1		06/19/09 17:41
69	P2.061909.174742	L09060486-11	0906-ER-SS-21	50/50	1		06/19/09 17:47
70	P2.061909.175422	L09060486-18	0906-ER-SS-01	50/50	1		06/19/09 17:54
71	P2.061909.180102	L09060487-06	0906-ER-VE-21	50/50	1		06/19/09 18:01
72	P2.061909.180736	L09060487-11	0906-ER-VE-41	50/50	1		06/19/09 18:07
73	P2.061909.181416	L09060487-18	0906-ER-VE-01	50/50	1		06/19/09 18:14
74	P2.061909.182057	L09060489-04	13134-W0001	50/50	1		06/19/09 18:20

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Maren Berry

Microbac®

Microbac Laboratories Inc.

Instrument Run Log

00098014

Instrument: PE-ICP2 Dataset: 061909H2.CSV

Analyst1: PDM Analyst2: N/A

Method: 6010B SOP: ME660E Rev: 9

Maintenance Log ID: 29168

Calibration Std: STD33163 ICV/CCV Std: STD33465 Post Spike: STD27612

ICSA: STD33438 ICSAB: STD33342 Int. Std: STD32011

Workgroups: 304246,304372 304823,305243,305151,305150,305093

Comments: Sequence 33-42 had to be reanalyzed due to ccv failure for all analytes as a result of the internal standard becoming detached.

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	P2.061909.182900	L09060491-01	7424-W001	50/50	1		06/19/09 18:29
76	P2.061909.183537	L09060493-01	AV-NCB-SG23-1-061509	50/50	1		06/19/09 18:35
77	P2.061909.184222	L09060493-02	AV-NCB-SG23-1-061509	50/50	1		06/19/09 18:42
78	P2.061909.184900	WG305255-24	CCV		1		06/19/09 18:49
79	P2.061909.185551	WG305255-25	CCB		1		06/19/09 18:55
80	P2.061909.190227	L09060493-03	AV-NCB-EB-1-061509	50/50	1		06/19/09 19:02
81	P2.061909.190900	L09060493-04	AV-NCB-EB-1-061509	50/50	1		06/19/09 19:09
82	P2.061909.191540	WG305150-02	Method/Prep Blank	50/50	1		06/19/09 19:15
83	P2.061909.192221	WG305150-03	Laboratory Control S	50/50	1		06/19/09 19:22
84	P2.061909.192855	WG305150-01	Reference Sample		1	L09060502-01	06/19/09 19:28
85	P2.061909.193543	WG305150-04	Matrix Spike	50/50	1	L09060502-01	06/19/09 19:35
86	P2.061909.194229	WG305150-05	Matrix Spike Duplica	50/50	1	L09060502-01	06/19/09 19:42
87	P2.061909.194907	L09060502-02	010	50/50	1		06/19/09 19:49
88	P2.061909.195554	WG305245-01	Post Digestion Spike		1	L09060502-02	06/19/09 19:55
89	P2.061909.200238	WG305245-02	Serial Dilution		5	L09060502-02	06/19/09 20:02
90	P2.061909.200917	WG305255-26	CCV		1		06/19/09 20:09
91	P2.061909.201605	WG305255-27	CCB		1		06/19/09 20:16
92	P2.061909.202237	L09060502-03	012	50/50	1		06/19/09 20:22
93	P2.061909.202915	L09060502-04	012	50/50	1		06/19/09 20:29
94	P2.061909.203554	L09060502-05	016	50/50	1		06/19/09 20:35
95	P2.061909.204233	L09060502-06	016	50/50	1		06/19/09 20:42
96	P2.061909.204917	L09060502-07	017	50/50	1		06/19/09 20:49
97	P2.061909.205603	L09060502-08	017	50/50	1		06/19/09 20:56
98	P2.061909.210248	L09060502-09	018	50/50	1		06/19/09 21:02
99	P2.061909.210927	L09060502-10	018	50/50	1		06/19/09 21:09
100	P2.061909.211612	L09060508-01	SPRING	50/50	1		06/19/09 21:16
101	P2.061909.212256	L09060508-02	POND UNDERDRAIN	50/50	1		06/19/09 21:22
102	P2.061909.212941	WG305255-28	CCV		1		06/19/09 21:29
103	P2.061909.213619	WG305255-29	CCB		1		06/19/09 21:36
104	P2.061909.214255	L09060508-03	801	50/50	1		06/19/09 21:42
105	P2.061909.214934	L09060508-04	901	50/50	1		06/19/09 21:49
106	P2.061909.215622	L09060511-05	001/COMP.	50/50	1		06/19/09 21:56
107	P2.061909.220307	WG305151-02	Method/Prep Blank	5/50	1		06/19/09 22:03
108	P2.061909.220942	WG305151-03	Laboratory Control S	5/50	1		06/19/09 22:09
109	P2.061909.221619	WG305107-01	Fluid Blank		1		06/19/09 22:16
110	P2.061909.222304	L09060457-01	29ROLLOFFBOX-061609	5/50	1		06/19/09 22:23
111	P2.061909.222951	WG305151-01	Reference Sample		1	L09060460-01	06/19/09 22:29

Page: 3 Approved: June 22, 2009

Maren Berry

Microbac

Microbac Laboratories Inc.

Instrument Run Log

00098015

Instrument: PE-ICP2 Dataset: 061909H2.CSV

Analyst1: PDM Analyst2: N/A

Method: 6010B SOP: ME660E Rev: 9

Maintenance Log ID: 29168

Calibration Std: STD33163 ICV/CCV Std: STD33465 Post Spike: STD27612

ICSA: STD33438 ICSAB: STD33342 Int. Std: STD32011

Workgroups: 304246,304372 304823,305243,305151,305150,305093

Comments: Sequence 33-42 had to be reanalyzed due to ccv failure for all analytes as a result of the internal standard becoming detached.

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
112	P2.061909.223626	WG305151-04	Matrix Spike	5/50	1	L09060460-01	06/19/09 22:36
113	P2.061909.224307	WG305151-05	Matrix Spike Duplica	5/50	1	L09060460-01	06/19/09 22:43
114	P2.061909.224952	WG305255-30	CCV		1		06/19/09 22:49
115	P2.061909.225627	WG305255-31	CCB		1		06/19/09 22:56
116	P2.061909.230300	L09060460-02	GT090071/BOTTOM	5/50	1		06/19/09 23:03
117	P2.061909.230939	WG305228-01	Post Digestion Spike		1	L09060460-02	06/19/09 23:09
118	P2.061909.231621	WG305228-02	Serial Dilution		5	L09060460-02	06/19/09 23:16
119	P2.061909.232306	WG305255-32	CCV		1		06/19/09 23:23
120	P2.061909.232949	WG305255-33	CCB		1		06/19/09 23:29

 Approved: June 22, 2009

Maren Berry

Microbac®

Microbac Laboratories Inc.

00098016

Data Checklist

Date: 19-JUN-2009
Analyst: PDM
Analyst: NA
Method: 6010B
Instrument: PE-ICP2
Curve Workgroup: WG305255
Runlog ID: 28700
Analytical Workgroups: 304246,304372 304823,305243,305151,305150,305093

Calibration/Linearity	X
ICV/CCV	X
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	0060,0170,0399,0400,0474,0475,0486
	0487,0489,0491,0493,0457,0460,
Client Forms	X
Level X	
Level 3	
Level 4	0475,0486,0487,0489,0491,0493,0457
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	PDM
Secondary Reviewer	MMB
Comments	

Primary Reviewer: 22-JUN-2009 Pierce Morris

Secondary Reviewer: 22-JUN-2009 Maren Berry

CHECKLIST1 - Modified 03/05/2008
Generated: JUN-22-2009 14:30:01

Microbac Laboratories Inc.

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00098017

Analytical Method: 6010B AAB#: WG305228

Login Number: L09060457

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
29ROLLOFFBOX-061609	06/16/09	06/17/09	06/19/09	180	2.96	06/19/09	180	0.619	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 1422442
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.

00098018

METHOD BLANK SUMMARY

Login Number:	L09060457	Work Group:	WG305228
Blank File ID:	P2.061909.220307	Blank Sample ID:	WG305151-02
Prep Date:	06/19/09 07:31	Instrument ID:	PE-ICP2
Analyzed Date:	06/19/09 22:03	Method:	6010B
Analyst:	PDM		

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG305151-03	P2.061909.220942	06/19/09 22:09	01
29ROLLOFFBOX-061609	L09060457-01	P2.061909.222304	06/19/09 22:23	01

Report Name: BLANK_SUMMARY
PDF File ID: 1422443
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.

METHOD BLANK REPORT

00098019

Login Number:L09060457 Prep Date:06/19/09 07:31 Sample ID:WG305151-02
Instrument ID:PE-ICP2 Run Date:06/19/09 22:03 Prep Method:3015
File ID:P2.061909.220307 Analyst:PDM Method:6010B
Workgroup (AAB#):WG305228 Matrix:Leachate Units:mg/L
Contract #:DACA56-94-D-0020 Cal ID:PE-ICP-19-JUN-09

Analytes	SDL	PQL	Concentration	Dilution	Qualifier
Arsenic, TCLP	0.100	1.00	0.100	1	U
Barium, TCLP	0.0250	0.100	0.0250	1	U
Cadmium, TCLP	0.0250	0.100	0.0250	1	U
Chromium, TCLP	0.0250	0.200	0.0250	1	U
Lead, TCLP	0.100	1.00	0.100	1	U
Selenium, TCLP	0.400	0.800	0.400	1	U
Silver, TCLP	0.0500	0.100	0.0500	1	U

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > RL

Report Name:BLANK
PDF ID: 1422444
22-JUN-2009 11:19

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

00098020

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305151-03
Instrument ID: PE-ICP2 Run Time: 22:09 Prep Method: 3015
File ID: P2.061909.220942 Analyst: PDM Method: 6010B
Workgroup (AAB#): WG305228 Matrix: Leachate Units: mg/L
QC Key: STD Lot#: STD27612 Cal ID: PE-ICP-19-JUN-09

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, TCLP	2.00	1.94	96.8	85 - 115	
Barium, TCLP	5.00	5.04	101	85 - 115	
Cadmium, TCLP	0.250	0.232	92.7	85 - 115	
Chromium, TCLP	2.50	2.52	101	85 - 115	
Lead, TCLP	2.50	2.46	98.5	85 - 115	
Selenium, TCLP	2.00	1.84	91.8	85 - 115	
Silver, TCLP	2.00	1.96	98.2	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 1422445
Report generated: 06/22/2009 11:19

Loginnum:L09060457 Cal ID: PE-ICP2- Worknum:WG305228
Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG305151-01 File ID:P2.061909.222951 Dil:1 Matrix:WATER
Sample ID:WG305151-04 MS File ID:P2.061909.223626 Dil:1 Units:mg/L
Sample ID:WG305151-05 MSD File ID:P2.061909.224307 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, TCLP	ND	2.00	2.00	100	2.00	1.94	97.2	2.90	80 - 120	20	
Barium, TCLP	0.0251	5.00	5.08	101	5.00	5.09	101	0.306	80 - 120	20	
Cadmium, TCLP	0.121	0.250	0.357	94.2	0.250	0.357	94.5	0.182	80 - 120	20	
Chromium, TCLP	ND	2.50	2.52	101	2.50	2.55	102	1.13	80 - 120	20	
Lead, TCLP	ND	2.50	2.53	101	2.50	2.50	100	0.847	80 - 120	20	
Selenium, TCLP	ND	2.00	1.81	90.3	2.00	1.79	89.5	0.817	80 - 120	20	
Silver, TCLP	ND	2.00	1.97	98.6	2.00	1.98	99.0	0.338	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

WG_MS_MSD_DRYWT - Modified 03/07/2008
PDF File ID:1422446
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
Serial Dilution Report

Login: L09060457 **Worknum:** WG305228
Instrument: PE-ICP2 **Method:** 6010B
Serial Dil: WG305228-02 **File ID:** P2.061909.231621 **Dil:** 5 **Units:** mg/L
Sample: L09060460-02 **File ID:** P2.061909.230300 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	ND	U	ND	U		
Barium	.057	X	.055	X	3.51	
Cadmium	.0801	X	.0795	X	0.75	
Chromium	ND	U	ND	U		
Lead	.0324	F	ND	U		
Selenium	ND	U	ND	U		
Silver	ND	U	ND	U		

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 50 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 50 times the MDL.

SERIAL_DIL - Modified 09/22/2008
PDF File ID: 1422440
06/22/2009 11:23

Sample Login ID: L09060457 **Worknum:** WG305228
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG305228-01 **File ID:** P2.061909.230939 **Dil:** 1 **Units:** mg/L
Sample ID: L09060460-02 **File ID:** P2.061909.230300 **Dil:** 1 **Matrix:** Leachate

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	0.191		0	U	.2	95.4	75 - 125	
BARIUM	0.541		0.0570		.5	97.9	75 - 125	
CADMIUM	0.0932		0.0801		.025	84.3	75 - 125	
CHROMIUM	0.248		0	U	.25	99.0	75 - 125	
LEAD	0.270		0.0324	F	.25	96.2	75 - 125	
SELENIUM	0.193		0	U	.2	96.3	75 - 125	
SILVER	0.193		0	U	.2	96.4	75 - 125	

N = % Recovery exceeds control limits
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation

POST_SPIKE - Modified 03/06/2008
PDF File ID: 1422441
Report generated: 06/22/2009 11:23

Microbac Laboratories Inc.
Initial Calibration Summary

00098024

Login:	**L09060457**	Workgroup (AAB#):	**WG305228**
Analytical Method:	**6010B**	Instrument ID:	**PE-ICP2**
ICAL Worknum:	**WG305255**	Initial Calibration Date:	**19-JUN-2009 10:05**

	WG305255-01		WG305255-02		WG305255-03		WG305255-04		WG305255-05			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ARSENIC	0	0.199	NA	NA	.008	3.09	.4	194	.8	393	.999974	
BARIUM	0	-131	.01	731	.02	1460	1	71700	2	143000	.999998	
CADMIUM	0	45.9	.0005	14.9	.001	33.5	.05	1720	.1	3440	.999999	
CHROMIUM	0	62.9	.005	196	.01	389	.5	19200	1	38300	.999998	
LEAD	0	28.2	.005	13.3	.01	26.5	.5	1410	1	2800	.999989	
SELENIUM	0	0.464	NA	NA	.008	2.96	.4	98.6	.8	195	.999979	
SILVER	0	-882	.004	469	.008	1010	.4	46500	.8	93800	.999991	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 1422449
Report generated: 22-JUN-2009 11:19

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

00098025

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-07
Instrument ID: PE-ICP2 Run Time: 10:18 Method: 6010
File ID: P2.061909.101845 Analyst: PDM Units: mg/L
Workgroup (AAB#): WG305228 Cal ID: PE-ICP2 - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.01	.1	.01	U
BARIUM	.0025	.01	.0025	U
CADMIUM	.0025	.01	.0025	U
CHROMIUM	.0025	.02	.0025	U
LEAD	.01	.1	.01	U
SELENIUM	.04	.08	.04	U
SILVER	.005	.01	.005	U

ICB - Modified 03/06/2008
PDF File ID: 1422451
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

00098026

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-11

Instrument ID: PE-ICP2 Run Time: 10:43 Method: 6010B

File ID: P2.061909.104325 Analyst: PDM Units: mg/L

Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09

Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.0100	0.100	0.0100	U
Barium	0.00250	0.0100	0.00250	U
Cadmium	0.00250	0.0100	0.00250	U
Chromium	0.00250	0.0200	0.00250	U
Lead	0.0100	0.100	0.0100	U
Selenium	0.0400	0.0800	0.0400	U
Silver	0.00500	0.0100	0.00500	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1422454
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098027

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-29
Instrument ID: PE-ICP2 Run Time: 21:36 Method: 6010B
File ID: P2.061909.213619 Analyst: PDM Units: mg/L
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.0100	0.100	0.0100	U
Barium	0.00250	0.0100	0.00250	U
Cadmium	0.00250	0.0100	0.00250	U
Chromium	0.00250	0.0200	0.00250	U
Lead	0.0100	0.100	0.0100	U
Selenium	0.0400	0.0800	0.0400	U
Silver	0.00500	0.0100	0.00500	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1422454
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098028

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-31
Instrument ID: PE-ICP2 Run Time: 22:56 Method: 6010B
File ID: P2.061909.225627 Analyst: PDM Units: mg/L
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.0100	0.100	0.0100	U
Barium	0.00250	0.0100	0.00250	U
Cadmium	0.00250	0.0100	0.00250	U
Chromium	0.00250	0.0200	0.00250	U
Lead	0.0100	0.100	0.0100	U
Selenium	0.0400	0.0800	0.0400	U
Silver	0.00500	0.0100	0.00500	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1422454
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098029

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-33
Instrument ID: PE-ICP2 Run Time: 23:29 Method: 6010B
File ID: P2.061909.232949 Analyst: PDM Units: mg/L
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.0100	0.100	0.0100	U
Barium	0.00250	0.0100	0.00250	U
Cadmium	0.00250	0.0100	0.00250	U
Chromium	0.00250	0.0200	0.00250	U
Lead	0.0100	0.100	0.0100	U
Selenium	0.0400	0.0800	0.0400	U
Silver	0.00500	0.0100	0.00500	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1422454
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

00098030

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-06
Instrument ID: PE-ICP2 Run Time: 10:12 Method: 6010B
File ID: P2.061909.101205 Analyst: PDM Units: mg/L
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Arsenic		.4	0.396	99.0	90 - 110	
Barium		1	0.988	98.8	90 - 110	
Cadmium		.05	0.0482	96.4	90 - 110	
Chromium		.5	0.498	99.6	90 - 110	
Lead		.5	0.495	99.1	90 - 110	
Selenium		.4	0.404	101	90 - 110	
Silver		.4	0.397	99.2	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 1422450
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098031

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-10
Instrument ID: PE-ICP2 Run Time: 10:36 Method: 6010B
File ID: P2.061909.103645 Analyst: PDM QC Key: STD
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.398	mg/L	99.4	90 - 110		
Barium		1.00	0.988	mg/L	98.8	90 - 110		
Cadmium		0.0500	0.0486	mg/L	97.2	90 - 110		
Chromium		0.500	0.496	mg/L	99.2	90 - 110		
Lead		0.500	0.498	mg/L	99.5	90 - 110		
Selenium		0.400	0.400	mg/L	99.9	90 - 110		
Silver		0.400	0.398	mg/L	99.5	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1422453
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098032

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-28
Instrument ID: PE-ICP2 Run Time: 21:29 Method: 6010B
File ID: P2.061909.212941 Analyst: PDM QC Key: STD
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.394	mg/L	98.6	90 - 110		
Barium		1.00	0.972	mg/L	97.2	90 - 110		
Cadmium		0.0500	0.0471	mg/L	94.2	90 - 110		
Chromium		0.500	0.490	mg/L	98.0	90 - 110		
Lead		0.500	0.488	mg/L	97.6	90 - 110		
Selenium		0.400	0.401	mg/L	100	90 - 110		
Silver		0.400	0.391	mg/L	97.6	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1422453
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098033

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-30
Instrument ID: PE-ICP2 Run Time: 22:49 Method: 6010B
File ID: P2.061909.224952 Analyst: PDM QC Key: STD
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.386	mg/L	96.4	90 - 110		
Barium		1.00	0.983	mg/L	98.3	90 - 110		
Cadmium		0.0500	0.0471	mg/L	94.2	90 - 110		
Chromium		0.500	0.494	mg/L	98.9	90 - 110		
Lead		0.500	0.492	mg/L	98.5	90 - 110		
Selenium		0.400	0.400	mg/L	99.9	90 - 110		
Silver		0.400	0.390	mg/L	97.6	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1422453
Report generated 06/22/2009 11:19

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098034

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305255-32
Instrument ID: PE-ICP2 Run Time: 23:23 Method: 6010B
File ID: P2.061909.232306 Analyst: PDM QC Key: STD
Workgroup (AAB#): WG305228 Cal ID: PE-ICP - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.392	mg/L	97.9	90 - 110		
Barium		1.00	0.982	mg/L	98.2	90 - 110		
Cadmium		0.0500	0.0475	mg/L	94.9	90 - 110		
Chromium		0.500	0.494	mg/L	98.7	90 - 110		
Lead		0.500	0.496	mg/L	99.1	90 - 110		
Selenium		0.400	0.389	mg/L	97.2	90 - 110		
Silver		0.400	0.387	mg/L	96.9	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1422453
Report generated 06/22/2009 11:19

Login number: L09060457 **Workgroup (AAB#):** WG305228
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG305255-08 **File ID:** P2.061909.102523 **Units:** mg/L
Sol. AB : WG305255-09 **File ID:** P2.061909.103103 **Matrix:** Leachate

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Arsenic	NS	-0.00150	NS	0.250	0.243	97.2	
Barium	NS	0.000670	NS	0.250	0.247	98.8	
Cadmium	NS	-0.000120	NS	0.500	0.422	84.4	
Chromium	NS	-0.0000500	NS	0.250	0.245	98.0	
Lead	NS	0.00236	NS	0.500	0.482	96.4	
Selenium	NS	-0.00255	NS	0.250	0.255	102	
Silver	NS	0.000230	NS	0.500	0.511	102	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	396.15	0	0	0.206	0	0
ANTIMONY	206.84	0	0	-0.740	0	0
ARSENIC	188.98	0	-0.00216	0	0	0
BARIUM	233.53	0	0	0	0	0
BERYLLIUM	234.86	0	0	0	0	0
BORON	249.68	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	227.55	0	-0.370	0.0414	0	0
CHROMIUM	267.72	0	0	0	0	0
COBALT	228.62	0	0	0	0	-1.07
COPPER	327.39	0	0	0	0	0
IRON	239.56	0	0	0	0	0
LEAD	220.35	0	-0.107	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0	0	0	0
MANGANESE	257.61	-0.185	0	-0.231	-0.0949	-0.230
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	0.207	0	0	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0	0.200	0	0.0400
ZINC	206.20	0	0.0753	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	396.15	0	0.274	0	0	0
ANTIMONY	206.84	0	0	0	0	19.8
ARSENIC	188.98	0	-0.00673	-0.0875	0	-2.91
BARIUM	233.53	0	0	0	0	0
BERYLLIUM	234.86	0	0	0	0	-0.0105
BORON	249.68	0	0	50.1	3.51	1.50
CADMIUM	228.80	0	0	0	-5.41	0
CALCIUM	227.55	0	0	0	126	-21.8
CHROMIUM	267.72	0	0	0	0	0
COBALT	228.62	0	0	0	0	0.156
COPPER	327.39	0	0	0	0.380	-0.0467
IRON	239.56	0	0.0227	0	1.91	0.331
LEAD	220.35	0	-0.0247	0	0.666	-0.0700
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0.638	0	0	0
MANGANESE	257.61	-1.04	0.0280	-0.755	-0.0418	-0.110
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	0.623	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	0.0190	0	-0.633	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	0	-0.0100	0	0.953	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	-0.0233	0	0	0.297
VANADIUM	290.88	0	-0.00100	0	0	0
ZINC	206.20	0	-0.0333	15.3	0	-7.08

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	396.15	0	0.108	0	0	0
ANTIMONY	206.84	0	0	0	0	0
ARSENIC	188.98	0	0.00251	0	0	0
BARIUM	233.53	0	0.0520	0	0	0
BERYLLIUM	234.86	0	0.152	0	0	0
BORON	249.68	0	-4.02	0	0	0
CADMIUM	228.80	0	-0.00274	0	0	0
CALCIUM	227.55	-2.44	-4.01	0	0	0.104
CHROMIUM	267.72	0	-0.0239	0	0	0
COBALT	228.62	0	0.00949	0	0	0
COPPER	327.39	0	-0.0851	0	0.154	0.0143
IRON	239.56	0	0	0	0	0.0276
LEAD	220.35	0.551	0.103	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0.174	0	0	0
MANGANESE	257.61	-0.0457	-0.156	-0.0181	-0.794	0.0147
MOLYBDENUM	202.03	0	-0.0494	0	0	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.49	0	-0.0451	0	0	0
SELENIUM	196.03	0	-1.01	0	0	-0.0113
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0.0717	-0.00209	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0.138	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0.0715	0	0	-0.0400
ZINC	206.20	-0.200	-0.0563	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	MN	MO	NA	NI	PB
ALUMINUM	396.15	0	32.9	0	0	0
ANTIMONY	206.84	0	-17.4	0	0	0
ARSENIC	188.98	0	3.66	0	0	0
BARIUM	233.53	0	-0.548	0	0	0
BERYLLIUM	234.86	-0.131	-0.529	0	-0.00974	0
BORON	249.68	0	-2.08	0	0	0
CADMIUM	228.80	0	0.0112	0	-0.0299	0
CALCIUM	227.55	0	-18.6	0	-1090	0
CHROMIUM	267.72	0.434	-0.00100	0	0	0
COBALT	228.62	0	-0.835	0	0.129	0
COPPER	327.39	0.136	-0.0774	0	0.150	0.257
IRON	239.56	0.480	0	0	0	0.407
LEAD	220.35	0.0756	-2.50	0	-0.174	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	-5.58	0	0	0.0252
MANGANESE	257.61	0	-0.0482	-0.00916	-0.0340	-0.0413
MOLYBDENUM	202.03	-0.209	0	0	0.120	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.49	0	0	1.00	0	0
SELENIUM	196.03	0.451	0.199	0	0.0799	0
SILICON	251.61	0	12.9	0	0	0
SILVER	328.07	0.130	0.0781	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	-0.00100	1.20	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0.578	0	0	0
ZINC	206.20	0	0.180	0	-0.200	-0.100

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	SB	SE	SI	SN	SR
ALUMINUM	396.15	0	0	0	0	0
ANTIMONY	206.84	0	0	0	-10.6	0
ARSENIC	188.98	0	0	0	0	0
BARIUM	233.53	0	0	0	0	0
BERYLLIUM	234.86	0	0	0	0	0
BORON	249.68	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	227.55	0	0	2.79	0	0
CHROMIUM	267.72	0	0	0	0	0
COBALT	228.62	0	0	0	0	0
COPPER	327.39	0	0.148	0	0	0
IRON	239.56	0	0	0	0	0
LEAD	220.35	-0.0100	0	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	-0.0924	0	0	0
MANGANESE	257.61	-0.0505	-0.0281	-0.185	-0.0445	-0.625
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	-0.0500	-0.0100	0	0	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	0	0	0	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0.200
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0	0	0	0
ZINC	206.20	-0.300	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 02/02/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	TI	TL	V	ZN
ALUMINUM	396.15	0	0	0	0
ANTIMONY	206.84	0	0	-3.59	0
ARSENIC	188.98	0	0	0.0930	0
BARIUM	233.53	0	0	-1.83	0
BERYLLIUM	234.86	0	0	0	0
BORON	249.68	0	0	0	0
CADMIUM	228.80	0	0	0.0940	0
CALCIUM	227.55	0	0	19.1	0
CHROMIUM	267.72	0	0	-0.567	-0.0400
COBALT	228.62	2.21	0	0	0
COPPER	327.39	-1.05	0	-0.603	0
IRON	239.56	0	0	0	-0.0613
LEAD	220.35	-0.441	0	-0.150	0
LITHIUM	670.78	0	0	0	0
MAGNESIUM	279.08	0	0	-0.0280	0
MANGANESE	257.61	-0.00931	-0.0414	-0.0601	-0.0553
MOLYBDENUM	202.03	0	0	-0.288	0
NICKEL	231.60	0	0.617	0	0
POTASSIUM	766.49	0	0	0	0
SELENIUM	196.03	-0.220	0	0.823	0
SILICON	251.61	0	0	0	0
SILVER	328.07	0	0	-5.47	0
SODIUM	589.59	0	0	0	0
STRONTIUM	407.77	0	0	0	0
THALLIUM	190.80	-4.00	0	0	0
TIN	189.93	0	0	0	0
TITANIUM	334.94	0	0	0	0
VANADIUM	290.88	0	0	0	0
ZINC	206.20	0	0	-0.100	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 1422448
Report generated: 06/22/2009 11:19

Login Number: L09060457 **Date:** 03/25/2009
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Integration Time (Sec.)	Concentration (mg/L)
Aluminum	10.00	450.0
Antimony	10.00	45.0
Arsenic	10.00	9.0
Barium	10.00	9.0
Beryllium	10.00	4.5
Boron	10.00	45.0
Cadmium	10.00	9.0
Calcium	10.00	450.0
Chromium	10.00	45.0
Cobalt	10.00	45.0
Copper	10.00	45.0
Iron	10.00	450.0
Lead	10.00	90.0
Lithium	10.00	1.8
Magnesium	10.00	450.0
Manganese	10.00	27.0
Molybdenum	10.00	45.0
Nickel	10.00	45.0
Potassium	10.00	90.0
Selenium	10.00	45.0
Silicon	10.00	36.0
Silver	10.00	9.0
Sodium	10.00	180.0
Strontium	10.00	4.5
Thallium	10.00	45.0
Tin	10.00	45.0
Titanium	10.00	45.0
Vanadium	10.00	45.0
Zinc	10.00	45.0

Comments:
All analytes passed acceptance criteria at the specified concentration.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 1422447
Report generated: 06/22/2009 11:19

2.2.2 Metals CVAA Data (Mercury)

2.2.2.1 Summary Data

LABORATORY REPORT

L09060457

00098045

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	7470A	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098046

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Leachate**
Workgroup Number: **WG305251**
Collect Date: **06/16/2009 08:30**
Sample Tag: **01**

PrePrep Method: **1311**
Prep Method: **7470A**
Analytical Method: **7470A**
Analyst: **ADC**
Dilution: **1**
Units: **mg/L**

Instrument: **HYDRA**
Prep Date: **06/19/2009 07:26**
Cal Date: **06/19/2009 16:09**
Run Date: **06/19/2009 16:31**
File ID: **HY.061909.163144**

Analyte	CAS.Number	Result	Qual	PQL	SDL	EPA HW#	Reg. Limit
Mercury	7439-97-6		U	.002	.001	D009	.2

U Not detected at or above adjusted sample detection limit

2.2.2.2 QC Summary Data

Example Cold Vapor Mercury Calculations
Hydra AA Mercury Analyzer

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and five standards.

2.0 Calculating the concentration (C) of an element in water using data from run log and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Diluted to Volume (mL)	40
Vi = Aliquot Volume (mL)	40
D = Manual dilution factor, if required (10X = 10)	1
Cx = Concentration of element in ppb (ug/L)	0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Ws} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Diluted to volume (mL)	40
Ws = Aliquot weight (g)	0.6
D = Manual dilution factor	1
Cx = Concentration of element in ug/kg	6.67

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

1 Cx = Concentration calculated as received (wet basis)	6.67
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (ug/kg)	8.33

8.33 ug/kg = 0.00833 mg/kg

TCLP Non-Volatile

Analyst(s): Ruc

Date: 06-18-09

Analyst/Date		Analyst/Date	
Ruc 6/18/09		Ruc 6-19-09	
Time On	Temp On °C	Time Off	Temp Off °C
1330	24	0630	23

Jug #	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction Yes	Size Reduction No	Int. Wt. (g)	Fluid Vol. (mL)
D	06-457-01	ME	1311	FD-256	S/S	100		✓	100.04	2000
D	06-460-02	"	"	FI-752	S	100		✓	100.02	"
N/A	FBLK	"	"	"	N/A	N/A		✓	2000	"
"	06-460-01	" (SPK)	"	Filtered	W	<1.5		✓	100	100

RW 6-18-09

*Matrix Code = (S-solid) (SS-sand, soil or sludge) (P-paint) (O-organic) (W-water or waste)
Agitator speed is 30 ± 2 rpm unless otherwise noted.

Comments: Filtered SY processed @10:00 - Ruc 6-18-09

Peer Review By: _____ Supervisor Review: _____

Microbac Laboratories Inc.
Metals Digest Log

00098050

Workgroup: WG305154
Analyst: REK
Spike Analyst: REK
Method: 7470A
Run Date: 06/19/2009 07:26
Hotblock Start Temp: 95.2 @ 07:20
Hotblock End Temp: 94.7 @ 09:20

SOP: ME404 Revison 11
Spike Solution: STD33456
Spike Witness: VC
H2SO4 Lot #: COA13254
Digest tubes Lot #: COA13926
HNO3 Lot #: COA13945
KMnO4 1:1 Lot #: RGT13913
K2S2O8 1:1 Lot #: RGT13949
Mercury Water ICV Lot #: STD33458
HG H2O STDS 10PPM Lot #: STD33464

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Spike Amount	Due Date
1	WG305154-02	BLANK	1	40 mL	40 mL		
2	WG305107-01	FBLK	17	4 mL	40 mL		
3	WG305154-06	FLT_BLK	1	40 mL	40 mL		
4	WG305154-03	LCS	1	40 mL	40 mL	4 mL	
5	L09060457-01	SAMP	17	4 mL	40 mL		06/24/09
6	WG305154-01	REF	17	4 mL	40 mL		
7	L09060460-01	SAMP	17	4 mL	40 mL		06/22/09
8	L09060460-02	SAMP	17	4 mL	40 mL		06/22/09
9	L09060466-01	SAMP	2	40 mL	40 mL		06/26/09
10	L09060474-01	SAMP	1	40 mL	40 mL		06/24/09
11	L09060474-02	SAMP	1	40 mL	40 mL		06/24/09
12	L09060475-01	SAMP	1	40 mL	40 mL		06/26/09
13	L09060475-04	SAMP	1	40 mL	40 mL		06/26/09
14	L09060475-06	SAMP	1	40 mL	40 mL		06/26/09
15	L09060481-01	SAMP	1	40 mL	40 mL		06/26/09
16	L09060481-02	SAMP	1	40 mL	40 mL		06/26/09
17	L09060481-03	SAMP	1	40 mL	40 mL		06/26/09
18	L09060481-04	SAMP	1	40 mL	40 mL		06/26/09
19	L09060481-05	SAMP	1	40 mL	40 mL		06/26/09
20	L09060481-06	SAMP	1	40 mL	40 mL		06/26/09
21	L09060481-07	SAMP	1	40 mL	40 mL		06/26/09
22	L09060528-01	SAMP	1	40 mL	40 mL		06/22/09
23	L09060528-03	SAMP	1	40 mL	40 mL		06/22/09
24	WG305154-04	MS	1	4 mL	40 mL	4 mL	
25	WG305154-05	MSD	1	4 mL	40 mL	4 mL	

Analyst:

Reviewer:

BLOCK_DIG - Modified 07/22/2008
PDF ID: 1421485
Report generated: 06/19/2009 13:46

Microbac®

Microbac Laboratories Inc.

Instrument Run Log

00098051

Instrument: HYDRA Dataset: 061909B.PRN

Analyst1: ADC Analyst2: N/A

Method: 7470A SOP: 404 Rev: 11

Maintenance Log ID: 29173

Calibration Std: STD33464 ICV/CCV Std: STD33458 Post Spike: STD33464

ICSA: N/A ICSAB: N/A Int. Std:

Workgroups: WG305251

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	HY.061909.160027	WG305303-01	Calibration Point		1		06/19/09 16:00
2	HY.061909.160211	WG305303-02	Calibration Point		1		06/19/09 16:02
3	HY.061909.160359	WG305303-03	Calibration Point		1		06/19/09 16:03
4	HY.061909.160556	WG305303-04	Calibration Point		1		06/19/09 16:05
5	HY.061909.160752	WG305303-05	Calibration Point		1		06/19/09 16:07
6	HY.061909.160938	WG305303-06	Calibration Point		1		06/19/09 16:09
7	HY.061909.161126	WG305303-07	Initial Calibration Verification		1		06/19/09 16:11
8	HY.061909.161312	WG305303-08	Initial Calib Blank		1		06/19/09 16:13
9	HY.061909.161508	WG305303-09	CCV		1		06/19/09 16:15
10	HY.061909.161656	WG305303-10	CCB		1		06/19/09 16:16
11	HY.061909.161851	WG305154-02	Method/Prep Blank	40/40	1		06/19/09 16:18
12	HY.061909.162046	WG305154-03	Laboratory Control S	40/40	1		06/19/09 16:20
13	HY.061909.162239	WG305107-01	Fluid Blank		1		06/19/09 16:22
14	HY.061909.162420	WG305154-06	Filter Blank		1		06/19/09 16:24
15	HY.061909.162606	L09060528-01	W-SVE-091609		1		06/19/09 16:26
16	HY.061909.162811	WG305251-02	Post Digestion Spike		1	L09060528-01	06/19/09 16:28
17	HY.061909.162953	L09060528-03	W-SVE-091609	40/40	1		06/19/09 16:29
18	HY.061909.163144	L09060457-01	29ROLLOFFBOX-061609	4/40	1		06/19/09 16:31
19	HY.061909.163327	WG305251-01	Post Digestion Spike		1	L09060457-01	06/19/09 16:33
20	HY.061909.163523	WG305303-11	CCV		1		06/19/09 16:35
21	HY.061909.163746	WG305303-12	CCB		1		06/19/09 16:37
22	HY.061909.164001	L09060460-01	GT090070	4/40	1	WG305154-01	06/19/09 16:40
23	HY.061909.164148	WG305154-04	Matrix Spike	4/40	1	L09060460-01	06/19/09 16:41
24	HY.061909.164339	WG305154-05	Matrix Spike Duplica	4/40	1	L09060460-01	06/19/09 16:43
25	HY.061909.164520	L09060460-02	GT090071/BOTTOM	4/40	1		06/19/09 16:45
26	HY.061909.164743	L09060466-01	OUTFALL 002 / GRAB	40/40	1		06/19/09 16:47
27	HY.061909.164935	L09060474-01	1	40/40	1		06/19/09 16:49
28	HY.061909.165117	L09060474-02	2	40/40	1		06/19/09 16:51
29	HY.061909.165259	WG305303-13	CCV		1		06/19/09 16:52
30	HY.061909.165454	WG305303-14	CCB		1		06/19/09 16:54
31	HY.061909.165647	L09060475-01	ZIM WS-1	40/40	1		06/19/09 16:56
32	HY.061909.165829	L09060475-04	ZIM WS-2	40/40	1		06/19/09 16:58
33	HY.061909.170032	L09060475-06	ZIM WS-3	40/40	1		06/19/09 17:00
34	HY.061909.170306	L09060481-01	GT090032	40/40	1		06/19/09 17:03
35	HY.061909.170447	L09060481-02	GT090033	40/40	1		06/19/09 17:04
36	HY.061909.170632	L09060481-03	GT090034	40/40	1		06/19/09 17:06
37	HY.061909.170816	L09060481-04	GT090035	40/40	1		06/19/09 17:08

Page: 1 Approved: June 22, 2009

Maren Berry

Microbac

Microbac Laboratories Inc.

Instrument Run Log

00098052

Instrument: HYDRA Dataset: 061909B.PRN

Analyst1: ADC Analyst2: N/A

Method: 7470A SOP: 404 Rev: 11

Maintenance Log ID: 29173

Calibration Std: STD33464 ICV/CCV Std: STD33458 Post Spike: STD33464

ICSA: N/A ICSAB: N/A Int. Std:

Workgroups: WG305251

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	HY.061909.171017	L09060481-05	GT090036	40/40	1		06/19/09 17:10
39	HY.061909.171210	L09060481-06	GT090037	40/40	1		06/19/09 17:12
40	HY.061909.171353	L09060481-07	GT090038	40/40	1		06/19/09 17:13
41	HY.061909.171534	WG305303-15	CCV		1		06/19/09 17:15
42	HY.061909.171727	WG305303-16	CCB		1		06/19/09 17:17
43	HY.061909.171912	L09060528-01	W-SVE-091609	40/40	2		06/19/09 17:19
44	HY.061909.172056	WG305251-02	Post Digestion Spike		2	L09060528-01	06/19/09 17:20
45	HY.061909.172240	WG305251-03	Serial Dilution		10	L09060528-01	06/19/09 17:22
46	HY.061909.172423	WG305303-17	CCV		1		06/19/09 17:24
47	HY.061909.172624	WG305303-18	CCB		1		06/19/09 17:26

Comments

Seq.	Rerun	Dil.	Reason	Analytes
15	X	2	Over Calibration Range	HG
16	X	2	Over Calibration Range	HG

Approved: June 22, 2009

Maren Berry

Microbac®

Microbac Laboratories Inc.

Data Checklist

00098053

Date: 19-JUN-2009
Analyst: ADC
Analyst: NA
Method: 7470A
Instrument: HYDRA
Curve Workgroup: WG305303
Runlog ID: 28706
Analytical Workgroups: WG305251

Calibration/Linearity	X
ICV/CCV	X
ICB/CCB	X
ICSA/ICSAB	
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	0457, 0460, 0475, 0481, 0528
Client Forms	X
Level X	
Level 3	0457
Level 4	0475, 0528
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	ADC
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
22-JUN-2009

Secondary Reviewer:
22-JUN-2009

CHECKLIST1 - Modified 03/05/2008
Generated: JUN-22-2009 10:38:33

Microbac Laboratories Inc.

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00098054

Analytical Method: 7470A AAB#: WG305251

Login Number: L09060457

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
29ROLLOFFBOX-061609	06/16/09	06/17/09	06/19/09	28	2.96	06/19/09	28	0.379	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 1421953
Report generated 06/22/2009 09:21

METHOD BLANK SUMMARY

00098055

Login Number: L09060457
Blank File ID: HY.061909.161851
Prep Date: 06/19/09 07:26
Analyzed Date: 06/19/09 16:18
Analyst: ADC

Work Group: WG305251
Blank Sample ID: WG305154-02
Instrument ID: HYDRA
Method: 7470A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG305154-03	HY.061909.162046	06/19/09 16:20	01
FLT_BLK	WG305154-06	HY.061909.162420	06/19/09 16:24	01
29ROLLOFFBOX-061609	L09060457-01	HY.061909.163144	06/19/09 16:31	01

Report Name: BLANK_SUMMARY
PDF File ID: 1421954
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.

METHOD BLANK REPORT

00098056

Login Number: L09060457 Prep Date: 06/19/09 07:26 Sample ID: WG305154-02
Instrument ID: HYDRA Run Date: 06/19/09 16:18 Prep Method: 7470A
File ID: HY.061909.161851 Analyst: ADC Method: 7470A
Workgroup (AAB#): WG305251 Matrix: Leachate Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: HYDRA-19-JUN-09

Analytes	SDL	PQL	Concentration	Dilution	Qualifier
Mercury	0.000100	0.000200	0.000100	1	U

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > RL

Report Name:BLANK
PDF ID: 1421955
22-JUN-2009 09:21

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

00098057

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305154-03
Instrument ID: HYDRA Run Time: 16:20 Prep Method: 7470A
File ID: HY.061909.162046 Analyst: ADC Method: 7470A
Workgroup (AAB#): WG305251 Matrix: Leachate Units: mg/L
QC Key: STD Lot#: STD33456 Cal ID: HYDRA-19-JUN-09

Analytes	Expected	Found	% Rec	LCS Limits	Q
Mercury	0.00400	0.00425	106	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 1421956
Report generated: 06/22/2009 09:21

Microbac Laboratories Inc.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00098058

Loginnum:L09060457 Cal ID:HYDRA- Worknum:WG305251

Instrument ID:HYDRA Contract #:DACA56-94-D-0020 Method:7470A

Parent ID:WG305154-01 File ID:HY.061909.164001 Dil:1 Matrix:WATER

Sample ID:WG305154-04 MS File ID:HY.061909.164148 Dil:1 Units:mg/L

Sample ID:WG305154-05 MSD File ID:HY.061909.164339 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Mercury	ND	0.0400	0.0356	89.0	0.0400	0.0348	87.0	2.27	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

WG_MS_MSD_DRYWT - Modified 03/07/2008

PDF File ID:1421957

Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
POST SPIKE REPORT

00098059

Sample Login ID: L09060457 **Worknum:** WG305251
Instrument ID: HYDRA **Method:** 7470A
Post Spike ID: WG305251-01 **File ID:** HY.061909.163327 **Dil:** 1 **Units:** ug/L
Sample ID: L09060457-01 **File ID:** HY.061909.163144 **Dil:** 1 **Matrix:** Leachate

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
MERCURY	1.06		0	U	1	106.0	85 - 115	

N = % Recovery exceeds control limits
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation

POST_SPIKE - Modified 03/06/2008
PDF File ID: 1421952
Report generated: 06/22/2009 09:21

Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

00098060

Login Number: L09060457
Analytical Method: 7470A
ICAL Worknum: WG305303

Workgroup (AAB#): WG305251
Instrument ID: HYDRA
Initial Calibration Date: 06/19/2009 16:09

Analyte	WG305303-01		WG305303-02		WG305303-03		WG305303-04		WG305303-05		WG305303-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	-112	0.200	670	1.00	3007	2.00	6275	5.00	15621	10.0	32301

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INT_CAL_HG_FU - Modified 03/06/2008
PDF File ID: 1421958
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.

INITIAL CALIBRATION SUMMARY

00098061

Login Number: L09060457
Analytical Method: 7470A
ICAL Worknum: WG305303

Workgroup (AAB#): WG305251
Instrument ID: HYDRA
Initial Calibration Date: 06/19/2009 16:09

Analyte	R	Q
Mercury	1.000	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INT_CAL_HG_FU - Modified 03/06/2008
PDF File ID: 1421958
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

00098062

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-08
Instrument ID: HYDRA Run Time: 16:13 Method: 7471
File ID: HY.061909.161312 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
MERCURY	.1	.2	.1	U

ICB - Modified 03/06/2008
PDF File ID: 1421960
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098063

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-10
Instrument ID: HYDRA Run Time: 16:16 Method: 7470A
File ID: HY.061909.161656 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.200	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1421962
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098064

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-12
Instrument ID: HYDRA Run Time: 16:37 Method: 7470A
File ID: HY.061909.163746 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.200	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1421962
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098065

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-14
Instrument ID: HYDRA Run Time: 16:54 Method: 7470A
File ID: HY.061909.165454 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.200	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1421962
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098066

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-16
Instrument ID: HYDRA Run Time: 17:17 Method: 7470A
File ID: HY.061909.171727 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.200	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1421962
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

00098067

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-18
Instrument ID: HYDRA Run Time: 17:26 Method: 7470A
File ID: HY.061909.172624 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.200	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 1421962
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

00098068

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-07
Instrument ID: HYDRA Run Time: 16:11 Method: 7470A
File ID: HY.061909.161126 Analyst: ADC Units: ug/L
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	1.93	96.5	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 1421959
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098069

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-09
Instrument ID: HYDRA Run Time: 16:15 Method: 7470A
File ID: HY.061909.161508 Analyst: ADC QC Key: STD
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00206	mg/L	103	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1421961
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098070

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-11
Instrument ID: HYDRA Run Time: 16:35 Method: 7470A
File ID: HY.061909.163523 Analyst: ADC QC Key: STD
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00204	mg/L	102	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1421961
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098071

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-13
Instrument ID: HYDRA Run Time: 16:52 Method: 7470A
File ID: HY.061909.165259 Analyst: ADC QC Key: STD
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00195	mg/L	97.5	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1421961
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098072

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-15
Instrument ID: HYDRA Run Time: 17:15 Method: 7470A
File ID: HY.061909.171534 Analyst: ADC QC Key: STD
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00182	mg/L	91.0	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1421961
Report generated 06/22/2009 09:21

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

00098073

Login Number: L09060457 Run Date: 06/19/2009 Sample ID: WG305303-17
Instrument ID: HYDRA Run Time: 17:24 Method: 7470A
File ID: HY.061909.172423 Analyst: ADC QC Key: STD
Workgroup (AAB#): WG305251 Cal ID: HYDRA - 19-JUN-09
Matrix: LEACHATE

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00200	mg/L	100	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 1421961
Report generated 06/22/2009 09:21

2.3 General Chemistry Data

Microbac Laboratories Inc.
GENERAL CHEMISTRY

Microbac Login No: L09060457

METHOD

Analysis: See report for method reference.

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Flashpoint

The sample was a sludge-like material and there was insufficient volume to analyze for flashpoint.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: DIH

Approved: 18-JUN-09

2.3.1 Percent Solids Data

2.3.1.1 Raw Data

LABORATORY REPORT

L09060457

00098078

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	D2216-90	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098079

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Soil**
Workgroup Number: **WG305080**
Collect Date: **06/16/2009 08:30**
Sample Tag: **01**

PrePrep Method: **NONE**
Prep Method: **D2216-90**
Analytical Method: **D2216-90**
Analyst: **JDH**
Dilution: **1**
Units: **weight %**

Instrument: **BAL001**
Prep Date: **06/19/2009 09:29**
Cal Date:
Run Date: **06/19/2009 09:29**
File ID: **B1.305080-0110**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Percent Solids	**10-02-6**	**26.5**		**1.00**	**1.00**

Example Percent Solids Calculations

1.0 Calculating the percent solids of a sample.

$$\%Solids = \frac{WT3 - WT1}{WT2 - WT1} \times F$$

Where:	
WT1 = Weight, in grams, of the empty container	1.30 g
WT2 = Weight, in grams, of the container and wet sample	21.274 g
WT3 = Weight, in grams, of the container and dried sample	5.21 g
F = Factor to get units as percent weight	100
%Solids = Percent solids present in sample.	19.58%

2.0 Calculating the percent moisture of a sample.

% Moisture = 100 - % Solids from 1.0 calculation

Microbac Laboratories Inc.

PERCENT SOLIDS

00098081

Workgroup (AAB#):WG305080 Analyst:JDH ADT(on):06/18/2009 10:55

Method:D2216-90 Instrument:BAL001 ADT(off):06/19/2009 09:29

SOP:K0003 Rev:9

SAMPLE NUMBER	EMPTY PAN WT 1	WET WT 2	DRY WT 3A	DRY WT 3B	DRY WT 3C	PERCENT SOLID	PERCENT MOISTURE
L09060436-01	1.25	23.88	20.7			85.95	
L09060436-02	1.24	25.52	21.75			84.47	
L09060436-03	1.25	19.16	16.94			87.60	
L09060436-04	1.29	23.39	20.11			85.16	
L09060436-05	1.26	20.72	18.45			88.34	
L09060457-01	1.26	17.15	5.47			26.49	
L09060475-02	1.28	30.38	24.79			80.79	
L09060475-03	1.26	30.33	29.88			98.45	
L09060475-05	1.29	27.23	22.75			82.73	
L09060483-01	1.26	17.63	10.68			57.54	
WG305080-01	1.26	17.15	5.47			26.49	73.51
WG305080-02	1.26	18.02	5.73			26.67	73.33

Analyst: Justin Hansen

PERCENT_SOLIDS - Modified 04/24/2008

PDF ID: 1420252

Report generated: 06/19/2009 09:32

2.3.2 Reactivity Data

2.3.2.1 Summary Data

LABORATORY REPORT

L09060457

00098084

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	SW7.34	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098085

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Soil**
Workgroup Number: **WG305101**
Collect Date: **06/16/2009 08:30**

PrePrep Method: **NONE**
Prep Method: **SW7.34**
Analytical Method: **SW7.34**
Analyst: **JBK**
Dilution: **1**
Units: **mg/kg**

Instrument: **BURET**
Prep Date: **06/18/2009 13:40**
Cal Date:
Run Date: **06/18/2009 13:40**
File ID: **ET.0906181340-04**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Reactivity, Sulfide	18496-25-8		U	100	50.0

U Not detected at or above adjusted sample detection limit

2.3.2.2 QC Summary Data

Example Calculations - Reactive Sulfide

$$A = \frac{((B * C) - (D * E) * 16000}{F * G} = sulfide\,(mg / L)$$

$$\frac{A * I}{J} = reactive\ sulfide\ (mg / Kg)$$

Example Calculation:

B (mL of Iodine):	15
C (N of Iodine):	0.02514
D (mL of titrant):	9.4
E (N of titrant):	0.02489
16000 factor (1mL of 0.025N iodine reacts with 0.4mg sulfide):	16000
F (mL of scrubber solution used for titrating for sulfide):	100
G (dilution of sample (include 50/250 scrubber dilution)):	0.20
I (volume of NaOH placed in scrubber):	50
J (grams of sample used):	10
A=	114.5072
mg/Kg reactive sulfide=	572.536

Microbac Laboratories Inc.

00098088

Data Checklist

Date: 18-JUN-2009
Analyst: JBK
Analyst: NA
Method: REACTS
Instrument: BURET
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG305101

Calibration/Linearity	06/18/2009
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JBK
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
18-JUN-2009

Secondary Reviewer:
19-JUN-2009

CHECKLIST1 - Modified 03/05/2008
Generated: JUN-19-2009 11:26:32

2.3.2.3 Raw Data

WORKGROUP: WG305101

REACTIVE SULFIDE

☑ EPA ch. 7 SOP K7332 Revision #: 8
☐ Other

Instrument: buret

LCS: Std 33455 Daily Dilution: 4(1078)/200
non-reacted LCS Daily Dilution = 21.56

Iodine standardization (0.025 N and 0.1N)

mL _____ N titrant: 6/11/09
Volume I: _____ mL
Normality I: 0.102 N

mL _____ N titrant: 6/11/09
Volume I: _____ mL
Normality I: 0.0254

Stock standardization (in duplicate)

mL I 1) 10.0 2) 10.0
N I 1) 0.102 2) 0.102
mL 0.025 titrant 1) 13.60 2) 13.80

1078 = stock conc (mg/L)

SAMPLE	Grams Reacted	Volume Titrated	mL Iodine	N Iodine	mL 0.0254 N Sodium Thiosulfate 6/18/09
BLANK	X	200	15	0.0254	15.0
Non-reacted LCS (mg/L)	X	200	↓	↓	5.1
Reacted (mg/L)	10.0000	100	↓	↓	8.0
QU-457-01	9.8858	↓	5	↓	5.0
Dup ↓	9.8409	↓	↓	↓	5.0
DUP:					

Analyst: _____ Date / Time: 6/18/09@1340

DCN#79806

Approved: June 19, 2009

Microbac Laboratories Inc.
TITRAMETRIC REPORT

Workgroup (AAB#):WG305101 Analyst:JBK
Product:SW7.34 Run Date:06/18/2009 13:40
Analyte:Reactivity, Sulfide

SAMPLE NUMBER	Sample	Volume	Vol I	Nor I	Vol T	Nor T	Dil	NaOH	Scrub.	Anal.	Reported	Units
WG305101-01	250	200.0	15	.0254	15	.0251	1	50	250	0.3600	0.3600	mg/kg
WG305101-02	250	200.0	15	.0254	5.1	.0251	1	50	250	20.24	20.24	mg/kg
WG305101-03	10	100.0	15	.0254	8	.0251	1	50	250	720.8	720.8	mg/kg
L09060457-01	9.8858	100.0	5	.0254	5	.0251	1	50	250	ND	ND	mg/kg
WG305101-04	9.8858	100.0	5	.0254	5	.0251	1	50	250	6.069	6.069	mg/kg
WG305101-05	9.8409	100.0	5	.0254	5	.0251	1	50	250	6.097	6.097	mg/kg

REACTS_REPORT - Modified 03/06/2008

Report generated 06/18/2009 16:34

Microbac

Approved: June 19, 2009

2.3.3 PH Data

2.3.3.1 Summary Data

LABORATORY REPORT

L09060457

00098094

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	9045D	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098095

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Soil**
Workgroup Number: **WG305015**
Collect Date: **06/16/2009 08:30**

PrePrep Method: **NONE**
Prep Method: **9045D**
Analytical Method: **9045D**
Analyst: **JBK**
Dilution: **1**
Units: **UNITS**

Instrument: **ORION-4STA**
Prep Date: **06/17/2009 16:20**
Cal Date:
Run Date: **06/17/2009 16:20**
File ID: **OS09061815281401**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Corrosivity pH	**10-29-7**	**12.3**			

2.3.3.2 QC Summary Data

Microbac Laboratories Inc.

00098097

Data Checklist

Date: 18-JUN-2009
Analyst: JBK
Analyst: NA
Method: PH
Instrument: ORION 4-STAR
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG305015

Calibration/Linearity	06/17/2009
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JBK
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
18-JUN-2009

Secondary Reviewer:
18-JUN-2009

CHECKLIST1 - Modified 03/05/2008
Generated: JUN-18-2009 15:08:14

2.3.3.3 Raw Data

WORKGROUP: WG305015

pH

Sample	Calibration Buffers	Water Misc. Liquid	50% Slurry Of Solid	50% Water Org. Liq. Mix
LCS 6 Std33002	7,4,10	6.04		
06-457-01	↓		12.27	
06-460-01		6.77		
-02			6.80	
6/17/09 1655 ##K 06-0465-01		7.63		
DUP 06-460-01		6.79		
LCS 9 Std32862		9.02		

pH = 12.45 buffer (STD32249) = 12.47

SW846 9040C/9045D

SM 4500-H(+)-B

EPA 150.1

SOP K1501 Rev 11

Circle Instrument

(Orion 4-Star)

Orion 710A #1

Orion 710A #2

Sargent - Welch

Analyst: _____ Date: 6/17/09 @ 1620

DCN#79791

Approved: June 18, 2009

2.3.4 Method Flashpoint

2.3.4.1 Summary Data

LABORATORY REPORT

L09060457

00098102

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	1010	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098103

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Soil**
Workgroup Number: **WG305122**
Collect Date: **06/16/2009 08:30**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **JBK**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **06/18/2009 14:45**
Cal Date:
Run Date: **06/18/2009 14:45**
File ID: **PR09061909250301**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Ignitability			**QNS**		

QNS Quantity of sample not sufficient to perform analysis

2.3.4.2 QC Summary Data

1.0 Calculating the flashpoint of a sample.

$$Flashpoint = C + 0.033(760 - P)$$

Where:
C = Observed flashpoint (Celcius)
P = Ambient barometric pressure(mmHg) corrected for temperature and gravity.

Flashpoint = Flashpoint of the sample.

Microbac Laboratories Inc.

Data Checklist

00098106

Date: 18-JUN-2009

Analyst: JBK

Analyst: NA

Method: FLASH

Instrument: PRECISION

Curve Workgroup: NA

Runlog ID:

Analytical Workgroups: WG305122

Calibration/Linearity	01/2009
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JBK
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
18-JUN-2009

Secondary Reviewer:
18-JUN-2009

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-18-2009 17:09:04

2.3.4.3 Raw Data

WORKGROUP: WG305122

FLASHPOINT

LCS: Std 32161
TEMPERATURE: 23C PRESSURE: 741.8

SOP K1010 Revision #: 12 Method SW846 1010
Instrument: Pensky Marten Closed Cup Tester

SAMPLE	DESCRIPTION	INITIAL TEMP(C)	COMMENTS or FLASHPOINT	FINAL RESULT (C)
LCS	p-Xylene	14	flash@ 27	27
LCS DUP	"	13	flash@27	27
Blank	DI H_2O	17	no flash@68	>68
06-474-01	dirty water	15	flame ext@69	>69
-02	↓	14	flame ext@ 72	>72
06-457-01	wet sandy soil	—	QNS	QNS
DUP:474-01	(dito)	14	flame ext@ 74	>74

ANALYST: [signature] DATE: 06/18/09 @ 1445

DCN#79808

Approved: June 18, 2009

Microbac Laboratories Inc.
FLASH CALCULATIONS

Workgroup: WG305122
Date: 18-JUN-09
Analyst: JBK

Observed Barometric Pressure: 741.8

Lowest Pressure in Bracket: 740
Temperature Correction #1: 2.84
Temperature Correction #2: 2.77

Lowest Pressure in Bracket: 700
Grav Correction #1: .48
Grav Correction #2: .42

Temperature Correction: 2.7763
Grav Correction: .44508
Corrected Barometric Pressure: 755.01862

Correction for Flash: .16438554

Approved: June 18, 2009

2.3.5 Reactive Cyanide Data

2.3.5.1 Summary Data

LABORATORY REPORT

L09060457

00098112

06/24/09 10:05

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFFBOX-061609	L09060457-01	SW7.33	1	17-JUN-09

Report Number: **L09060457**
Report Date : **June 24, 2009**

00098113

Sample Number: **L09060457-01**
Client ID: **29ROLLOFFBOX-061609**
Matrix: **Soil**
Workgroup Number: **WG305100**
Collect Date: **06/16/2009 08:30**

PrePrep Method: **NONE**
Prep Method: **SW7.33**
Analytical Method: **SW7.33**
Analyst: **JBK**
Dilution: **1**
Units: **mg/kg**

Instrument: **UV-120-1V**
Prep Date: **06/18/2009 15:45**
Cal Date:
Run Date: **06/18/2009 15:45**
File ID: **1V.0906181545-03**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Reactivity, Cyanide	57-12-5		U	50.6	25.3

U Not detected at or above adjusted sample detection limit

2.3.5.2 QC Summary Data

Microbac Laboratories Inc.

00098115

Data Checklist

Date: 18-JUN-2009

Analyst: JBK

Analyst: NA

Method: REACTC

Instrument: UV-120-1V

Curve Workgroup: NA

Runlog ID:

Analytical Workgroups: WG305100

Calibration/Linearity	04/16/2009
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	
Blank	
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JBK
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
18-JUN-2009

Secondary Reviewer:
18-JUN-2009

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-18-2009 17:09:05

2.3.5.3 Raw Data

WG300020

Curves

Parameter: REACT (CN)

Spectrophotometer: UV-120-1U

Calibration (Curve) standard stock: Std 31613

Concentration: 900

Recipe for preparation of curve standards found in:
SOP: K7332 Revision: 8 Page: 8

Second Source Stock: Std 31614 (concentration: 960)

Daily Preparation: 5(960)/250 = 19.2
10(19.2)/100 = 1.92
concentration = 5(1.92)/50 = 0.192

Calibration Standards (mg/L)	Volume	Cell Size	Wavelength	Absorbance
0.000	50	1	578	0.000
0.018				0.027
0.036				JK ~~0.058~~ 0.056
0.09				0.136
0.18				0.280
0.27				0.422
0.36				0.584
2nd 0.192				0.302

Analyst: [signature]

Date/Time: 04/16/09 @ 1330

DCN#79117

Approved: April 17, 2009

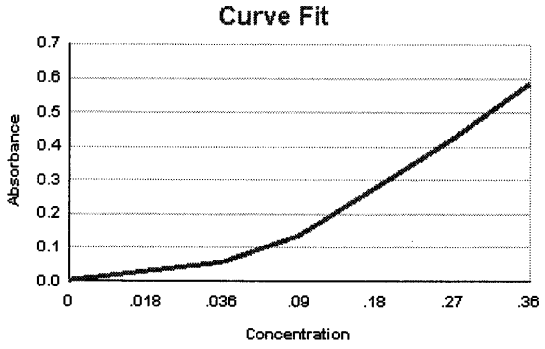
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup:WG300020
Analytical Method:846
Instrument ID:UV-120-1V

Analyst:JBK
Initial Calibration Date:04/16/2009

Analyte: CYANIDE
Number of Points: 7
Slope: 1.60739
Y-Intercept: -0.00406381
Coef. Of Correlation (R^2): 0.999237
Coef. Of Correlation (R): 0.999618

Concentration X	Absorbance Y	X^2	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	-0.00406381
0.0180	0.0270	0.000324	0.000486	0.0248691
0.0360	0.0560	0.00130	0.00202	0.0538021
0.0900	0.136	0.00810	0.0122	0.140601
0.180	0.280	0.0324	0.0504	0.285266
0.270	0.422	0.0729	0.114	0.429931
0.360	0.584	0.130	0.210	0.574595



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 04/16/2009 14:07

Microbac

Approved: April 17, 2009

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG300020
File ID: 1V.0904161330-08
CCV ID: WG300020-08
Units: mg/kg
Analyte: CYANIDE

Instrument ID: UV-120-1V
Run Date: 04/16/2009
Run Time: 13:30
Analyst: JBK
Cal ID: UV-120 -

Analyte	Expected	Found	RF	%D	Q
Reactivity, Cyanide	.192	0.190	1.57	1.0	

* Exceeds %D Limit

CCC Calibrtion Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 04/16/2009 14:08

Microbac

Approved: April 17, 2009

WORKGROUP: WG305100

Reactive Cyanide

LCS: Std 33349
CCV: Std 33348 SOP: K7332 Revision # 8

Daily Dilution: 5(968)/250 = 19.36
10(19.36)/100 = 1.936
5(1.936)/50 = 0.1934

Curve ID: 291773 4/16
Spec: UV-120-1U

Sample	Grams Reacted	Dilution	Cell Size	Aborbance @ 578nm
CCV: 0.1934	NA	1	1	0.292
LCS: 1020	10.0000	JBK 6/18 5/5	↓	0.423
06-457-01	9.8858	1		0.000
Dup 1	9.8409	1		0.001
DUP:				

Analyst: [signature] Date/Time: 6/18/09 @ 1545

DCN#79805

[signature]
Approved: June 18, 2009

Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG305100 **Analyst:** JBK
Analyte: CYANIDE **Date:** 06/18/2009

Sample ID	I Vol	F Vol	Response	Scrubber		Slope	Y Intercept	Dil	Anal. Conc.	Rep. Conc.	Units
WG305100-01	10	50	0.423	50	250	1.607	-0.004064	5	1.3284	33.211	mg/kg
L09060457-01	9.8858	50	0	50	250	1.607	-0.004064	1	0.063935	ND	mg/kg
WG305100-02	9.8858	50	0	50	250	1.607	-0.004064	1	0.063935	0.32337	mg/kg
WG305100-03	9.8409	50	0.00100	50	250	1.607	-0.004064	1	0.080032	0.40663	mg/kg

UV_REACTC - Modified 03/06/2008
Report generated 06/18/2009 16:37

Microbac

Approved: June 18, 2009

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG305141
File ID: 1V.0906181545-01
CCV ID: WG305141-01
Units: mg/kg
Analyte: CYANIDE

Instrument ID: UV-120-1V
Run Date: 06/18/2009
Run Time: 15:45
Analyst: JBK
Cal ID: UV-120 -

Analyte	Expected	Found	RF	%D	Q
Reactivity, Cyanide	.194	0.184	1.51	5.2	

* Exceeds %D Limit

CCC Calibrtion Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/18/2009 16:37

Microbac

Approved: June 18, 2009

3.0 Attachments

Microbac Laboratories Inc.
Analyst Listing
June 24, 2009

ADC – ANTHONY D. CANTER	AJF – AMANDA J. FICKIESEN	ALB – ANNIE L. BROWN
AML – ANTHONY M. LONG	BRG – BRENDA R. GREGORY	CAA – CASSIE A. AUGENSTEIN
CAF – CHERYL A. FLOWERS	CAH – CHARLES A. HALL	CEB – CHAD E. BARNES
CLC – CHRYS L. CRAWFORD	CLW – CHARISSA L. WINTERS	CPD – CHAD P. DAVIS
CSH – CHRIS S. HILL	DDE – DEBRA D. ELLIOTT	DEL – DON E. LIGHTFRITZ
DEV – DAVID E. VANDENBERG	DGB – DOUGLAS G. BUTCHER	DIH – DEANNA I. HESSON
DLB – DAVID L. BUMGARNER	DLP – DOROTHY L. PAYNE	DLR – DIANNA L. RAUCH
DR – DEANNA ROBERTS	ECL – ERIC C. LAWSON	EDA – ERIN D. AGEE
ERP – ERIN R. PORTER	FJB – FRANCES J. BOLDEN	HAV – HEMA VILASAGAR
HJR – HOLLY J. REED	JBK – JEREMY B. KINNEY	JDH – JUSTIN D. HESSON
JKT – JANE K. THOMPSON	JWR – JOHN W. RICHARDS	JWS – JACK W. SHEAVES
JYH – JI Y. HU	KEB – KATHRYN E. BARNES	KHR – KIM H. RHODES
KRA – KATHY R. ALBERTSON	LKN – LINDA K. NEDEFF	LSB – LESLIE S. BUCINA
MDA – MIKE D. ALBERTSON	MDC – MICHAEL D. COCHRAN	MES – MARY E. SCHILLING
MMB – MAREN M. BEERY	MRT – MICHELLE R. TAYLOR	MSW – MATT S. WILSON
NPM – NATHANIEL P. MILLER	PDM – PIERCE D. MORRIS	RAH – ROY A. HALSTEAD
RB – ROBERT BUCHANAN	REK – ROBERT E. KYER	RLK – ROBIN L. KLINGER
RWC – RODNEY W. CAMPBELL	SDH – SHANA D. HINYARD	SLM – STEPHANIE L. MOSSBURG
SLP – SHERI L. PFALZGRAF	TIP – TAE I. PARRISH	TMB – TIFFANY M. BAILEY
TMM – TAMMY M. MORRIS	VC – VICKI COLLIER	WTD – WADE T. DELONG

Microbac Laboratories Inc.
List of Valid Qualifiers
June 24, 2009

00098125

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
FL	Free Liquid
H1	Sample analysis performed past holding time.
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit (RL).
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

00098126

NO. 5819

Chain of Custody

Shaw® Shaw Environmental & Infrastructure, Inc.
3010 Briarpark Drive, Suite 400
Houston, TX 77042
(713) 996-4400

Laboratory Name: MICROBAC Address: 158 STARLITE DR. MARIETTA, OH Contact: STEPHANIE MOSSBURG

Project Name: LHAAP Project Location: KARNACK, TX.

Project No.: 117591.0006A100 Project Contact: ALLEN WILLMORE Project Telephone No.: 713-996-4586

Point of Contact: ALLEN WILLMORE Project Manager/Supervisor: PRAVEEN SRIVASTAV

Telephone No.: 713-996-4586

Item No.	Sample Number	Date	Time	Comp	Grab	Matrix	Sample Description, Location	Number of Containers	Reactivity	Corrosivity	Ignitability	TCLP RCRA Metals	TCLP VOCs			Remarks
1	29 ROLLOFFBOX-061609	6/16/09	8:30		✓	S	SITE 29	1	✓	✓	✓					
2	29 ROLLOFFBOX-061609	6/16/09	8:30		✓	S	SITE 29	1				✓	✓			
3																
4																
5																
6																
7																
8																
9																
10																

Analysis and Method Desired (Indicate separate containers)

Transfers Relinquished By (signature)	Date/Time	Transfers Accepted By (signature)	Date/Time
Scott Beesinger	6/16/09 9:00		

Special Instructions: 7 DAY TAT

Ex Airbill No.:

Sampler's Signature: Scott Beesinger

TAT: ____ Standard ____ Rush Date ____ ____Y ____N ____Cold

Microbac OVD
Received: 06/17/2009 14:49
By: ROBIN KLINGER
221000000106

White - Lab Copy Canary - Field Copy Pink - File Copy

Form Number: 433_2
Rev. 10-19-07

Internal Chain of Custody Report

00098127

Login: L09060457
Account: 2773
Project: 2773.025
Samples: 1
Due Date: 24-JUN-2009

Samplenum	Container ID	Products
L09060457-01	591354	TC-ZHE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	17-JUN-2009 14:53	RLK	
2	PREP	W1	TCL	18-JUN-2009 08:39	RWC	RLK
3	STORE	TCL	A1	18-JUN-2009 09:27	RLK	RWC

Samplenum	Container ID	Products
L09060457-01	591355	REACTC REACTS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	17-JUN-2009 14:53	RLK	
2	ANALYZ	W1	WET	17-JUN-2009 14:55	HJR	RLK
3	STORE	WET	A1	19-JUN-2009 08:29	JKT	JBK

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

00098128

158 Starlite Drive, Marietta, OH 45750 • T:740-373-4071 • F:740-373-4835 • http://www.microbac.com

Laboratory Report Number: L09060649

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories.

Review and compilation of your report was completed by Microbac's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Kathy Albertson	*Team Chemist/Data Specialist*	kalbertson@microbac.com
Stephanie Mossburg	*Team Chemist/Data Specialist*	smossburg@microbac.com
Tony Long	*Team Chemist/Data Specialist*	tlong@microbac.com
Amanda Fickiesen	*Client Services Specialist*	afickiesen@microbac.com
Annie Brown	*Client Services Specialist*	abrown@microbac.com

This report was reviewed on July 01, 2009.

Stephanie Mossburg - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the accrediting authority listed below. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories.

This report was certified on July 01, 2009.

David Vandenberg - Managing Director

State of origin: Texas
Accrediting authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: Microbac OVD
This report contains a total of 26 pages.

Look closer. Go further. Do more.

Microbac REPORT L09060649
PREPARED FOR Shaw E I, Inc.
WORK ID:

1.0 Introduction 3
2.1 General Chemistry Data 10
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1.0 Introduction

Microbac Laboratories Inc.
REPORT NARRATIVE

Microbac Login No: L09060649

CHAIN OF CUSTODY: The chain of custody number was 090622

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 0 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 25-JUN-09
Stephanie Mossburg

Laboratory Data Package Cover Page

00098132

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: [] This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

DEANNA I. HESSON	Deanna I. Hesson	Conventional Lab Supervisor	June 30, 2009
Name (Printed)	Signature	Official Title (printed)	DATE

Checklist ID: **39692**
00098133

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060649
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG305653
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 30, 2009

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

00098134

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

00098135

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

Microbac Laboratories Inc.
Laboratory Review Checklist

Laboratory Name:	Microbac Laboratories Inc.
Laboratory Log Number:	L09060649
Project Name:	798-LONGHORN
Method:	FLASHPOINT
Prep Batch Number(s):	WG305653
Reviewer Name:	DEANNA I. HESSON
LRC Date:	June 30, 2009

EXCEPTIONS REPORT
ER# - Description
Method 1010 is applicable only to liquid samples as specified in 40 CFR Part 261.21(a) (1). Section 261.21 does not define ignitability criteria, or test methods, for solid matrices. Any flashpoint data reported in this report for samples other than liquids should be considered of screening value only.
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

2.1 General Chemistry Data

2.1.1 Method Flashpoint

2.1.1.1 Summary Data

LABORATORY REPORT

L09060649

00098140

07/01/09 09:40

Submitted By

Microbac Laboratories Inc.
158 Starlite Drive
Marietta , OH 45750
(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Jennifer Hoang

Project Number: 2773.025
Project: Longhorn AAP
Site: LONGHORN AAP KARNACK TX

P.O. Number: 389869/ 390836(GWTP)

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
29ROLLOFF-090622	L09060649-01	1010	1	24-JUN-09

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Report Number: **L09060649**
Report Date : **July 1, 2009**

00098141

Sample Number: **L09060649-01**
Client ID: **29ROLLOFF-090622**
Matrix: **Soil**
Workgroup Number: **WG305653**
Collect Date: **06/22/2009 17:30**

PrePrep Method: **NONE**
Prep Method: **1010**
Analytical Method: **1010**
Analyst: **JBK**
Dilution: **1**
Units: **Degrees C**

Instrument: **PRECISION**
Prep Date: **06/25/2009 09:15**
Cal Date:
Run Date: **06/25/2009 09:15**
File ID: **PR09062515025701**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Ignitability		**69.0**	**>**		

> Result is greater than the associated numerical value.

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2.1.1.2 QC Summary Data

Example Flashpoint Calculations

1.0 Calculating the flashpoint of a sample.

$$Flashpoint = C + 0.033(760 - P)$$

Where:
C = Observed flashpoint (Celcius)
P = Ambient barometric pressure(mmHg) corrected for temperature and gravity.

Flashpoint = Flashpoint of the sample.

Checklist ID: 39565

00098144

Microbac Laboratories Inc.

Data Checklist

Date: 25-JUN-2009

Analyst: JBK

Analyst: NA

Method: FLASH

Instrument: PRECISION

Curve Workgroup: NA

Runlog ID:

Analytical Workgroups: WG305653

Calibration/Linearity	01/2009
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JBK
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
25-JUN-2009

Secondary Reviewer:
25-JUN-2009

2.1.1.3 Raw Data

00098146

WORKGROUP: WG305653

FLASHPOINT

LCS: STD 32162
TEMPERATURE: 22C PRESSURE: 740.5

SOP K1010 Revision #: 12

Method SW846 1010
Instrument: Pensky Marten Closed Cup Tester

SAMPLE	DESCRIPTION	INITIAL TEMP(C)	COMMENTS or FLASHPOINT	FINAL RESULT (C)
LCS	p-Xylene	14	flash @ 28	28
LCS DUP	"	15	flash @ 27	27
Blank	DI H_2O	19	no flash @ 70	> 70
06-649-01	Soil / unable to stir	19	flame ext @ 69	> 69
06-655-01	Water sol. liq. w/ sediment	16	flame ext @ 74	> 74
-02	Antifreeze odor / water sol. liq.	16	flame ext @ 70	> 70
-03	↓	17	flame ext @ 71	> 71
-04	↓	16	flame ext @ 76	> 76
-05	↓	16	flame ext @ 72	> 72
-06	water sol. liq. / citrus odor	18	flame ext @ 74	> 74
-07	bi-layer organic / shaken runs one	16	flash @ 74	74
-08	thin oil / penetrating oil	15	flash @ 71	71
DUP: 655-01	(ditto)	17	flash @ 71	71

ANALYST: [signature] DATE: 4/25/09 @ 0915

DCN#79867

Microbac Laboratories Inc.
FLASH CALCULATIONS

00098147

Workgroup: WG305653
Date: 25-JUN-09
Analyst: JBK

Observed Barometric Pressure: 740.5

Lowest Pressure in Bracket: 740
Temperature Correction #1: 2.72
Temperature Correction #2: 2.65

Lowest Pressure in Bracket: 700
Grav Correction #1: .48
Grav Correction #2: .42

Temperature Correction: 2.65175
Grav Correction: .4443
Corrected Barometric Pressure: 753.84395

Correction for Flash: .20314965

3.0 Attachments

Microbac Laboratories Inc.
Analyst Listing
July 1, 2009

ADC – ANTHONY D. CANTER	AJF – AMANDA J. FICKIESEN	ALB – ANNIE L. BROWN
AML – ANTHONY M. LONG	BRG – BRENDA R. GREGORY	CAA – CASSIE A. AUGENSTEIN
CAF – CHERYL A. FLOWERS	CAH – CHARLES A. HALL	CEB – CHAD E. BARNES
CLC – CHRYS L. CRAWFORD	CLW – CHARISSA L. WINTERS	CPD – CHAD P. DAVIS
CSH – CHRIS S. HILL	DDE – DEBRA D. ELLIOTT	DEL – DON E. LIGHTFRITZ
DEV – DAVID E. VANDENBERG	DGB – DOUGLAS G. BUTCHER	DIH – DEANNA I. HESSON
DLB – DAVID L. BUMGARNER	DLP – DOROTHY L. PAYNE	DLR – DIANNA L. RAUCH
DR – DEANNA ROBERTS	ECL – ERIC C. LAWSON	EDA – ERIN D. AGEE
ERP – ERIN R. PORTER	FJB – FRANCES J. BOLDEN	HAV – HEMA VILASAGAR
HJR – HOLLY J. REED	JBK – JEREMY B. KINNEY	JDH – JUSTIN D. HESSON
JKT – JANE K. THOMPSON	JWR – JOHN W. RICHARDS	JWS – JACK W. SHEAVES
JYH – JI Y. HU	KEB – KATHRYN E. BARNES	KHR – KIM H. RHODES
KRA – KATHY R. ALBERTSON	LKN – LINDA K. NEDEFF	LSB – LESLIE S. BUCINA
MDA – MIKE D. ALBERTSON	MDC – MICHAEL D. COCHRAN	MES – MARY E. SCHILLING
MMB – MAREN M. BEERY	MRT – MICHELLE R. TAYLOR	MSW – MATT S. WILSON
NPM – NATHANIEL P. MILLER	PDM – PIERCE D. MORRIS	RAH – ROY A. HALSTEAD
RB – ROBERT BUCHANAN	REK – ROBERT E. KYER	RLK – ROBIN L. KLINGER
RWC – RODNEY W. CAMPBELL	SDH – SHANA D. HINYARD	SLM – STEPHANIE L. MOSSBURG
SLP – SHERI L. PFALZGRAF	TIP – TAE I. PARRISH	TMB – TIFFANY M. BAILEY
TMM – TAMMY M. MORRIS	VC – VICKI COLLIER	WTD – WADE T. DELONG

Microbac Laboratories Inc.
List of Valid Qualifiers
July 01, 2009

00098150

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
FL	Free Liquid
H1	Sample analysis performed past holding time.
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit (RL).
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

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00098151

Shaw Environmental & Infrastructure, Inc.
3010 Briarpark Drive, Suite 400
Houston, TX 77042
(713) 996-4400

Laboratory Name: Microbac COC NO. (090622)
Address : 158 Starlite Drive, Marietta OH 45750
Contact : Stephanie Mossburg
Phone: 1-800-373-4071

PM: Praveen Svrivastav (713.996.4588)			TAT:														
Project Contact: Jennifer Hoang			Phone No: 713-996-4408														
Project Name: Longhorn			Site: 4 (DPT)														
Project #: 117591-			Location: Karnack, TX														
Sampler Print: ALLEN WILLMORE (713)247-9292	Sampler Sign:				# of Containers	Ignitability											Comments
Sample Number	Grab	Date	Time	Matrix													
29Rolloff-090622	X	6/22/2009	17:30	Soil	1	X											

Relinquished By:	Received By:	Special Instructions 7-day TAT !!
Date/Time 6/23/09 17:30	Date/Time	
Relinquished By:	Received for Laboratory By:	Remarks:
Date/Time	Date/Time Microbac 6-24-09 0945	

Microbac Laboratories, Inc. **SAMPLE RECEIPT FORM**

150 Sheridan Drive
Marietta, OH 45750
(740) 373-4071

00098152

Client: SHAW	
Workorder Number: B	
Date Received: 6-24-09	
Delivered by: ( ) Fedx (✓) UPS ( ) Client ( ) Courier	**Time:** 0945
Opened by: ERP	
IR Temp Gun: (✓) G ( ) H	
Logged by: JET	L 090600649

Cooler information

Cooler ID	Temp C	Airbill#	COC#	Other
3568	0	J223 8801784		

Inspection Checklist	**Y**	**N**	**NA**	**Discrepancy ID**
Were shipping coolers sealed?	✓			
Were custody seals intact?	✓			
Were cooler temperatures in range of 0 - 6?	✓			
Was ice present?	✓			
Were COC's received/ information complete/signed and dated?	✓			
Were sample containers and labels intact and match COC?	✓			
Were the correct containers and volumes received?	✓			
Were correct preservatives used? (water only)			✓	
Were pH ranges acceptable? (voa's excluded)			✓	
Were VOA samples free of headspace (< 6mm)?			✓	
Were samples received within EPA hold times?	✓			

Discrepancy/Comments/Other Problems

Distribution

Name of Microbac representative:
Client/Company:
Person Contacted:
Date contacted:

Resolution/other comments:

Microbac Laboratories Inc.

Internal Chain of Custody Report

00098153

Login: L09060649
Account: 2773
Project: 2773.025
Samples: 1
Due Date: 01-JUL-2009

Samplenum	Container ID	Products
L09060649-01	593752	FLASH

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	WET	24-JUN-2009 14:16	ERE	
2	STORE	WET	A1	26-JUN-2009 08:16	RLK	JBK

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

Appendix E

Basis of Estimate for LHAAP-29 Remediation

Alternative 2, Excavation, In Situ Chemical Oxidation (Intermediate Zone), MNA, LUCs
Present Value
LHAAP-29 Feasibility Study

WBS NO. : 1.30				COMPANY NAME:	SHAW ENVIRONMENTAL				
				PROJECT LOCATION:	KARNACK, TEXAS				
Year	Capital Costs		O & M Costs			Present Value (NPV)		
						Discount Rate	Capital	O & M
	Design/Studies	Excav and Chemox Injection w/ Extraction	MNA/LUCs	O&M Plant	Total O&M	2.8%		
1	175,465	1,933,748	222325	32,880	255,205	**NPV**	**2,109,213**	**918,542**
2		0	111996		111,996			
3		0	58711		58,711	**Total Present Value =**		**$3,027,755**
4		0	58711		58,711			
5		0	101236		101,236			
6		0	35335		35,335			
7		0	35335		35,335			
8		0	35335		35,335			
9		0	35335		35,335			
10		0	77860		77,860			
11		0			0			
12		0			0			
13		0			0			
14		0			0			
15		0	78393		78,393			
16		0			0			
17		0			0			
18		0			0			
19		0			0			
20		0	78393		78,393			
21		0			0			
22		0			0			
23		0			0			
24		0			0			
25		0	78393		78,393			
26		0			0			
27		0			0			
28		0			0			
29		0			0			
30		0	78393		78,393			
	175,465	1,933,748	1,085,751	32,880	1,118,630			

Alternative 2, Remedial Design Documents
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. : 1.30.20

PROJECT LOCATION: KARNACK, TEXAS

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	Engineering Support														
1	Develop design report, drawings, specs & procurement pkgs.	1	lot	400	400	eng	81.60	32,640	3,800	1,000			1,600	1,600	35,240
2	Injection Permit	1	lot										15,000	15,000	15,000
3	RFP & S / C procurement doc.support	1	ea	40	40	eng	81.60	3,264	100	100					3,364
4	Bid and award S / C support	1	ea	40	40	eng	81.60	3,264							3,264
5	Completion Report	1	ea	350	350	eng	81.60	28,560	1,200	1,200					29,760
	Subtotal							**67,728**		**2,300**		**0**		**16,600**	**86,628**
	Taxes @ 6.5 %									150					150
														** WBS TOTAL **	**$ 86,778**
	Site-Wide Metals Evaluation for Remedial Design														
1	Coordination, develop work plans, etc.	1	ea	20	20	eng	81.60	1,632	2,250	2,250			5000	5,000	8,882
3	shallow zone - collect and prepare samples (GW) for Metals	40	ea	4	160	tech	34.30	5,490	110	4,400	36	1,440			11,330
4	int. zone - collect and prepare samples (GW) for Metals	11	ea	4	44	tech	34.30	1,510	110	1,210	36	396			3,116
5	Sample analysis (Metals)	51	ea										50	2,550	2,550
8	Chemist	13	hrs	1	13	chem	71.20	930							930
9	Truck	29	dys								60	1,740			1,740
10	Per Diem	29	dys										109	3,161	3,161
11	Site-Wide Metals Evaluation report	1	ea	80	80	eng	81.60	6,530	100	100					6,630
	Subtotal							**16,092**		**7,960**		**3,576**		**10,711**	**38,339**
	Taxes @ 6.5 %									517					517
	Subtotal														**38,856**
	Indirects @ 21.5%														8,354
															$ 47,211
	Flow Tests/Pilot Test														
1	Install wells for flow test and conduct test	3	wells	120	80	Engr tech	65.70	5,256	100	300	150	450	4,000	12,000	18,006
2	Truck	4	days								60	240			240
3	Per Diem	8	days										109	872	872
4	Prepare report	1	ea										15,000	15,000	15,000
	Subtotal							**5,256**		**300**		**690**		**27,872**	**34,118**
	Taxes @ 6.5 %									20					20
	Subtotal														**34,138**
	Indirects @ 21.5%														7,340
														**** WBS TOTAL ****	**$ 41,477**

Alternative 2, Construction Management
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. : 1.30.30

PROJECT LOCATION: KARNACK, TEXAS

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	Construction Management														
1	Temporary facilities	1	mo										750	750	750
2	Equipment	1	mo								600	600			600
3	Site superintendent	1	ea	200	200	super	72.30	14,460			2,825	2,825			17,285
4	Health & safety officer	1	ea	200	200	h/s	55.70	11,140	50	50	160	160			11,350
5	Field service technician	2	ea	200	400	hmt	43.60	17,440	100	200					17,640
6	G & A / overhead / profit / bond @ 15 % of	0.15	%										1,586,690	238,003	238,003
	Construction costs														
	Subtotal							**43,040**		**250**		**3,585**		**238,753**	**285,628**
	Taxes @ 6.5 %									16					16
	Subtotal														**285,645**
	Indirects @ 21.5%														61,414

**** WBS T O T A L **** **$ 347,058**

Alternative 2, Conventional Excavation
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. :1.40.30.20.10

PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	General conditions														
1	Safety, training ,waste, health plans, etc.	1	ea	80	80	eng	81.60	6,528	200	200					6,728
2	Mob / Demob	1	ea	240	240	op	33.80	8,112	2,500	2,500	3,000	3,000			13,612
3	Port-let rental-2 ea	1	mo										320	320	320
5	Silt fence at construction area	600	lf	0.02	12	lab	24.00	288	0.40	240	0.05	30			558
6	Hay bales	200	ea	0.02	4	lab	24.00	96	0.40	80	0.05	10			186
7	Erosion control, straw bales at const. area	1	lot	80	80	lab	24.00	1,920	1,000	1,000					2,920
9	Survey crew	5	day										1000	5,000	5,000
10	Personal protective equipment	129	mday								30	3,870			3,870
11	Construction equip. staging area	1	ea	120	120	op	33.80	4,056	2,000	2,000	1,500	1,500			7,556
12	Site Orientation - 1 day	5	pers	8	40	op	33.80	1,352							1,352
	Truck	55	days								60	3,270			3,270
	Per Diem	109	days										109	11,881	11,881
	Decon area														
1	Provide small temporary decon area for	1	ea	120	120	lab	24.00	2,880	6,000	6,000	2,000	2,000			10,880
	decon of const. equipment. Demo at end of job														
2	Decon all equipment at completion of work	1	lot	8	8	lab	24.00	192	200	200	200	200			592
3	Pressure washer	1	ea								650	650			650
	Soils staging / segregation area														
	Staging area not required. Load excavated														
	soils directly into off-site shipping containers.														
	Excavation														
1	Waste excavation	3,900	bcy	0.03	117	op	33.80	3,955							3,955
2	Excavator (20 Ton)	40	day	10	400	op	33.80	13,520			185.00	7,400			20,920
3	Wheel loader (2.5 CY)	40	day	10	400	op	33.80	13,520			106.00	4,240			17,760
4	Gravel for access to excavated areas	150	cy		16	op	33.80	541	20	3,000	7.42	1,113			4,654
5	Truck w/ water spray / tank for excavated area	40	hrs.	1	40	td	24.00	960			64	2,560			3,520
6	Continuous air monitors	4	ea						1,200	4,800					4,800
7	Aerosol Monitor	40	day								7.80	312			312
8	Photoionization Detector	40	day								12.42	497			497
9	LEL 4 Gas Meter	40	day								12.42	497			497
10	Soil samples to to confirm risk limits	40	ea										825	33,000	33,000
11	Confirmation samples (explosives,VOC,perchlorate)	50	ea	1	50	tech	34.30	1,715	50	2,500	36	1,800	825	41,250	47,265
	Chemist	10	hrs.	1	10	chem	71.20	712							712

Alternative 2, Conventional Excavation
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. :1.40.30.20.10

PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
12	Sample Supplies	40	ea						4.00	160					160
13	Sample Shipping	20	ea										55	1,100	1,100
	Truck	119	days								60	7,140			7,140
	Per Diem	119	days										109	12,971	12,971
	Plug and Abandon Lines														
1	Plug and abandon lines	4,500	lf	0.025	113	op	33.80	3,803	0.50	2,250	0.25	1,125			7,178
2	Fill manholes	12	ea	8	96	op	33.80	3,245	300.00	3,600	75.00	900			7,745
	Truck	36	days								60	2,160			2,160
	Per Diem	36	days										109	3,924	3,924
	Backfill														
1	Borrow fill material from off-site (delivered)	4,875	lcy						9.90	48,263					48,263
2	Compaction ,6" lifts, 4 passes	4,875	lcy	0.009	44	op	33.80	1,483			0.47	2,291			3,774
3	Fertilize, seed, and mulch	77,000	sf										0.131	10,087	10,087
4	Truck w/ water spray / tank for excavated area	60	hrs.	1	60	td	24.00	1,440			64	3,840			5,280
5	Support personnel	40	hrs.	1	40	lab	24.00	960			15.16	606			1,566
	Truck	25	days								60	1,500			1,500
	Per Diem	25	days										109	2,725	2,725
	Excavated soils waste characterization														
1	Waste characterization disposal profile	10	ea	1.000	10	tech	34.30	343	50	500	36.00	360	1,500	15,000	16,203
2	Waste documentation / Reports	1	lot	240	240	engr tech	65.70	15,768	400	400					16,168
	Waste disposal														
1	Title "D" ,Texas class 1 trans/waste disposal fees	5,460	tons										27.00	147,420	147,420
2	Truck Liners	273	ea								49.50	13,514			13,514
	Subtotal							**87,388**		**77,693**		**66,385**		**284,678**	**516,143**
	Taxes @ 6.5 %									5,050					5,050
	Subtotal														**521,193**
	Indirects @ 21.5%														112,056

**** WBS T O T A L ** $ 633,249**

Alternative 2, In Situ Chemical Oxidation
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. :1.30.30.20.20.20

PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	General conditions														
1	Safety, training ,waste, health plans, etc.	1	ea	80	80	eng	81.60	6,528	200	200					6,728
2	Mob / Demob	1	ls								20,000	20,000			20,000
3	Port-let rental-2 ea	0.5	mo										320	160	160
4	Personal protective equipment	70	mday								30	2,100			2,100
	Injection Well Installation														
1	Pickup Truck	4	day								31	124			124
2	FOGM Pickup Truck	20	hrs								12	240			240
3	Decon Pads	1	ea						1,500	1,500					1,500
4	Install Wells	1	ls										47000	47,000	47,000
5	Sampling and Analytical	6	ea										2350	14,100	14,100
6	Field engineer/scientist	1	ea	88	88	eng	81.60	7,181			450	450			7,631
7	Field equipment operator	1	ea	20	20	op	33.80	676			450	450			1,126
8	Site superintendent	1	ea	9	9	super	72.30	651			450	450			1,101
9	Per Diem	20	days								60	1,200			1,200
10	Truck	20	days										109	2,180	2,180
	Phase I Injection														
1	6,000-gal holding tank	6	wk								400	2,400			2,400
2	15 KW generator	2	wk								350	700			700
3	Forklift	2	wk								300	600			600
4	Water truck	14	day								115	1,610			1,610
5	YSI water meter	2	wk								100	200			200
6	Reagent (persulfate/sodium hydroxide)	117,500	lb						1.50	176,250					176,250
7	Reagent delivery	1	ls										4000	4,000	4,000
8	Water purchase	50	kgal						12	575					575
9	Oudoor rated tankless water heaters (3 gal/min)	3	ea	16	48	tech	34.30	1,646	100	300	700.00	2,100	750	2,250	6,296
10	Diesel Fuel	100	gal						4.00	400					400
11	Propane for water heaters	600	gal						2.50	1,500			1	600	2,100
12	Injection well heads	5	ea						150	750					750
13	PVC braided 1-inch hose	200	lf						1.75	350					350
14	Misc pipe/fittings	1	ls						1,500	1,500					1,500
15	Secondary containment	1	ea						1,500	1,500			55	55	1,555
16	Perastaltic pump	1	ea						300	300					300
17	Teflon hose (5/8-inch)	200	lf						3	600					600
18	Colorimetric analyzer	1	ea								450	450			450
19	Field engineer/scientist	2	ea	150	300	eng	81.60	24,480			450	900			25,380

Alternative 2, In Situ Chemical Oxidation
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. :1.30.30.20.20.20

PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
20	Field equipment operator	1	ea	40	40	op	33.80	1,352			450	450			1,802
21	Site superintendent	1	ea	40	40	super	72.30	2,892			450	450			3,342
22	Per Diem	67	days								60	4,020			4,020
23	Truck	67	days										109	7,303	7,303
	Phase II Injection														
1	6,000-gal holding tank	6	wk								400	2,400			2,400
2	15 KW generator	2	wk								350	700			700
3	Forklift	2	wk								300	600			600
4	Water truck	14	day								115	1,610			1,610
5	YSI water meter	2	wk								100	200			200
6	Reagent (persulfate/sodium hydroxide)	117,500	lb						1.50	176,250					176,250
7	Reagent delivery	1	ls										4000	4,000	4,000
8	Water purchase	50	kgal						12	575					575
9	Oudoor rated tankless water heaters (3 gal/min)	3	ea	16	48	tech	38.00	1,824	100	300	700.00	2,100	750	2,250	6,474
10	Fuel for equipment	100	gal						4	400					400
11	Propane for water heaters	600	gal						3	1,500			1	600	2,100
12	Injection well heads	5	ea						150	750					750
13	PVC braided 1-inch hose	200	lf						1.75	350					350
14	Misc pipe/fittings	1	ls						1,500	1,500					1,500
15	Secondary containment	1	ea						1,500	1,500			55	55	1,555
16	Perastaltic pump	1	ea						300	300					300
17	Teflon hose (5/8-inch)	200	lf						3	600					600
18	Colorimetric analyzer	1	ea								450	450			450
19	Field engineer/scientist	2	ea	150	300	eng	81.60	24,480			450	900			25,380
20	Field equipment operator	1	ea	40	40	op	33.80	1,352			450	450			1,802
21	Site superintendent	1	ea	40	40	super	72.30	2,892			450	450			3,342
22	Per Diem	67	days								60	4,020			4,020
23	Truck	67	days										109	7,303	7,303
	Subtotal							**75,954**		**369,750**		**52,774**		**91,856**	**590,334**
	Taxes @ 6.5 %									24,034					24,034
	Subtotal														**614,368**
	Indirects @ 21.5%														132,089

**** WBS T O T A L ** $ 746,457**

Alternative 2, Simultaneous Groundwater Extraction
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTNAL

WBS NO.:1.30.30.20.20.30

PROJECT LOCATION: KARNACK, TEXAS

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	General Conditions														
1	Safety, training ,waste, health plans, etc.	1	ea	40	40	eng	81.60	3,264	200	200					3,464
2	Site orientation,training, etc	4	pers	8	32	op	33.80	1,082							1,082
3	Mob/demob	1	ea										5500	5,500	5,500
4	Survey crew	2	day										1000	2,000	2,000
5	Site superintendent	2	wk	40	80	super	72.30	5,784			2,825	5,650			11,434
6	Engineering technician	2	wk	40	80	h/s	55.70	4,456	50	100	160	320			4,876
7	Per Diem	28	days								60	1,680			1,680
8	Trucks	28	days										109	3,052	3,052
	Field Work														
1	Modify existing wells, install new well pump	5	ea	72	360	pf	34.20	12,312	4,500	22,500	250	1,250			36,062
2	power discharging piping, level controls, etc.														
3	Assmes aboveground temporary piping														
4	4" dia HDPE pipe w/fittings	500	lf	0.10	50	pf	34.20	1,710	1.70	850	1.15	575			3,135
5	Backflow preventer (check) valves, 4" dia	5	ea	8	40	pf	34.20	1,368	895	4,475					5,843
6	Air release valves with fittings	5	ea	8	40	pf	34.20	1,368	340	1,700					3,068
7	Pressure relief valves with fittings	2	ea	8	16	pf	34.20	547	380	760					1,307
8	4" dia cleanout	8	ea	6	48	pf	34.20	1,642	65	520					2,162
9	4" dia gate valves	8	ea	6	48	pf	34.20	1,642	465	3,720					5,362
10	Pre-cast concrete vault w/secure lid for valves	5	ea	16	80	op	33.80	2,704	320	1,600					4,304
11	Booster pump, 1 HP, 7 GPM, 50' head w/fittings	1	ea	24	24	pf	34.20	821	1,500	1,500					2,321
12	Pre-cast concrete vault, water tight for pump	1	ea	64	64	op	33.80	2,163	3,500	3,500					5,663
13	15 KW generator	12	wk								350	4,200			4,200
14	Diesel Fuel	600	gal						4	2,400					2,400
15	Misc. support for above activities	240	hrs	1	240	lab	24.00	5,760	2.50	600	10.11	2,426			8,786
16	20000 gal frac tank	3	mo						697.00	2,091	1,170.00	3,510	1000	3,000	8,601
16	Gravel for holding tank area	150	cy		16	op	33.80	541	20	3,000	7.42	1,113			4,654
18	Secondary containment	100	ea										60	6,000	6,000
19	Transport cont. water to GWTP at LHAAP-18/24	24	day	8	192	td	24.00	4,608			115.00	2,760			7,368
20	Trucks	135	days								60	8,100			8,100
21	Per Diem	135	days										109	14,715	14,715
	Subtotal							**51,771**		**49,516**		**31,584**		**34,267**	**167,138**
	Taxes @ 6.5 %									3,219					3,219
	Subtotal														**170,357**
	Indirects @ 21.5%														36,627

** WBS T O T A L ** **$ 206,983**

Alternative 2, Groundwater Monitoring and MNA
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR UNIT MH	LABOR TOTAL MH	LABOR CRAFT	LABOR $/MH	LABOR $ VALUE	MATERIAL $/UNIT	MATERIAL $ VALUE	EQUIPMENT $/UNIT	EQUIPMENT $ VALUE	SUBCONTRACT $/UNIT	SUBCONTRACT $ VALUE	TOTAL ($)
	Land Use Controls **Recordation with Harrison County**														
1	Allowance for Legal Fees, Administration Controls, and Documentation	1	lot										15,000	15,000	15,000
	Total Land Use Controls Initial (assumes annual and 5 year inspections included with GW monitoring							**0**		**0**		**0**		**15,000**	**15,000**
	Shallow Zone MNA - 13 wells, Intermediate zone MNA - 4 wells, Intermediate insitu wells - 6														
	Year 1														
1	Establish initial database, licenses, coordinate well characterization & other well info, develop work plans, etc.	1	ea	200	200	eng	81.60	16,320	2,250	2,250			5,000	5,000	23,570
2	Install one well in shallow zone (incl driller mobe/demobe)	1	ea	16	16	geol	71.20	1,139	100	100	100	100	7,000	7,000	8,339
3	shallow zone - collect and prepare samples quarterly (GW) MNA	64	ea	4	256	tech	34.30	8,780	110	7,040	36	2,304			18,124
4	int. zone - collect and prepare samples biweekly for 6 events. (GW)	66	ea	4	264	tech	34.30	9,060	110	7,260	36	2,376			18,696
5	Sample analysis (explosives, MNA)	64	ea										525	33,600	33,600
6	Sample analysis (perchlorate, MNA)	36	ea										475	17,100	17,100
7	Sample analysis (VOCs)	94	ea										225	21,150	21,150
8	Sample analysis (Metals)	64	ea										50	3,200	3,200
9	Chemist	49	hrs	1	49	chem	71.20	3,490							3,490
10	Truck	73	dys								60	4,380			4,380
11	Per Diem	73	dys										109	7,957	7,957
12	Annual report	1	ea	120	120	eng	81.60	9,790	150	150					9,940
	Subtotal							**48,579**		**16,800**		**9,160**		**95,007**	**169,546**
	Taxes @ 6.5 %									1,092					1,092
	Subtotal														**170,638**
	Indirects @ 21.5%														36,687
	Year 1 total (current dollars)														**$ 207,325**

Alternative 2, Groundwater Monitoring and MNA
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR UNIT MH	LABOR TOTAL MH	LABOR CRAFT	LABOR $/MH	LABOR $ VALUE	MATERIAL $/UNIT	MATERIAL $ VALUE	EQUIPMENT $/UNIT	EQUIPMENT $ VALUE	SUBCONTRACT $/UNIT	SUBCONTRACT $ VALUE	TOTAL ($)
	Year 2														
1	Collect/prepare samples qtly - shallow zone (GW)	64	ea	4	256	tech	34.30	8,780	110	7,040	36	2,304	55	3,520	21,644
2	Collect/prepare samples qtly - int. zones (MNA)	28	ea	4	112	tech	34.30	3,840	110	3,080	36	1,008	55	1,540	9,468
3	Sample analysis (explosives)	64	ea										325	20,800	20,800
4	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
5	Sample analysis (VOCs)	7	ea										225	1,575	1,575
6	Sample analysis (VOCs, MNA)	28	ea										425	11,900	11,900
7	Sample analysis (Metals)	60	ea										50	3,000	3,000
8	Chemist	27	hrs	1	27	chem	71.20	1,920							1,920
9	Truck	52	dys								60	3,120			3,120
10	Per Diem	52	dys										109	5,668	5,668
11	Annual report	1	ea	120	120	eng	81.60	9,790	150	150					9,940
	Subtotal							**24,330**		**10,270**		**6,432**		**50,478**	**91,510**
	Taxes @ 6.5 %									668					668
	Subtotal														**92,178**
	Indirects @ 21.5%														19,818
	Year 2 total (current dollars)														**$ 111,996**
	Years 3 & 4														
1	Collect and prepare samples semiannually for both shallow and int. zones (GW)	46	ea	4	184	tech	34.30	6,310	110	5,060	36	1,656			13,026
2	Sample analysis (perchlorate)	18	ea										275	4,950	4,950
3	Sample analysis (explosives)	32	ea										325	10,400	10,400
4	Sample analysis (VOCs)	14	ea										225	3,150	3,150
5	Sample analysis (Metals)	23	ea										50	1,150	1,150
6	Chemist	16	hrs	1	16	chem	71.20	1,140							1,140
7	Truck	25	days										60	1,500	1,500
8	Per Diem	25	days										109	2,725	2,725
9	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**17,242**		**5,210**		**1,656**		**23,875**	**47,983**
	Taxes @ 6.5 %									339					339
	Subtotal														**48,322**
	Indirects @ 21.5%														10,389
	Years 3 & 4 Annual Cost														**$ 58,711**
	Years 3 & 4 Total Cost														**117,422**

Alternative 2, Groundwater Monitoring and MNA
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR UNIT MH	LABOR TOTAL MH	LABOR CRAFT	LABOR $/MH	LABOR $ VALUE	MATERIAL $/UNIT	MATERIAL $ VALUE	EQUIPMENT $/UNIT	EQUIPMENT $ VALUE	SUBCONTRACT $/UNIT	SUBCONTRACT $ VALUE	TOTAL ($)
	Year 5														
1	Collect and prepare samples semiannually for both shallow and int. zones (GW)	46	ea	4	184	tech	34.30	6,310	110	5,060	36	1,656			13,026
2	Sample analysis (perchlorate)	18	ea										275	4,950	4,950
3	Sample analysis (explosives)	32	ea										325	10,400	10,400
4	Sample analysis (VOCs)	14	ea										225	3,150	3,150
5	Sample analysis (Metals)	23	ea										50	1,150	1,150
6	Chemist	16	hrs	1	16	chem	71.20	1,140							1,140
7	Truck	25	days										60	1,500	1,500
8	Per Diem	25	days										109	2,725	2,725
9	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
10	CERCLA 5-year review	1	ea										35000	35,000	35,000
	Subtotal							**17,242**		**5,210**		**1,656**		**58,875**	**82,983**
	Taxes @ 6.5 %									339					339
	Subtotal														**83,322**
	Indirects @ 21.5%														17,914
	Year 5 total (current dollars)														**$ 101,236**
	Years 6 through 9														
1	Collect and prepare samples annually for both shallow and int. zones (GW)	23	ea	4	92	tech	34.30	3,160	110	2,530	36	828			6,518
2	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
3	Sample analysis (explosives)	16	ea										325	5,200	5,200
4	Sample analysis (VOCs)	7	ea										225	1,575	1,575
5	Sample analysis (Metals)	12	ea										50	600	600
6	Chemist	8	hrs	1	8	chem	71.20	570							570
7	Truck	12	days										60	720	720
8	Per Diem	12	days										109	1,308	1,308
9	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**13,522**		**2,680**		**828**		**11,878**	**28,908**
	Taxes @ 6.5 %									174					174
	Subtotal														**29,082**
	Indirects @ 21.5%														6,253
	Years 6 through 9 Annual Cost														**$ 35,335**
	Years 6 through 9 Total Cost														**141,339**

Alternative 2, Groundwater Monitoring and MNA
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR UNIT MH	LABOR TOTAL MH	LABOR CRAFT	LABOR $/MH	LABOR $ VALUE	MATERIAL $/UNIT	MATERIAL $ VALUE	EQUIPMENT $/UNIT	EQUIPMENT $ VALUE	SUBCONTRACT $/UNIT	SUBCONTRACT $ VALUE	TOTAL ($)
	Year 10														
1	Collect and prepare samples annually for both shallow and int. zones (GW)	23	ea	4	92	tech	34.30	3,160	110	2,530	36	828			6,518
2	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
3	Sample analysis (explosives)	16	ea										325	5,200	5,200
4	Sample analysis (VOCs)	7	ea										225	1,575	1,575
5	Sample analysis (Metals)	12	ea										50	600	600
6	Chemist	8	hrs	1	8	chem	71.20	570							570
7	Truck	12	days										60	720	720
8	Per Diem	12	days										109	1,308	1,308
9	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
10	CERCLA 5-year review	1	ea										35000	35,000	35,000
	Subtotal							**13,522**		**2,680**		**828**		**46,878**	**63,908**
	Taxes @ 6.5 %									174					174
	Subtotal														**64,082**
	Indirects @ 21.5%														13,778
	Year 10 total (current dollars)														**$ 77,860**
	Years 15, 20, 25, 30														
1	Collect and prepare samples (GW)	23	wells	4	92	tech	34.30	3,160	110	2,530	36	828			6,518
2	Sample analysis (perchlorate)	8	ea										275	2,200	2,200
3	Sample analysis (explosives)	14	ea										325	4,550	4,550
4	Sample analysis (VOCs)	12	ea										225	2,700	2,700
5	Sample analysis (Metals)	12	ea										50	600	600
6	Chemist	9	hrs	1	9	chem	71.20	640							640
7	Truck	13	days										60	780	780
8	Per Diem	13	days										109	1,417	1,417
9	Event Report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
10	CERCLA 5-year review	1	ea										35000	35,000	35,000
	Subtotal							**3,160**		**2,680**		**828**		**47,247**	**64,347**
	Taxes @ 6.5 %									174					174
	Subtotal														**64,521**
	Indirects @ 21.5%														13,872
	Years 15, 20, 25, 30 Event Total (current dollars)														**$ 78,393**
	Years 15, 20, 25, 30 Combined Total (current dollars)														**313,573**

Alternative 2, Treatment Plant Operation and Maintenance
LHAAP-29 Feasibility Study

COMPANY NAME: SHAW ENVIRONMENTAL

WBS NO. :1.30.40.10.20

PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	O&M Annual costs														
	The water is placed in a storage tank at the LHAAP treatment plant.														
	These costs are associated with operating the plant.														
	Costs have been factored from approximate actual costs, which are from the 5-Year Review (Shaw, 2008) and inflated 4%.														
1	Additional annual Plant Costs	0.06	yr										432,981	27,061	27,061
	Subtotal							**0**		**0**		**0**		**27,061**	**27,061**
	Taxes @ 6.5 %									0					0
	Subtotal														**27,061**
	Indirects @ 21.5%														5,818

**** WBS T O T A L **** **$ 32,880**

Alternative 3, Excavation, Extraction. Monitoring, MNA, LUCs
Present Value
LHAAP-29 Feasibility Study

WBS NO. : 1.40				COMPANY NAME:		SHAW ENVIRONMENTAL			
				PROJECT LOCATION:		KARNACK, TEXAS			
Year	Capital Costs		O & M Costs				Present Value (NPV)		
			Interm. Monitoring, MNA, and LUCs	O&M Extract		Total	Discount Rate	Capital	O & M
							2.8%		
1	1,359,689		226,985	198,154		425,139	NPV	1,359,689	1,557,834
2	0		122,181	198,154		320,335			
3	0		122,181	198,154		320,335	Total Present Value =		$2,917,523
4	0		71,849			71,849			
5	0		114,579			114,579			
6	0		33,522			33,522			
7	0		33,522			33,522			
8	0		33,522			33,522			
9	0		33,522			33,522			
10	0		78,636			78,636			
11	0		0			0			
12	0		0			0			
13	0		0			0			
14	0		0			0			
15	0		78,636			78,636			
16	0		0			0			
17	0		0			0			
18	0		0			0			
19	0		0			0			
20	0		78,636			78,636			
21	0		0			0			
22	0		0			0			
23	0		0			0			
24	0		0			0			
25	0		78,636			78,636			
26	0		0			0			
27	0		0			0			
28	0		0			0			
29	0		0			0			
30	0		78,636			78,636			
	1,359,689		1,185,045	594,461		1,779,506			

Alternative 3, Remedial Design Documents
LHAAP-29 Feasibility Study

WBS NO. : 1.40.20 **COMPANY NAME: SHAW ENVIRONMENTAL**
PROJECT LOCATION: KARNACK, TEXAS

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	Engineering Support														
1	Develop design report, drawings, specs & procurement pkgs.	1	lot	350	350	eng	81.60	28,560	1,000	1,000			1,600	1,600	31,160
2	RFP & S / C procurement doc.support	1	ea	40	40	eng	81.60	3,264	100	100					3,364
3	Bid and award S / C support	1	ea	40	40	eng	81.60	3,264							3,264
4	Completion Report	1	ea	350	350	eng	81.60	28,560	1,200	1,200					29,760
	Subtotal							**63,648**		**2,300**		**0**		**1,600**	**67,548**
	Taxes @ 6.5 %									150					150
														**** WBS T O T A L ****	**$ 67,698**
	Site-Wide Metals Evaluation for Remedial Design														
1	Coordination, develop work plans, etc.	1	ea	20	20	eng	81.60	1,632	2,250	2,250			5000	5,000	8,882
3	shallow zone - collect and prepare samples (GW) for Metals	40	ea	4	160	tech	34.30	5,490	110	4,400	36	1,440			11,330
4	int. zone - collect and prepare samples (GW) for Metals	11	ea	4	44	tech	34.30	1,510	110	1,210	36	396			3,116
5	Sample analysis (Metals)	51	ea										50	2,550	2,550
8	Chemist	13	hrs	1	13	chem	71.20	930							930
9	Truck	29	dys								60	1,740			1,740
10	Per Diem	29	dys										109	3,161	3,161
11	Site-Wide Metals Evaluation report	1	ea	80	80	eng	81.60	6,530	100	100					6,630
	Subtotal							**16,092**		**7,960**		**3,576**		**10,711**	**38,339**
	Taxes @ 6.5 %									517					517
	Subtotal														**38,856**
	Indirects @ 21.5%														8,354
															$ 47,211
	Flow Tests														
1	Install wells for flow test and conduct test	3	wells	80	80	Engr tech	65.70	5,256	100	300	150	450	4,000	12,000	18,006
2	Truck	4	days								60	240			240
3	Per Diem	8	days										109	872	872
4	Prepare report	1	ea										15,000	15,000	15,000
	Subtotal							**5,256**		**300**		**690**		**27,872**	**34,118**
	Taxes @ 6.5 %									20					20
	Subtotal														**34,138**
	Indirects @ 21.5%														7,340
														**** WBS T O T A L ****	**$ 41,477**

Alternative 3, General Contractor Construction Management
LHAAP-29 Feasibility Study

WBS NO. : 1.40.30.10 **COMPANY NAME: SHAW ENVIRONMENTAL**
PROJECT LOCATION: KARNACK, TEXAS

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	Construction Management														
	For Excavation and GW Extraction System Installation														
1	Temporary facilities	3	mo										750	2,250	2,250
2	Equipment	3	mo								600	1,800			1,800
3	Site superintendent	1	ea	504	504	super	72.30	36,439			2,825	2,825			39,264
4	Health & safety officer	1	ea	504	504	h/s	55.70	28,073	50	50	160	160			28,283
5	Field service technician	2	ea	504	1008	hmt	43.60	43,949	100	200					44,149
6	G & A / overhead / profit / bond @ 15 % of	0.15	%										633,249	94,987	94,987
	Construction costs														
7	Truck	176.5	days								60	10,590			10,590
8	Per Diem	353	days										109	38,477	38,477
	Subtotal							**108,461**		**250**		**15,375**		**135,714**	**259,800**
	Taxes @ 6.5 %									16					16
	Subtotal														**259,816**
	Indirects @ 21.5%														55,861

**** WBS T O T A L **** **$ 315,677**

Alternative 3, Conventional Excavation
LHAAP-29 Feasibility Study

WBS NO. :1.40.30.20.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	General conditions														
1	Safety, training ,waste, health plans, etc.	1	ea	80	80	eng	81.60	6,528	200	200					6,728
2	Mob / Demob	1	ea	240	240	op	33.80	8,112	2,500	2,500	3,000	3,000			13,612
3	Port-let rental-2 ea	1	mo										320	320	320
4	Silt fence at construction area	600	lf	0.02	12	lab	24.00	288	0.40	240	0.05	30			558
5	Hay bales	200	ea	0.02	4	lab	24.00	96	0.40	80	0.05	10			186
6	Erosion control, straw bales at const. area	1	lot	80	80	lab	24.00	1,920	1,000	1,000					2,920
7	Survey crew	5	day										1000	5,000	5,000
8	Personal protective equipment	129	mday								30	3,870			3,870
9	Construction equip. staging area	1	ea	120	120	op	33.80	4,056	2,000	2,000	1,500	1,500			7,556
10	Site Orientation - 1 day	5	pers	8	40	op	33.80	1,352							1,352
11	Truck	55	days								60	3,270			3,270
12	Per Diem	109	days										109	11,881	11,881
	Decon area														
1	Provide small temporary decon area for	1	ea	120	120	lab	24.00	2,880	6,000	6,000	2,000	2,000			10,880
2	decon of const. equipment. Demo at end of job														
3	Decon all equipment at completion of work	1	lot	8	8	lab	24.00	192	200	200	200	200			592
4	Pressure washer	1	ea								650	650			650
	Soils staging / segregation area														
	Staging area not required. Load excavated														
	soils directly into off-site shipping containers.														
	Excavation														
1	Waste excavation	3,900	bcy	0.03	117	op	33.80	3,955							3,955
2	Excavator (20 Ton)	40	day	10	400	op	33.80	13,520			185.00	7,400			20,920
3	Wheel loader (2.5 CY)	40	day	10	400	op	33.80	13,520			106.00	4,240			17,760
4	Gravel for access to excavated areas	150	cy		16	op	33.80	541	20	3,000	7.42	1,113			4,654
5	Truck w/ water spray / tank for excavated area	40	hrs.	1	40	td	24.00	960			64	2,560			3,520
6	Continuous air monitors	4	ea						1,200	4,800					4,800
7	Aerosol Monitor	40	day								7.80	312			312
8	Photoionization Detector	40	day								12.42	497			497
9	LEL 4 Gas Meter	40	day								12.42	497			497
10	Soil samples to to confirm risk limits	40	ea										825	33,000	33,000
11	Confirmation samples (VOC,perchlorate,explosives)	50	ea	1	50	tech	34.30	1,715	50	2,500	36	1,800	825	41,250	47,265
12	Chemist	10	hrs.	1	10	chem	71.20	712							712
13	Sample Supplies	40	ea						4.00	160					160
14	Sample Shipping	20	ea										55	1,100	1,100
15	Truck	119	days								60	7,140			7,140
16	Per Diem	119	days										109	12,971	12,971

Alternative 3, Conventional Excavation
LHAAP-29 Feasibility Study

WBS NO. :1.40.30.20.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		TOTAL ($)
				UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	
	Plug and Abandon Lines														
1	Plug and abandon lines	4,500	lf	0.025	113	op	33.80	3,803	0.50	2,250	0.25	1,125			7,178
2	Fill manholes	12	ea	8	96	op	33.80	3,245	300.00	3,600	75.00	900			7,745
3	Truck	36	days								60	2,160			2,160
4	Per Diem	36	days										109	3,924	3,924
	Backfill														
1	Borrow fill material from off-site (delivered)	4,875	lcy						9.90	48,263					48,263
2	Compaction ,6" lifts, 4 passes	4,875	lcy	0.009	44	op	33.80	1,483			0.47	2,291			3,774
3	Fertilize, seed, and mulch	77,000	sf										0.131	10,087	10,087
4	Truck w/ water spray / tank for excavated area	60	hrs.	1	60	td	24.00	1,440			64	3,840			5,280
5	Support personnel	40	hrs.	1	40	lab	24.00	960			15.16	606			1,566
6	Truck	25	days								60	1,500			1,500
7	Per Diem	25	days										109	2,725	2,725
	Excavated soils waste characterization														
1	Waste characterization disposal profile	10	ea	1.000	10	tech	34.30	343	50	500	36.00	360	1,500	15,000	16,203
2	Waste documentation / Reports	1	lot	240	240	engr tech	65.70	15,768	400	400					16,168
	Waste disposal														
1	Title "D" ,Texas class 1 trans/waste disposal fees	5,460	tons										27.00	147,420	147,420
2	Truck Liners	273	ea								49.50	13,514			13,514
	Subtotal							**87,388**		**77,693**		**66,385**		**284,678**	**516,143**
	Taxes @ 6.5 %									5,050					5,050
	Subtotal														**521,193**
	Indirects @ 21.5%														112,056

**** WBS T O T A L **** **$ 633,249**

Alternative 3, Groundwater Extraction
LHAAP-29 Feasibility Study

WBS NO.:1.40.30.20.20.30 **COMPANY NAME: SHAW ENVIRONMENTNAL**
PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	General Conditions														
1	Safety, training ,waste, health plans, etc.	1	ea	40	40	eng	81.60	3,264	200	200					3,464
2	Site orientation,training, etc	4	pers	8	32	op	33.80	1,082							1,082
3	Mob/demob	1	ea										5500	5,500	5,500
4	Survey crew	2	day										950	1,900	1,900
5	Site superintendent	2	wk	40	80	super	72.30	5,784			2,825	5,650			11,434
6	Engineering technician	2	wk	40	80	h/s	55.70	4,456	50	100	160	320			4,876
7	Truck	28	days								60	1,680			1,680
8	Per Diem	28	days										109	3,052	3,052
	Field Work														
1	Install new wells, install new well pump	5	ea	72	360	pf	34.20	12,312	4,500	22,500	250	1,250			36,062
	power discharging piping, level controls, etc.														
2	Pipe trench excavation (2,350 lf)	270	bcy	0.08	22	op	33.80	730			3.70	999			1,729
3	Sand bedding for pipe, compacted	35	lcy	0.25	9	op	33.80	296	3.70	130	2.15	75			501
4	Backfill and compaction, 6" lifts	290	lcy	0.06	17	op	33.80	588			2.75	798			1,386
5	4" dia HDPE pipe w/fittings	2,350	lf	0.10	235	pf	34.20	8,037	1.70	3,995	1.15	2,703			14,735
6	Backflow preventer (check) valves, 4" dia	5	ea	8	40	pf	34.20	1,368	895	4,475					5,843
7	Air release valves with fittings	5	ea	8	40	pf	34.20	1,368	340	1,700					3,068
8	Pressure relief valves with fittings	2	ea	8	16	pf	34.20	547	380	760					1,307
9	4" dia cleanout	15	ea	6	90	pf	34.20	3,078	65	975					4,053
10	4" dia gate valves	15	ea	6	90	pf	34.20	3,078	465	6,975					10,053
11	Pre-cast concrete vault w/secure lid for valves	5	ea	16	80	op	33.80	2,704	320	1,600					4,304
12	Booster pump, 1 HP, 7 GPM, 50' head w/fittings	1	ea	24	24	pf	34.20	821	1,500	1,500					2,321
13	Pre-cast concrete vault, water tight for pump	1	ea	64	64	op	33.80	2,163	3,500	3,500					5,663
14	Electrical power lines w/ poles, disconnects, etc.	1	lot										12000	12,000	12,000
15	Misc. support for above activities	240	hrs	1	240	lab	24.00	5,760	2.50	600	10.11	2,426			8,786
16	15,000-gal holding tank	12	mo										1000	12,000	12,000
17	Gravel for holding tank area	150	cy		16	op	33.80	541	20	3,000	7.42	1,113			4,654
18	Secondary containment	100	ea										60	6,000	6,000
19	Truck	228	days								60	13,680			13,680
20	Per Diem	228	days										109	24,852	24,852
	Subtotal							**57,977**		**52,010**		**30,694**		**65,304**	**205,984**
	Taxes @ 6.5 %									3,381					3,381
	Subtotal														**209,364**
	Indirects @ 21.5%														45,013

**** WBS T O T A L ** $ 254,378**

Alternative 3, Groundwater Monitoring, MNA, and LUCs
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item NO	DESCRIPTION	QTY	UNIT	LABOR UNIT MH	LABOR TOTAL MH	LABOR CRAFT	LABOR $/MH	LABOR $ VALUE	MATERIAL $/UNIT	MATERIAL $ VALUE	EQUIPMENT $/UNIT	EQUIPMENT $ VALUE	SUBCONTRACT $/UNIT	SUBCONTRACT $ VALUE	TOTAL ($)
	Land Use Controls														
	Deed Restriction														
1	Allowance for Legal Fees, Administration Controls, and Documentation	1	lot										15,000	15,000	15,000
	Total Land Use Controls (assumes annual and 5 year inspections included with GW monitoring)							**0**		**0**		**0**		**15,000**	**15,000**
	Shallow Zone MNA - 13 wells Intermediate zone MNA - 4 wells, Intermediate zone extraction wells - 5 + 1 MW														
	Year 1														
1	Establish database, licenses, well characterization & info, develop work plans, etc.	1	ea	200	200	eng	81.60	16,320	2,250	2,250			5,000	5,000	23,570
2	Install one well in shallow zone (incl driller mobe.demobe)	1	ea	16	16	geol	71.20	1,139	100	100	100	100	7,000	7,000	8,339
3	shallow zone - collect and prepare samples quarterly (GW)	64	ea	4	256	tech	34.30	8,780	110	7,040	36	2,304			18,124
4	int. zone - collect and prepare samples monthly for 6 months. (GW)	54	ea	4	216	tech	34.30	7,410	110	5,940	36	1,944			15,294
5	int. zone - collect and prepare samples quarterly for 6 mos. (GW)	18	ea	4	72	tech	34.30	2,470	110	1,980	36	648			5,098
6	Sample analysis (explosives, MNA)	64	ea										525	33,600	33,600
7	Sample analysis (perchlorate, MNA)	36	ea										475	17,100	17,100
8	Sample analysis (VOCs)	100	ea										225	22,500	22,500
9	Sample analysis (Metals)	64	ea										50	3,200	3,200
10	Chemist	50	hrs	1	50	chem	71.20	3,560							3,560
11	Truck	77	dys								60	4,620			4,620
12	Per Diem	77	dys										109	8,393	8,393
13	Annual report	1	ea	120	120	eng	81.60	9,790	150	150					9,940
	Subtotal							**49,469**		**17,460**		**9,616**		**96,793**	**173,338**
	Taxes @ 6.5 %									1,135					1,135
	Subtotal														**174,473**
	Indirects @ 21.5%														37,512
	Year 1 total (current dollars)														**$ 211,985**

Alternative 3, Groundwater Monitoring, MNA, and LUCs
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	Year 2														
1	shallow - collect/prepare samples quarterly	64	ea	4	256	tech	34.30	8,780	110	7,040	36	2,304			18,124
2	Intermediate - collect/prepare samples quarterly	36	ea	4	144	tech	34.30	4,940	110	3,960	36	1,296			10,196
3	Sample analysis (perchlorate, MNA)	9	ea										475	4,275	4,275
4	Sample analysis (explosives, MNA)	64	ea										525	33,600	33,600
5	Sample analysis (VOCs)	43	ea										225	9,675	9,675
6	Sample analysis (Metals)	50	ea										50	2,500	2,500
7	Chemist	29	hrs	1	29	chem	71.20	2,060							2,060
8	Truck	56	dys								60	3,360			3,360
9	Per Diem	56	dys										109	6,104	6,104
10	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**25,572**		**11,150**		**6,960**		**56,154**	**99,836**
	Taxes @ 6.5 %									725					725
	Subtotal														**100,561**
	Indirects @ 21.5%														21,621
	Year 2 total (current dollars)														**$ 122,181**
	Year 3														
1	shallow - collect/prepare samples quarterly	64	ea	4	256	tech	34.30	8,780	110	7,040	36	2,304			18,124
2	Intermediate - collect/prepare samples quarterly	36	ea	4	144	tech	34.30	4,940	110	3,960	36	1,296			10,196
3	Sample analysis (perchlorate)	9	ea										475	4,275	4,275
4	Sample analysis (explosives)	64	ea										525	33,600	33,600
5	Sample analysis (VOCs)	43	ea										225	9,675	9,675
6	Sample analysis (Metals)	50	ea										50	2,500	2,500
7	Chemist	29	hrs	1	29	chem	71.20	2,060							2,060
8	Truck	56	dys								60	3,360			3,360
9	Per Diem	56	dys										109	6,104	6,104
10	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**25,572**		**11,150**		**6,960**		**56,154**	**99,836**
	Taxes @ 6.5 %									725					725
	Subtotal														**100,561**
	Indirects @ 21.5%														21,621
	Year 3 total (current dollars)														**$ 122,181**

Alternative 3, Groundwater Monitoring, MNA, and LUCs
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	Year 4														
1	shallow - collect/prepare samples semiannually	32	ea	4	128	tech	34.30	4,390	110	3,520	36	1,152			9,062
2	Collect / prepare samples quarterly MNA for intermediate zone	28	ea	4	112	tech	34.30	3,840	110	3,080	36	1,008			7,928
3	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
4	Sample analysis (explosives)	32	ea										325	10,400	10,400
5	Sample analysis (VOCs)	7	ea										225	1,575	1,575
6	Sample analysis (VOCs, MNA)	28	ea										425	11,900	11,900
7	Sample analysis (Metals)	30	ea										50	1,500	1,500
8	Chemist	17	hrs	1	17	chem	71.20	1,210							1,210
9	Truck	16	dys								60	960			960
10	Per Diem	16	dys										109	1,744	1,744
11	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**19,232**		**6,750**		**3,120**		**29,594**	**58,696**
	Taxes @ 6.5 %									439					439
	Subtotal														**59,135**
	Indirects @ 21.5%														12,714
	Year 4 total (current dollars)														**$ 71,849**
	Year 5														
1	shallow - collect/prepare samples semiannually	32	wells	4	128	tech	34.30	4,390	110	3,520	36	1,152			9,062
2	Collect / prepare samples quarterly MNA for intermediate zone	28	ea	4	112	tech	34.30	3,840	110	3,080	36	1,008			7,928
3	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
4	Sample analysis (explosives)	32	ea										325	10,400	10,400
5	Sample analysis (VOCs)	7	ea										225	1,575	1,575
6	Sample analysis (VOCs, MNA)	28	ea										425	11,900	11,900
7	Sample analysis (Metals)	30	ea										50	1,500	1,500
8	Chemist	17	hrs	1	17	chem	71.20	1,210							1,210
9	Truck	17	days										60	1,020	1,020
10	Per Diem	17	days										109	1,853	1,853
11	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
12	CERCLA 5-year review	1	ea										35000	35,000	35,000
	Subtotal							**19,232**		**6,750**		**2,160**		**65,723**	**93,865**
	Taxes @ 6.5 %									439					439
	Subtotal														**94,304**
	Year 5 total (current dollars)														**$ 114,579**

Alternative 3, Groundwater Monitoring, MNA, and LUCs
LHAAP-29 Feasibility Study

WBS NO. : 1.40.40.10.10 — **COMPANY NAME: SHAW ENVIRONMENTAL** — **PROJECT LOCATION: KARNACK, TEXAS**

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	Years 6 through 9														
1	shallow - collect/prepare samples annually	16	ea	4	64	tech	34.30	2,200	110	1,760	36	576			4,536
2	Intermediate - collect/prepare samples annually	7	ea	4	28	tech	34.30	960	110	770	36	252			1,982
3	Sample analysis (perchlorate)	9	ea										275	2,475	2,475
4	Sample analysis (explosives)	16	ea										325	5,200	5,200
5	Sample analysis (VOCs)	7	ea										225	1,575	1,575
6	Sample analysis (Metals)	12	ea										50	600	600
7	Chemist	6	hrs	1	6	chem	71.20	430							430
8	Truck	4	dys								60	240			240
9	Per Diem	4	dys										109	436	436
10	Annual report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
	Subtotal							**13,382**		**2,680**		**1,068**		**10,286**	**27,416**
	Taxes @ 6.5 %									174					174
	Subtotal														**27,590**
	Indirects @ 21.5%														5,932
	Year 6 through 9 Annual Cost (current dollars)														**$ 33,522**
	Year 6 through 9 Combined Cost (current dollars)														**134,088**
	Years 10, 15, 20, 25, 30														
	5 Year Reviews/Inspections														
1	Collect and prepare samples annually (GW)	23	wells	4	92	tech	34.30	3,160	110	2,530	36	828			6,518
2	Sample analysis (perchlorate)	8	ea										275	2,200	2,200
3	Sample analysis (explosives)	14	ea										325	4,550	4,550
4	Sample analysis (VOCs)	12	ea										225	2,700	2,700
6	Sample analysis (Metals)	16	ea										50	800	800
6	Chemist	9	hrs	1	9	chem	71.20	640							640
7	Truck	13	dys								60	780			780
8	Per Diem	13	dys										109	1,417	1,417
9	Event report	1	ea	120	120	eng	81.60	9,792	150	150					9,942
10	CERCLA 5-year review	1	ea										35000	35,000	35,000
	Subtotal							**3,800**		**2,680**		**1,608**		**46,667**	**64,547**
	Taxes @ 6.5 %									174					174
	Subtotal														**64,721**
	Indirects @ 21.5%														13,915
	Years 10, 15, 20, 25, 30 Event Cost (current dollars)														**$ 78,636**
	Years 10, 15, 20, 25, 30 Combined Cost (current dollars)														**393,181**

Alternative 3, Extraction Wells Operation and Maintenance
LHAAP-29 Feasibility Study

WBS NO. :1.40.40.10.20 **COMPANY NAME: SHAW ENVIRONMENTAL**
PROJECT LOCATION: KARNACK, TEXAS

Item				LABOR					MATERIAL		EQUIPMENT		SUBCONTRACT		
NO	DESCRIPTION	QTY	UNIT	UNIT MH	TOTAL MH	CRAFT	$/MH	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	$/UNIT	$ VALUE	TOTAL ($)
	LHAAP-29 - 5 wells														
	Extraction Well O&M Annual costs														
1	Install new filter socks	5	ea	24	120	pf	34.20	4,104	20	100	200	1,000			5,204
2	Leak test 2" dia underground pipe, fittings	1	lot	170	170	pf	34.20	5,814	3,000	3,000	1,600	1,600			10,414
	valves, pumps, etc -- 900 lf.														
3	Extraction and booster pumps power usage	24090	kwh						0.120	2,891					2,891
4	15,000-gal holding tank	12	mo										1000	12,000	12,000
5	Annual LHAAP water treatment plant operations	0.25	an cost										432981	108,245	108,245
6	Transport cont. water to GWTP at LHAAP-18/24	78	day	8	624	td	24.00	14,976			115.00	8,970			23,946
	Subtotal							**24,894**		**5,991**		**11,570**		**120,245**	**162,700**
	Taxes @ 6.5 %									389					389
	Subtotal														**163,089**
	Indirects @ 21.5%														35,064
	Annual total														**$ 198,154**
	O & M will be conducted for 3 Years														**594,461**

Shaw Environmental & Infrastructure, Inc.

Shaw The Shaw Group Inc.™

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Memorandum

Date: **May 4, 2010**

To: **Aaron Williams**
U. S. Army Corps of Engineers

CC: **Praveen Srivastav, Ph.D., P.G.**
Shaw Environmental, Inc.

From: **Arthur F. Eidson, Ph.D.**
Shaw Environmental, Inc.

RE: **Errata to Final Data Evaluation Report, Chemical Concentrations in Soil Samples Associated with LHAAP-35/36 Sumps, Longhorn Army Ammunition Plant, Karnack, Texas, January 2008**

It was recently discovered that sumps WRSump-014 and WRSump-019 were assigned to incorrect sites in the *Final Data Evaluation Report, Chemical Concentrations in Soil Samples Associated With LHAAP-35/36 Sumps, Longhorn Army Ammunition Plant, Karnack, Texas, January 2008*, which is referred to herein as the Shaw (2008) document. This memorandum presents corrections to the Final Shaw (2008) document resulting from reassignment of these sumps to the correct sites.

The waste rack sump WRSump-014 location was reassigned from site LHAAP-47 to site LHAAP-46. Waste rack sump WRSump-019 was reassigned from site LHAAP-46 to site LHAAP-35B(37).

The reassignment of these sumps requires assigning the soil analytical data from the incorrect sites to the correct sites and a re-evaluation of the report conclusions based on the revised data sets.

The impact of these re-evaluations on the Shaw (2008) document is described in this memorandum, which is referred to herein as this Errata Memorandum. This Errata memorandum includes text and tables in attachments that are organized as follows:

- Unrevised Text. Specific sump information that is unchanged but supports portions of the Shaw (2008) document different from those originally referenced, as indicated by clarifying notes in the attachment.
- Revised Text. New and modified text that incorporates changes related to sump reassignments.
- Revised Tables. New and modified tables that incorporate changes related to sump reassignments.

Reassignment of WRSump-014 from Site LHAAP-47 to Site LHAAP-46

WRSump-014 is discussed in **Section 4.4.52** of Volume I of the Shaw, 2008 document. This text is unchanged by the reassignment to LHAAP-46. This Errata Memorandum includes **Section 4.4.52** within the attachment titled Unrevised Text, which provides a note to clarify the reassignment of WRSump-014.

The text in **Section 4.4.52** of the Shaw (2008) document refers to **Table 4-111**. There are no changes to **Table 4-111** required by the reassignment to LHAAP-46.

Reassignment of WRSump-019 from LHAAP-46 to site LHAAP-35B(37)

WRSump-019 is discussed in **Section 4.2.59** of Volume I of the Shaw, 2008 document. This text is unchanged by the reassignment to LHAAP-35B(37). This Errata Memorandum includes **Section 4.2.59** within the Unrevised Text attachment, which provides a note to clarify the reassignment of WRSump-019.

The text in the Shaw (2008) document refers to **Table 4-59**. There are no changes to **Table 4-59** required by the reassignment.

Revision of Sections 4.3.2 and 4.3.3 of the Shaw (2008) Document

Reassignments of WRSump-014 from LHAAP-47 to LHAAP-46 and WRSump-019 from LHAAP-46 to LHAAP-35B(37) require addition of WRSump-014 data to **Table 4-61** of the Shaw (2008) document, removal of WRSump-019 data from **Table 4-61**, and recalculation of the 95% Upper Confidence Limits (95% UCLs) in **Table 4-61**. These reassignments do not affect the identity of chemicals addressed in **Table 4-61** (aluminum, arsenic, mercury, and vanadium). The revised **Table 4-61** is included in an attachment of Revised Tables.

The recalculation of 95% UCL values for soil concentrations of aluminum, arsenic, mercury, and vanadium require revision of **Tables 4-62** through **4-66** of the Shaw (2008) document to incorporate the revised soil concentrations in the calculated cancer risk and noncancer hazard estimates. The revised tables are included in the attachment to this Errata Memorandum titled Revised Tables.

The revisions to **Tables 4-62** through **4-66** require revisions to **Section 4.3.2** and **Section 4.3.3** of the Shaw (2008) document. However, none of the changes to **Tables 4-61** through **4-66** or to **Sections 4.3.2** and **4.3.3** change the conclusions of the Shaw (2008) document. The revised text of **Sections 4.3.2** and **4.3.3** is included in an attachment to this Errata Memorandum titled Revised Text.

Revision of Sections 4.5 and 4.5.1 of the Shaw (2008) Document

Removal of WRSump-014 data from the data set used to calculate 95% UCLs for LHAAP-47 requires recalculation of 95% UCLs in **Table 4-114**. The revised **Table 4-114** is provided in the Revised Tables attachment with the same table number.

The recalculation of 95% UCL values for soil concentrations of aluminum, manganese, mercury, and vanadium requires revision of **Table 4-115** of the Shaw (2008) document to incorporate the revised soil concentrations in the calculated cancer risk and noncancer hazard estimates. The revised **Table 4-115** is provided in the Revised Tables attachment with the same table number.

Revisions to **Table 4-115** require revisions to **Section 4.5** and **Section 4.5.1** of the Shaw (2008) document. None of the changes to **Table 4-115** change the conclusions of the Shaw (2008) document. Because all revised EPC concentrations shown in **Table 4-115** are less than the EPC values reported in the Jacobs (2003) risk assessment, no changes to the conclusions of the Shaw (2008) document are required. Therefore, no revisions to **Section 4.5** tables are required as were required for **Tables 4-62** through **4-66** of **Sections 4.3.2** and **4.3.3**. The revised text of **Sections 4.5** and **4.5.1** is included in the Revised Text attachment.

Addition of Section 4.12

The Shaw (2008) document does not include a discussion of any sumps located at LHAAP-35B(37) because of the incorrect assignment of WRSump-019 to LHAAP-46. The reassignment of WRSump-019 from LHAAP-46 to LHAAP-35B(37) requires renaming of **Section 4.2.59** as a new **Section 4.11** and addition of a new section (**Section 4.12)** to provide the evaluation of potential cancer risk and noncancer

hazards associated with LHAAP-35B(57) . Evaluation of the impact of post-2002 data on the conclusions of the Jacobs (2003) risk assessment of LHAAP-35B(37) is included as **Section 4.12** with the Revised Text attachment. New table numbers were chosen to provide continuity with the Shaw (2008) document.

Attachment 1

Unrevised Text

Note: the following text is taken unchanged from the Shaw (2008) document and supports the revised Sections 4.3.2 and 4.3.3. It should no longer be considered part of Section 4.4; instead it is now a part of Section 4.2.

4.4.52 WRSump-014

Screening of soil concentrations versus RBSV concentrations is shown in **Table 4-111**. All chemicals except vanadium and selected SVOCs have concentrations below the RBSV, and were removed from further consideration in the baseline risk assessment evaluation of the chemical relative to the Jacobs (2003) risk assessment as described in **Section 1.1**. The evaluation of vanadium is described in **Section 4.5.**

Sample WRS14-SB01-01 was diluted by a factor of 10, which resulted in an elevation of the SQL above the MQL, even though the SVOCs were not detected in the sample.

Note: the following text is taken unchanged from the Shaw (2008) document and supports the newly added Section 4.12. It should no longer be considered part of Section 4.2; instead it should be considered as a new section, Section 4.11, with title "LHAAP-35B(37) – WRSump-019."

4.2.59 WRSump-019

Screening of soil concentrations versus RBSV concentrations is shown in **Table 4-59**. All chemicals except vanadium and selected SVOCs have concentrations below the RBSV, and were removed from further consideration in the baseline risk assessment evaluation of the chemical relative to the Jacobs (2003) risk assessment as described in **Section 1.1.**

WRS019-SB01-01, WRS019-SB01-01-QC, WRS019-SB02-01 were diluted by a factor of 5, which resulted in an elevation of the MQL for SVOCs, even though the SVOCs were not detected in the sample. The evaluation of vanadium is described in **Section 4.3.**

Attachment 2

Revised Text

4.3.2 Aluminum, Mercury, and Vanadium

Aluminum, mercury, and vanadium were evaluated in the Jacobs (2003) risk assessment for LHAAP-46 that evaluated exposures to soil by the ingestion, inhalation, and dermal contact pathways. Because these three metals are noncarcinogens, all human health risks from worker exposures to soil are evaluated in the calculated pathway HI for each metal, and the total soil HI calculated for exposures to all chemicals in soil by all exposure pathways.

The pathway HI values for each metal given in the Jacobs (2003) risk assessment, and the total soil HI values for all chemicals and all exposure pathways are summarized in **Table 4-66b**. The post-2002 EPC concentration of mercury is less than the EPC evaluated in the Jacobs (2003) assessment. Therefore, the post-2002 mercury concentration would not increase the HI values reported in the Jacobs (2003) assessment.

The post-2002 EPC concentration of aluminum (1.11E+04 mg/kg) is greater than the Jacobs (2003) EPC (8.07E+03 mg/kg) (see **Table 4-66b**). The calculated HI for exposure of a future maintenance worker to aluminum in soil at a concentration of 8.07E+03 mg/kg was 1.30E-02 (Jacobs, 2003). Therefore, the estimated post-2002 HI for exposure of a future worker to aluminum in soil is 1.30E-02 x 1.11E+04 mg/kg / 8.07E+03 mg/kg = 1.79E-02, which represents a net increase in the HI of 1.77E-02 - 1.30E-02 = 4.9E-03 (**Table 4-66b**).

The post-2002 EPC concentration of vanadium (2.90E+01 mg/kg) is the same as the Jacobs (2003) EPC (2.89E+01 mg/kg) within the uncertainty of the data (see **Table 4-66b**). The calculated HI for exposure of a future maintenance worker to vanadium in soil at a concentration of 2.89E+01 mg/kg was 1.40E-02 (Jacobs, 2003). Therefore, the estimated post-2002 HI for exposure of a future worker to vanadium in soil is 1.40E-02 x 2.90E+01 mg/kg/2.89E+01 mg/kg = 1.40E-02, which represents a negligible net increase in the HI (see **Table 4-66b**).

4.3.3 Summary

Application of the arsenic concentrations reported for post-2002 soil samples to the Jacobs (2003) risk assessment would increase the Jacobs (2003) ILCR estimate from 1.7E-05 to 1.8E-05 (**Table 4-66a**), which is still within the acceptable risk range of 1E-06 to 1E-04 (USEPA, 1994) and within the risk range established in 30TAC§335.563(b).

Application of the aluminum, mercury, and vanadium concentrations reported for post-2002 soil samples to the Jacobs (2003) risk assessment would increase the Jacobs (2003) HI estimate from 1.2E-01 to 1.3E-01 (**Table 4-66b**), which is still below the acceptable maximum HI of 1 [USEPA, 1994; 30TAC§335.563(c)].

Because it is demonstrated that EPC values developed using post-2002 sampling results contribute negligible increases to the Jacobs (2003) risk assessment cancer risk and noncancer hazard values, and all concentrations of other chemicals are below the RBSV values, no further action is required for the soil around the sumps at LHAAP-46.

4.5 Evaluation of Risks from Chemicals Exceeding RBSVs in Post-2002 Samples at LHAAP-47 Sumps

Screening of chemical concentrations in soil at LHAAP-47 indicates that concentrations of aluminum, mercury, manganese or vanadium were quantitated in one or more samples at concentrations above RBSV levels (**Tables 4-67** through **4-113**). The analytical results for these metals in all soil samples from sump locations where a metal concentration exceeds the RBSV in at least one sample are summarized in **Table 4-114**, which shows the mean, standard deviation, sample size, and the 95% UCL of the mean. All concentrations detected above the MDL (J-qualified values), and the full value of the SQL representing a proxy value for concentrations reported as not detected (U-qualified) concentrations were used in all statistical calculations. Bootstrapping (Efron and Tibshirani, 1993) is among the statistical methods described in USEPA (2002) guidance for calculating UCLs and EPCs for use in risk assessments.

The Jacobs (2003) risk assessment for LHAAP-47 evaluated future maintenance exposures to chemicals in soil by the ingestion, inhalation, and dermal contact pathways. That risk assessment calculated pathway ILCR values and HI values for each metal; and the total soil ILCR and HI values for exposures to all chemicals by all exposure pathways.

Because aluminum, mercury, manganese, and vanadium are noncarcinogens, application of the concentrations of these metals reported for post-2002 soil samples to the Jacobs (2003) risk assessment would not increase the Jacobs (2003) ILCR estimate for LHAAP-47 (**Table 4-115a**).

Aluminum, manganese, mercury, and vanadium were evaluated in the Jacobs (2003) risk assessment for LHAAP-47 that evaluated exposures to soil by the ingestion, inhalation, and dermal contact pathways. Because these four metals are noncarcinogens, all human health risks from worker exposures to soil are evaluated in the calculated pathway HI for each metal, and the total soil HI calculated for exposures to all chemicals in soil by all exposure pathways.

The pathway HI values for each metal given in the Jacobs (2003) risk assessment, and the total soil HI values for all chemicals and all exposure pathways are summarized in **Table 4-115b**. The Post-2003 EPC concentration of manganese, mercury, and vanadium are less than the EPC evaluated in the Jacobs (2003) assessment. Therefore, the post-2002 concentrations of these metals would not increase the HI values reported in the Jacobs (2003) assessment.

The Post-2003 EPC concentration of aluminum (1.28E+04 mg/kg) is greater than the Jacobs (2003) EPC (8.82+03 mg/kg) (see **Table 4-115**). The calculated HI for exposure of a future maintenance worker to aluminum in soil at a concentration of 8.82E+03 mg/kg was 1.50E-02 (Jacobs, 2003). Therefore, the estimated Post-2003 HI for exposure of a future worker to

aluminum in soil is 1.50E-02 x 1.28E+04 mg/kg / 8.82E+03 mg/kg = 2.17E-02, which represents a net increase in the HI of 2.17E-02 - 1.50E-02 = 6.7E-03 (**Table 4-115b**).

4.5.1 Summary

Application of the aluminum, manganese, mercury, and vanadium concentrations reported for post-2002 soil samples to the Jacobs (2003) risk assessment would increase the Jacobs (2003) HI estimate from 4.6E-01 to 4.7E-01 (**Table 4-115b**), which is still below the acceptable maximum HI of 1 [USEPA, 1994; 30TAC§335.563(c)]. None of these metals are carcinogens; therefore, there is no impact to the ILCR from these metals.

Because it is demonstrated that EPC values developed using post-2002 sampling results contribute negligible increases to the Jacobs (2003) risk assessment cancer risk and noncancer hazard values, and all concentrations of other chemicals are below the RBSV values, no further action is required for the soil around sumps at LHAAP-47.

4.12 Evaluation of Risks from Chemicals Exceeding RBSVs in Post-2002 Samples at LHAAP-35B(37)

Screening of chemical concentrations in soil at WRSump-019 indicates that vanadium was reported with a concentration above the RBSV level in one sample (WRS019-SB02-01, **Table 4-59**).

The exposure point concentrations for COPCs at LHAAP-35B(37) are shown in Table 3-41 of the Jacobs (2003) risk assessment, which is reproduced here. Because vanadium was not identified as a COPC in Jacobs (2003) risk assessment, potential human health effects to the industrial worker from exposure to vanadium in post-2002 samples were calculated to evaluate the impact on the conclusions of the 2003 risk assessment.

The maximum vanadium concentration measured in the WRSump-019 soil samples was 72.2 mg/kg (WRS019-SB02-01, **Table 4-59**). The maximum concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene are above the EPC concentrations used in Table 3-41 of the Jacobs (2003) risk assessment. Therefore, the impact of these concentrations on the Jacobs (2003) risk assessment conclusions was evaluated. Because the maximum concentrations of aluminum, cadmium, manganese, and aldrin measured in the post-2002 samples were less than the EPC concentration used in the Jacobs (2003) risk assessment, the potential impact of those data on the Jacobs (2003) risk assessment conclusions was not evaluated.

Evaluation of Vanadium Quantitated at LHAAP-35B(37)

Because vanadium was not identified as a COPC in the Jacobs (2003) risk assessment for LHAAP-35B(37), ILCR and HI values were calculated for the future maintenance worker exposure to vanadium in soil using the single concentration quantitated above the RBSV (72.2 mg/kg, **Table 4-59**). Risk and hazard estimates were calculated using the equations, exposure factors, toxicity factors, and physical chemical properties provided in TCEQ (1998) guidance as updated through March 2009. Site-specific properties were used as indicated in the calculations. The cancer risk and noncancer hazard index calculations are shown in **Tables 4-136** through **4-139**. The impact of these calculations on the Jacobs (2003) risk assessment is shown in **Table 4-140**.

Because vanadium is a noncarcinogen, application of the maximum quantitated vanadium concentration reported for post-2002 soil samples (**Table 4-59**) to the Jacobs (2003) risk assessment would not affect the Jacobs (2003) ILCR estimate for LHAAP-35B(37) (**Table 4-139a**), which is within the acceptable risk range of 1E-06 to 1E-04 (USEPA, 1994) and within the risk range established in 30TAC§335.563(b).

Application of the vanadium concentration to the Jacobs (2003) risk assessment would increase the Jacobs (2003) HI estimate from 1.4E-01 to 1.6E-01 (**Table 4-140b**), which is still below the acceptable maximum HI of 1 [USEPA, 1994; 30TAC§335.563(c)].

Evaluation of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, and Indeno(1,2,3-cd)pyrene at LHAAP-35B(37)

Although benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene were not detected in the post-2002 samples, the MDL concentrations that were adjusted for moisture content and sample dilution exceed the EPCs for these compounds that were used in the Jacobs (2003) assessment. Therefore, cancer risk and noncancer hazard estimates were calculated for these PAH compounds using the equations, exposure factors, toxicity factors, and physical chemical properties provided in TCEQ (1998) guidance as updated through March 2009. The calculations of ILCR and HI values for arsenic are shown in **Tables 4-136** through **4-139**.

The total soil ILCR and HI values for exposure of a future maintenance worker to all chemicals and all exposure pathways given in the Jacobs (2003) risk assessment are summarized in **Table 4-140**.

Summary

Application of the ILCR values calculated for vanadium and PAH compound concentrations to the 2003 risk assessment would increase the Jacobs (2003) ILCR estimate from 5.2E-06 to 6.4E-06 (**Table 4-140a**), which is within the acceptable risk range of 1E-06 to 1E-04 (USEPA, 1994) and within the risk range established in 30TAC§335.563(b).

Application of the HI values calculated for vanadium and PAH to the 2003 risk assessment would increase the Jacobs (2003) HI estimate from 1.4E-01 to 1.6E-01 (**Table 4-140b**), which is still below the acceptable maximum HI of 1 [USEPA, 1994; 30TAC§335.563(c)].

Because it is demonstrated that EPC values developed using post-2002 sampling results contribute negligible increases to the Jacobs (2003) risk assessment cancer risk and noncancer hazard values, it is concluded that reassignment of WRSump-019 from LHAAP-46 to LHAAP-35B(37) does not change the conclusions of the Jacobs (2003) risk assessment for LHAAP-35B(37).

Attachment 3

Revised Tables

This attachment includes the following new and modified tables:

Table 4-61 Upper Confidence Limits of Mean Concentrations in Soil at LHAAP-46 Locations Where One or More Values Exceed Risk-Based Screening Values in Samples Collected After 2003

Table 4-62a Incremental Lifetime Cancer Risk (ILCR) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-62b Hazard Index (HI) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-63a Incremental Lifetime Cancer Risk (ILCR) for Potential Inhalation Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-63b Hazard Index (HI) for Potential Inhalation Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-64a Incremental Lifetime Cancer Risk (ILCR) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-64b Hazard Index (HI) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site

Table 4-65a Exposures and Incremental Lifetime Cancer Risks for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-46 Site

Table 4-65b Exposures and Noncancer Hazards for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-46 Site

Table 4-66a Revision of Cancer Risk Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-46

Table 4-66b Revision of Noncancer Hazard Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-46

Table 4-114 Upper Confidence Limits of Mean Concentrations in Soil at LHAAP-47 Locations Where One or More Values Exceed Risk-Based Screening Values in Samples Collected After 2003

Table 4-115a Revision of Cancer Risk Estimates Based on Pre-2003 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-47

Table 4-115b Revision of Noncancer Hazard Estimates Based on Pre-2003 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-47

Table 4-136a Incremental Lifetime Cancer Risk (ILCR) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-136b Hazard Index (HI) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-137a Incremental Lifetime Cancer Risk (ILCR) for Potential Inhalation Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-137b Hazard Index (HI) for Potential Inhalation Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-138a Incremental Lifetime Cancer Risk (ILCR) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-138b Hazard Index (HI) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site

Table 4-139a Exposures and Incremental Lifetime Cancer Risks for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-35(B)37 Site

Table 4-139b Exposures and Noncancer Hazards for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-35(B)37 Site

Table 4-140a Revision of Cancer Risk Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-35B(37)

Table 4-140b Revision of Noncancer Hazard Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results, LHAAP-35B(37)

Table 4-61
Upper Confidence Limits of Mean Concentrations in Soil at LHAAP-46 Locations Where One or More Values Exceed Risk-Based Screening Values
Samples Collected After 2003

	Soil Concentration (mg/kg)			
Sample Number	Aluminum	Arsenic	Mercury	Vanadium
35-SMP01-SB01-01	4640	1.250	0.010	15.600
35-SMP01-SB01-02	5460	0.752	0.265	9.210
35-SMP01-SB02-01	7060	2.590	0.026	**61.100**
35-SMP01-SB02-02	6510	0.832	0.273	19.900
WRS04-SB01-01	7500	1.050	0.021	46.700
WRS04-SB01-02	10200	0.386	0.011	13.900
35-SMP02-SB01-01	13600	1.740	0.013	32.000
35-SMP02-SB01-02	10000	2.090	0.282	18.300
35-SMP02-SB02-01	4110	2.210	0.031	24.100
35-SMP02-SB02-02	9780	2.850	0.270	18.700
35-SMP03-SB01-01	**17400**	1.720	0.035	28.500
35-SMP03-SB01-01-QC	11500	2.330	0.046	27.300
35-SMP03-SB01-02	8160	1.190	0.024	16.900
35-SMP04-SB01-01	15900	3.030	0.080	**58.500**
35-SMP04-SB01-02	8840	1.530	0.282	13.400
35-SMP05-SB01-01	11000	1.710	0.025	26.600
35-SMP05-SB01-02	12400	2.240	0.032	25.300
35-SMP07-SB01-01	7800	6.130	0.026	44.800
35-SMP07-SB01-02	**21300**	2.400	0.276	30.000
35-SMP07-SB02-01	11300	2.420	0.042	28.100
35-SMP07-SB02-01-QC	12400	4.030	0.065	26.000
35-SMP07-SB02-02	10600	0.449	0.296	14.400
35-SMP08-SB01-02	8220	3.460	0.015	18.800
35-SMP09-SB01-02	12300	0.490	0.276	16.500
WRSMP005-SB01-01	9100	4.260	0.015	31.700
WRSMP005-SB01-02	**18800**	1.330	0.297	29.700
WRSMP005-SB02-02	**20900**	1.770	0.063	41.000
WRSMP005-SB02-02-QC	16000	1.730	0.042	28.900
35-SMP17-SB01-01	7240	2.270	0.023	19.700
35-SMP17-SB01-02	**28400**	1.120	0.029	30.900
35-SMP18-SB02-02	15200	1.12	0.0184	23.200
WRS10-SB02-01	8760	1.290	0.029	34.400
WRS10-SB02-02	**28700**	1.060	0.084	40.200
35-SMP21-SB01-02	**27500**	1.410	0.036	35.300
35-SMP21-SB02-02	**26700**	2.530	0.021	42.600
35-SMP22-SB01-01	7240	**25.800**	0.031	26.600
35-SMP22-SB01-02	6320	3.300	0.023	**60.000**
35-SMP24-SB01-02	**16800**	3.100	0.050	38.000
35-SMP24-SB02-02	7430	0.776	0.268	18.000
LH-S24-01-BERA-SS01 (mercury not analyzed)	10100	8.300		27.300
35-SMP25-SB01-02	12700	0.959	0.276	16.800
35-SMP25-SB02-02	12600	1.210	0.282	22.000
35-SMP26-SB01-02	**32200**	2.320	0.117	48.300
35-SMP30-SB01-02	12000	2.660	0.035	48.000
35-SMP30-SB02-02	**28800**	1.600	0.105	40.000
35-SMP31-SB01-02	**19500**	3.930	0.020	41.700
35-SMP32-SB01-01	6700	5.600	0.109	32.300
35-SMP33-SB01-01	6020	1.540	0.027	19.300
35-SMP33-SB01-02	12100	2.130	0.020	22.700
WRS-015-SB01-01	6240	5.940	0.046	32.900
35-SMP034-SB01-02	**16800**	1.540	0.032	41.100
35-SMP34-SB01-01	11500	8.230	0.080	31.200
35-SMP34-SB01-01-QC	9410	4.310	0.078	27.700
35-SMP034-SB02-02	10700	5.000	0.231	35.900
35-SMP34-SB02-01	10600	6.400	0.077	**63.600**
WRS-015-SB01-02	**22200**	4.360	0.047	**49.100**
WRS-15-SB02-01	6340	5.510	0.030	41.500
WRS-15-SB02-02	13500	2.310	0.019	30.500
35-SMP35-SB01-01	6090	6.230	0.110	18.000
35-SMP35-SB01-02	3050	1.870	0.016	12.400
35-SMP35-SB02-01	6430	7.100	**0.750**	35.800
35-SMP35-SB02-02	14200	2.710	0.032	40.700
35-SMP42-SB01-01	7890	5.660	0.062	24.800
35-SMP42-SB01-02	**19200**	1.340	0.124	31.800
35-SMP42-SB01-02-QC	**18200**	2.220	0.115	33.600
WRS011-SB01-01	4640	1.250	0.0101	15.600

Table 4-61
Upper Confidence Limits of Mean Concentrations in Soil at LHAAP-46 Locations Where One or More Values Exceed Risk-Based Screening Values
Samples Collected After 2003

Sample Number	Soil Concentration (mg/kg)			
	Aluminum	Arsenic	Mercury	Vanadium
WRS011-SB01-02	15400	1.990	0.0655	29.200
WRS011-SB02-01	7890	2.710	0.0379	22.100
WRS011-SB02-02	**18400**	0.783	0.0121	23.800
35-SMP107-SB01-01	4640	1.250	0.010	15.600
35-SMP107-SB01-02	4900	0.376	0.022	19.900
35-SMP107-SB02-01	7690	1.040	0.034	20.400
35-SMP107-SB02-02	10100	0.948	0.015	22.600
35-SMP107-SB02-02-QC	8460	0.532	0.014	30.300
WRS14-SB01-01	6340	1.080	0.045	**62.500**
WRS14-SB01-02	11600	0.499	0.019	26.1
WRS016-SB01-01	7340	0.888	0.022	**105.000**
WRS016-SB02-01	8830	0.954	0.028	**83.700**
Mean (mg/kg)	**1.21E+04**	**2.78E+00**	**8.99E-02**	**3.18E+01**
Std. Dev. (mg/kg)	**6.59E+03**	**3.24E+00**	**1.20E-01**	**1.62E+01**
Sample size (N)	**78**	**78**	**77**	**78**
95% UCL EPC (mg/kg) Post-2003 Samples [a]	**1.11E+04**	**2.94E+00**	**8.69E-02**	**2.90E+01**

Notes:

[a] 95% upper confidence limit (UCL) determined using bootstrapping (2000 replications).

Table 4-62a
Incremental Lifetime Cancer Risk (ILCR) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Soil Ingestion Rate, IRsoil (mg/d)	50
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, ATc (yr)	70
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$ID = \frac{EPC * IRsoil * MCF * ED * EF}{BW * ATc * TCF}$$

$$ILCR = ID * SFo$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral Slope Factor, SFo 1/(mg/kg/d)	Weight of Evidence	Intake Dose ID (mg/kg/d)	Incremental Lifetime Cancer Risk ILCR
Arsenic	2.94E+00	1.50E+00	A	5.13E-07	7.69E-07
			PATHWAY CANCER RISK		7.69E-07

Table 4-62b
Hazard Index (HI) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Soil Ingestion Rate, IRsoil (mg/d)	50
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, ATn (yr)	25
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$ID = \frac{EPC * IRsoil * MCF * ED * EF}{BW * ATn * TCF}$$

$$HQ = \frac{ID}{RfDo}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral RfDo (mg/kg/d)	Intake Dose ID (mg/kg/d)	Hazard Quotient HQ
Arsenic	2.94E+00	3.00E-04	1.44E-06	4.79E-03
TOTAL PATHWAY HAZARD INDEX				4.79E-03

Table 4-63a
Incremental Lifetime Cancer Risk (ILCR) for Potential Inhalation Exposure of Future Maintenance Workers to Airborne Chemicals from Soil at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:

Particulate Emissions Factor, PEF (m3/kg	4.63E+09
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Averaging Time, ATc (yr)	70
Conversion Factor	
Time, TCF (d/yr)	365
Mass, MCF (microg/mg)	1000

SITE DATA / DEFAULT FACTORS:

Length of contaminated area, LS (m)	1.72E+03 LHAAP-46 specific
True soil porosity, E (unitless)	0.35
Wind speed in mixing zone, V (m/s)	2.25
True soil density, ps (g/cm^3)	2.65
Diffusion height, DH (m)	2
Exposure interval, T (s)	7.90E+08
Area of contamination, A (cm^2)	9.19E+09 LHAAP-46 specific
Organic carbon content, OC (unitless)	0.02

EQUATIONS

$$\text{Air Concentration (ug/m}^3\text{)} = \frac{EPC * MCF * (1/VF+1/PEF) * EF * ED}{ATc * TCF}$$

ILCR = Air concentration * URF

$$VF = \frac{(LS * V * DH}{A} \times \frac{(3.14 * a * T)^{1/2}}{(2 * Dei * E * Kas * 10^{-3}\ kg/g)}$$

$$a = \frac{Dei * E}{E + (ps) * (1-E) / Kas}$$

$Dei = Di * E^{0.33}$

Kd = Koc * OC

Kas = (H / Kd) * 41

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Unit Risk Factor, URF 1/(microg/m^3)	Weight of Evidence	Molecular Diffusivity, Di (cm^2/s)	Henry's Law Constant, H (atm-m^3/mol)	Organic Carbon Partition Coefficient, Koc (cm^3/g)	Effective Diffusivity, Dei (cm^2/s)	Soil-Water Partition Coefficient, Kd (cm^3/g)	α (cm^2/s)	Soil/air Partition Coefficient, Kas (cm^3/g)	Volatilization factor, VF (m^3/kg)	Air Concentration (ug/m^3)	Incremental Lifetime Cancer Risk ILCR
Arsenic	2.94E+00	4.3E-03	A	NA	0.00E+00	NA	NA	NA	NA	NA	NA	1.55E-07	6.67E-10
										TOTAL PATHWAY CANCER RISK			6.67E-10

Table 4-63b
Hazard Index (HI) for Potential Inhalation Exposure of Future maintenance Workers to Airborne Chemicals from Soil at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:

Particulate Emissions Factor, PEF (m^3/kg)	4.63E+09
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Averaging Time, ATn (yr)	25
Conversion Factors	
Time, TCF (d/yr)	365

SITE DATA / DEFAULT FACTORS:

Length of contaminated area, LS (m)	1.72E+03 LHAAP-46 specific
True soil porosity, E (unitless)	0.35
Wind speed in mixing zone, V (m/s)	2.25
True soil density, ps (g/cm^3)	2.65
Diffusion height, DH (m)	2
Exposure interval, T (s)	7.90E+08
Area of contamination, A (cm^2)	9.19E+09 LHAAP-46 specific
Organic carbon content, OC (unitless)	0.02

EQUATIONS

$$\text{Air Concentration } (mg/m^{**}3) = \frac{EPC * (1/VF + 1/PEF) * EF * ED}{ATn * TCF}$$

$$HQ = \frac{\text{Air Concentration}}{RfC}$$

$$VF = \frac{(LS * V * DH}{A} \times \frac{(3.14 * a * T)^{1/2}}{(2 * Dei * E * Kas * 10^{-3}\ kg/g)}$$

$$a = \frac{Dei * E}{E + (ps) * (1-E) / Kas}$$

$$Dei = Di * E^{0.33}$$

$$Kd = Koc * OC \qquad Kas = (H / Kd) * 41$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Reference Conc., RfC (mg/m^3)	Molecular Diffusivity, Di (cm^2/s)	Henry's Law Constant, H ($atm\text{-}m^3/mol$)	Organic Carbon Partition Coefficient, Koc (cm^3/g)	Effective Diffusivity, Dei (cm^2/s)	Soil-Water Partition Coefficient, Kd (cm^3/g)	α (cm^2/s)	Soil/air Partition Coefficient, Kas (cm^3/g)	Volatilization factor, VF m^3/kg	Air Concentration (mg/m^3)	Hazard Quotient HQ
Arsenic	2.94E+00	NA	NA	0.00E+00	NA	NA	NA	NA	NA	NA	4.34E-10	0.00E+00
										TOTAL PATHWAY HAZARD INDEX		0.00E+00

Table 4-64a
Incremental Lifetime Cancer Risk (ILCR) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:

Exposed Skin Surface Area, SA (cm2) - Adult	2,500
Adherence Factor, AF (mg/cm^2-event)	0.2
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, AT (yr)	70
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$DAD = \frac{EPC * MCF * ED * EF * SA * AF * ABSd}{BW * ATc * TC}$$

$$ILCR = DAD * DERMAL\ SF$$

$$DERMAL\ SF = ORAL\ SF / ABS_{GI}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral Slope factor, SF 1/(mg/kg/d)	Gastrointestinal Absorption Factor, ABS_{GI} (unitless)	Dermal Slope factor, SFd 1/(mg/kg/d)	Absorption Factor, ABSd (unitless)	Weight of Evidence	Dermal Absorbed Dose, DAD (mg/kg/d)	Incremental Lifetime Cancer Risk ILCR
Arsenic	2.94E+00	1.50E+00	9.50E-01	1.50E+00	3.00E-02	A	1.54E-07	2.31E-07
					TOTAL PATHWAY CANCER RISK			2.31E-07

Table 4-64b
Hazard Index (HI) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Skin Surface Area, SA (cm^2)	2,500
Adherence Factor, AF (mg/cm^2)	0.2
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight-adult, BW (kg)	70
Averaging Time-adult, ATn (yr)	25
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$DAD = \frac{EPC * MCF * ED * EF * SA * AF * ABSd}{BW * ATn * TCF}$$

$$HQ = \frac{DAD}{DERMAL\ RfD}$$

$$DERMAL\ RfD = ORAL\ RfD \times ABS_{GI}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral RfD (mg/kg/d)	Gastrointestinal Absorption Factor, ABS_{GI} (unitless)	Dermal RfD (mg/kg/d)	Absorption Factor, ABSd (unitless)	Dermal Absorbed Dose, DAD (mg/kg/d)	Hazard Quotient HQ
Arsenic	2.94E+00	3.00E-04	9.50E-01	3.00E-04	3.00E-02	4.31E-07	1.44E-03
				TOTAL PATHWAY HAZARD INDEX			1.44E-03

Table 4-65a
Exposures and Incremental Lifetime Cancer Risks for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

Chemical	Source Term Concentration (mg/kg)	Soil Ingestion Cancer Risk (ILCR)	Soil Inhalation Cancer Risk (ILCR)	Dermal Cancer Risk (ILCR)
Arsenic	2.94E+00	7.7E-07	6.7E-10	2.3E-07
Pathway Cancer Risk (ILCR)		7.7E-07	6.7E-10	2.3E-07
Total ILCR[a]				1.0E-06

Table 4-65b
Exposures and Noncancer Hazards for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

Chemical	Source Term Concentration (mg/kg)	Soil Ingestion HQ	Soil Inhalation HQ	Dermal HQ
Arsenic	2.94E+00	4.8E-03	0.0E+00	1.4E-03
Pathway Hazard Index (HI)		4.8E-03	0.0E+00	1.4E-03
Total HI[a]				6.2E-03

a Total value reported to one significant figure

Table 4-66a
Revision of Cancer Risk Estimates Based on Pre-2002 Measurements of Metals in Soil by Using Post-2002 Soil Analysis Results
LHAAP-46 [a]

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Incremental Lifetime Cancer Risk (ILCR) [c]	Jacobs Total Soil Incremental Lifetime Cancer Risk (ILCR) [d]	Post-2002 EPC (mg/kg) [e]	Post-2002 Incremental Lifetime Cancer Risk (ILCR) [f]	Revised Total Soil Cancer Risk (ILCR) [g]
Aluminum	8.07E+03	NA	1.7E-05	1.11E+04	NA	1.8E-05
Arsenic	NE	NE		2.94E+00	1.0E-06	
Mercury	5.60E-01	NA		8.69E-02	NA	
Vanadium	2.89E+01	NA		2.90E+01	NA	

Table 4-66b
Revision of Noncancer Hazard Estimates Based on Pre-2002 Measurements of Metals in Soil by Using Post-2002 Soil Analysis Results
LHAAP-46 [a]

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Hazard Index (HI) [h]	Jacobs (2003) Total Soil Hazard Index (HI) [i]	Post-2002 EPC (mg/kg) [e]	Post-2002 Hazard Index (HI) [j]	Net Increase in Hazard Index (HI) [k]	Revised Total Soil Hazard Index (HI) [l]
Aluminum	8.07E+03	1.30E-02	1.2E-01	1.11E+04	1.79E-02	4.9E-03	1.3E-01
Arsenic	NE	NA		2.94E+00	4.79E-03	4.8E-03	
Mercury	5.60E-01	3.50E-03		8.69E-02	NC	NA	
Vanadium	2.89E+01	1.40E-02		2.90E+01	1.40E-02	negligible	

Notes:

a Jacobs Engineering Group, Inc., *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites, Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, and Caddo Lake* , Volume 1, Longhorn Army Ammunition Plant, Karnack, Texas, Oak Ridge, Tennessee, June 2003.

b Table 3-43 of Jacobs (2003) risk assessment.

c ILCR calculated for exposures to the metal in soil by all pathways evaluated, Table C-107 of Jacobs (2003) risk assessment.

d ILCR calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-107 of Jacobs (2003) risk assessment.

e Value based on samples collected since 2003, Table 4-61

f Value based on samples collected since 2003 (Table 4-65).

g Value equals sum of Jacobs (2003) value and result of calculations summarized in Table 4-65.

h HI calculated for exposures to the metal in soil by all pathways evaluated, Table C-104 of Jacobs (2003) risk assessment.

i HI calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-104 of Jacobs (2003) risk assessment.

j Values for aluminum and vanadium calculated as Post-2002 HI = Jacobs HI x (Post-2002 EPC/Jacobs-2003 EPC).

k Net increase in HI for aluminum and vanadium = Post-2002 HI - Jacobs-2003 HI. Calculated value for arsenic is shown in Table 4-65.

l Revised HI = Jacobs-2003 Total HI + Sum of Net Increases in HI associated with aluminum, arsenic, and vanadium

NA - not applicable

NC - not calculated, Post-2002 EPC is less than Jacobs (2003) EPC.

NE - not evaluated, chemical was not evaluated in Jacobs (2003) risk assessment

Table 4-114

Upper Confidence Limits of Mean Concentrations in Soil at LHAAP-47 Locations Where One or More Values Exceed Risk-Based Screening Values in Samples Collected After 2003

	Soil Concentration (mg/kg)			
Sample Number	Aluminum	Manganese	Mercury	Vanadium
35-SMP48-SB01-01	6890	308	**0.342**	33.5
35-SMP48-SB01-02	10500	106	0.31	16.4
35-SMP050-SB01-01	10300	55.60	0.023	**59.0**
35-SMP050-SB01-02	13700	24.40	0.282	17.0
35-SMP53-SB01-01	8250	219	0.037	**63.5**
35-SMP53-SB01-02	7110	485	0.275	22.7
35-SMP073-SB01-01	13100	173	0.0257	22.4
35-SMP073-SB01-02	9520	114	**0.789**	19.1
35-SMP073-SB02-01	10000	165	**0.273**	22.7
35-SMP073-SB02-02	9980	109	0.0444	44.7
35-SMP074-SB01-01	7340	236	0.0161	19.6
35-SMP074-SB01-02	11900	**3650**	0.285	40.8
35-SMP074-SB01-02-QC	8930	241	0.284	21.0
35-SMP074-SB02-01	9730	237	0.0218	22.4
35-SMP074-SB02-02	8810	80.3	0.281	12.3
35-SMP077-SB01-01	6480	137	0.0408	33.8
35-SMP077-SB01-02	**19600**	52.3	0.306	26.9
SUMP081-SB-01-01	**19200**	59.1	0.0678	**59.7**
SUMP081-SB-01-02	5640	166	0.290	17.5
SUMP082-SB-01-01	6490	131	0.014	20.1
SUMP082-SB-01-02	7750	55.8	0.293	20.3
SUMP083-SB-01-01	**17800**	34.7	0.083	**59.9**
SUMP083-SB-01-02	4460	21.7	0.290	26.3
35SUMP084-SB01	**21600**	37.8	0.075	**55.5**
35SUMP084-SB01	**22800**	77.4	0.055	**63.0**
35SUMP084-SB02	**22800**	18.4	0.071	**63.9**
35SUMP084-SB02	11800	106.0	0.052	23.7
35-SMP085-SB01-02	12500	60	0.295	18.10
35-SMP086-SB01-01	5300	143	0.019	22.70
35-SMP086-SB01-02	4580	21	0.294	7.55
WRS17-SB01-01	5430	169	0.040	23.1
WRS17-SB01-02	**24100**	63	0.069	**49.5**
WRS17-SB02-01	8550	241	0.051	28.1
WRS17-SB02-02	17400	53.2	0.288	29.2
35-SMP087-SB01-01	6310	572.0	0.012	18.9
35-SMP087-SB01-02	**22700**	42.4	0.018	31.9
35-SMP087-SB02-01	10300	51.3	0.084	**72.8**
35-SMP087-SB02-02	9210	216.0	0.049	28.4
35-SMP091-SB01-01	11900	143.0	0.022	34.8
35-SMP091-SB01-02	**17800**	244.0	0.028	21.3
35-SMP92-SB01-02	8320	28.9	0.283	8.7
35-SMP01-SB01-01	5300	143.0	0.019	22.70
35-SMP01-SB01-02	4580	21.0	0.294	7.55
35-SMP01-SB02-01	4800	182.0	0.100	
35-SMP01-SB02-02	6490	17.5	0.100	
WRS04-SB01-01	17400	53.2	0.288	29.20
WRS04-SB01-02	10200	17.1	0.011	13.90
35-SMP076-SB01-01	12300	181.0	0.027	24.60
35-SMP076-SB01-02	13000	48.4	0.275	23.90
WRS018-SB01-01	3030	117.0	0.016	19.80
WRS018-SB01-02	18400	455.0	0.038	52.20
WRS018-SB02-01	10200	209.0	0.029	56.20
WRS018-SB02-02	20000	101.0	0.028	40.90
Mean (mg/kg)	**1.14E+04**	**2.02E+02**	**1.45E-01**	**3.12E+01**
Std. Dev. (mg/kg)	**5.71E+03**	**4.97E+02**	**1.52E-01**	**1.70E+01**
Sample size (N)	**53**	**53**	**53**	**51**
95% UCL EPC (mg/kg) Post-2003 Samples a	**1.28E+04**	**2.83E+02**	**1.83E-01**	**3.23E+01**

a 95% upper confidence limit (UCL) determined using bootstrapping (2000 replications).

Table 4-115a
Revision of Cancer Risk Estimates Based on Pre-2003 Measurements of Metals in Soil by Using Post-2003 Soil Analysis Results
LHAAP-47

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Incremental Lifetime Cancer Risk (ILCR) [c]	Jacobs Total Soil Incremental Lifetime Cancer Risk (ILCR) [d]	Post-2003 EPC (mg/kg) [e]	Post-2003 Incremental Lifetime Cancer Risk (ILCR)	Revised Total Soil Cancer Risk (ILCR)
Aluminum	8.82E+03	NA	1.80E-05	1.28E+04	NA	NA
Manganese	3.60E+02	NA		2.83E+02	NA	
Mercury	5.78E+00	NA		1.83E-01	NA	
Vanadium	3.40E+01	NA		3.23E+01	NA	

Table 4-115b
Revision of Noncancer Hazard Estimates Based on Pre-2003 Measurements of Metals in Soil by Using Post-2003 Soil Analysis Results
LHAAP-47

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Hazard Index (HI) [f]	Jacobs (2003) Total Soil Hazard Index (HI) [g]	Post-2003 EPC (mg/kg) [e]	Post-2003 Hazard Index (HI) [h]	Net Increase in Hazard Index (HI) [i]	Revised Total Soil Hazard Index (HI) [k]
Aluminum	8.82E+03	1.50E-02	4.60E-01	1.28E+04	2.17E-02	6.69E-03	4.7E-01
Manganese	3.60E+02	1.70E-02		2.83E+02	NC	NA	
Mercury	5.78E+00	3.60E-02		1.83E-01	NC	NA	
Vanadium	3.40E+01	1.70E-02		3.23E+01	NC	NA	

Notes:

a Jacobs Engineering Group, Inc., *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites, Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, and Caddo Lake*, Volume 1, Longhorn Army Ammunition Plant, Karnack, Texas, Oak Ridge, Tennessee, June 2003.

b Table 3-44 of Jacobs (2003) risk assessment.

c ILCR calculated for exposures to the metal in soil by all pathways evaluated, Table C-125 of Jacobs (2003) risk assessment.

d ILCR calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-125 of Jacobs (2003) risk assessment.

e Value based on samples collected since 2003, Table 4-114

f HI calculated for exposures to the metal in soil by all pathways evaluated, Table C-122 of Jacobs (2003) risk assessment.

g HI calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-122 of Jacobs (2003) risk assessment.

h Values for aluminum Post-2003 HI = Jacobs HI x (Post-2003 EPC/Jacobs-2003 EPC).

i Net increase in HI for aluminum = Post-2003 HI - Jacobs-2003 HI.

k Revised HI = Jacobs-2003 Total HI + Sum of Net Increase in HI associated with aluminum.

NA - not applicable

NC - not calculated, Post 2003 EPC is less than or equal to Jacobs (2003) EPC.

Table 4-136a
Incremental Lifetime Cancer Risk (ILCR) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Waste Rack Sump 19 at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Soil Ingestion Rate, IRsoil (mg/d)	50
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, ATc (yr)	70
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$ID = \frac{EPC * IRsoil * MCF * ED * EF}{BW * ATc * TCF}$$

$$ILCR = ID * SFo$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral Slope Factor, SFo 1/(mg/kg/d)	Weight of Evidence	Intake Dose ID (mg/kg/d)	Incremental Lifetime Cancer Risk ILCR
Vanadium	7.22E+01	0.00E+00	NA	1.26E-05	0.00E+00
Benzo(a)anthracene	8.68E-01	7.30E-01	B2	1.52E-07	1.11E-07
Benzo(a)pyrene	4.46E-01	7.30E+00	B2	7.79E-08	5.69E-07
Benzo(b)fluoranthene	8.68E-01	7.30E-01	B2	1.52E-07	1.11E-07
Indeno(1,2,3-cd)pyrene	8.68E-01	7.30E-01	B2	1.52E-07	1.11E-07
			PATHWAY CANCER RISK		9.01E-07

Table 4-136b
Hazard Index (HI) for Potential Ingestion Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Waste Rack Sump 19 at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Soil Ingestion Rate, IRsoil (mg/d)	50
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, ATn (yr)	25
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$ID = \frac{EPC * IRsoil * MCF * ED * EF}{BW * ATn * TCF}$$

$$HQ = \frac{ID}{RfDo}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral RfDo (mg/kg/d)	Intake Dose ID (mg/kg/d)	Hazard Quotient HQ
Vanadium	7.22E+01	7.00E-03	3.53E-05	5.05E-03
Benzo(a)anthracene	8.68E-01	7.30E-01	4.25E-07	5.82E-07
Benzo(a)pyrene	4.46E-01	7.30E+00	2.18E-07	2.99E-08
Benzo(b)fluoranthene	8.68E-01	7.30E-01	4.25E-07	5.82E-07
Indeno(1,2,3-cd)pyrene	8.68E-01	7.30E-01	4.25E-07	5.82E-07
TOTAL PATHWAY HAZARD INDEX				5.05E-03

Table 4-137a
Incremental Lifetime Cancer Risk (ILCR) for Potential Inhalation Exposure of Future Maintenance Workers to Airborne Chemicals from Soil at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:

Particulate Emissions Factor, PEF (m3/kg	4.63E+09
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Averaging Time, ATc (yr)	70
Conversion Factor	
Time, TCF (d/yr)	365
Mass, MCF (microg/mg)	1000

SITE DATA / DEFAULT FACTORS:

Length of contaminated area, LS (m)	4.70E+02 LHAAP-35B(37) specific
True soil porosity, E (unitless)	0.35
Wind speed in mixing zone, V (m/s)	2.25
True soil density, ps (g/cm^3)	2.65
Diffusion height, DH (m)	2
Exposure interval, T (s)	7.90E+08
Area of contamination, A (cm^2)	6.25E+08 LHAAP-35B(37) specific
Organic carbon content, OC (unitless)	0.02

EQUATIONS

$$\text{Air Concentration (ug/m}^3\text{)} = \frac{EPC * MCF * (1/VF+1/PEF) * EF * ED}{ATc * TCF}$$

ILCR = Air concentration * URF

$$VF = \frac{(LS * V * DH}{A} \times \frac{(3.14 * a * T)^{1/2}}{(2 * Dei * E * Kas * 10^{-3}\ kg/g)}$$

$$a = \frac{Dei * E}{E + (ps) * (1-E) / Kas}$$

$Dei = Di * E^{0.33}$

Kd = Koc * OC

Kas = (H / Kd) * 41

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Unit Risk Factor, URF 1/(microg/m^3)	Weight of Evidence	Molecular Diffusivity, Di (cm^2/s)	Henry's Law Constant, H (atm-m^3/mol)	Organic Carbon Partition Coefficient, Koc (cm^3/g)	Effective Diffusivity, Dei (cm^2/s)	Soil-Water Partition Coefficient, Kd (cm^3/g)	α (cm^2/s)	Soil/air Partition Coefficient, Kas (cm^3/g)	Volatilization factor, VF (m^3/kg)	Air Concentration (ug/m^3)	Incremental Lifetime Cancer Risk ILCR
Vanadium	7.22E+01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.81E-06	0.00E+00
Benzo(a)anthracene	8.68E-01	8.80E-05	B2	5.10E-02	3.34E-06	3.55E+05	3.61E-02	7.10E+03	1.41E-10	1.93E-08	4.12E+06	5.16E-05	4.54E-09
Benzo(a)pyrene	4.46E-01	8.80E-04	B2	4.30E-02	1.13E-06	9.55E+05	3.04E-02	1.91E+04	1.50E-11	2.43E-09	1.26E+07	8.66E-06	7.62E-09
Benzo(b)fluoranthene	8.68E-01	8.80E-05	B2	2.26E-02	1.20E-05	1.20E+06	1.60E-02	2.40E+04	6.66E-11	2.05E-08	6.00E+06	3.55E-05	3.12E-09
Indeno(1,2,3-cd)pyrene	8.68E-01	8.80E-05	B2	1.90E-02	6.86E-08	3.47E+06	1.34E-02	6.94E+04	1.11E-13	4.05E-11	1.47E+08	1.49E-06	1.31E-10
										TOTAL PATHWAY CANCER RISK			1.54E-08

Table 4-137b
Hazard Index (HI) for Potential Inhalation Exposure of Future maintenance Workers to Airborne Chemicals from Soil at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:

Particulate Emissions Factor, PEF (m^3/kg)	4.63E+09
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Averaging Time, ATn (yr)	25
Conversion Factors	
Time, TCF (d/yr)	365

SITE DATA / DEFAULT FACTORS:

Length of contaminated area, LS (m)	4.70E+02 LHAAP-35B(37) specific
True soil porosity, E (unitless)	0.35
Wind speed in mixing zone, V (m/s)	2.25
True soil density, ps (g/cm^3)	2.65
Diffusion height, DH (m)	2
Exposure interval, T (s)	7.90E+08
Area of contamination, A (cm^2)	6.25E+08 LHAAP-35B(37) specific
Organic carbon content, OC (unitless)	0.02

EQUATIONS

$$\text{Air Concentration (mg/m**3)} = \frac{EPC * (1/VF+1/PEF) * EF * ED}{ATn * TCF}$$

$$HQ = \frac{\text{Air Concentration}}{RfC}$$

$$VF = \frac{(LS * V * DH}{A} \times \frac{(3.14 * a * T)^{1/2}}{(2 * Dei * E * Kas * 10^{-3}\ kg/g)}$$

$$a = \frac{Dei * E}{E + (ps) * (1-E) / Kas}$$

$$Dei = Di * E^{0.33}$$

$$Kd = Koc * OC \qquad Kas = (H / Kd) * 41$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Reference Conc., RfC (mg/m^3)	Molecular Diffusivity, Di (cm^2/s)	Henry's Law Constant, H ($atm-m^3/mol$)	Organic Carbon Partition Coefficient, Koc (cm^3/g)	Effective Diffusivity, Dei (cm^2/s)	Soil-Water Partition Coefficient, Kd (cm^3/g)	α (cm^2/s)	Soil/air Partition Coefficient, Kas (cm^3/g)	Volatilization factor, VF m^3/kg	Air Concentration (mg/m^3)	Hazard Quotient HQ
Vanadium	7.22E+01	5.0E-05	NA	NA	NA	NA	NA	NA	NA	NA	1.07E-08	2.14E-04
Benzo(a)anthracene	8.68E-01	NA	5.10E-02	3.34E-06	3.55E+05	3.61E-02	7.10E+03	1.41E-10	1.93E-08	4.12E+06	1.45E-07	0.00E+00
Benzo(a)pyrene	4.46E-01	NA	4.30E-02	1.13E-06	9.55E+05	3.04E-02	1.91E+04	1.50E-11	2.43E-09	1.26E+07	2.42E-08	0.00E+00
Benzo(b)fluoranthene	8.68E-01	NA	2.26E-02	1.20E-05	1.20E+06	1.60E-02	2.40E+04	6.66E-11	2.05E-08	6.00E+06	9.93E-08	0.00E+00
Indeno(1,2,3-cd)pyrene	8.68E-01	NA	1.90E-02	6.86E-08	3.47E+06	1.34E-02	6.94E+04	1.11E-13	4.05E-11	1.47E+08	4.17E-09	0.00E+00
										TOTAL PATHWAY HAZARD INDEX		2.14E-04

Table 4-138a
Incremental Lifetime Cancer Risk (ILCR) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

CARCINOGENIC EFFECTS

ASSUMPTIONS:

Exposed Skin Surface Area, SA (cm2) - Adult	2,500
Adherence Factor, AF (mg/cm^2-event)	0.2
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight, BW (kg)	70
Averaging Time, AT (yr)	70
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$DAD = \frac{EPC * MCF * ED * EF * SA * AF * ABSd}{BW * ATc * TC}$$

$$ILCR = DAD * DERMAL\ SF$$

$$DERMAL\ SF = ORAL\ SF / ABS_{GI}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral Slope factor, SF 1/(mg/kg/d)	Gastrointestinal Absorption Factor, ABS_{GI} (unitless)	Dermal Slope factor, SFd 1/(mg/kg/d)	Absorption Factor, ABSd (unitless)	Weight of Evidence	Dermal Absorbed Dose, DAD (mg/kg/d)	Incremental Lifetime Cancer Risk ILCR
Vanadium	7.22E+01	NA	2.60E-02	NA	1.00E-02	NA	1.26E-06	0.00E+00
Benzo(a)anthracene	8.68E-01	7.30E-01	8.90E-01	7.30E-01	1.30E-01	B2	1.97E-07	1.44E-07
Benzo(a)pyrene	4.46E-01	7.30E+00	8.90E-01	7.30E+00	1.30E-01	B2	1.01E-07	7.40E-07
Benzo(b)fluoranthene	8.68E-01	7.30E-01	8.90E-01	7.30E-01	1.30E-01	B2	1.97E-07	1.44E-07
Indeno(1,2,3-cd)pyrene	8.68E-01	7.30E-01	8.90E-01	7.30E-01	1.30E-01	B2	1.97E-07	1.44E-07
					TOTAL PATHWAY CANCER RISK			1.17E-06

Table 4-138b
Hazard Index (HI) for Potential Dermal Exposure of Future Maintenance Workers to Chemicals in Soil Associated with Sumps at the LHAAP-35B(37) Site
Longhorn Army Ammunition Plant
Karnack, Texas

NON-CARCINOGENIC EFFECTS

ASSUMPTIONS:	
Skin Surface Area, SA (cm^2)	2,500
Adherence Factor, AF (mg/cm^2)	0.2
Exposure Frequency, EF (d/yr)	250
Exposure Duration, ED (yr)	25
Body Weight-adult, BW (kg)	70
Averaging Time-adult, ATn (yr)	25
Conversion Factors	
Mass, MCF (kg/mg)	1.00E-06
Time, TCF (d/yr)	365

EQUATIONS

$$DAD = \frac{EPC * MCF * ED * EF * SA * AF * ABSd}{BW * ATn * TCF}$$

$$HQ = \frac{DAD}{DERMAL\ RfD}$$

$$DERMAL\ RfD = ORAL\ RfD \times ABS_{GI}$$

Chemical Name	Exposure Point Concentration EPC (mg/kg)	Oral RfD (mg/kg/d)	Gastrointestinal Absorption Factor, ABS_{GI} (unitless)	Dermal RfD (mg/kg/d)	Absorption Factor, ABSd (unitless)	Dermal Absorbed Dose, DAD (mg/kg/d)	Hazard Quotient HQ
Vanadium	7.22E+01	7.00E-03	2.60E-02	1.82E-04	1.00E-02	3.53E-06	1.94E-02
Benzo(a)anthracene	8.68E-01	NA	8.90E-01	NA	1.30E-01	5.52E-07	0.00E+00
Benzo(a)pyrene	4.46E-01	NA	8.90E-01	NA	1.30E-01	2.84E-07	0.00E+00
Benzo(b)fluoranthene	8.68E-01	NA	8.90E-01	NA	1.30E-01	5.52E-07	0.00E+00
Indeno(1,2,3-cd)pyrene	8.68E-01	NA	8.90E-01	NA	1.30E-01	5.52E-07	0.00E+00
				TOTAL PATHWAY HAZARD INDEX			1.94E-02

Table 4-139a
Exposures and Incremental Lifetime Cancer Risks for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-35(B)37 Site
Longhorn Army Ammunition Plant
Karnack, Texas

Chemical	Source Term Concentration (mg/kg)	Soil Ingestion Cancer Risk (ILCR)	Soil Inhalation Cancer Risk (ILCR)	Dermal Cancer Risk (ILCR)
Vanadium	7.22E+01	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	8.68E-01	1.11E-07	4.54E-09	1.44E-07
Benzo(a)pyrene	4.46E-01	5.69E-07	7.62E-09	7.40E-07
Benzo(b)fluoranthene	8.68E-01	1.11E-07	3.12E-09	1.44E-07
Indeno(1,2,3-cd)pyrene	8.68E-01	1.11E-07	1.31E-10	1.44E-07
Pathway Cancer Risk (ILCR)		9.01E-07	1.54E-08	1.17E-06
Total ILCR[a]				2.E-06

Table 4-139b
Exposures and Noncancer Hazards for Potential Exposure of Future Maintenance Workers to Soil at the LHAAP-35(B)37 Site
Longhorn Army Ammunition Plant
Karnack, Texas

Chemical	Source Term Concentration (mg/kg)	Soil Ingestion HQ	Soil Inhalation HQ	Dermal HQ
Vanadium	7.22E+01	5.05E-03	2.14E-04	1.94E-02
Benzo(a)anthracene	8.68E-01	5.82E-07	0.00E+00	0.00E+00
Benzo(a)pyrene	4.46E-01	2.99E-08	0.00E+00	0.00E+00
Benzo(b)fluoranthene	8.68E-01	5.82E-07	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	8.68E-01	5.82E-07	0.00E+00	0.00E+00
Pathway Hazard Index (HI)		5.05E-03	2.14E-04	1.94E-02
Total HI[a]				2.E-02

a Total value reported to one significant figure

Table 4-140a
Revision of Cancer Risk Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results
LHAAP-35B(37) [a]

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Incremental Lifetime Cancer Risk (ILCR) [c]	Jacobs Total Soil Incremental Lifetime Cancer Risk (ILCR) [d]	Post-2002 EPC (mg/kg) [e]	Post-2002 Incremental Lifetime Cancer Risk (ILCR) [f]	Revised Total Soil Cancer Risk (ILCR) [g]
2,3,7,8-TCDD	2.56E-06	1.9E-07	5.2E-06	not analyzed	NA	6.4E-06
Aluminum	1.86E+04	NA		1.18E+04	NC	
Cadmium	7.50E+00	7.1E-10		1.06E-01	NC	
Manganese	1.86E+03	NA		1.08E+02	NC	
Vanadium	NE	NE		7.22E+01	NA	
Aldrin	1.70E-01	2.3E-06		not analyzed	NA	
Benzo(a)anthracene	4.40E-01	2.2E-07		8.68E-01	1.4E-07	
Benzo(a)pyrene	4.10E-01	2.0E-06		4.46E-01	7.4E-07	
Benzo(b)fluoranthene	5.80E-01	2.9E-07		8.68E-01	1.4E-07	
Indeno(1,2,3-cd)pyrene	3.70E-01	1.8E-07		8.68E-01	1.4E-07	

Table 4-140b
Revision of Noncancer Hazard Estimates Based on Pre-2002 Measurements of Chemicals in Soil by Using Post-2002 Soil Analysis Results
LHAAP-35B(37) [a]

Chemical	Jacobs (2003) Exposure Point Concentration (EPC) (mg/kg) [b]	Jacobs (2003) Hazard Index (HI) [h]	Jacobs (2003) Total Soil Hazard Index (HI) [i]	Post-2002 EPC (mg/kg) [e]	Post-2002 Hazard Index (HI) [j]	Revised Total Soil Hazard Index (HI) [k]
2,3,7,8-TCDD	2.56E-06	NA	1.4E-01	not analyzed	NA	1.6E-01
Aluminum	1.86E+04	3.1E-02		1.18E+04	NC	
Cadmium	7.50E+00	9.2E-03		1.06E-01	NC	
Manganese	1.86E+03	8.6E-02		1.08E+02	NC	
Vanadium	NE	NE		7.22E+01	1.9E-02	
Aldrin	1.70E-01	1.3E-02		not analyzed	NA	
Benzo(a)anthracene	4.40E-01	NA		8.68E-01	NA	
Benzo(a)pyrene	4.10E-01	NA		4.46E-01	NA	
Benzo(b)fluoranthene	5.80E-01	NA		8.68E-01	NA	
Indeno(1,2,3-cd)pyrene	3.70E-01	NA		8.68E-01	NA	

Notes:

a Jacobs Engineering Group, Inc., *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites, Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, and Caddo Lake* , Volume 1, Longhorn Army Ammunition Plant, Karnack, Texas, Oak Ridge, Tennessee, June 2003.

b Table 3-41 of Jacobs (2003) risk assessment.

c ILCR calculated for exposures to the chemical in soil by all pathways evaluated, Table C-71 of Jacobs (2003) risk assessment.

d ILCR calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-71 of Jacobs (2003) risk assessment.

e Maximum value based on samples collected since 2003, Table 4-59

f Value based on samples collected since 2003 (Table 4-59).

g Value equals sum of Jacobs (2003) value and result of calculations summarized in Table 4-139.

h HI calculated for exposures to the chemical in soil by all pathways evaluated, Table C-68 of Jacobs (2003) risk assessment.

i HI calculated for exposures to all chemicals in soil by all pathways evaluated, Table C-68 of Jacobs (2003) risk assessment.

j Value for vanadium calculated in Table 4-139.

k Revised HI = Jacobs-2003 Total HI + HI associated with vanadium

NA - not applicable

NC - not calculated, Post-2002 EPC is less than Jacobs (2003) EPC.

NE - not evaluated, chemical was not evaluated in Jacobs (2003) risk assessment

TCDD - tetrachlorodibenzo-p-dioxin

LONGHORN ARMY AMMUNITION PLANT,

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE:	Thursday, 13 May 2010
TIME:	2:00 p.m.
PLACE:	Teleconference, Call-in-Number Courtesy of Shaw: 866-797-9304, Passcode 4155734

Welcome **RMZ**

Action Items:

Army

- **IAP –** Status
  Refresh and send out the updated IAP.

EPA

- **MMRP Sites** – EPA to issue response to perchlorate tech memo.
- **LHAAP-18/24 ESD** – EPA to sign and send back to Army for distribution

TCEQ

- **MMRP Sites –** TCEQ to issue response to perchlorate tech memo

Defense Environmental Restoration Program (DERP) PBC Update **PS/GJ**

- Document Status/Environmental Sites (Table)
- Groundwater Treatment Plant
- Response to Comments on multiple proposed plans

DERP Total Environmental Restoration Contract Update

- LHAAP-37/67 – Draft Final ROD Status
- Response to Comments on Site 37/67 Proposed Plan
- Remaining TERC Recordations **RMZ**

BRAC-Funded Environmental Restoration

- LHAAP-19 – Demolition Landfill Progress **JRL/AW**

MMRP **JRL/AW**

Update from EPA, TCEQ response to Perchlorate Memo

Other Issues **RMZ**

- Sitewide Schedule Review – Critical Documents
- June RAB meeting
- Transfer Issues Impact on Restoration Progress
- IAP Comments

Adjourn

Shaw® Shaw Environmental, Inc.

Subject: **Draft Final Minutes, Monthly Managers' Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: **Teleconference**

Date of Meeting: **May 13, 2010; 2:00 PM – 3:45 PM**

Meeting Participants:

BRAC:	Rose M. Zeiler
USACE-Tulsa:	Aaron Williams, John Lambert
Shaw:	Susan Watson, Kay Everett, Greg Jones
USEPA Region 6:	Steve Tzhone, Carlos Sanchez, Terry Burton
TCEQ:	Fay Duke, Dale Vodak
USGS:	Kent Becher

Action Item Status:

Army

- **IAP –** Status
  Rose Zeiler indicated that when the database opens back up, Aaron Williams will make any changes and then send out the refreshed version.

EPA

- **MMRP Sites –** Status
  EPA will issue response to the perchlorate technical memorandum.
- **LHAAP-18/24 ESD–** Status
  EPA will sign the document and return to Army for distribution.

TCEQ

- **MMRP Sites – Perchlorate Tech Memo Response**
  Fay Duke indicated that she still needs to talk with EPA regarding this issue. Steve would be drafting the memo.

Defense Environmental Restoration Program (DERP) PBC Update

Document Status/Environmental Sites
How to implement LUC Management Plan updates and add new information was discussed since the county recordation and the survey have been completed for some of the sites. The

schedule for LHAAP-17 was also discussed. Rose requested that the Final Feasibility Study for LHAAP-17 be sent to the RAB and CLI in advance.

Susan Watson went over the document status/environmental sites table.

- LHAAP-02: The Draft Final Decision Document for LHAAP-02 is in review with the TCEQ.
- LHAAP-03: The draft work plan for soil removal is in preparation and will be submitted soon.
- LHAAP-04: The Draft Completion Report for LHAAP-04 is in Army review.
- LHAAP-06, -07, -51, -55, -64, -66, and -68: The deed notifications were filed in April at the Harrison County office.
- LHAAP-16: The Final Feasibility Study Addendum was submitted 3/31/10. Comments on the draft Proposed Plan for LHAAP-16 were received by Shaw on 5/12/10.
- LHAAP-17: The Final Feasibility Study for LHAAP-17 was 4/28/10. Responses to Army's comments on the Proposed Plan are in progress.
- LHAAP-18/24: Responses on the Draft Feasibility Study are being resolved. The Draft Final will be submitted today, 5/13/10.
- LHAAP-29: The Final Feasibility Study was submitted 4/30/10. The Draft Proposed Plan is in preparation and will be submitted to the Army for review next week.
- LHAAP-46: The Draft Record of Decision is in Army review.
- LHAAP-47: The Draft Final Feasibility Study for LHAAP-47 is in regulatory review.
- LHAAP-49: The Draft Final ROD for LHAAP-49 is in preparation.
- LHAAP-50: The Draft ROD is in Army review.
- LHAAP-58: The Draft ROD will be sent to Army for review.
- LHAAP-60: The deed notifications were filed in April at the Harrison County office.
- LHAAP-35/36: Responses to TCEQ comments have been submitted on 5/6/10 along with the Errata Memorandum.
- Pistol Range: Army is currently reviewing the Draft ROD.

The next proposed plan that appears to be ready for a public review period is LHAAP-17. The Army, EPA, and TCEQ discussed informing the general public and CLI in a timely fashion and to not present too much information at one time. EPA suggested that future proposed plans, e.g. LHAAP-17, be delayed until current public concerns are resolved. Rose clarified that the concerns expressed did not originate from the general public but come primarily from CLI. She further stated that the Army cannot delay its schedule, particularly on LHAAP-17, because of the contract performance period. However she agreed that putting out multiple plans should not happen in the future and suggested that we go forward with Site 17. Thus, potential dates were discussed, and June 29th was selected for the public meeting for LHAAP-17 Proposed Plan. The public comment period would start approximately 2-3 weeks earlier depending on the timing.

Groundwater Treatment Plant

The quarterly monitoring report for January-March 2010 was issued yesterday. Steve asked Kent Becher for a status of the review of these reports. Kent reported that he had received them but had not reviewed yet. Susan noted that the treatment plant operated normally since the last monthly managers' meeting, but that there has been an increase in flow from the wells. She indicated that they have been running the FBR at an increased rate over the last month at 18 to 25 gpm. The treated water has been released to the INF pond in conjunction with injection since Harrison Bayou did not have adequate flow. Rose had noticed that a small section of the liner,

which is UV ray sensitive, was exposed at the INF pond. Depending on the purpose of the INF pond in relation to the current operations at the Groundwater Treatment Plant, Rose asked if the liner should be maintained. Historically, the INF pond has been used to hold treated discharge water from the plant when injection is not capable of handling the discharge and when Harrison Bayou does not have adequate flow. Shaw will check the permit for the Groundwater Treatment Plant to verify that the language stated that the water must be held if there is not flow in the bayou and if there is a requirement as how treated water should be stored when release to the creek is not possible. The INF pond is part of the ECOP VI transfer package (LHAAP-53). After transfer, the INF pond can still be utilized when there is a need in conjunction with the Groundwater Treatment Plant operation, but the transfer documents will need to contain certain statements to reserve or retain its use.

Response to Comments on multiple proposed plans
Susan indicated that the written and verbal comments from the recent public meeting will be handled collectively and entered in the Administrative Record. Also, a summary of the significant comments will be placed in the responsiveness summary of each ROD. Rose wanted to clarify that all comments and questions are captured in writing and responded to. It was clarified that any verbal question asked at the public meeting that could not be answered would be addressed in the ROD responsiveness summary. John indicated that we should request going forward that the public submit their questions and comments in writing so that they will all be addressed to their satisfaction.

Fish Study –Mercury
Rose asked Kent Becher if there was a mercury issue in fish at Longhorn. Kent indicated that there was a report by Jennifer Wilson available that showed mercury levels in Goose Prairie Creek and the cove area. Another report from CLI is also available. John pointed out that there are higher levels of mercury on the west side of the lake, upgradient to LHAAP. Similar results have been found in other lakes and water bodies such as Big Cypress Bayou nearby that do not discharge into or have any connection to LHAAP or Caddo Lake. Dale Vodak agreed and mentioned that TCEQ did fish tissue studies in the past and other studies were conducted by Art Crowe with TCEQ on Pruitt Lake, which also indicated similar mercury levels in fish. But the mercury origins were related to off site contamination and are not related to former processes from LHAAP. Rose mentioned that Longhorn also had a Baseline Ecological Risk Assessment that further demonstrated that although elevated mercury levels were found in fish samples in Caddo Lake, Longhorn was not contributing to the mercury levels found.

DERP Total Environmental Restoration Contract Update

LHAAP-37/67 – Draft Final ROD Status
A signature date for the ROD has been extended to June.

Response to Comments on Site 37/67 Proposed Plan
Status – In review

Remaining TERC Recordations
There were no sites at this step currently.

BRAC-Funded Environmental Restoration

LHAAP-19 – Demolition Landfill Progress

Some erosion was noted at the landfill and corrective measures are being implemented. Dale Vodak inspected the landfill and indicated it was good. The native grasses are beginning to grow. The contractor has placed a straw apron around the edges of the landfill for erosion control. John said it took several years for the vegetation at LHAAP-16 landfill to establish itself.

MMRP

Update from EPA, TCEQ response to Perchlorate
Need regulators' response on Longhorn's Perchlorate Memo to continue pushing forward the rest of the tasks for these sites.

Other Issues

Site-wide Schedule Review – Critical Documents
LHAAP-17 Proposed Plan is critical (discussed earlier). Very soon there will be several documents that will become critical to push through the review process because of the proposed plan public notice and review requirements. If it looks like there may be a scheduling issue, then it is necessary to identify the problem as soon as possible.

The schedule does not look good for LHAAP-18/24 FS. The potential for an on board meeting regarding LHAAP-18/24 and -47 Draft Final FSs was discussed. June 28th (afternoon) and June 29th (morning) dates were tentatively set for the on board review meeting at LHAAP.

June RAB Meeting
Tom Lederle may have a conflict but is hoping to attend this meeting. The next RAB meeting is scheduled for 6/10/10.

Transfer Issues Impact on Restoration Progress
No sites are on hold because of restoration progress.

IAP Comments
At present there are no comments and the refreshed IAP hasn't been sent out yet.

Next Monthly Managers' Meeting
Thursday, 2:00 PM, June 10, 2010 at Longhorn Army Ammunition Plan.

Action Items

Shaw

- Review GWTP permit language regarding release of treated water to storage or stream

EPA/TCEQ

- **MMRP Sites –** Technical
  EPA will issue response to the perchlorate technical memorandum.

Meeting Adjourned

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
May 13, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
1	Draft Final Decision Document, LHAAP-02	03/30/10	x	x	Final	05/30/10	x	x		Document in regulatory review	
2	Draft Soil Removal Work Plan, LHAAP-03	03/18/10	x		Draft	05/15/10	x			Removal action work plan in internal review	
3	Draft Completion Report, LHAAP-04	01/21/10	x		Draft Final	5/30/10	x	x	In progress	Army comments received.	
4	County Notification LHAAP-06, 07, 51, 55, 64, 66, 68	01/30/10	x							Filed at County office in April 2010	
5	Final Feasibility Study Addendum,, LHAAP-16	3/31/10	x	x						Submitted	
6	Draft Proposed Plan, LHAAP-16	4/30/10	x							In Army review	
7	Final Feasibility Study, LHAAP-17	4/28/10	x	x						Submitted	
8	Draft Proposed Plan, LHAAP-17	4/16/10	x		Draft Final	5/30/10	x	x	In progress	Army comments received	

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
May 13, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
9	Draft Feasibility Study, LHAAP-18/24	3/3/09	x		Draft Final	05/13/10	x	x	In progress	Army comments received. Resolution in progress.	
10	Draft Final Feasibility Study, LHAAP-29	03/11/09	x	x	Final	04/30/10	x	x		Submitted	
11	Draft Proposed Plan, LHAAP-29	5/21/10	x							In preparation	
11	Draft Record of Decision, LHAAP-46	04/30/10	x							In Army review	
12	Draft Final Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Final	05/30/10	x	x		In regulatory review	
13	Draft ROD, LHAAP-49	04/01/10	x		Draft Final	05/30/10	x	x	In progress	Army comments received	
14	Draft Record of Decision, LHAAP-50	05/7/10	x							In Army review	
15	Draft Record of Decision, LHAAP-58	05/14/10	x							In preparation	
16	County Notification, LHAAP-60	01/30/10	x							Filed at County office in April 2010	

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
May 13, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
17	Draft Final Decision Document, LHAAP-35/36	07/15/09	x	x	Final	4/30/10	x	x		Responses to TCEQ comments submitted - 5/6/10	
18	Draft Record of Decision, Pistol Range	02/08/10	x		Draft Final	05/30/10	x	x		In Army review	

Shaw

LONGHORN ARMY AMMUNITION PLANT
MONTHLY MANAGERS' MEETING

Location	Longhorn Army Ammunition Plant, Karnack, Texas	Teleconference	
Date	13-May-2010	**Time**	2:00 PM

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
Longhorn Team Members				
Rose M. Zeiler	✓	BRAC	(479) 635-0110	rose.zeiler@us.army.mil
Matthew Mechenes		USAEC	(410) 436-1505	matthew.mechenes@us.army.mil
Aaron Williams	✓	USACE, Tulsa	(918) 669-4915	aaron.k.williams@usace.army.mil
John Lambert	✓	USACE, Tulsa	(918) 669-4992	john.r.lambert@SWT03.usace.army.mil
Stephen Tzhone	✓	USEPA, Dallas	(214) 665-8409	tzhone.stephen@epa.gov
Raji Josiam	✓	USEPA, Dallas	(214) 665-8529	josiam.raji@epa.gov
Fay Duke	✓	TCEQ, Austin	(512) 239-2443	fduke@tceq.state.tx.us
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Barry Forsythe		USFSW, Dallas	(214) 665-8467	forsythe.barry@epa.gov
Paul Bruckwicki	✓	USFSW, Karnack	(903) 679-4536	paul_bruckwicki@fws.gov
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Praveen Srivastav		SHAW, Houston	(281) 531-3188	praveen.srivastav@shawgrp.com
Kay Everett	✓	SHAW, Houston	(281) 531-3121	kay.everett@shawgrp.com
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Carlos Sanchez	✓	EPA		
Susan Watson	✓	Shaw		
Terry Burton	✓	EPA		
Kent Becher	✓	USGS		

00098223

Shaw® Shaw Environmental, Inc.

Date: ***May 21, 2010***

Project No.:117591

TRANSMITTAL LETTER:

To: Mr. Aaron Williams

Address: US Army Corps of Engineers - Tulsa
CESWT-PP-M
1645 South 101st East Ave
Tulsa, Oklahoma 74128

Re: Final Proposed Plan for LHAAP-17, Burning Ground No. 2/Flashing Area, Longhorn Army Ammunition Plant

Contract No. W912QR-04-D-0027/DS02

For: Review ____ As Requested ____ Approval ____ Corrections ____ Submittal ____ Other X ____

Item No:	*No. of Copies*	*Date:*	*Document Title*
1	2	May 2010	**Final Proposed Plan for LHAAP-17, Burning Ground No. 2/Flashing Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron– Enclosed are two copies of Shaw's final version of the above-named document. Copies have been distributed as indicated below.

Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert– USACE, Tulsa (sent to A. Williams for distribution)
Mr. M. Mechenes – USAEC
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

1401 Enclave Parkway, Suite 250, Houston, Texas 77077 ***Phone: (281) 531-3100/Fax: (281) 531-3136***

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

May 21, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Proposed Plan for LHAAP-17 Burning Ground No. 2/Flashing Area, Longhorn Army Ammunition Plant, Karnack, Texas, May 2010

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your files. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert/S. Fiehler, USACE, OK
A. Williams, USACE, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw – Houston, TX (for project files)

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

May 21, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Proposed Plan for LHAAP-17, Burning Ground No. 2/Flashing Area
Longhorn Army Ammunition Plant, Karnack, Texas, May 2010
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your files. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
S. Tzhone, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, OK
J. Lambert/S. Fiehler, USACE, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw – Houston, TX (for project files)

00098226

FINAL

PROPOSED PLAN
FOR LHAAP-17
BURNING GROUND NO. 2/FLASHING AREA
GROUP 2

ISSUED BY: U.S. ARMY

Longhorn Army Ammunition Plant
Karnack, Texas

May 2010

INTRODUCTION

The purpose of this Proposed Plan is to present for public review the remedial alternatives for LHAAP-17. This Proposed Plan identifies the Preferred Remedial Alternative for LHAAP-17, site of the former Burning Ground No.2/ Flashing Area, at Longhorn Army Ammunition Plant (LHAAP). This plan includes summaries of other potential remedial alternatives evaluated for implementation at the site. The primary purpose of the Proposed Plan is to facilitate public involvement in the remedy selection process. The Proposed Plan provides the public with basic background information about LHAAP-17, identifies the preferred final remedy for the potential threats posed by the chemical contamination at the site, explains the rationale for the preference, and describes other remedial options considered. The preferred alternative for LHAAP-17 is Alternative 4 (excavation and off-site disposal of soil; groundwater extractions, monitored natural attenuation [MNA] and land use controls [LUCs] for groundwater). The extracted groundwater would be conveyed to the existing groundwater treatment plant for treatment.

The U.S. Army is issuing this Proposed Plan for public review, comment, and participation to fulfill part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986, and under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA prescribes a step-wise progression of activities to respond to risk posed by contaminated sites **(Figure 1)**.

Dates to remember: June 10 to July 10, 2010
MARK YOUR CALENDER

PUBLIC COMMENT PERIOD:
June 10, 2010 to July 10, 2010
The U.S. Army will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: The U.S. Army will hold a public meeting to explain the Proposed Plan for LHAAP-17. Oral and written comments will be accepted at the meeting. The meeting will be held on June 29, 2010 from 6:00 p.m. to 8:00 p.m. at Karnack Community Center.

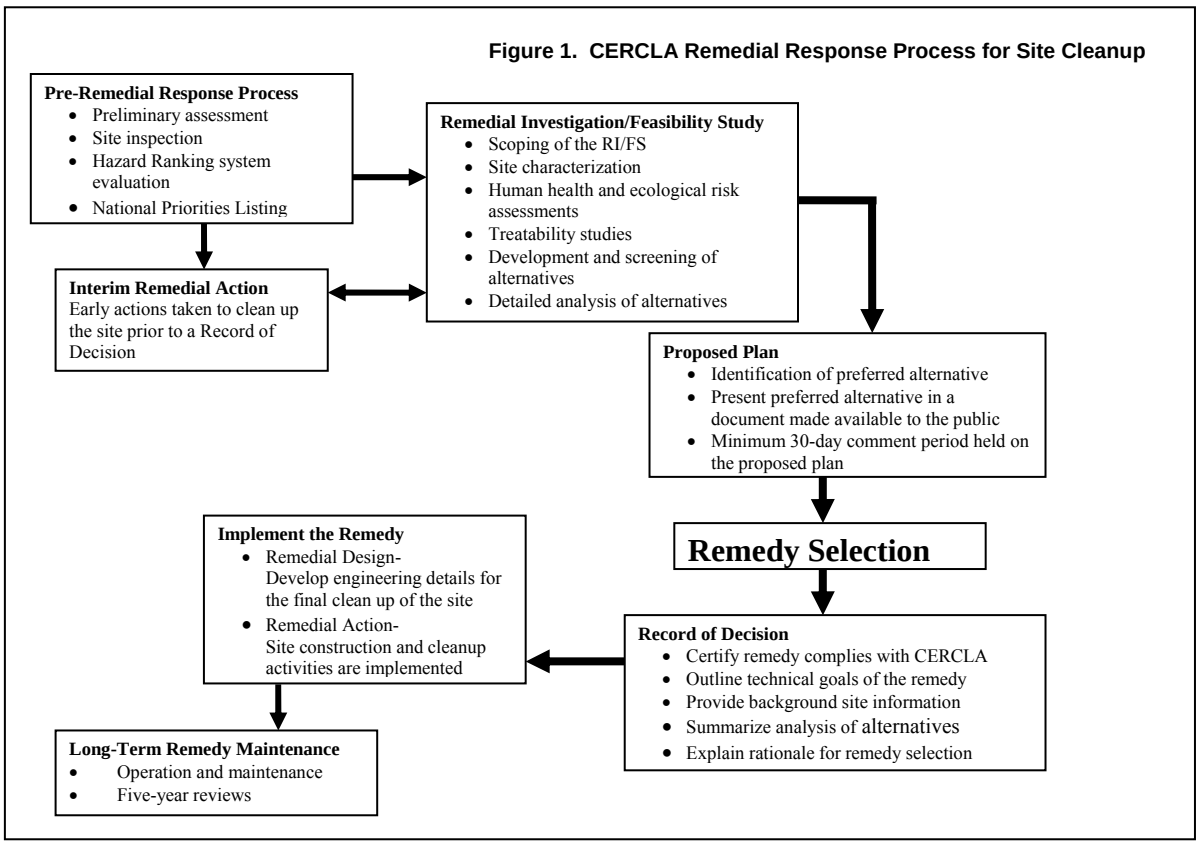
For more information, see the Administrative Record at the following location:

Marshall Public Library
300 S. Alamo
Marshall, Texas 75670

Business Hours:
Monday – Thursday (10:00 a.m. – 8:00 p.m.)
Friday – Saturday (10:00 a.m. – 5:00 p.m.

For further information on LHAAP-17, please contact:
Dr. Rose M. Zeiler
Site Manager
Longhorn Army Ammunition Plant
P.O. Box 220
Ratcliff, Arkansas, 72951
Direct No.: (479) 635-0110
E-mail address: rose.zeiler@us.army.mil

The preparation and review of a Proposed Plan is a distinct step required by CERCLA. This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation (RI) Report, the Data Gaps Investigation, the Feasibility Study (FS) Report (including the Natural Attenuation Evaluation Report and the Additional Investigation Data Summary Report), the Installation-Wide Baseline Ecological Risk Assessment (BERA), and other supporting documents that are contained in the LHAAP-17 Administrative Record that is publically available in the Marshall Public Library. The project management team, including the U.S. Army, U.S. Environmental Protection Agency



(USEPA), and the Texas Commission on Environmental Quality (TCEQ) encourages the public to review these documents and to comment on the alternatives presented in this Proposed Plan.

The U.S. Army is acting in partnership with USEPA Region 6 and TCEQ. As the lead agency for environmental response actions at LHAAP, the U.S. Army is charged with planning and implementing remedial actions at LHAAP. The regulatory agencies assist the U.S. Army by providing technical support, project review, project comment, and oversight in accordance with the CERCLA and the NCP as well as the Federal Facility Agreement (FFA).

The Proposed Plan summarizes site characteristics, scope and role of the response action, and site risks. This is followed by a presentation of the remedial action objectives (RAOs) and a summary of remedial alternatives for LHAAP-17. Finally, an evaluation of alternatives and a summary of the preferred alternative are presented.

SITE BACKGROUND

LHAAP is located in central-east Texas in the northeastern corner of Harrison County **(Figure 2)**. The installation occupies approximately 1,400 of its former 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the southeast. Caddo Lake, a large freshwater lake situated on the Texas-Louisiana border, bounds LHAAP to the north and east.

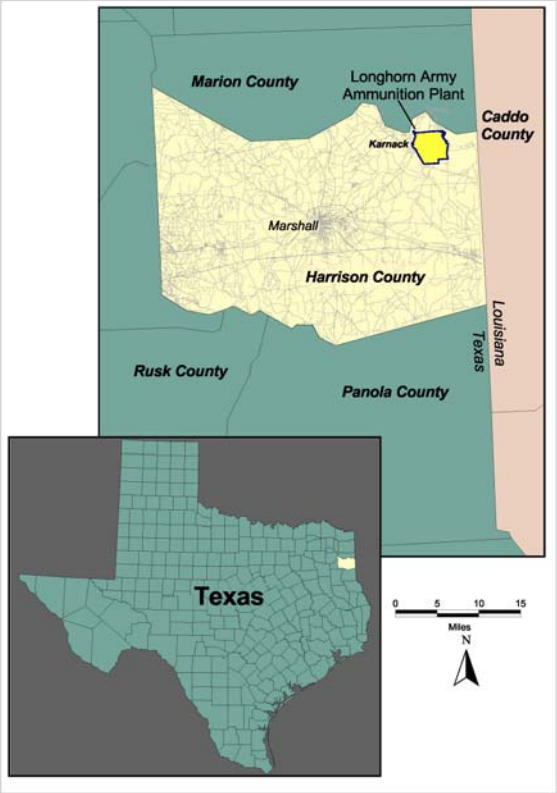


Figure 2 Location of the Longhorn Army Ammunition Plant, Harrison County, Texas

The U.S Army has transferred nearly 7,000 acres to the U.S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge.

The property transfer process is continuing as responses are completed at individual sites. The local restoration advisory board has been kept informed of previous investigations at this site through regularly held quarterly meetings. Additionally, the administrative record is updated at least twice per year and is available at the Marshall Public Library.

Due to releases of chemicals from facility operations, LHAAP was placed on the Superfund National Priorities List (NPL) on August 9, 1990. Activities to remediate contamination associated with the listing of LHAAP as a Superfund site began in 1990. After being listed on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

LHAAP-17 was originally listed as an NPL site in the FFA due to threatened releases of hazardous substances, pollutants or contaminants. The shallow and intermediate groundwater zones and the soil at LHAAP-17 are contaminated.

LHAAP-17, known as the Burning Ground No. 2/Flashing Area, is located in the southeastern portion of LHAAP **(Figure 3)**. The site covers approximately 3.9 acres. The site was used as a burning ground from 1959 through 1980. In 1959, the materials removed from the TNT Production Area (LHAAP-29) and the TNT Waste Disposal Plant (LHAAP-32) during demolition were burned and/or flashed at LHAAP-17. Bulk trinitro-toluene (TNT), photo flash powder, and reject material from Universal Match Corporation operations were burned at LHAAP-17. The site was used as a flashing area to decontaminate recoverable metal byproducts until 1980, when it became inactive.

Between 1982 and 2009, numerous investigations were conducted to identify potential contamination at LHAAP-17. Media investigated included soil, groundwater, surface water, and sediment. These investigations included a Pre-RI investigation in 1982 and 1987; Phase I, Phase II, and Phase III RIs conducted in 1993, 1995, and 1998; and investigations by the U.S. Army in 1998. The results of these investigations are summarized in the Final Remedial Investigation Report –

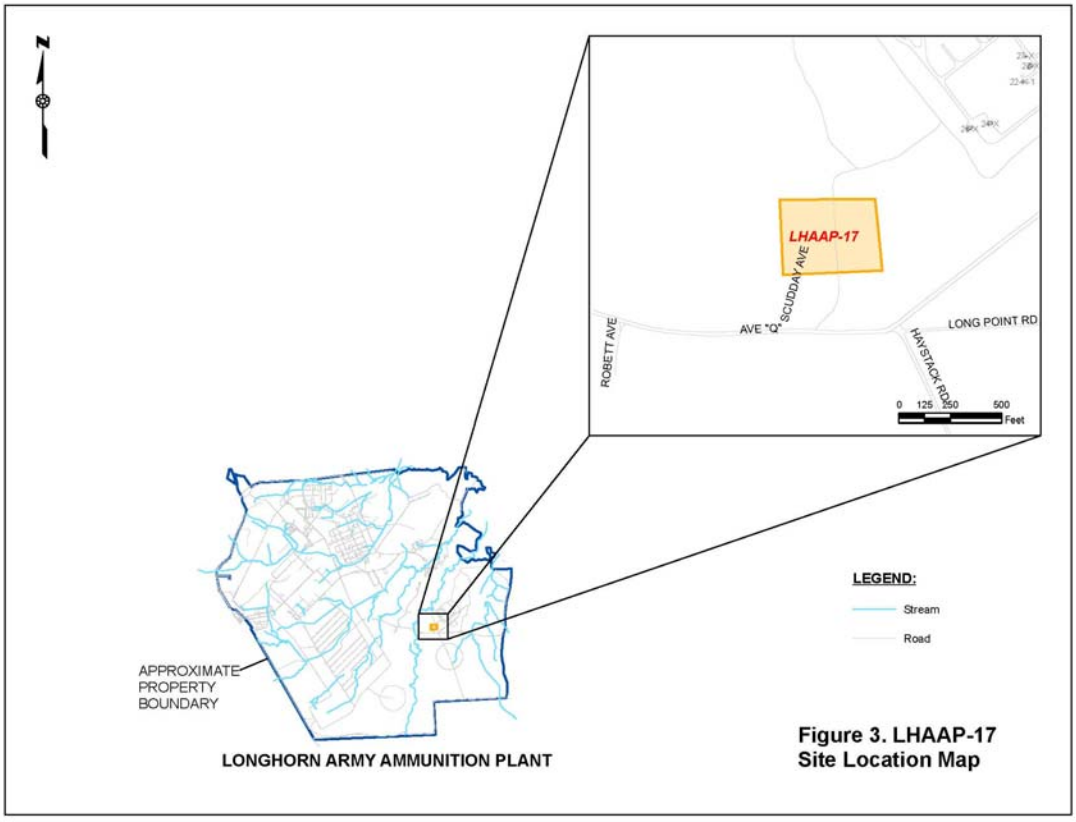


Figure 3. LHAAP-17 Site Location Map

Group 2 Sites (Group 2 RI) (Jacobs, 2001). The Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 2 Sites (BHHRA) (Jacobs, 2002) was performed using the data presented in the Group 2 RI. The BHHRA identified explosives and dioxins as chemicals of concern (COCs) for soil and perchlorate, explosives, and chlorinated solvents as COCs for groundwater at LHAAP-17. The screening ecological risk assessment concluded that a site-wide baseline ecological risk assessment should be conducted.

Additional investigations were conducted after the BHHRA was completed. In 2002, a site-wide perchlorate investigation was conducted and reported in the Final Project Report – Plant-Wide Perchlorate Investigation (STEP, 2005). In 2003-2004, an Environmental Site Assessment Phase I and II was conducted (Plexus, 2005). In 2003 and early 2004, a perchlorate treatability study was conducted at LHAAP-17 and documented in the Treatability Demonstration Study (PEC, 2004).

Between 2004 and 2009, several follow-up investigations were performed to further delineate the extent of contamination identified during previous sampling events. These include the data gaps investigation in 2004 (Shaw, 2007a), the BERA in 2006 (Shaw, 2007b), sampling for attenuation evaluation in 2007, additional sampling and new wells in 2008, and additional sampling in 2009, which are reported in the Final FS (Shaw, 2010).

SITE CHARACTERISTICS

The surface features at LHAAP-17 include two 185-feet by 305-feet cleared areas, separated by a gravel access road. The site is covered with grass and

scattered brush and has been graded above the surrounding terrain. The topography is relatively flat. Surface drainage flows to ditches along the eastern and western boundaries of the site and then to Harrison Bayou. Harrison Bayou is located to the west of LHAAP-17 flowing approximately 1,200 feet northwest of the site towards Caddo Lake. The lake is a source of drinking water for several neighboring communities in Louisiana.

Groundwater at the site was encountered at 18 to 35 feet below ground surface (bgs) in the shallow groundwater zone, approximately 55 feet bgs in the intermediate zone, and about 152 feet bgs in the deep groundwater zone. The predominant groundwater flow in the shallow and intermediate zones at the site is generally to the northwest towards Harrison Bayou, but historical groundwater flow direction has varied to the west or to the north.

Contamination was found in the soil and groundwater (shallow and intermediate zones). However, no principal threat source material was identified at LHAAP-17.

The COCs for LHAAP-17 identified in the FS for the various media are:

- Soil COCs are explosives (2,4,6-TNT, 2,4-dinitrotoluene [DNT], 2,6-DNT), dioxin (2,3,7,8- tetrachlorodibenzo-p-dioxin [TCDD] toxicity equivalent quotient [TEQ]), perchlorate (potential soil COC based on groundwater concentrations), and barium.
- Shallow groundwater COCs are perchlorate and volatile organic compounds (VOCs) (1,2-dichloroethane [DCA], 1,1-dichloroethene [DCE], cis-1,2-DCE, trichloroethene [TCE] and vinyl chloride [VC]).
- Intermediate groundwater COCs are TCE and its daughter products (DCE and VC).

There are approximately 8,000 cubic yards of contaminated soil proposed to be removed for ecological and human health risk mitigation (see **Figure 4** for approximate areas). The maximum 2,4,6-TNT in the soil is 10,000 milligram per kilogram (mg/kg). Other explosives, 2,4-DNT and 2,6-DNT, have maximum concentrations of 4,000 mg/kg and an estimated concentration of 840 mg/kg, respectively. Additionally, perchlorate has been detected in the soil at a maximum concentration of 7.11 mg/kg. The concentrations of 2,3,7,8-TCDD TEQ and barium affecting ecological receptors are 1.9×10^{-4} mg/kg and 20,500 mg/kg, respectively.

The shallow groundwater zone has approximately 4,500,000 gallons of contaminated groundwater, and the intermediate zone has approximately 55,000 gallons; their areal extent is shown on **Figure 5**. The shallow groundwater perchlorate plume has the largest extent with detected concentrations at160,000 micrograms per liter (µg/L), but the intermediate zone does not have a perchlorate plume. The maximum TCE concentration in the shallow groundwater is 6,090 µg/L and in the intermediate zone is 10.8 µg/L. Other VOCs detected in the shallow groundwater are 1,2-DCA at an estimated concentration of 35.8 J µg/L and 1,1-DCE at 70 µg/L. Other COCs identified for the shallow and intermediate groundwater zones are degradation daughter products of VOCs that have not been detected above their MCLs.

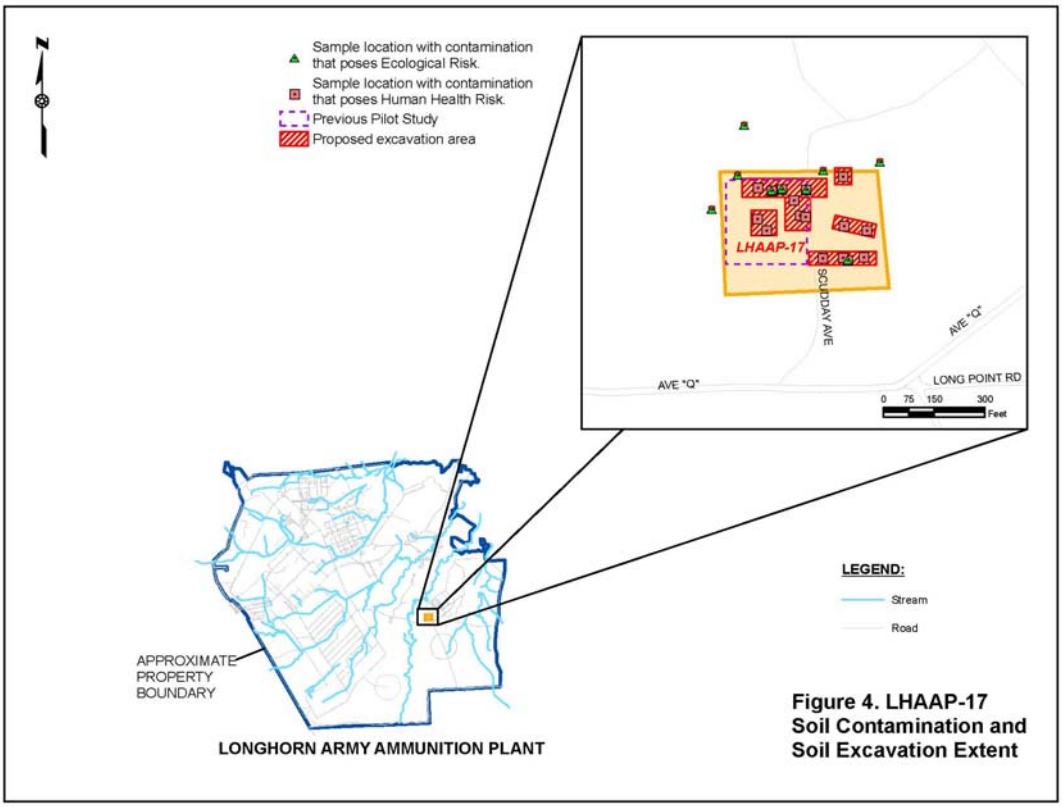


Figure 4. LHAAP-17 Soil Contamination and Soil Excavation Extent

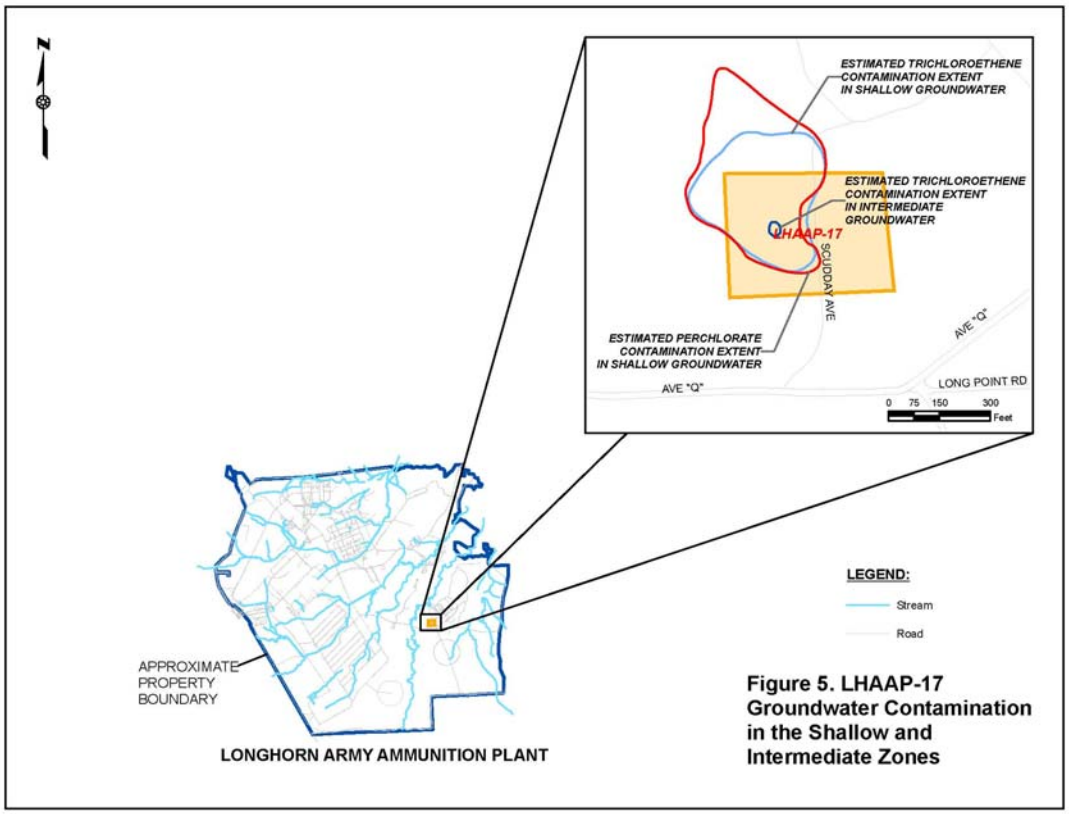


Figure 5. LHAAP-17 Groundwater Contamination in the Shallow and Intermediate Zones

SCOPE AND ROLE OF THE PROPOSED ACTION

The scope and role of the action discussed in this Proposed Plan includes all the remedial actions for this site. The recommended remedial action at LHAAP-17 will prevent potential risks associated with exposure to contaminated soil and groundwater in both the shallow and intermediate zones. Groundwater at Longhorn is not currently being used as drinking water, nor may be used in the future based on its reasonably anticipated use as a national wildlife refuge. However, when establishing the RAOs for this response action, the U.S. Army has considered the NCP's expectation to return useable groundwater to its potential beneficial use wherever practicable. The U.S. Army has also considered the State of Texas designation of all groundwater as potential drinking water, unless otherwise classified, consistent with Texas Administrative Code (TAC), Title 30, §335.563 (h)(1). The Army intends to return the contaminated shallow and intermediate groundwater zones at LHAAP-17 to its potential beneficial uses, which is considered to be the attainment of Safe Drinking Water Act maximum contaminant levels (MCLs) to the extent practicable, and consistent with Code of Federal Regulations, Title 40, §300.430(e)(2)(i)(B&C). If an MCL is not available for a chemical, the promulgated TCEQ medium-specific concentration (MSC) for groundwater that could be used for industrial purposes will be used (TCEQ, 2006). If return to potential beneficial uses is not practicable, the NCP expectation is to prevent further migration of the plume, prevent exposure to contaminated groundwater, and evaluate further risk reduction.

The remedial action will include groundwater monitoring to demonstrate that the plume is not migrating and to verify that contaminant levels are being reduced. Land use controls (LUCs) that restrict groundwater use may be terminated when groundwater contaminant levels are reduced to the cleanup levels.

The removal of source soils will positively impact groundwater by eliminating the potential for the leaching of contaminants from the soil into groundwater and will remove the contamination that poses a risk to ecological receptors.

SUMMARY OF SITE RISKS

The reasonably anticipated future use of this site is nonresidential use as part of the Caddo Lake National Wildlife Refuge. This anticipated future use is based on a Memorandum of Agreement (U.S. Army, 2004) between the USFWS and the U.S. Army which documents the transfer process of the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge. Presently the Caddo Lake National Wildlife Refuge occupies nearly 7,000 acres of the former installation. The property must be kept as a national wildlife refuge unless there is an act of Congress which removes the parcel or the land is exchanged in accordance with the National Wildlife Refuge System Administration Act of 1966 and the National Wildlife Refuge System Act Amendments of 1974.

As part of the RI/FS, a baseline human health risk assessment and screening ecological risk assessment were conducted for LHAAP-17 to determine current and future effects of contaminants on human health and the environment to support technical review and risk management decisions.

Human Health Risks

Using data presented in the RI, the baseline risk assessment estimates the risk that the site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The applicable receptor scenario for future use as a national wildlife refuge is a hypothetical future maintenance worker. For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen and are expressed in scientific notation (e.g. 1×10^{-6}). USEPA's acceptable risk range for site-related exposures is 1×10^{-4} to 1×10^{-6}, i.e., one-in-ten thousand to one-in-one million. The potential for non-cancer effects is expressed by a ratio of the exposure to the toxicity. An individual chemical ratio less than 1 indicates that toxic non-cancer effects from that chemical are unlikely. A non-cancer hazard index (HI) is calculated when all the ratios for the individual chemicals are summed. An HI greater than 1 indicates that site-related exposures may present a risk to human health. Thus, an HI of less than 1 is acceptable since it indicates toxic non-cancer effects are unlikely.

The cancer risk and the non-cancer HI were calculated based on a hypothetical future maintenance worker exposure to the site environmental media (e.g., soil and groundwater) under an industrial scenario. The human health risk assessment concluded that chemicals in soil pose an unacceptable cancer risk (1.4×10^{-3}) and non-cancer hazard (HI of 37) to a hypothetical future maintenance worker under the industrial scenario. The groundwater was also determined to pose an unacceptable cancer risk (1.6×10^{-3}) and a non-cancer hazard (HI of 3,500) to a hypothetical future maintenance worker. The risk and HI values are based on the industrial exposure scenario that includes drinking the water or using the water for hand washing or showering. Soil contaminants retained as COCs in the FS contributing to human health cancer risk are 2,4-DNT, 2,4,6-TNT and 2,6-DNT, and to non-cancer hazard are 2,4-DNT and 2,4,6-TNT.

The potential soil-to-groundwater pathway was evaluated for the emerging contaminant perchlorate (found in groundwater) and the explosives posing risks or hazards in soil. The concentrations of these chemicals were compared to their TCEQ soil MSCs for industrial use based on groundwater protection (GWP-Ind), which is more stringent than the MSCs for industrial use based on inhalation, ingestion, and dermal contact. Because the GWP-Ind is more stringent, they are the proposed soil cleanup levels for human health. Those cleanup levels are:

- 2,4,6-TNT 5.1 mg/kg
- 2,4-DNT 0.042 mg/kg
- 2,6-DNT 0.042 mg/kg
- Perchlorate 7.2 mg/kg

Since these soil cleanup levels apply to the soil-to-groundwater pathway and not direct human contact, they would apply to the soil interval from the surface down to where groundwater is encountered.

Groundwater contaminants retained as COCs in the FS contributing to human health cancer risk are TCE, 1,1- DCE, and 1,2-DCE, and to non-cancer hazard are perchlorate, TCE, 1,2-DCE, and 1,1-DCE. TCE degrades to cis-1,2-DCE and vinyl chloride, which are also considered COCs. The MCLs are proposed as the cleanup levels for groundwater for the following:

- TCE 5 µg/L
- 1,1-DCE 7 µg/L
- 1,2-DCE 5 µg/L
- cis-1,2-DCE 70 µg/L
- Vinyl Chloride 2 µg/L

For perchlorate, the TCEQ groundwater MSC for industrial use (GW-Ind) of 72 µg/L is also a proposed cleanup level since an MCL has not been promulgated. Detected concentrations of COCs exceed the proposed cleanup level in the shallow zone. Currently only TCE has been detected above its proposed cleanup level in the intermediate zone.

Ecological Risks

The ecological risk for LHAAP-17 was addressed in the installation-wide BERA (Shaw, 2007b). For the BERA, the entire installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. The individual sites at LHAAP were grouped into one of these sub-areas, which were delineated based on commonalities of historic use, habitat type, and spatial proximity to each other. The conclusions regarding the potential for chemicals detected at individual sites to adversely affect the environment were made in the context of the overall conclusions of the sub-area in which the site falls. Site LHAAP-17 lies within the Waste Sub-Area.

For the Waste Sub-Area, the BERA concluded that unacceptable ecological risk was present (Shaw, 2007b) associated with barium, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, and dioxin (reported as 2,3,7,8-TCDD TEQ]. Detected concentrations of these chemicals exceeded the Waste Sub-Area ecological preliminary remediation goal (EcoPRGs) and are targeted for excavation. Some of the areas are co-located with excavation for human health. For ecological receptors, the depth of excavation varies since they are based on the different ecological receptors (deer mouse from 0 to 0.5 feet and the short-tailed shrew from 0 to 3 feet).

Proposed soil cleanup levels for the ecological receptors are as follows:

- 2,4,6-TNT 4.7 mg/kg (0 to 3 feet)
- 2,4-DNT 12 mg/kg (0 to 3 feet)
- 2,6-DNT 6.8 mg/kg (0 to 3 feet)
  2.7 mg/kg (0 to 0.5 feet)
- 2,3,7,8-TCDD TEQ
  4×10^{-6} mg/kg (0 to 3 feet)
- Barium 222 mg/kg (0 to 0.5 feet)
  520 mg/kg (0 to 3 feet)

It is the current judgment of the U.S. Army that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The Army recognizes USEPA's policy to return all groundwater to potential beneficial uses, based upon the non-binding programmatic expectation in the NCP.

The RAOs for LHAAP-17, which address contamination associated with the media at the site and take into account the future uses of LHAAP streams, land, and groundwater are:

- Protect human health for the hypothetical future maintenance worker by preventing exposure to contaminants in the soil and groundwater

- Prevent migration of contaminants to groundwater from potential sources in the soil
- Protect ecological receptors by preventing exposure to the contaminated soil
- Return groundwater to its potential beneficial use as drinking water, where practicable, within a reasonable time period given the particular site circumstances.

SUMMARY OF REMEDIAL ALTERNATIVES

The FS identified and screened remedial technologies and associated process options that may be appropriate for satisfying the RAOs for LHAAP-17 with respect to effectiveness, implementability, and cost. The following remedial alternatives were developed from the retained remedial technologies carried forward after the initial screening:

- Alternative 1 – No Action
- Alternative 2 – Excavation and Off-site Disposal for Soil; Monitored Natural Attenuation (MNA) and LUCs for Groundwater
- Alternative 3 – Excavation and Off-site Disposal for Soil; In Situ Bioremediation, MNA and LUCs for Groundwater
- Alternative 4 – Excavation and Off-site Disposal for Soil; Groundwater Extraction, MNA and LUCs for Groundwater

Common Elements. Four elements, LUCs, MNA, inspection and long-term monitoring (LTM), and soil excavation and off-site disposal, are common to Alternatives 2, 3, and 4. These elements are described below.

Land Use Controls (LUCs). The LUCs would be implemented to support the RAOs. The U.S. Army would be responsible for implementation, maintenance, inspection, reporting, and enforcement of the LUCs. The Army intends to provide details of the LUC implementation actions in a remedial design (RD) document. Until cleanup levels are met in the groundwater for Alternatives 2, 3, and 4, the LUCs would prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health by ensuring there is no withdrawal or use of groundwater beneath the sites for anything other than treatment, environmental monitoring, or testing. The groundwater restriction LUCs would be maintained until the concentrations of contaminants in groundwater have been reduced to cleanup levels. In addition, the Texas Department of Licensing and Regulation responsible for notifying well drillers of groundwater restrictions would be notified and a notification of LUCs with the Harrison County Courthouse would include a map showing the areas of groundwater restriction at the site.

In order to transfer this property (LHAAP-17), an Environmental Condition of Property (ECOP) document would be prepared and attached to the letter of transfer. The ECOP would include LUCs for groundwater as part of the Environmental Protection Provisions. The property would be transferred subject to the LUCs identified in the ECOP. These restrictions would prohibit or restrict property uses that may result in exposure to the contaminated groundwater (e.g., drilling restrictions, residential/ agricultural land use restrictions, drinking water well restrictions).

Monitored Natural Attenuation (MNA). MNA is a passive remedial action that relies on natural biological, chemical, and physical processes to reduce the mass and concentration of groundwater COCs under favorable conditions. MNA would assure the protection of human health and the environment by documenting that the contaminated groundwater remains localized with minimal migration and that contaminant concentrations are being reduced to cleanup levels. Monitoring activities would occur on a quarterly basis for the first two years and MNA effectiveness would be evaluated.

Inspection and Long-term Monitoring (LTM). Alternatives 2, 3, and 4 include inspection and long-term groundwater monitoring activities. Monitoring would be continued as required to demonstrate effectiveness of the remedies, to demonstrate compliance with applicable or relevant and appropriate requirements (ARARs), to-be-considered requirements, and RAOs, and to support CERCLA Five-Year Reviews. After the initial MNA monitoring period of 2 years, semiannual monitoring would be continued for 3 years. Then sampling frequency would be reduced to annually until the next CERCLA Five-Year Review. Future sampling frequencies would be evaluated in the CERCLA Five-Year Review.

Groundwater LUCs would remain in effect until cleanup levels are met.

Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army would retain ultimate responsibility for remedy integrity.

Excavation and Off-site Disposal of Contaminated Soil. Soil contamination would be excavated at LHAAP-17 under Alternatives 2, 3, and 4, and disposed off site. This action would eliminate ecological risk from direct contact as well as human health risk associated with both direct contact and the soil-to-groundwater pathway.

If soil is found that contains perchlorate that exceeds the TCEQ groundwater protection level of 7.2 mg/kg, it will be included with the remediation of the other soil. In 2004, a perchlorate study was performed by PLANTECO to identify suitable carbon sources for cleanup of perchlorate contaminated soil at LHAAP-17 (PEC, 2004); although the study reported to have reduced the perchlorate concentrations, final sampling results are not available. Thus, additional sampling will be conducted as part of the RD to determine the perchlorate concentrations and evaluate any potential impact to the groundwater.

Alternative 1 – No Action. As required by the NCP, the no action alternative provides a comparative baseline against which the action alternatives can be evaluated. Under this alternative, the groundwater would be left "as is" without implementing any additional containment, removal, treatment, or other mitigating actions. No other actions would be implemented to prevent potential human exposure to contaminated groundwater or to demonstrate that nearby surface water bodies are protected from groundwater impacts.

Estimated Capital Present Worth Cost: $0

Estimated Operation and Maintenance (O&M) Present Worth Cost: $0

Estimated Duration: -

Estimated Total Present Worth Cost: $0

Alternative 2 – Excavation and Off-site Disposal for Soil; MNA and LUCs for Groundwater

Alternative 2 would include excavation of the contaminated soil from LHAAP-17. MNA in both the shallow and intermediate zones would ensure that groundwater contamination remains localized and degrades over time. It is estimated to take approximately 120 years for TCE to attenuate to MCLs. Perchlorate is estimated to attenuate within this time frame, or approximately 15 years. Groundwater monitoring would continue until cleanup levels are met. LUCs would be implemented to prevent exposure to the contaminated groundwater until cleanup levels are achieved.

Estimated Capital Present Worth Cost: $1,440,000

Estimated O&M Present Worth Cost: $460,000

Cost Estimate Duration: 30 years

Estimated Total Present Worth Cost: $1,900,000

Alternative 3 – Excavation and Off-site Disposal of Soil; In Situ Bioremediation; MNA and LUCs for Groundwater

As with Alternative 2, contaminated soil would be removed. Groundwater contamination would be reduced in the groundwater via in situ bioremediation in the shallow zone. It is expected the in situ bioremediation would primarily reduce the perchlorate concentrations. This would make conditions favorable for MNA of TCE. MNA would be implemented in the shallow zone (after in situ bioremediation) and in the intermediate zone. The in situ bioremediation is expected to reduce the TCE concentration to its MCL in less than 120 years and perchlorate in less than 15 years. LUCS would be implemented to prevent exposure to the contaminated groundwater until cleanup levels are achieved.

Estimated Capital Present Worth Cost: $2,030,000

Estimated O&M Present Worth Cost: $590,000

Estimated Duration: 30 years

Cost Estimate Total Present Worth Cost: $2,620,000

Alternative 4 – Excavation and Off-site Disposal of Soil; Groundwater extraction; MNA and LUCs for Groundwater

As with Alternatives 2 and 3, contaminated soil would be removed. Groundwater contamination would be reduced throughout the shallow zone groundwater contaminant plume via groundwater extraction until perchlorate levels are reduced to 20,000 µg/L to make conditions favorable for MNA of TCE. If the trigger value of 20,000 µg/L of perchlorate has not been reached by the end of the estimated 1.5-year pumping period, pumping may cease, pending lead agency and regulatory approval to initiate a contingency action of in situ bioremediation followed by MNA (see Alternative 3 description for basic elements). If perchlorate levels are successfully reduced to 20,000 µg/L or below after the estimated 1.5-year pumping period, then two years of MNA sampling will be implemented. If MNA is not shown to be supported after 2 years of sampling, a contingency remedy of in situ bioremediation will be initiated. As in Alternatives 2 and 3, this alternative utilizes MNA to treat the intermediate zone. Perchlorate is expected to attenuate to its cleanup level in 15 years without

pumping. The pump and treat step is expected to actively reduce the perchlorate concentrations, thus making conditions more favorable for TCE attenuation. TCE should attenuate to MCLs in less time than 120 years. Additionally, 1,2-DCA is estimated to attenuate to its MCL in 10 years. Similar to Alternative 3, LUCs would be implemented to prevent exposure to the contaminated groundwater until cleanup levels are achieved.

Estimated Capital Present Worth Cost: $1,570,000

Estimated O&M Present Worth Cost: $520,000

Estimated Duration: 30 years

Cost Estimate Total Present Worth Cost: $2,090,000

EVALUATION OF ALTERNATIVES

Nine criteria identified in the NCP, §300.430(e)(9)(iii), are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other alternatives under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS for LHAAP-17 (Shaw, 2010).

1. Overall Protection of Human Health and the Environment

The four alternatives provide varying levels of human health protection. Alternative 1, no action, does not achieve the RAOs and provides the least protection of all the alternatives; it provides no reduction in risks to human health or the environment because no measures would be implemented to eliminate the pathway for human exposure to soil or to the groundwater contamination and potential groundwater impacts to Harrison Bayou would not be addressed. Additionally, the soil pathway for ecological receptors would not be addressed.

Alternatives 2, 3, and 4 all satisfy the RAOs for LHAAP-17. They would remove the contaminated soil, restore the groundwater to cleanup levels and provide access and use restrictions for residual contamination. Alternatives 2, 3, and 4 would rely on LUCs to prevent access to the groundwater until cleanup levels are achieved by MNA. Alternatives 3 and 4 provide a level of overall protection similar to Alternative 2, but achieve cleanup levels for the shallow groundwater zone in a shorter time.

2. Compliance with ARARs

Alternative 1 does not comply with chemical-specific ARARs because no remedial action or measures would be implemented. Alternatives 2, 3, and 4 do comply with all chemical-specific ARARs for soil because the contaminated soil above the chemical-specific ARAR will be removed, and all chemical-specific groundwater ARARs because they will return the contaminated groundwater at LHAAP-17 to its potential beneficial use wherever practicable, in compliance with Safe Drinking Water Act MCLs as relevant and appropriate.

Location-specific and action-specific ARARs would not apply to Alternative 1 since no remedial activities would be conducted. Alternatives 2, 3, and 4 would comply with all location-specific and action-specific ARARs.

3. Long-Term Effectiveness and Permanence

Alternative 1 would be the least effective and permanent in the long term because no contaminant removal or treatment would take place and no measures would be implemented to control exposure risks posed by contaminated site soil and groundwater.

Alternative 2 would provide a moderate degree of long-term effectiveness by removing the source soils and providing restoration of the groundwater by MNA. LUCs would be required for groundwater for the protection of human health exposure.

Alternatives 3 and 4 would also provide a moderate degree of long-term effectiveness by removing the source soils and provide better long-term effectiveness by achieving cleanup levels in the shallow zone in a shorter time as compared to Alternative 2. Alternatives 3 and 4 would significantly reduce initial groundwater contaminant concentrations and thereafter rely on MNA and LUCs until the cleanup levels are achieved.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 does not employ treatment and would not result in a reduction of toxicity, mobility, or volume of contaminants.

Natural attenuation and in situ bioremediation or pumping/treatment coupled with excavation would permanently reduce the mass and concentration of contaminants and, therefore, the toxicity, mobility, and volume of the contaminants. MNA is a passive remedial action and in situ bioremediation is an active treatment process.

Alternatives 2, 3, and 4 would generate daughter products that may temporarily increase toxicity or mobility of the contaminant plume, with in situ bioremediation working in a shorter time frame and pumping and treatment working to reduce concentrations initially. The alternatives include monitoring so TCE daughter products would be quantified, documented and evaluated. Daughter product concentrations would be reduced under these alternatives to levels below their cleanup levels to return groundwater to its potential beneficial use as drinking water wherever practicable.

For Alternative 3, achievement of cleanup levels in groundwater would be expedited by implementing in situ bioremediation in areas of highest contaminant concentrations. Monitoring for contaminants would be performed to assess the effectiveness of the treatment. It is also anticipated that COCs would remain in the plume outside the treated areas and continue to attenuate to cleanup levels over time.

Achievement of cleanup goals would also be expedited for Alternative 4 by implementing pumping and treatment of the contaminated groundwater to reduce perchlorate concentrations throughout the plume.

The soil excavation in Alternatives 2, 3, and 4 would reduce mobility because perchlorate would be removed from the site and placed in a permitted disposal facility. Toxicity and volume would not be reduced by the excavation portion of the alternatives as the form and quantity of the perchlorate would not be altered.

5. Short-Term Effectiveness

Alternative 1 would not involve any remedial measures; therefore, no short-term risk to workers, the community or

the environment would exist. The activities associated with Alternatives 2, 3, and 4 would be protective to the surrounding community from short-term risks except for minimal potential short-term risks during transport (possible accident when soil is transported off site) of perchlorate and explosive contaminated soil.

Alternatives 2, 3, and 4 would involve potential short-term risks to workers associated with exposure to contaminated groundwater from monitoring and/or operation of drilling/construction equipment.

Alternative 3 would have short-term risks to remediation workers associated with exposure while performing in situ bioremediation activities, including handling of additives/materials.

Alternatives 2, 3, and 4 include LUCs as elements of their remedies and would provide almost immediate protection from the contaminated groundwater by prohibiting installation of potable water wells through relatively quick LUC implementation. The time period to achieve groundwater cleanup levels is the most significant difference between Alternative 1 versus Alternatives 2, 3, and 4. Alternatives 3 and 4 are expected to take less time to achieve RAOs.

Alternative 4 would have short-term risks to the workers associated with exposure during increased operations at the LHAAP groundwater treatment system, which include chemical handling (caustic acids) and operation of a high-temperature catalytic oxidizer. The implementation of Alternatives 3 and 4 would require more time than Alternative 2.

6. Implementability

Under Alternative 1, no remedial action would be taken. Therefore, no difficulties or uncertainties would be associated with its implementation. For Alternatives 2, 3, and 4, soil excavation would require extensive coordination between excavation, sampling, transportation and disposal. For groundwater, Alternatives 3 and 4 are technically implementable, although less so than Alternative 2 because of the uncertainties associated with hydrogeologic conditions. Those conditions may impact the ability of in situ bioremediation or groundwater extraction to lower perchlorate concentrations quickly to levels that would be more amenable to MNA of TCE.

Alternative 3 would involve the use of in situ bioremediation, which requires specialized expertise to design and construct the in situ bioremediation treatment elements. A groundwater treatment system currently exists at the LHAAP and is easily accessible to the site; therefore, groundwater extraction for Alternative 4 technically would be readily implementable.

Administratively, all of the alternatives are implementable.

7. Cost

Cost estimates are used in the CERCLA FS process to eliminate those remedial alternatives that would be significantly more expensive than competing alternatives without offering commensurate increases in performance or overall protection of human health or the environment. The cost estimates developed are preliminary estimates with an intended accuracy range of +50 to –30 percent. Final costs will depend on actual labor and material costs, actual site

conditions, productivity, competitive market conditions, final scope, final schedule, final engineering design, and other variables.

The cost estimates include capital costs (including fixed-price remedial construction) and long-term O&M costs (post-remediation). Overall present worth costs are developed for each alternative assuming a discount rate of 2.8 percent. The duration used for the estimates is a 30-year period.

The progression of present worth costs from the least expensive alternative to the most expensive alternative is as follows: Alternative 1, Alternative 2, Alternative 4, and Alternative 3. No costs are associated with Alternative 1 because no remedial activities would be conducted.

Alternative 2 has the lowest present worth and capital costs of the active remedial alternatives as no active remediation of groundwater would be implemented.

Alternative 3 has the highest present worth and capital costs primarily due to the activities associated with the injection phase of in situ bioremediation. The presence of the existing groundwater treatment system at LHAAP greatly reduces the costs associated with groundwater extraction in Alternative 4.

8. State/Support Agency Acceptance

The USEPA and TCEQ have reviewed the Proposed Plan. Comments received from the USEPA and TCEQ during the Proposed Plan development have been incorporated. Both agencies concur with the preferred alternative.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the record of decision (ROD) for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

Alternative 4 (excavation and off-site disposal of soil; groundwater extraction, MNA, and LUCs for groundwater) is the preferred alternative for LHAAP-17 and is consistent with the intended future use of the site as a national wildlife refuge. This alternative would satisfy the RAOs for the site through the following:

- Contaminated soil removal with off-site disposal to protect the hypothetical future maintenance worker and ecological receptors and eliminate the soil-to-groundwater pathway
- Extraction and treatment of groundwater until the trigger level of 20,000 µg/L of perchlorate is reached in order to expedite MNA
- MNA to assure protection of human health and the environment by documenting that the contaminated groundwater remains localized with minimal migration and that contaminate concentrations are being reduced to MCLs
- LUCs that would ensure protection of human health by preventing exposure to groundwater until cleanup levels are met.

If the 20,000 µg/L of perchlorate level is not reached after approximately 1.5 years, a contingency remedy, such as in situ bioremediation described in Alternative 3 may be implemented to reduce the perchlorate levels more quickly so the conditions become amenable for TCE to attenuate naturally. The monitoring and reporting associated with MNA would continue until the cleanup levels are achieved.

By extracting contaminated groundwater, Alternative 4 intends to lower the highest concentrations of perchlorate in groundwater to levels more amenable to natural attenuation. The extracted contaminated groundwater would be conveyed to the existing on-site groundwater treatment plant for treatment. The groundwater plume is contaminated with both perchlorate and TCE, and high concentrations of perchlorate tend to inhibit degradation of the TCE, so removal of much of the perchlorate by extraction is expected to accelerate the TCE degradation by MNA. The performance of natural attenuation would be evaluated after two years of monitoring using data from the eight quarters and from the historical sampling events of the prior ten years. The performance objectives for groundwater remediation will be included in the RD. If it is found that the performance objectives are not met, a contingency remedy such as in situ bioremediation (see Alternative 3 description for basic elements) would be implemented. The decision regarding use of the contingency remedy to address the groundwater contamination would be considered after two years of MNA and would be implemented, if required, after approval of the RD.

The selected alternative offers a high degree of long-term effectiveness, can be easily and immediately implemented, and costs less than the other most comparable alternative, Alternative 3.

Based on information currently available, the U.S. Army believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the CERCLA §121(b) criteria used to evaluate remedial alternatives. The preferred alternative will 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize a permanent solution; and 5) utilize an active treatment as a principal element. The selected remedy addresses the statutory preference for treatment to the maximum extent possible. No source materials constituting principle threats will be addressed within the scope of this action.

The Army intends to present details of the soil excavation plan, groundwater extraction plan, LUCs implementation plan, groundwater monitoring plan, and MNA remedy implementation in the RD for LHAAP-17.

The remedy selected in the ROD may change from the preferred alternative presented here, based on public comment.

Notification that the site is suitable for nonresidential use will accompany all transfer documents and will be recorded in the Harrison County Courthouse. Five-Year Reviews will be performed to document that the remedy remains protective of human health and the environment.

COMMUNITY PARTICIPATION

The U.S. Army, USEPA, and TCEQ provide information regarding LHAAP-17 through public meetings, the Administrative Record file for the facility, and announcements published in the Shreveport Times and Marshall News Messenger newspapers.

The dates for the public comment period, the date, location, time of the public meeting, and the locations of the Administrative Record files are provided on the front page of this Proposed Plan.

Any significant changes to the Proposed Plan, as presented in this document, will be identified and explained in the ROD.

PRIMARY REFERENCE DOCUMENTS FOR LHAAP-17

Jacobs Engineering Group Inc. (Jacobs), 2001, *Final Remedial Investigation Report for the Group 2 Sites Remedial Investigation (Sites 12, 17, 18/24, 29, and 32) at the Longhorn Army Ammunition Plant, Karnack, Texas,* April.

Jacobs, 2002, *Baseline Human Health and Screening Ecological Risk Assessment for the Group 2 Sites (Sites 12, 17, 18/24, 29, 32, 49, Harrison Bayou and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* February.

Planteco Environmental Consultants, LLC (PEC), 2004, *Draft Final In Situ Bioremediation of Perchlorate Contaminated Soils and Groundwater at Site-17 (Burning Ground No. 2), Longhorn Army Ammunition Plant, Karnack, Texas,* March.

Plexus Scientific Corporation (Plexus), 2005, *Final Environmental Site Assessment, Phase I and II Report, Production Areas, Longhorn Army Ammunition Plant, Karnack, Texas, Columbia, Maryland,* February.

Shaw Environmental, Inc. (Shaw), 2007a, *Final Data Gaps Investigation Report, Longhorn Army Ammunition Plant, Karnack, Texas,* April.

Shaw, 2007b, *Installation-Wide Baseline Ecological Risk Assessment, Longhorn Army Ammunition Plant, Karnack, Texas, Volume I: Step 3 Report*, Houston, Texas, November.

Shaw, 2010, *Final Feasibility Study, LHAAP-17, Burning Ground No. 2/Flashing Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas,* Houston, Texas, April.

Solutions to Environmental Problems, Inc. (STEP), 2005, *Final Plant-Wide Perchlorate Investigation, Longhorn Army Ammunition Plant, Karnack, Texas, Oak Ridge, Tennessee,* April.

Texas Commission on Environmental Quality (TCEQ), 2006, Updated Examples of Standard No. 2, Appendix II, Medium-Specific Concentrations, March 21, 2006.

U.S. Army, 2004, *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas,* Signed by the Department of the Interior on April 27, 2004 and the Army on April 29, 2004.

GLOSSARY OF TERMS

Administrative Record — The body of reports, official correspondence, and other documents that establish the official record of the analysis, cleanup, and final closure of a CERCLA site.

ARARs — Applicable or relevant and appropriate requirements. Refers to the federal and state requirements that a selected remedy will attain.

Attenuation — The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution, and/or transformation.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) — This law authorizes the Federal Government to respond directly to releases (or threatened releases) of hazardous substances that may be a danger to public health, welfare, or the environment. The U.S. Army currently has the lead responsibility for these activities.

Environmental Media —Major environmental categories that surrounds or contact humans, animals, plants, and other organisms (e.g. surface water, ground water, soil or air) and through which chemicals or pollutants move.

Exposure — Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lung, digestive tract, etc.) and available for absorption.

Groundwater — Underground water that fills pores in soil or openings in rocks to the point of saturation.

Hazard Index — The hazard index is the sum of the hazard quotients for all chemicals to which an individual is exposed. A hazard index value of 1.0 or less indicates that no adverse non-cancer human health effects are expected to occur. Each hazard quotient is a comparison of an estimated chemical intake (dose) with a reference dose level below which adverse health effects are unlikely. Each hazard quotient is expressed as the ratio of the estimated intake (numerator) to the reference dose (denominator). The value is used to evaluate the potential for non-cancer health effects, such as organ damage, from chemical exposures.

Maximum Contaminant Level (MCL) — The maximum contaminant level is based on the National Primary Drinking Water Standard. The TCEQ has adopted MCLs at the regulatory cleanup level for both industrial and residential uses. Any detected compound in the groundwater samples with an MCL was evaluated by comparing it to its associated MCL.

Proposed Plan — A report for public comment highlighting the key factors that form the basis for the selection of the preferred remediation alternative.

Remedial Action — The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

Risk Assessment — An analysis of the potential adverse health effects (current and future) caused by hazardous substances at a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action). The assessment contributes to decisions regarding appropriate response alternatives.

Superfund — The common name used for CERCLA; also referred to as the Trust Fund. The Superfund Program was established to help fund cleanup of hazardous waste sites. It also allows legal action to force those responsible for sites to clean them up.

ACRONYMS

ARARs	applicable or relevant and appropriate requirements
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BHHRA	baseline human health risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
DCA	dichloroethane
DCE	dichloroethene
DNT	dinitrotoluene
ECOP	environmental condition of property
EcoPRG	ecological preliminary remediation goal
FFA	Federal Facility Agreement
FS	feasibility study
ft	feet
GW-Ind	groundwater MSC for industrial use
GWP-Ind	soil MSC for industrial use based on groundwater protection
HI	hazard index
LHAAP	Longhorn Army Ammunition Plant
LTM	long-term monitoring
LUC	land use control
MCL	maximum contaminant level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
MSC	medium-specific concentration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
RAO	remedial action objective
RD	remedial design
RI	remedial investigation
ROD	record of decision
TAC	Texas Administrative Code
TCDD	tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TEQ	toxicity equivalent quotient
TNT	trinitrotoluene
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VC	vinyl chloride
VOC	volatile organic compound

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for LHAAP-17 is important to the U.S. Army. Comments provided by the public are valuable in helping the U.S. Army select a final remedy for these sites.

You may use the space below to write your comments, then fold and mail to Dr. Rose M. Zeiler, P.O. Box 220, Ratcliff, Arkansas 72951. Comments must be postmarked by July 10, 2010. If you have questions about the comment period, please contact Dr. Rose M. Zeiler directly at (479) 635-0110. Those with electronic communications capabilities may submit their comments to the U.S. Army via Internet at the following e-mail address: rose.zeiler@us.army.mil

MEDIA RELEASE

The United States Army has prepared a Proposed Plan for the environmental site LHAAP-17, Burning Ground No. 2/Flashing Area, at the Longhorn Army Ammunition Plant. The Proposed Plan is the document that describes LHAAP-17 and its proposed remedies. The Proposed Plan was developed to facilitate public involvement in the remedy selection process.

Copies of the Proposed Plan and other supporting documentation for LHAAP-17 are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. The public comment period is June 10, 2010 through July 10, 2010.

A public meeting will be held on June 29, 2010, from 6:00 to 8:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661.

All written public comments on the Proposed Plan must be postmarked on or before July 10, 2010. Written comments may be provided to Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951 or e-mailed to rose.zeiler@us.army.mil. E-mailed comments must be submitted by close of business on July 10, 2010.

00098249

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Wednesday, May 26, 2010 7:58 AM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

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-------Fax Transmission Report-------

To:	KTBS3 at 9033340288
Subject:	Media Release
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Explanation:	All Pages Ok
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Fax Line:	3
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Wednesday, May 26, 2010 8:00 AM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(2)

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-------Fax Transmission Report-------

To:	KMSS at 3186314194
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Job Id:	5053
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1005261258291543
Fax Line:	1
Fax Server:	127.0.0.1

00098251

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Wednesday, May 26, 2010 8:00 AM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(3)

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Job Id:	5054
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1005261259081544
Fax Line:	7
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Wednesday, May 26, 2010 8:02 AM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

4/

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Fax Line:	1
Fax Server:	127.0.0.1

Norris, Mary

(5)

From: faxadmin [faxadmin@shawgrp.com]
Sent: Wednesday, May 26, 2010 8:04 AM
To: Norris, Mary
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Explanation:	All Pages Ok
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Retry Count:	0
Job Id:	5057
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1005261302391546
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00098254

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STATE OF TEXAS
COUNTY OF HARRISON

On this 27th day of May ,20 10
nally appeared before me the undersigned, a Notary Pul
for said county and state.

DIANNE GRAY

e MARSHALL NEWS MESSENGER, a daily newspa
shed at MARSHALL, County of HARRISON, State
AS, who, being by me duly sworn, states that the attac
rtisement, a true copy of which is hereto annexed, w
shed in said newspaper in its issues thereof on the follow
s:

27th day of May 20 10
day of 20
day of 20
day of 20
day of 20
day of 20

Diane Gray

Subscribed and sworn to before me this 27th
of May 20 10.

Dana Morton

Notary Public, Harrison County, Texas

My Commision expires 3-21-13

DANA MORTON
MY COMMISSION EXPIRES
March 21, 2013

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-17 LONGHORN ARMY AMMUNITION PLANT, TEXAS
PUBLIC MEETING AT KARNACK COMMUNITY CENTER JUNE 29, 2010

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed the Proposed Plan for NPL site LHAAP-17. Although the Proposed Plan for LHAAP-17 identifies the preferred remedy for the site, the U.S. Army welcomes the public's review and comments. The public comment period is June 10, 2010 through July 10, 2010. The public meeting will be held on June 29, 2010 at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas. Questions, comments, and responses on the Proposed Plan will be recorded by a court reporter during the public meeting. Copies of the Proposed Plan and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. A summary of the site, including a discussion of various alternatives that were evaluated, are provided below.

Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor-operated and -maintained industrial facility located in central-east Texas in the northeastern corner of Harrison County. The installation occupies nearly 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. LHAAP was established in December 1941 near the beginning of World War II for the manufacture of trinitrotoluene. Other past industrial operations at the installation included the use of secondary explosives, rocket motor propellants, and various pyrotechnics, such as illuminating and signal flares and ammunition.

LHAAP-17, Burning Ground No. 2/Flashing Area, is located in the west-central portion of LHAAP and covers an area of approximately 3.9 acres. The site was used as a burning ground from 1959 through 1980 and as a flashing area to decontaminate recoverable metal byproducts. Four alternatives were evaluated for addressing the contaminated soil and groundwater at the site: 1) no action; 2) excavation and off-site disposal for soil; monitored natural attenuation (MNA) and land use controls (LUCs) for groundwater; 3) excavation and off-site disposal for soil; in situ bioremediation; MNA and LUCs for groundwater; and 4) excavation and off-site disposal for soil; groundwater extraction, MNA and LUCs for groundwater. Based on available information, the preferred remedy is alternative 4 which would remove contaminated soil from LHAAP-17 with off-site disposal; reduce groundwater contamination throughout the shallow zone groundwater contaminant plume via groundwater extraction; MNA to assure protection of human health and the environment by documenting that the contaminated groundwater remains localized and that contaminant concentrations are being reduced to MCLs; and LUCs to protect human health by preventing human exposure to contaminated groundwater.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

00098255

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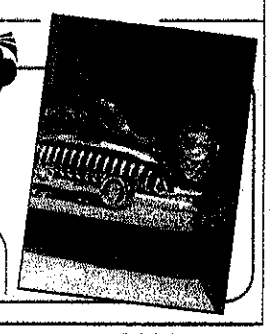

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2030 LEGAL NOTICES

NOTICE TO BUYERS HARRISON COUNTY PUBLIC AUCTION

The County of Harrison is offering for sale by public auction vehicles, furniture, computer equipment, cameras, doors, windows and other miscellaneous items. The auction will be conducted on-line by GovDeals. A detailed listing and pictures of the items offered may be viewed at www.GovDeals.com. The auction start date is June 7, 2010 and closes on June 22, 2010.

Public viewing will be **by appointment only.** See website for details. For additional information regarding this auction, contact Amy Holdeman, Harrison County Purchasing Agent @ 903.935.8412.

Harrison County reserves the right to reject any and all offers and to act in the best interest of Harrison County. All items shall be sold as is with no expressed or implied warranties and/or guarantees from Harrison County.

Harrison County
Amy Holdeman, CPPB
Purchasing Agent

NOTICE TO ALL PERSONS HAVING CLAIMS AGAINST THE ESTATE OF CLINT R. HUMPHREYS, DECEASED

Notice is hereby given that original Letters Testamentary for the Estate of Clint R. Humphreys, Deceased, were issued on May 24, 2010, in Cause No. 2010-16,224-CCL, pending in the County Court at Law of Harrison County, Texas to: Nancy B. Humphreys, Independent Executor of the Estate of Clint R. Humphreys, Deceased

Claims may be presented to the following address, in care of Nancy B. Humphreys, Independent Executor: 253 Shady Brook Lane, Longview, Texas 75602

All persons having claims against this Estate which is currently being administered are required to present them within the time and in the manner prescribed by law.

DATED the 24th of May, 2010.

LOWREY & MILLIKIN, L.L.P.
1127 Judson Road, Suite 141, Longview, Texas 75601
By: D. Kent Lowrey
Attorneys for the Estate

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For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

2030 LEGAL NOTICES

PUBLIC HEARING NOTICE

The Gregg County Health Facilities Development Corporation (the "Issuer") will hold a public hearing at 10:00 a.m. on June 11, 2010 at the offices of Southwest Securities Inc., 1127 Judson Road, Suite 242, Longview, Texas 75601. Among items to be discussed will be a proposal for issuance by the Issuer of its hospital revenue bonds (the "Series 2010 Bonds") to be issued in one or more series in an estimated aggregate principal amount of $100,000,000 plus any original issue discount. The proceeds from the sale of the Series 2010 Bonds, along with other available funds, will be used to undertake projects consisting of: (a) (i) financing or refinancing the development, construction and equipping of a free-standing emergency department/urgent care facility and imaging center, (ii) the renovation of certain floors of Good Shepherd Medical Center, including various capital equipment purchases, and (iii) other capital projects, all of which will be owned and operated by The Good Shepherd Hospital, Inc. d/b/a Good Shepherd Medical Center ("Good Shepherd") and located at 3133 Good Shepherd Way, Longview, Texas and 700 East Marshall Avenue, Longview, Texas, (b) capital projects, including various equipment purchases, which will be owned and operated by Harrison County Hospital Association d/b/a Good Shepherd Medical Center - Marshall ("Good Shepherd - Marshall") and located at 811 South Washington, Marshall, Texas, 612 South Grove, Marshall, Texas, 614-620 South Grove, Marshall, Texas, and 805 Lindsay, Marshall, Texas, (c) refunding all or a portion of the outstanding Harrison County Health Facilities Development Corporation Hospital Revenue Bonds (Marshall Regional Medical Center Project) Series 2006 (the "Marshall Bonds"), which bonds were originally issued to (i) finance, refinance and reimburse the cost of acquisition, construction, renovation and equipping of health care facilities owned and operated by Good Shepherd - Marshall and located at 811 South Washington, Marshall, Texas, 612 South Grove, Marshall, Texas, 614-620 South Grove, Marshall, Texas, and 805 Lindsay, Marshall, Texas, (ii) to pay capitalized interest, (iii) to fund a debt service reserve fund, and (iv) to pay costs of issuance of the Marshall Bonds, (d) refunding all or a portion of the issuer's outstanding Hospital Revenue Bonds (Good Shepherd Medical Center Project) Series 2004, which bonds were originally issued to refinance the cost of certain health facilities owned and operated by Good Shepherd and located at 700 East Marshall Avenue, Longview, Texas, (e) establishing a debt service reserve fund for the Series 2010 Bonds, and (f) paying a portion of the cost of issuance of the Series 2010 Bonds. Members of the general public may attend or submit written comments prior to the hearing regarding the projects or the Series 2010 Bonds.

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PUBLICATION: Wed., June 2
DEADLINE: Fri., May 28 at 3pm

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33 Corn spike
34 Shove
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37 Pound of verse
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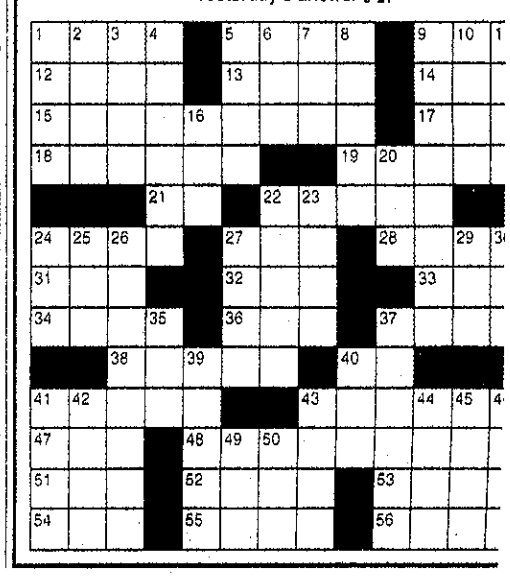
Yesterday's answer 5-27



00098256

The Times

PROOF OF PUBLICATION

STATE OF LOUISIANA

PARISH OF CADDO

Before me, the undersigned authority, personally came and appeared

Altheas Critton personally known to me,

Who being duly sworn, deposes and says that she is the Assistant to the Classified Advertising Manager of The Times, and that the attached Advertisement entitled:

PUBLIC NOTICE THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-17 LONGHORN ARMY AMMUNITION PLANT, TEXAS PUBLIC MEETING AT KARNACK COMMUNITY CENTER JUNE 29, 2010

The Times on the following dates to wit:

May 27, 2010

(Signed) Altheas Critton

Sworn to and subscribed before me this 27th day of May, 2010

Diana W. Barber

DIANA W. BARBER, NOTARY PUBLIC # 60491
CADDO PARISH, LOUISIANA
MY COMMISSION IS FOR LIFE

(Notary)

GANNETT

00098257

BP begins novel effort to stop leak

By Greg Bluestein and Mike Baker
The Associated Press

COVINGTON — BP on Wednesday launched its latest bid to plug the gushing well in the Gulf of Mexico by force-feeding it heavy drilling mud, a maneuver known as a "top kill" that has never before been tried 5,000 feet underwater.

The oil giant's chief executive earlier gave the procedure a 60 to 70 percent chance of working, and President Obama cautioned Wednesday there were "no guarantees."

BP spokesman Steve Rinehart said the company will pump mud for hours, and officials have indicated it may be a couple of days before they know whether the procedure is working. The top kill involves pumping enough mud into the gusher to overcome the flow of oil, and engineers plan to follow it up with cement to try to permanently seal the well.

A live video stream showed pictures of the oil gushing and the blowout preventer, the five-story device the mud was being pumped into. A weak spot in the device could blow under the pressure, causing a brand new leak.

Gene Beck, a petroleum engineering professor at Texas A&M in College Station, said the endeavor would likely fail quickly if the mud could not overcome the pressure of the oil.

"The longer it goes, maybe the better news that is," Beck said. "They are hoping that nothing breaks, that they don't have any failures in what they're pumping into."

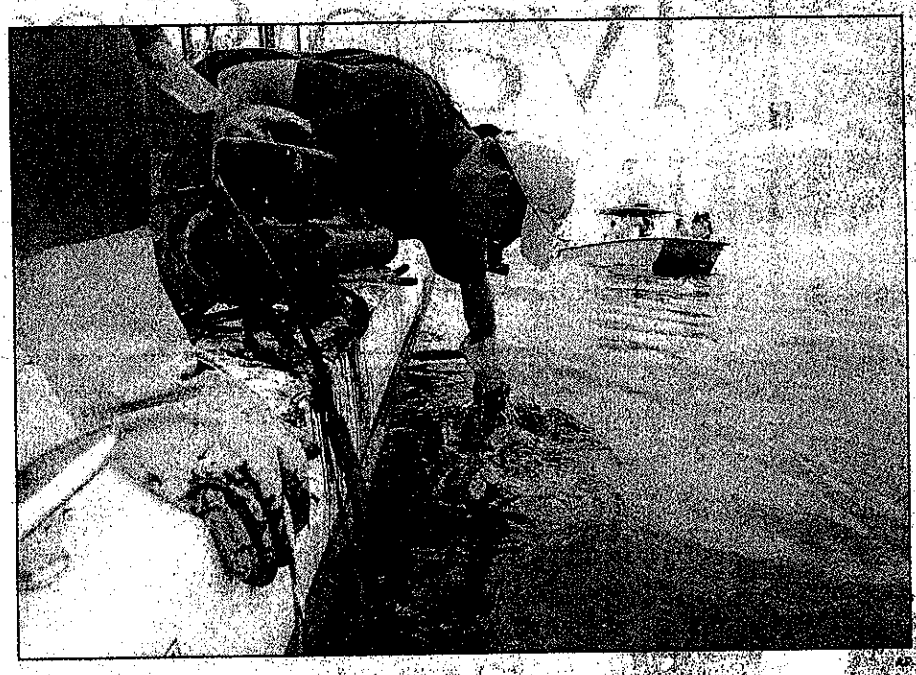
BP PLC was leasing the rig Deepwater Horizon when it exploded April 20, killing 11 workers and triggering the spill that has so far spewed at least 7 million gallons into the Gulf. Oil has begun coating birds and washing into Louisiana's delicate wetlands.

Witness statements obtained by The Associated Press show senior managers complained BP was "taking shortcuts" the day of the explosion by replacing heavy drilling fluid with saltwater in the well that blew out.

Truitt Crawford, a roustabout for drilling rig owner Transocean Ltd., told Coast Guard investigators about the complaints. The seawater, which would have provided less weight to contain surging pressure from the ocean depths, was being used to prepare for dropping a final blob of cement into the well.

"I overheard upper management talking saying that BP was taking shortcuts by displacing the well with saltwater instead of mud without sealing the well with cement plugs, this is why it blew out," Crawford said in his statement. BP declined to comment.

The statements show workers talked just minutes before the blowout about pressure problems in the well. At first, nobody seemed too worried: The chief mate for Transocean left two crew members to deal with the issue on their own.



Kevin Boswell, a researcher from LSU, trails his gloved hand Wednesday through oil floating on the surface of the Gulf of Mexico near the coast of Louisiana. AP

Clinton wants world to act on S. Korean sinking of warship

By Matthew Lee and Hyung-Jin Kim
The Associated Press

SEOUL, South Korea — U.S. Secretary of State Hillary Rodham Clinton said Wednesday the world must respond to the "unacceptable provocation" represented by the sinking of a South Korean warship blamed on Pyongyang, as the regime unleashed more blistering rhetoric against Seoul and Washington.

Clinton

Tension on the divided Korean peninsula has risen dramatically since international investigators said last week that a torpedo fired by a North Korean submarine tore apart and sank the South Korean warship Cheonan on March 26, killing 46 sailors.

Relations are at their lowest point in a decade, w[illegible] South Korea began reaching out t[illegible]e north with unconditional aid as part of reconciliation efforts. South Korean President Lee Myung-bak has taken a harder line against Pyongyang since taking office in 2008 amid delays in the north's promised denuclearization and has suspended aid.

South Korea, backed by the U.S., Japan and other allies, began implementing a package of punitive measures against the North on Tuesday — ranging from slashing trade, resuming propaganda warfare and barring the North's cargo ships. Those were seen as among the strongest it could implement short of military action.

"This was an unacceptable provocation by North Korea, and the international community has a responsibility and a duty to respond," Clinton told reporters in Seoul. She said South Korea's measures "are absolutely appropriate and they have the full support of the United States."

Later Wednesday, North Korea again called the investigation results a "fabrication" and accused President Obama's administration of being behind a plot to pinpoint the North as the culprit to bolster its military presence in the region.

North Korea, which has vowed to retaliate against any punishment for the ship sinking, has declared it is cutting relations with South Korea, starting "all-out counterattacks" against the South's psychological warfare operations and barring South Korean ships and airliners from passing through its territory.

BRIEFS

Canada to spend $1B on summit security

TORONTO — Canada's leadership came under heavy criticism from opposition leaders Wednesday after announcing the country will spend nearly $1 billion for security at the G-8 and G-20 summits next month.

Public Safety Minister Vic Toews said Canada has budgeted up to $872 million. He said hosting the two summits back-to-back is unprecedented.

Canada is hosting the Group of 20 economic summit June 26-27 in Toronto. The G-20 is the group of leading rich and developing nations. The Group of Eight — the group of leading industrial nations — summit is being held in Huntsville, Ontario, a day earlier.

The near $1 billion tab in Canada comes as the governments of the G-20 conference are expected to discuss getting their deficits and debt under control.

Opposition parties in Canada decried the cost.

Royal Canadian Mounted Police Sgt. Leo Monbourquette declined to say how many officers will be deployed, but thousands are expected. A massive temporary accommodations facility is being built in Huntsville and officers will be housed in hotels in Toronto. The leaders of the G-8 will be flown by helicopter from Huntsville to Toronto for the start of the G-20.

Ads on NYC buses asking 'Leaving Islam?' criticized

NEW YORK — The questions on the ads aren't subtle: Leaving Islam? Fatwa on your head? Is your family threatening you?

A conservative activist and the organizations she leads have paid several thousand dollars for the ads to run on at least 30 city buses for a month.

The ads point to a website called RefugefromIslam.com, which offers information to those wishing to leave Islam, but some Muslims are calling the ads a smoke screen for an anti-Muslim agenda.

Pamela Geller, who leads an organization called Stop Islamization of America, said the ads were meant to help provide resources for Muslims who are fearful of leaving the faith.

"It's not offensive to Muslims, it's religious freedom," she said. "It's not targeted at practicing Muslims."

Metropolitan Transportation Authority officials said Geller's ad was reviewed and did not violate the agency's guidelines.

"All ads are screened," MTA spokesman Aaron Donovan said. Most are reviewed by the company that handles the MTA's advertising opportunities, but some are sent to the MTA for ultimate approval.

The agency had received no complaints since the ads went up on May 14, MTA spokesman Aaron Donovan said. The 30 or so buses with the ads pass through all five boroughs of the city.

— From Wire Reports

THE MARKET ROUNDUP

Stocks fade late as euro sinks; Dow ends under 10,000 points

NEW YORK — A drop in the euro set off a late-day slide in stocks Wednesday and sent the Dow Jones industrial average to its first close below 10,000 in nearly four months.

The Dow, up 135 points in morning trading, ended down about 69. It was the eighth drop for the Dow in 10 days. Wednesday's trading extended a streak of volatility since stocks went to their highest level of the year in late April.

The late reversal underscored how jittery traders are about Europe. They are worried that heavy debt loads in European countries and more rounds of cost-cutting will hamper a recovery there, which could spread quickly to other regions.

The euro fell in late trading, pulling major stock indexes lower, following a Financial Times report that China is reviewing its holdings of European government bonds because of the crisis in government debt there.

China has been seeking ways to diversify its massive foreign exchange holdings out of dollars for some time. However any indication that it was losing confidence in the euro, leading it to sell some portion of its European bond holdings, would deliver a major blow to the European currency.

The Dow fell 69.30, or 0.7 percent, to 9,974.45. The Nasdaq composite index closed down 15.07, or 0.7 percent, to 2,195.88.

— The Associated Press

STOCKS OF LOCAL INTEREST

AEP,AC	42.96	+.27	ElPasoCp	10.96	+.31	Microsoft	25.01	-1.06
AT&T	24.13	+.19	Entergy	73.17	+.35	Monsanto	52.66	-1.90
AlabamaLue	23.66	+.09	ExpressJet	3.13	+.08	NCR Corp	12.89	-.24
AEP	37.92	+.05	ExxonMbl	59.31	-.40	Office Depot	5.71	-.25
AmExpress	38.17	+.53	Gannett	14.91	+.21	PennNtnl	25.02	-.05
Apache	97.81	+.23	GE	16.01	+.06	Penney	26.43	-.71
ATMOS	26.55	+.14	GaGulfPr	17.93	+1.60	Petrohawk	17.86	+.27
BP Pru	90.45	+.96	GoodrPet	12.16	+.02	PinnclEnt	11.86	+.04
BcpSouth	19.17	+.16	Halliburton	25.88	+.25	QwestCm	5.17	+.08
BestBuy	40.56	+1.43	Haverties	15.98	-.09	RRI Engy	4.28	+.25
Boyd Gaming	12.48	+.17	HomeDepot	34.04	+.06	RegionsFn	7.40	-.05
CalumetSp	17.66	+.09	Hopewell	42.11	+.32	Rite-Aid	1.13	+.05
CapOne	40.31	+.34	Intel	20.70	+.15	StMaryLE	39.89	+1.10
CenterPnt	13.15	+.09	IBM	123.23	-1.29	Schlmbrg	58.75	+.29
CenturyTel	33.74	+.16	IP	22.34	+.11	SearsHldgs	84.25	-3.79
ChesEng	21.16	+.37	IsleCapri	9.21	+.02	Shaw Group	32.94	+.42
Chevron	71.55	-1.02	JPMorgCh	38.78	+.16	Stein Mart	7.74	-.34
Cintas	25.57	NC	JanusCap	10.28	+.51	Target	53.59	-.99
ConAgra	23.96	-.24	KC Southn	36.79	+.74	Union Pacific	70.12	+1.88
ConocPhil	49.57	-.35	Kroger	19.82	+.39	UnionAir	20.92	+1.00
Dell Inc	13.25	-.08	Libbey	13.16	+.16	Wal-Mart	50.02	-.26
DevonE	60.29	-.58	Lowes	24.84	+.08	Wells Fargo	28.04	-.86
Dillards	27.24	-.40	MagelMPtr	43.30	+1.01	Weyerh	41.57	+.04
			McDnlds	66.01	-1.83			

MARKET HIGHLIGHTS

STOCKS

	Prev. Close	Close	Chg.
Dow industrials	10043.75	9974.45	-69.30
Dow transports	4199.57	4247.28	+47.71
Dow utilities	355.99	354.59	-1.40
Dow 65	3450.32	3447.09	-3.23
NYSE composite	6665.83	6631.36	-34.47
S&P index	1074.03	1067.95	-6.08
DJ AIG index	122.40	124.34	+1.94
	4.35	4.37	+0.02

NYSE MOST ACTIVE

	Vol.	Last	Chg.
Citigrp	1,158,881,600	3.85	+.08
S&P500ETF	289,708,700	107.17	-.65
BkofAm	219,972,900	15.47	-.02
SprintNex	155,266,500	4.91	-.38
FordM	140,234,900	11.39	+.37
iShEMkts	125,719,700	36.53	-.02
SPDR Fncl	118,172,600	14.38	-.10
Pfizer	89,644,900	15.11	+.05

AMEX MOST ACTIVE

	Vol.	Last	Chg.
CelSci	4,735,100	.48	-.06
NwGold g	4,230,100	5.80	-.11
JavelinPh	3,654,000	1.61	+.16
GoldStr g	3,248,200	4.21	-.08
NovaGld g	3,010,000	7.02	-.24

NASDAQ MOST ACTIVE

	Vol.	Last	Chg.
Microsoft	172,018,900	25.01	-1.06
SiriusXM	144,843,200	.88	-.11
YRC Wwd h	119,333,300	.36	+.06
PwShs QQQ	114,616,600	44.20	-.56
Intel	83,798,100	20.70	-.15

COMMODITIES

COTTON (cents per pound)

Jul 10	81.84	-.23
Oct 10	78.15	+.62
Dec 10	78.93	+.78

GRAINS (cents per bushel)

WHEAT		
Jul 10	463¾	+16¾
Sep 10	473	+16¾
Dec 10	510	+14¼
CORN		
Jul 10	371½	+8¾
Sep 10	387	+7¾
Dec 10	396¾	+6¾

GRAINS (cents per bushel)

OATS		
Jul 10	192½	+1
Sep 10	201	+1
Dec 10	212½	+1
SOYBEANS		
Jul 10	938	+7½
Aug 10	929½	+8½
Sep 10	916½	+7

LIVESTOCK (cents per pound)

Cattle	90.80	+.78
Feeder		
Cattle	108.47	+.47
Hogs	81.65	+.69

LUMBER (per 1,000 bd. ft.)

Jul 10	225.0	-10.0
Sep 10	237.5	-10.0
Nov 10	227.5	-10.0

PETROLEUM

Lt. sweet crude ($ per barrel)

Jul 10	71.51	+2.76
Aug 10	72.54	+2.44
Sep 10	73.36	+2.32

Natural gas ($ per mmBtu)

Jun 10	4.155	+.104
Jul 10	4.179	+.065
Aug 10	4.253	+.057

METALS (per troy oz.)

Gold	1213.3	+16.3
Silver	18.29	+.529

Wednesday, May 26, 2010
Dow Jones Ind. Average: 69.30
Close: 9,974.45
NASDAQ: 15.07
Close: 2,195.88
Light Crude now: +2.76
$70.21 per bbl.
July '10

FUEL

Gas prices

Average price of a gallon of regular unleaded gas.

	U.S.	Shreveport-Bossier City
Wednesday	$2.[illegible]	$2.701
Tuesday	$2.790	$2.708
Month ago	$2.[illegible]	$2.756
Year ago	$2.625	$2.287

Source: AAA — The Times

Farmers Seafood Co.
If it swims, we sell it.
1192 Hawn Ave. 221-9967 | 8219 Jewella 687-2334

Large Peeled & Deveined Shrimp
Tail Off 50/60 ct. 5lb bag $19.95

Shrimp Specials
Medium Shrimp 50/60 ct. $4.99 lb
Large Shrimp 30/40 ct. $5.99 lb
Extra Large Shrimp 20/30 ct. $6.99 lb
Jumbo Shrimp 16/20 ct. $8.99 lb

Catfish
Fresh Catfish Fillets $4.99 lb
Fresh Whole Catfish $2.99 lb

Special
Domestic Pond Raised Catfish Fillets
$39.95/#15 Box
AN AMAZING PRICE. STOCK YOUR FREEZER NOW

LIVE Crawfish $1.49 lb.
Boiled Crawfish $1.99 lb.

Frog Legs
Reg. $5.95
$4.25 lb.

Fresh Louisiana Crawfish Meat $11.95 lb.
FRESH LA OYSTERS & CRABMEAT AVAILABLE
Price Good thru 5-26-10 thru 6-01-10

Buy A New Central Air Conditioner For Only $35 Per Month

With no down payment and payments as low as $35 per month, you can purchase a new central air conditioner. These air conditioners come with a full 5 year parts and labor warranty. This price [illegible] with smaller systems will pay even less per month. Plus, most homeowners save enough on their power bill to more than make their payment. To take advantage of this limited supply offer, call Southern

Advertisement

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-17 LONGHORN ARMY AMMUNITION PLANT, TEXAS PUBLIC MEETING AT KARNACK COMMUNITY CENTER JUNE 29, 2010

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed the Proposed Plan for NPL site LHAAP-17. Although the Proposed Plan for LHAAP-17 identifies the preferred remedy for the site, the U.S. Army welcomes the public's review and comments. The public comment period is June 10, 2010 through July 10, 2010. The public meeting will be held on June 29, 2010 at the Karnack Community Center, Highway 134 and Spur 429, Karnack, Texas. Questions, comments, and responses on the Proposed Plan will be recorded by a court reporter during the public meeting. Copies of the Proposed Plan and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. A summary of the site, including a discussion of various alternatives that were evaluated, are provided below.

Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor-operated and -maintained industrial facility located in central-east Texas in the northeastern corner of Harrison County. The installation occupies nearly 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. LHAAP was established in December 1941 near the beginning of World War II for the manufacture of trinitrotoluene. Other past industrial operations at the installation included the use of secondary explosives, rocket motor propellants, and various pyrotechnics, such as illuminating and signal flares and ammunition.

LHAAP-17, Burning Ground No. 2/Flashing Area, is located in the west-central portion of LHAAP and covers an area of approximately 3.9 acres. The site was used as a burning ground from 1959 through 1980 and as a flashing area to decontaminate recoverable metal byproducts. Four alternatives were evaluated for addressing the contaminated soil and groundwater at the site: 1) no action; 2) excavation and off-site disposal for soil; monitored natural attenuation (MNA) and land use controls (LUCs) for groundwater; 3) excavation and off-site disposal for soil; in situ bioremediation; MNA and LUCs for groundwater; and 4) excavation and off-site disposal for soil; groundwater extraction; MNA and LUCs for groundwater. Based on available information, the preferred remedy is alternative 4 which would remove contaminated soil from LHAAP-17 with off-site disposal; reduce groundwater contamination throughout the shallow zone groundwater contaminant plume via groundwater extraction; MNA to assure protection of human health and the environment by documenting that the contaminated groundwater remains localized and that contaminant concentrations are being reduced to MCLs; and LUCs to protect human health by preventing human exposure to contaminated groundwater.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

LONGHORN ARMY AMMUNITION PLANT,

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE: Thursday, 10 June 2010
TIME: 2:00 p.m.
PLACE: **Army Trailer at GWTP**

Welcome **RMZ**

Action Items

Shaw

- Review GWTP permit language regarding release of treated water to storage or stream

EPA/TCEQ

- **MMRP Sites –** Technical
  EPA will issue a written response to the perchlorate technical memorandum.

Defense Environmental Restoration Program (DERP) PBC Update **PS/GJ**

- Document Status/Environmental Sites (Table)
- Response to Comments on multiple proposed plans
- Records of Decision
- LHAAP-04 Monitoring Well
- INF Pond
- Groundwater Treatment Plant

DERP Total Environmental Restoration Contract Update **RMZ**

- LHAAP-37/67 – RTCs and Final ROD Status
- Remaining TERC Recordations

BRAC-Funded Environmental Restoration

- LHAAP-19 – Demolition Landfill Progress **JRL/AW**

MMRP Update

- EPA-TCEQ Response to Perchlorate Memo **JRL/AW**

USFWS Update **RMZ/PB**

- Receipt of Documents for Review
- OPS and Proposed Remedies
- Transfer Issues Impact on Restoration Progress

Other Issues **RMZ**

- Sitewide Schedule Review – Critical Documents
- RAB
- IAP Comments

Adjourn

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Subject: **Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: **US Fish & Wildlife Service Caddo Lake Natural Wildlife Refuge Offices**

Date of Meeting: **June 10, 2010; 2:00 PM – 4:30 PM**

Meeting Participants:

BRAC:	Rose M. Zeiler, Tom Lederle
USAEC:	Matthew Mechenes
USACE-Tulsa:	Aaron Williams, John Lambert
Shaw:	Praveen Srivastav, Kay Everett, Susan Watson
USEPA Region 6:	Steve Tzhone
TCEQ:	Fay Duke
USFWS:	Paul Bruckwicki
USGS:	Kent Becher

Action Items

Shaw

- Review GWTP permit language regarding release of treated water to storage or stream Praveen indicated that according to the Record of Decision for LHAAP-18/24, the effluent levels are calculated based on flow in the creek. If there is no flow (or "0"), the chloride and sulfate levels will exceed the effluent threshold limit and inhibits discharge into the creek, necessitating storage on site. Therefore, the INF pond is needed from time to time for storage, especially when the volume of water exceeds the ability to inject or the flow in the creek is nonexistent. The transfer of the INF pond should contain language that would retain the use of the pond.

EPA/TCEQ

- **MMRP Sites - Technical**
  EPA will issue a written response to the perchlorate technical memorandum. Steve said that at this time they were considering one more year of testing at LHAAP-27 and three more years of annual sampling at LHAAP-54 would be needed. Rose asked that EPA clarify the policy directives and provide something in writing

  Praveen, on behalf of John Elliott (with Shaw), asked the status of the Draft MC data summary report. It was indicated that once the Army gets the written technical memorandums and hear back from BRAC, the data summary report may proceed.

  Fay said that she would require one groundwater sampling event at LHAAP-54, but she stressed that the wells need to be redeveloped as the wells are probably set in a clay formation. John said that a silty clay formation may not develop or clean up as expected. Corrosion from the stainless steel screens in the wells at LHAAP-27 may have influenced sampling results and EPA agreed on that rationale, but indicated that those wells need to be replaced.

Defense Environmental Restoration Program (DERP) PBC Update — Praveen Srivastav

Document Status/Environmental Sites (Table)
Praveen Srivastav briefly went over the document status/environmental sites table.

- The Draft Final Decision Document for LHAAP-02 is in review.
- The draft work plan for soil removal at LHAAP-03 is in preparation.
- The Draft Completion Report for LHAAP-04 is in regulatory review. A proposed location for the well to be installed at LHAAP-04 was discussed.
- The Draft Proposed Plan for LHAAP-16 is in comment resolution with the Army.
- The Final Proposed Plan for LHAAP-17 was submitted with copies sent to RAB members and interested public. The notice for the public comment period (June 10 through July 10, 2010) and public meeting (June 29, 2010) was published in the local papers, Shreveport Times and the Marshall News Messenger. Fact Sheets for LHAAP-17 will be made available to the public at this evening's RAB meeting.
- The Draft Final Feasibility Study for LHAAP-18/24 is in regulatory review.
- The Draft Proposed Plan for LHAAP-29 is in Army review.
- The Draft Record of Decision for LHAAP-46 is in Army review.
- The Draft Final Focused Feasibility Study for LHAAP-47 is in regulatory review.
- The Draft ROD for LHAAP-49 is in Army review. Rose indicated concurrence on BRAC comment responses. These will be coming out shortly.
- The Draft ROD for LHAAP-50 is in Army review.
- The Draft ROD for LHAAP-58 is in Army review.

- The revised Draft Final Decision Document for LHAAP-35/36 is in regulatory review. A memorandum has been submitted to clarify corrections to the report and locations of some of the sumps.
- The Draft ROD for the Pistol Range is in Army review. It was stressed that there is approximately 3 months left before the end of FY10 and that several ROD's are still in the draft stage. In order to meet imposed deadlines, we should strive to get three RODs into Fay's hands within the next 2 weeks.

The responsiveness summary from last month's public meeting was discussed. Steve asked if any more comments were received and that they needed to be provided ahead of time in order to be looked at. John said that if additional comments were received, they were out of the public review period and that the responses should be kept informal. Steve said that we can respond tonight, but we didn't have to continue the dialogue. There is no need to add any additional comments into the formal comment period. If it is just an explanation of something, questions should be answered when asked, but it would not be part of the responsiveness summary. John indicated that the Army went above and beyond what is required during the public comment period.

A discussion regarding the placement of one or more wells at LHAAP-04 was brought up. Fay indicated that she needed two wells here, one in the supposed source area and one downgradient. She stated that she thought the groundwater gradient at this location was not clear. A discussion regarding soil contamination ensued. John said that groundwater was the issue and not the soil anymore. The location of a pipe and the liner was discussed. Susan Watson said the pipe was connected to a line. She indicated that the highest concentrations perchlorate concentrations in the soil were found under the liner. The source area is seen as being under the liner and the contamination was not flushed and spread because of its location under the liner. Shaw will send the proposed well locations with existing features showing on a figure for regulatory approval.

Groundwater Treatment Plant Update

There were no issues in the last month. The water extraction rate was increased and the FBR flow was increased to 28 gpm. About 500,000 gallons was extracted and treated since the last reporting period. This has almost doubled the previous volume. Rose asked about the increased rate and the FBR operational increase. Praveen explained that several extraction wells had been rehabilitated or replaced, some wells were converted to extraction wells, and the flow meter was changed out so they were able to open up the extraction rate more. The plant was built to run with a high extraction rate so increasing the rate is not a limitation. Shaw has been operating the plant for longer times. Along with a combination of other factors, past operations indicates that the pumps were not working as effectively they should.

Kent talked briefly about hot spots and gradient mounds and their causes. The sampling reports that USGS/EPA generated are not available yet. Kent asked about the location of MW-12 and that it was shown in earlier maps and not in later ones. He said USGS could not find it during their sampling activity.

DERP Total Environmental Restoration Contract (TERC) Update **Rose Zeiler**

LHAAP-37/67 – Draft Final ROD Status
The ROD for LHAAP-37/67 has been submitted to EPA. Steve said that George and everyone at EPA are looking at the electronic version of the ROD. The EPA/TCEQ hardcopies were not received by both parties. USACE will put a trace on it. Fay indicated she received the digital files of the TERC deed recordations, and that she said she would review the ROD first.

BRAC-Funded Environmental Restoration

LHAAP-19—Demolition Landfill Progress **John Lambert**
John said that they are wrapping up the closure reports for the landfill. The work has been finished and the landfill has been satisfactorily inspected. Fay said that she would have the Corrective Action people see if everything is okay. Landfill activities have been completed. The cover has been reseeded by native grasses. The gradient was not known and the general gradient appears that existing wells are either cross gradient or upgradient.

MMRP Update **John Lambert**
The EPA/TCEQ will provide the response to the perchlorate memo tomorrow.

USFWS Update **Rose Zeiler/Paul Bruckwicki**
--Receipt of documents for review
Paul informed the group that he has been receiving documents for review and in particular, the feasibility study and proposed plan for LHAAP-17.

--OPS and Proposed Remedies
They expect to go through the OPS stage as stipulated in the MOA. Paul agrees that there is no requirement to do that and it is an agreement that Army and the FWS made to do an OPS and ask the EPA to look at it. It is not a regulatory requirement and the FWS doesn't have to accept transfer. The options are 1) yes, it is suitable, we'll take it as proposed in the ECOP; 2) no, they are not convinced it is suitable and maybe want an option to conduct sampling themselves; 3) no not suitable and don't want it at all.

Mark Williams, the FWS Refuge Manager, joined the group and added to the discussion. He said that FWS may not take any property that is not cleaned up. By policy, they do not take it unless it is at OPS or clean. In other words, there must be a demonstration that it is cleaning up so there is not an exact timeline on when the (OPS) properties would be accepted by the FWS.

Other Issues
Roy Appleton and Richard Pruitt, videographers, have contacted the EPA in the hopes of videotaping activities at Longhorn for a documentary showing various components needed in

cleaning up contaminated sites. Specifically they wanted to see the Groundwater Treatment Plant in operation, some monitoring wells, etc. Steve thought that it would be good public relations to allow them on site to tape various clean up components.

Sitewide Schedule Review—Critical Documents **Rose Zeiler**
Several documents are in a time crunch in order to meet the schedule. That would include sites 18/24, 17, and 29. Rose acknowledged and thanked the timely responses on LHAAP-17 documentation to get the site at the public comment period.

RAB
Steve also mentioned that EPA is making an educational grant, called the Technical Assistance Grant (TAG), available to the public. Anyone can apply for it and he was informed that CLI has indicated their intent to apply for it. Steve discussed merging the RAB with the TAG. Rose said that you cannot merge the two and could not have a RAB/TAG website. The TAG is a separate entity, although the goals of both do overlap. Steve said he was not interested in competing. There was a discussion about whether TAG members could also be RAB members. The TAG was an effort to offer more technical opportunities to the community and is part of the EPA's "Community Engagement Initiative."

IAP Comments
No comments were recorded.

The next monthly manager's meeting will be held July 20 at 2 PM in Dallas.

Meeting Adjourned

Action Items

Shaw
- Renew Paul Bruckwicki and Kent Becher portal access.
- Provide well locations for LHAAP-04.

BRAC– Rose will talk to the "owner" of the mineral rights at Longhorn--Pennsylvania Virginia--regarding the government's mineral rights, how it is unitized, how it is drilled, and who administers the drilling rights.

USGS/EPA – To provide analytical results on recent groundwater sampling.

00098264

LONGHORN ARMY AMMUNITION PLANT
MONTHLY MANAGERS' MEETING

Location	Longhorn Army Ammunition Plant, Karnack, Texas
Date	10-Jun-2010 **Time** 2:00 PM

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
Longhorn Team Members				
Rose M. Zeiler		BRAC	(479) 635-0110	rose.zeiler@us.army.mil
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John Lambert		USACE, Tulsa	(918) 669-4992	john.r.lambert@SWT03.usace.army.mil
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Tom Lederle		BRAC	703602 2854	thomas.lederle@us.army.mil
Kirt Becker		USGS - OFW	(817)253-0353	KdBecker@usgs.gov

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
June 10, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
1	Draft Final Decision Document, LHAAP-02	03/30/10	x	x	Final	06/30/10	x	x		Document in regulatory review	
2	Draft Soil Removal Work Plan, LHAAP-03	03/18/10	x		Draft	06/30/10	x			Removal action work plan in internal review	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x		Final	7/15/10	x	x	In progress	In regulatory review.	
4	Final Feasibility Study Addendum,, LHAAP-16	3/31/10	x	x						Submitted	
5	Draft Proposed Plan, LHAAP-16	4/30/10	x							In comment resolution with Army	
6	Final Feasibility Study, LHAAP-17	4/28/10	x	x						Submitted 4/28/10	
7	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
8	Draft Final Feasibility Study, LHAAP-18/24	5/13/09	x	x	Final	07/30/10	x	x		Draft final in regulatory review as of 5/13/10	

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
June 10, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
9	Final Feasibility Study, LHAAP-29	04/30/09	x	x						Submitted 4/30/10	
10	Draft Proposed Plan, LHAAP-29	5/21/10	x		Draft Final Proposed Plan, LHAAP-29	06/30/10	x	x		In Army review	
11	Draft Record of Decision, LHAAP-46	04/30/10	x		Draft Final Record of Decision, LHAAP-46	06/30/10	x	x		In Army review	
12	Draft Final Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Final	07/15/10	x	x		In regulatory review as of 4/16/10	
13	Draft Record of Decision, LHAAP-49	04/01/10	x		Draft Final	06/30/10	x	x	In progress	RTCs in Army review	
14	Draft Record of Decision, LHAAP-50	05/7/10	x		Draft Final	06/30/10	x	x		In Army review	
15	Draft Record of Decision, LHAAP-58	05/14/10	x		Draft Final	06/30 /10	x	x	In progress	In Army review	
16	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	06/30/10	x	x		Revised Draft Final Decision Document in regulatory review	
17	Draft Record of Decision, Pistol Range	02/08/10	x		Draft Final	06/30/10	x	x	In progress	Resolution of Army comments in progress	

					Completion Dates										
					Interim Action or Removal Action				Final Action						
Site ID (DSERTS)	RMIS #	DERP	MIS	SITE DESCRIPTION	RI/FS or EE/CA	ROD/DD or AM	RA Starts	RA Completions	RI/FS Starts	ROD/DD		RA Completions	Site Construction Completions		
Army Terminology					RI/FS or EE/CA	ROD/DD or AM	RD	RA	RI/FS	ROD/DD	RD	RA	RIP	RA(O)	RC
LHAAP-001	1	1	X	Inert Burning Ground						Jan-98					Jan-98
LHAAP-002	2	2		Vacuum Truck Overnight Parking Lot					Jan-09	Apr-10					Apr-10
LHAAP-003	3	3		Building 722 - Paint Shop					Jan-09	Jun-10			Jun-10		Jun-10
LHAAP-004	4	4	XX	Pilot Waste Water Treatment Plant	Feb-09	Jul-09	Jul-09	Jan-10	Jul-10	Feb-11	Jul-11	Oct-11	Mar-12		
LHAAP-005	5	5		Power House Boiler Pond											
LHAAP-006	6	6		Building 54F Solvent						Dec-08					Dec-08
LHAAP-007	7	7		Building 50G Drum Processsing						Dec-08					Dec-08
LHAAP-008	8	8		Sewage Treatment Plant		Dec-08				Nov-08					
LHAAP-009	9	9		Building 31-W Drum Storage						Nov-99					
LHAAP-011	11	10	X	Suspected TNT Burial Site at P&Q Avenue						Jan-98					Jan-98
LHAAP-012	12	11	X	Active Landfill		Sep-95		Jul-06		Jul-06	Jun-07	Jun-07	Oct-07	Sep-40	Sep-40
LHAAP-013	13	12	X	Suspected TNT Burial Site Between Active and Old Landfill						Feb-96					
LHAAP-014	14	13	X	Area 54W Burial Site						Feb-96					
LHAAP-015	15	14		Area 49-W Drum Storage						Oct-99					
LHAAP-016	16	15	X	Old Landfill		Sep-95		Dec-10	Mar-10	Dec-10	May-11	Aug-11	Jan-12	Sep-15	
LHAAP-017	17	16	X	No. 2 Flashing Area Burning Ground					Apr-10	Nov-10	Apr-11	Jul-11	Dec-11	Sep-15	
LHAAP-018	18	17	X	Burning Ground/Rocket Motor Washout Pond		May-95		Feb-11	Jul-10	Feb-11	Jul-11	Oct-11	Mar-12	Sep-15	
----------	18	38		24X Holding Area											
----------	18	39		25X Washout Pad											
----------	18	40		Air Curtain Destructor											
----------	18	41		Open Burning Cage											
----------	18	42		Open Burning Pan											
----------	18	44		Building 41-X											
----------	18	62		Building 43-X											
LHAAP-019	19	63		Construction Materials Landfill											
LHAAP-023	23	23		Building 707 Storage for PCBs											Sep-00
LHAAP-024	24	43	X	Former Unlined Evaporation Pond		May-95		Feb-11	Jul-10	Feb-11	Jul-11	Oct-11	Mar-12	Sep-15	
LHAAP-027	27	19	X	South Test Area/Bomb Test Area						Jan-98					
LHAAP-029	29	21	X	Former TNT Production Area					Apr-10	Nov-10	Apr-11	Aug-11	Jan-12	Sep-15	
LHAAP-032	32	24	X	Former TNT Waste Disposal Plant						Aug-08					Aug-08
LHAAP-034	34	34		Building 701 - PCB Storage											Jul-00
LHAAP-035	35	35		Process Wastewater Sumps - Various					Apr-09	Apr-10					Apr-10
LHAAP-036	36	36		Explosive Waste Pads					Apr-09	Apr-10					Apr-10
LHAAP-037	37	37	XX	Quality Assurance Laboratory Building 29-A					Sep-08	Jun-10	Sep-10	Dec-10	May-11	Sep-40	Sep-40
LHAAP-045	45	45		Magazine Area											
LHAAP-046	46	46	XX	Plant 2/Pyrotechnic Operation					Jan-10	Sep-10	Feb-11	May-11	Oct-13	Sep-15	
LHAAP-047	47	47	XX	Plant 3/ Produces Hand Signal Assemblies					Jul-10	Mar-11	Aug-11	Nov-11	Apr-14	Apr-16	
LHAAP-048	48	48		Y-Area						Nov-08					
LHAAP-049	29	49	XX	Former Acid Plant						Sep-10			Sep-10		Sep-10
LHAAP-050	50	50	XX	Former Waste Disposal Facility					Jan-10	Sep-10	Feb-11	May-11	Oct-13	Sep-15	
LHAAP-051	51	51		Photographic Laboratory/Building 60-B						Dec-08					Oct-08

					Completion Dates										
					Interim Action or Removal Action				Final Action						
Site ID (DSERTS)	RMIS #	DERP	MIS	SITE DESCRIPTION	RI/FS or EE/CA	ROD/DD or AM	RA Starts	RA Completions	RI/FS Starts	ROD/DD		RA Completions	Site Construction Completions		
LHAAP-052	52	52		Magazine Washout Area											
LHAAP-053	53	53		Static Test Area						Nov-08					
LHAAP-054	54	54	X	Ground Signal Test Area						Jan-98	Jan-98				Jan-98
LHAAP-055	55	55		Septic Tanks						Dec-08					Dec-08
LHAAP-056	56	56		Vehicle Wash Rack and Oil/Water Separator											
LHAAP-057	57	57		Rubble Burial Site											
LHAAP-058	58	58	XX	Maintenance Complex					Jan-10	Sep-10	Feb-11	May-11	Oct-13	Sep-15	
LHAAP-059	59	59		Storage Building 725						Sep-08					
LHAAP-060	60	60		Former Storage Building #411 and #714					Aug-08	Dec-08					Dec-08
LHAAP-061	61	61		Potable Water Treatment Sediment Ponds											
LHAAP-063	63	63		Burial Pits											
LHAAP-064	64	64		Transformer Storage Area						Dec-08					Dec-08
LHAAP-065	65	65		Building #209						Sep-10					
LHAAP-066	66	66		Transformer at Building 401						Dec-08					Dec-08
LHAAP-067	67	67	XX	Above Ground Storage Tank					Sep-08	Jun-10	Sep-10	Dec-10	May-11	Sep-40	Sep-40
LHAAP-068	68	68		Building 51-F						Dec-08					Dec-08
LHAAP-069	69	69		Underground Storage Tank											
LHAAP-070				Loading Dock Magazine Area											Aug-04
LHAAP-071				Oil Spill at Bldg 813											Aug-04
Pistol Range			XX	Pistol Range	Feb-09	Jul-09	Jul-09	Dec-09		Oct-10			Oct-10		Sep-15
LHAAP-001-R-01			XX	South Test Area/Bomb Test Area (MMRP)					Jun-10	Jan-11					Sep-15
LHAAP-002-R-01				Static Test Area (MMRP)						Nov-08					
LHAAP-003-R-01			XX	Ground Signal Test Area (MMRP)					Jun-10	Jan-11					Sep-15

X	Site identified in FFA
XX	Additional sites identified as NPL

Legend

RI/FS- Remedial Investigation/Feasibility Study

ROD/DD-Record of Decision/Decision Document: Required for interim and final remedial actions, RODs for NPL sites, DDs for non-NPL sites, prepared prior to construction and remedial design phases

RA denotes Army phase completion of Remedial Action Construction.

RA Completions- Remedial Action Complete

Site Construction Completions- Remedy is in Place and Remedial Action Completion Report is Final.

RA(O)-Remedial Action Operation

RC-Response Complete: All cleanup objectives have been met (remediation completed) with the exception of the Long Term Management phase if required

Grey shading indicates phases complete

Yellow shading indicates site requires additional documentation

*** Note: EPA Target shown may not align with Army Phase Completion Terminology.

00098269

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

May 26, 2010

Distribution (one copy each)

Paul Fortune
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Tom Walker
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Jefferson, Texas 75657

Judith Johnson
1635 Dorough Road
Karnack, Texas 75661

Nigel R. Shivers
Post Office Box 558
Karnack, Texas 75661

Dear LHAAP RAB Member,

The next Restoration Advisory Board (RAB) meeting will be held on Thursday, June 10, 2010, from 6:30 to 8:30 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661. Because we have such a full agenda, please plan for an additional hour of meeting time.

With just four remaining RAB members, we are in need of new members. Our charter gives us general guidelines on selecting new members – but it was brought to my attention by Army Environmental Center (AEC) that the Longhorn Charter was written before the implementation of the RAB Rule in 2006. AEC advises that we update our charter to align it to that guidance and to support that effort a copy of the RAB Rule is enclosed for your perusal. AEC also noted that our membership drive should include a notice in the newspaper, that we select a panel of current RAB members to establish membership criteria, and that the panel select new members based on that criteria in time for the RAB meeting following the June meeting if possible. If you know of anyone interested, including those already noted, please ask them to attend the next RAB meeting. The Community Interest Form is attached for your use in recruitment efforts. Matt Mechenes of AEC will be on hand to present the highlights of the RAB Rule and to answer questions.

We hope that you can attend this meeting. If you have any questions, please do not hesitate to contact me.

00098270

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

Shaw Environmental, Inc. (Shaw) is the contractor supporting the U.S. Army environmental restoration activities at the Longhorn Army Ammunition Plant (LHAAP), and will be coordinating the RAB meeting. A tentative agenda is attached.

Regards,

Dr. Rose Zeiler
Department of the Army
Longhorn Army Ammunition Plant
Box 220
Ratcliff, Arkansas 72951

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

AGENDA

DATE:	Thursday, June 10, 2010
TIME:	6:30 – 8:30 PM
PLACE:	Karnack Community Center, Karnack, Texas

06:30 Welcome {RMZ & PF}

06:35 Open items
-RAB Membership

06:55 New Items
- Charter Revision
- Access to Documents

07:20 Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update {Shaw}
Groundwater Treatment Plant (GWTP) Update
Documents Status/ Environmental Sites

07:35 DERP Total Environmental Restoration Contract Update {RMZ}
ROD for LHAAP-37 and-67

07:35 Military Munitions Response Program (MMRP) Update {USACE}

07:35 Construction Debris Landfill

7:40 Responsiveness Summary
LHAAP-46, -49, -50, -58 and the Pistol Range Proposed Plans
LHAAP-37/67 Proposed Plan

08:05 Transfer Update

08:30 Adjourn {RMZ}

Shaw® Shaw Environmental, Inc.

Subject:	**Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Karnack Community Center, Karnack, Texas**
Date of Meeting:	**June 10, 2010, 6:00 – 07:00 PM**

Meeting Participants:

LHAAP/BRAC	Rose M. Zeiler, Tom Lederle
USACE-Tulsa:	John Lambert, Aaron Williams
USAEC:	Matt Mechenes
Shaw Environmental:	Praveen Srivastav, Greg Jones, Kay Everett, Susan Watson
TCEQ:	Fay Duke
USEPA Region 6:	Steve Tzhone
USFWS:	Mark Williams, Paul Bruckwicki
USGS:	Kent Becher
RAB:	Paul Fortune, Nigel Shivers, Tom Walker, Judith Johnson
Community:	Theresa Crawford, Ben Z. Grant, Carol Fortune, Doug Parker, Richard LeTourneau, Linda A. Adler, Patti Webb, Jay Webb, Charles Dixon, Jim Lambright

An agenda for the RAB meeting was distributed prior to the meeting.

Welcome – Rose Zeiler and Paul Fortune
Paul Fortune called the meeting to order and introduced the RAB members. Charles Dixon was introduced to the group.

Open Items – Rose Zeiler
--RAB Membership
A recruitment effort for the RAB is underway. Matt Mechenes, USAEC, discussed the RAB charter and explained that there is a new 2005 RAB rule that should be followed for charters. He indicated that there is a need to rewrite the current Longhorn RAB charter to be compliant with the 2005 RAB rule. The current charter states that RAB members are rotated out after 2

years. If the members want to change this rotation frequency and it is agreeable to the RAB members, Matt explained the charter would need to be revised. He gave a general presentation on what the RAB is and the function and purpose it provides to the community. Matt observed that the RAB is not a decision-making body. It is established generally to work well with no more than 30 individuals and may be smaller as long as it reflects the diversity of the community it represents. The Longhorn RAB was established in 2005 with the TRC predating it. The RAB is focused on environmental restoration only. The RAB serves to educate the community about environmental restoration and the environmental decision-making process using community input. The IAP has a community involvement component as well.

Policies and procedures for new and interested individuals wishing to join the RAB were discussed. Applications to become a RAB member are available. The RAB applications will be approved by Tom Lederle with the Army. Several members of the community have expressed interest and some applications have been received. Once RAB applications are approved, new RAB members will be selected from the approved applicants by the existing RAB board.

New Items

-Charter Revision

Rose said that the Longhorn RAB Charter is out of date, noting that it calls for a two-year term for members. The charter should be revised to be compatible with the 2005 RAB rule. Matt said that he has been comparing the LHAAP RAB charter with the current rule and that the group can vote on any changes for the charter. Rose indicated there is nothing in the charter about limiting meetings to once a quarter. She said that depending on the level of activity at the installation, the community may want to meet more often, if there is more going on, or meet less often, if there is not. The type of meeting or presentation of the meeting can also be decided on, if changes to current meeting formats are desired. Would the public like a more technical meeting approach? It was requested that any suggestions for changing the RAB charter should be sent to Rose. Changes to the charter will be discussed after new members are installed on the RAB board.

--Access to Documents

RAB members can get personal copies of published documents. In addition, the administrative record contains the supporting documents for the environmental program at Longhorn and is available to all interested parties at the Marshall library. CD copies of the administrative record are also available for copying at the library.

Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update–Shaw

Rose asked if there were any questions related to the responses to comments submitted by CLI and Paul Fortune on the Proposed Plans. CLI was not in attendance, and Paul indicated he had not had enough time to review the responses to his comments. Paul also informed everyone that he had brought along copies of a printed statement written by George Rice, representing CLI, for distribution.

Document Status/Environmental Sites

Praveen Srivastav distributed copies of the document status table and discussed each site.

- Praveen indicated that the LHAAP-02 decision document is in regulatory review. The decision document identifies limited groundwater monitoring in order to address the soil-to-groundwater COCs within LHAAP-02. Praveen explained that the site is a former parking lot within the LHAAP-58, and soil samples were collected in the ditches surrounding the parking lot for metals.
- A soil removal work plan for LHAAP-03 is in internal review and will be sent to Army by the end of the month. Praveen indicated that LHAAP-03 was a former waste storage pad for a drum of waste paint. It is also located within LHAAP-58.
- The Draft Completion Report for LHAAP-04 is in regulatory review and comment resolution for the soil removal. Praveen indicated that perchlorate contaminated soil was removed from the site last year. Groundwater concerns are still being addressed.
- The Final LHAAP-16 Feasibility (FS) Study was submitted March 31, 2010 and the Draft Proposed Plan is in review with the Army.
- The Final FS for LHAAP-17 was submitted April 28, 2010 and the Final Proposed Plan was submitted May 21, 2010. The Public Meeting for the Final Proposed Plan for LHAAP-17 will be held on June 29, 2010, here at the community center. RAB members have copies of the Proposed Plan. Please review it and give us your comments.
- The Draft Final FS for LHAAP-18/24 is in regulatory review as of May 13, 2010. Praveen said that there are fact sheets available for sites LHAAP-17 and 18/24.
- The Final FS for LHAAP-29 was submitted April 30, 2010. The Draft Proposed Plan for LHAAP-29 is in Army review. A fact sheet for this site is also available.
- The Draft Record of Decision (ROD) for LHAAP-46 is in Army review.
- The Draft Final FS for LHAAP-47 is in regulatory review as of April 16, 2010. Praveen indicated that this is a large production area and has a fact sheet available as a hand out.
- The Draft ROD for LHAAP-49 is in Army review and comment resolution.
- The Draft ROD for LHAAP-50 is in Army review.
- The Draft ROD for LHAAP-58 is in Army review.
- The Draft Final Decision Document for LHAAP-35/36 is in regulatory review. This site is a collection of approximately 145 waste sumps located throughout the installation.
- The Draft ROD for the Pistol Range is in Army review and comment resolution. The ROD is for no further action since the contaminated soil was removed.

Paul Fortune asked about LHAAP-17 and the proposed removal of 8,000 cubic yards of soil. He was comparing the cost of that with soil removal at Pistol Range and thought the costs were not in line with each other. He also asked why other sites have a number and the Pistol Range does not. The soil removal costs can vary based on the contaminant and disposal costs along with a number of other variables. It was explained that the Pistol Range was active until 2004 so it wasn't assigned a number when this was done years earlier.

Groundwater Treatment Plant (GWTP) Update
The GWTP has been operating normally since the last update. There have been some operational enhancements implemented whereby an increase in the pumping rate has occurred. These operational enhancements include replacing older pumps with newer pumps and operating these pumps at higher rates and for longer durations, thus optimizing the effectiveness of the water treatment.

DERP Total Environmental Restoration Contract (TERC) Update – Rose Zeiler

ROD for Sites LHAAP-37 and -67
The ROD for sites LHAAP-37 and -67 is in progress.

Military Munitions Response Program (MMRP) Update – USACE
The MMRP program consisted of 2 sites called LHAAP-001-R-01 (LHAAP-27) and LHAAP-003-R-01 (LHAAP-54). The field work has been complete the final documentation is being completed and submitted.

Construction Debris Landfill
The work on the landfill is complete as well as any inspections. The site is ready for closure.

Responsiveness Summaries
--LHAAP-46, -49, -50, -58 and the Pistol Range Proposed Plans
--LHAAP-37/67 Proposed Plan
General and individual comments received will be answered and all site-specific comments will be summarized and presented in the Responsiveness Summary of their respective ROD.

Transfer Update
ECOP VI will be the next transfer document and will be finalized after the LHAAP-49 ROD has been signed by Army and EPA. Some questions have surfaced regarding additional sampling at LHAAP-49. Rose indicated that the MOA offers the opportunity for FWS to conduct sampling, if they wish. The Army and FWS made plans to meet the next day and discuss this issue. The next ECOP will consist of the MMRP sites LHAAP-001-R-01 and -003-R-01, which are about 80 acres a piece, and Landfill 19.

The next RAB meeting is tentatively set for August 17, 2010, at 6:30 PM.

Adjourn

June Meeting Attachments and Handouts:
- *Status of Technical Documents PBC*
- *Meeting Agenda*
- *Fact Sheets for LHAAP-17, LHAAP-18/24, LHAAP-29, and LHAAP-47*

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Longhorn Army Ammunition Plant
Restoration Advisory Board Meeting

Location	Karnack Community Center, Karnack, Texas
Date	10-Jun-2010 6:30 PM **page 1 of 2**

Please sign in the space provided or add your name and address on next page if your name does not appear below.

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
RAB Members				
Paul Fortune	Paul Fortune	RAB Co-Chair		plfortune@hotmail.com
Nigel R. Shivers	Nigel R. Shivers	RAB Board Member	903-679-4128	nigelshivers@yahoo.com
Tom Walker	Tom Walker	RAB Board Member		twalkercaddolake@gmail.com
Judith Johnson	Judith Johnson	RAB Board Member	903 679 3130	judithjohnson@webtv.net
W. Lee Guice	W. Lee Guice			GUICEENGR@AOL.COM
Longhorn Team Members and Community				
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Matthew Mechenes	✓	USAEC	(410) 436-1505	matthew.mechenes@us.army.mil
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Susan Watson		SHAW	(281) 531-3107	susan.watson@shawgrp.com
Theresa Crawford	Theresa Crawford			
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Carol Fortune		Friends Group		plfortune@hotmail.com
Doug Parker	Doug Parker	GCLA	903 679-3650	parkerde@windstream.net
Kent Becher	Kent Becher	USGS	817-253-0356	kdbecher@usgs.gov
RICHARD LETOURNEAU		NETRWPG	903-668-4013	richardoii@aol.com

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Shaw Environmental, Inc.

Longhorn Army Ammunition Plant
Restoration Advisory Board Meeting

Location	Karnack Community Center, Karnack, Texas
Date	10-Jun-2010 6:30 PM **page 2 of 2**

Please provide your address for future mailings or information.

ATTENDEES

Name (printed)	Signature	Organization and/or Address	Phone	E-mail
Longhorn AAP Community (con't)				
Linda A. Adler	Linda A. Adler	PO B 1514, Marshall 75671	(903)938-9099	l.a.adler@hotmail.com
PATTI WEBB	Patti Webb	131 Bois D'Arc Marshall	903-785-2063	
JAY WEBB	Jay Webb	131 Bois D'Arc Marshall	903-785-2063	
Charles Dixon	Charles Dixon	4406 John Reagan	in 938-9737	
JIM LAMBRIGHT	Jim Lambright	5109 Cypress Dr	214-351-66	85 LARSPAIR@yahoo

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
June 10, 2010

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2	Draft Soil Removal Work Plan, LHAAP-03	03/18/10	x		Draft	06/30/10	x			Removal action work plan in internal review	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x		Final	7/15/10	x	x	In progress	In regulatory review.	
4	Final Feasibility Study Addendum,, LHAAP-16	3/31/10	x	x						Submitted	
5	Draft Proposed Plan, LHAAP-16	4/30/10	x							In comment resolution with Army	
6	Final Feasibility Study, LHAAP-17	4/28/10	x	x						Submitted 4/28/10	
7	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
8	Draft Final Feasibility Study, LHAAP-18/24	5/13/09	x	x	Final	07/30/10	x	x		Draft final in regulatory review as of 5/13/10	

Shaw® Shaw Environmental, Inc.

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14	Draft Record of Decision, LHAAP-50	05/7/10	x		Draft Final	06/30/10	x	x		In Army review	
15	Draft Record of Decision, LHAAP-58	05/14/10	x		Draft Final	06/30 /10	x	x	In progress	In Army review	
16	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	06/30/10	x	x		Revised Draft Final Decision Document in regulatory review	
17	Draft Record of Decision, Pistol Range	02/08/10	x		Draft Final	06/30/10	x	x	In progress	Resolution of Army comments in progress	

FACT SHEET – Investigation and Risk Assessment Summary
LHAAP – 17, Former Burning Ground No. 2/Flashing Area

00098280

April 27, 2010

Site History

LHAAP-17, known as the former Burning Ground No.2/Flashing Area, is located in the southeastern portion of LHAAP and covers approximately 4 acres. Historically, LHAAP-17 was used as a burning ground from 1959 through 1980. Materials burned included bulk trinitrotoluene (TNT), photo flash powder, reject material from Universal Match Corporation and materials removed from the TNT Production Area (LHAAP-29) and the TNT Waste Disposal Area (LHAAP-32). It was also used as a flashing area to decontaminate recoverable metal byproducts.

Site Characteristics

The surface features include two 184 foot by 305 foot cleared areas separated by a gravel access road. The site is covered with grass and scattered brush and small trees. The topography is relatively flat. Harrison Bayou is located to the west and north of LHAAP-17 within approximately 1200 feet of the site. The surface drainage flows to ditches along the boundaries of the site which flow into Harrison Bayou. The bayou discharges to Caddo Lake, a source of drinking water for several neighboring communities in Louisiana. Shallow zone groundwater is approximately 18 to 35 feet below ground surface (bgs), the intermediate zone is approximately 55 feet bgs and the deep zone is approximately 151 feet bgs. The predominant groundwater flow direction in the shallow and intermediate zones varies seasonally, but is generally to the northwest towards Harrison Bayou.

Summary of Investigation Activities

After LHAAP was listed as a Superfund site, investigations were conducted by several contractors and the U.S. Army Corps of Engineers from 1982 through 2008. Based on the findings of each investigation, more sampling was performed to further evaluate the nature and extent of contamination in the soil, sediment, and groundwater. Each investigation was planned and approved by TCEQ and USEPA. Samples collected have been analyzed for metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, anions, pesticides/PCBs, metals, dioxins and furans. Between 2000 and 2002, additional samples were collected for the analysis of perchlorate in both the soil and groundwater. In summary more than 150 soil/sediment samples have been collected to evaluate and delineate soil and sediment contamination at depths ranging from the surface to 9.5 feet bgs. Several monitoring wells were installed in the three groundwater zones (11 shallow wells, 5 intermediate wells, 1 shallow/intermediate well and 2 deep wells). Approximately 155 groundwater samples were collected to evaluate the extent of groundwater contamination. Additionally, a perchlorate treatability study was conducted at LHAAP-17 in 2003 and early 2004 to evaluate the effect of mixing amendments for the cleanup of perchlorate contaminated soils at the site.

Investigation Findings

Samples collected from the investigation activities reported sediment, soil and groundwater contamination at LHAAP-17. The sample results were compared to both federal and state standards. A Baseline Human Health Risk Assessment(BHHRA) and Ecological Screening Evaluation was conducted in 2002 to evaluate risk to the hypothetical future maintenance worker and screen data to further assess if an ecological risk assessment was needed. Based on the ecological screening data, it was concluded that an ecological risk assessment was needed. A Baseline Ecological Risk Assessment was conducted in 2007.

Human Health Risk Assessment

The Baseline Human Health Risk Assessment (BHHRA) was conducted for LHAAP-17 to determine current and future effects of contaminants on human health. Based on the BHHRA, it was concluded that both soil and groundwater pose an unacceptable cancer risk and non-cancer hazard to a hypothetical future maintenance worker. The exposure pathways evaluated for the hypothetical future maintenance worker were based on direct contact with soil (inhalation, ingestion and dermal contact), soil-to-groundwater migration of contamination and potential use of groundwater as a water supply (drinking the water, using it for hand washing or showering).

Ecological Risk Assessment

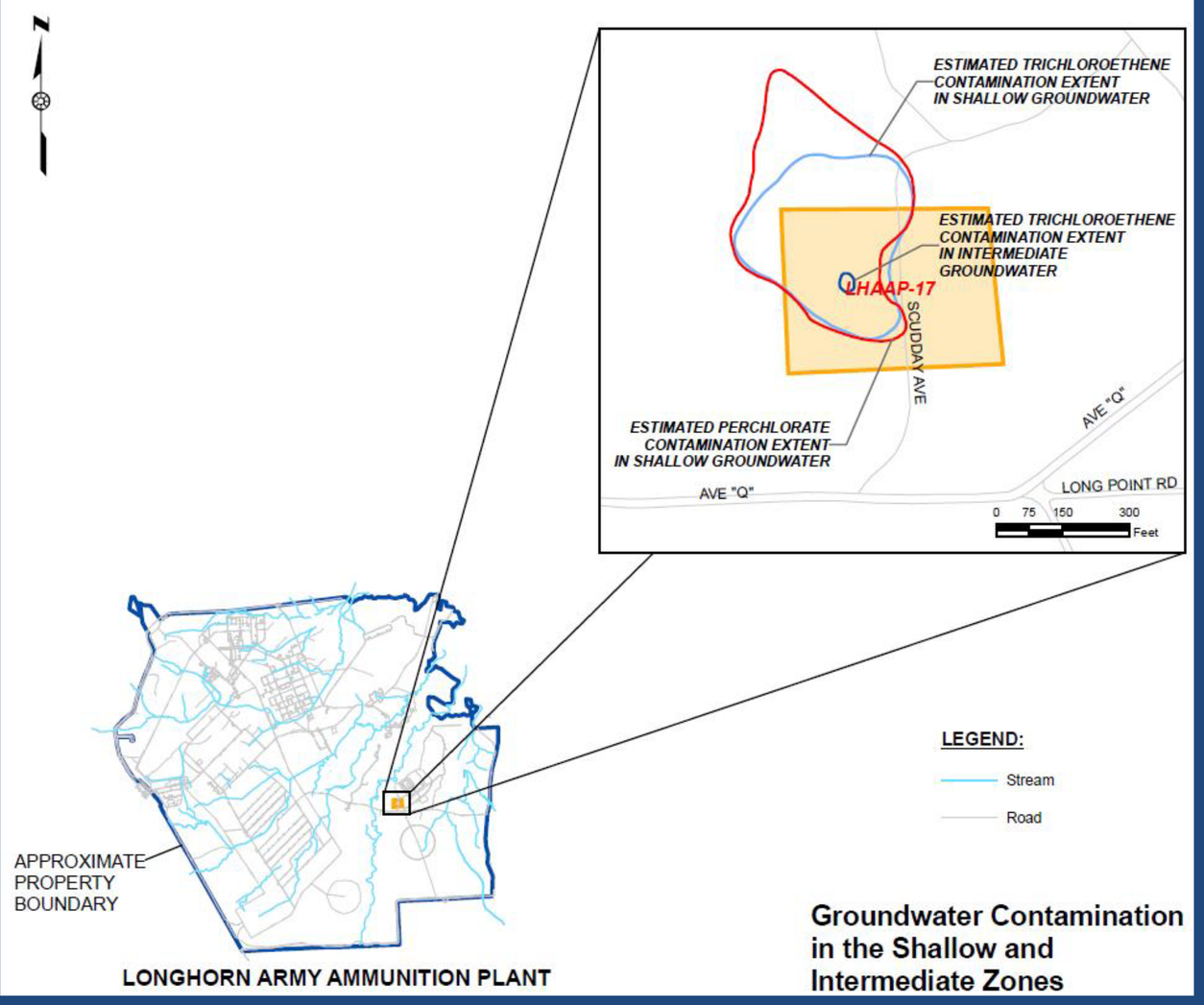
The Baseline Ecological Risk Assessment (BERA) was conducted for LHAAP-17 to evaluate potential hazards to ecological resources. The contaminants in soil that posed a risk to ecological receptors due to direct contact and require remedial action are 2,4,6-TNT, 2,4-DNT, 2,6-DNT, dioxin and barium.

Chemicals of Concern

The BHHRA and BERA investigated several media (soil, sediment, surface water, and groundwater) and identified chemicals of concern (COCs) that may require remediation. Perchlorate was determined to be a potential COC in soil due to soil-to-groundwater and soil-to-surface water pathways. The COCs for soil include three explosives (2,4,6-TNT, 2,4-DNT, 2,6-DNT), dioxin and barium. The COCs in the shallow groundwater zone are perchlorate, trichloroethene (TCE) and the daughter products of TCE (1,2-Dichloroethene [1,2-DCE], vinyl chloride [VC], 1,1-dichloroethene [1,1-DCE] and 1,2-dichloroethane [1,2-DCA]). TCE and its daughter products are the only COCs identified in the intermediate groundwater zone. No COCs are identified in the deep zone.

Remedial Technologies for Contaminated Soil and Groundwater

A number of technologies at LHAAP-17 are being considered for the remediation of soil and groundwater. One recommendation for the clean up of contaminated soils is the excavation of soil above clean up levels, which would help in the removal of soil posing unacceptable risk to the hypothetical future maintenance worker and ecological receptors and also remove a potential source of contamination to groundwater. Some of the technologies for treating perchlorate and volatile organic compounds (TCE, 1,1-DCE, 1,2-DCA, 1,2-DCE and VC) in contaminated groundwater are 1) Monitored Natural Attenuation 2) In situ bioremediation and 3) Extraction/ex situ treatment of contaminated groundwater.



FACT SHEET – Investigation and Risk Assessment Summary
LHAAP – 29, Former TNT Production Area

00098281

Site History

LHAAP-29, known as the former TNT Production Area is a heavily wooded 85 acre site located in the western central portion of the LHAAP installation. The production facilities at LHAAP-29 manufactured TNT from October 1942 to August 1945. The site previously contained one standby and five regular TNT production lines. The facility produced approximately 400 million pounds of flake TNT during its operation. Since the end of World War II, the only activity to have occurred is the "soak out" of out of specification rocket motors from 1959 to mid 1970s and involved the use of Turco®, a methylene chloride (MC) based industrial solvent. Explosive compound releases resulting from the manufacturing process of TNT, including releases from process tanks and process pipelines, are the suspected contamination sources at LHAAP-29.

Site Characteristics

Surface run off from the northern part of the site (about 40 percent of the site area) enters Goose Prairie Creek located approximately 1500 feet to the north and east of the site. In the southern portion of the site (about 60 percent of the site area), surface run off flows into a tributary of Central Creek located near the southeast portion of the site. The runoff from LHAAP-29 eventually enters Caddo Lake via these two creeks. There are three groundwater zones at LHAAP-29. The depth of the shallow groundwater zone generally ranges from 17 to 45 feet below ground surface (bgs). The depth of the intermediate zone has been measured to approximately 88 feet bgs. The predominant flow of groundwater in the shallow and intermediate zone is generally to the east/northeast with seasonal variations.

Summary of Investigation Activities

Investigations were conducted by several contractors and the U.S. Army Corps of Engineers from 1984 through 2008. Based on the findings of each investigation, more sampling was performed to further evaluate the nature and extent of contamination in the soil, sediment, surface water, groundwater and residue in cooling water and TNT wastewater pipelines. Each investigation was approved by TCEQ and USEPA. Samples have been analyzed for metals, volatile organic compounds (VOCs), semi-volatile organic compounds, explosives, anions, pesticides/PCBs, metals and/or dioxins and furans. Between 2000 and 2002, additional samples were collected for the analysis of perchlorate in both the soil and groundwater. Additionally, residual material samples were collected in the various process pipelines and analyzed for explosives. More than 320 soil/sediment samples have been collected to evaluate and delineate soil and sediment contamination from depths ranging from the surface to 20 feet bgs. Several monitoring wells were installed in all three zones (32 shallow wells, 10 intermediate wells, and 3 deep wells). More than 250 groundwater samples were collected to evaluate the extent of groundwater contamination.

Investigation Findings

Samples collected from the investigation activities reported soil and groundwater contamination at LHAAP-29. The surface water samples collected from the ponds, ditches and manholes at LHAAP-29 reported elevated concentrations of explosives and perchlorate. The sample results were compared to both federal and state standards. A Baseline Human Health Risk Assessment (BHHRA) and Ecological Screening Evaluation was conducted in 2002 to evaluate risk to the hypothetical future maintenance worker and screen data to further assess if an ecological risk assessment was needed. Based on the ecological screening data, it was concluded that an ecological risk assessment was needed. A Baseline Ecological Risk Assessment (BERA) was conducted in 2007.

Human Health Risk Assessment

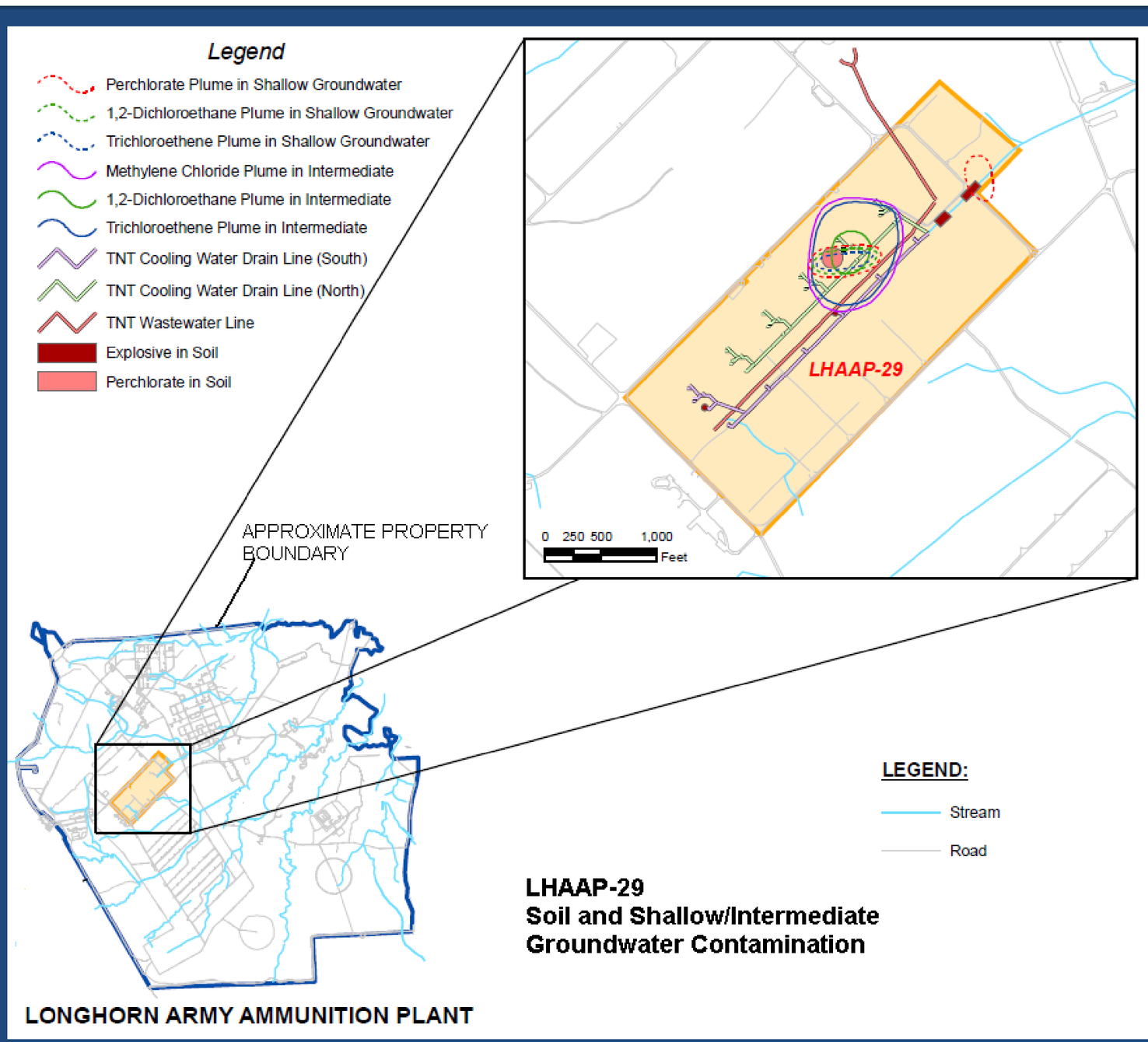
The Baseline Human Health Risk Assessment (BHHRA) was conducted for LHAAP-29 to determine current and future effects of contaminants on human health. Based on the BHHRA, it was concluded that soil poses an unacceptable non-cancer risk under an industrial scenario whereas groundwater poses an unacceptable cancer and non-cancer hazard to a hypothetical future maintenance worker under an industrial scenario.

Ecological Risk Assessment

The Baseline Ecological Risk Assessment (BERA) was conducted for LHAAP-29 to evaluate potential hazards to ecological resources. Ecological hazards were found to be acceptable at LHAAP-29; however, elevated concentrations of explosives found at one location at the site posed a threat to small range ecological receptors. Explosives (TNT, 2,4-DNT and 2,6-DNT) in the soil at LHAAP-29 are considered contaminants of potential ecological concern and pose a risk to ecological receptors due to direct contact and indirect (i.e., dietary) exposure routes.

Chemicals of Concern

Between 1984 and 2008 numerous investigations were conducted in a phased approach to determine the nature and extent of contamination at LHAAP-29. Media investigated included soil, sediment, surface water, and groundwater. The chemicals of concern (COCs) in soil include three explosives (2,4,6-TNT, 2,4-DNT and 2,6-DNT) and perchlorate. The COCs in the shallow groundwater zone are perchlorate, 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE) and its daughter products (1,2-dichloroethene [1,2-DCE] and vinyl chloride [VC]). The COCs reported in the intermediate groundwater zone are methylene chloride (MC), 1,2-DCA, and TCE and its daughter products. No contamination was reported in the deep zone. Explosives in the process pipelines that have been detected above the groundwater medium-specific concentration for industrial use include: 1,3,5-TNB, 2,4,6-DNT, 2,4-DNT, 2,6-DNT, 2-amino-4,6-DNT and 4-amino-2,6-DNT.



June 10, 2010

FACT SHEET – Investigation and Risk Assessment Summary
LHAAP – 47 Plant 3 Area

00098282

Site History

LHAAP-47 covers approximately 275 acres and is located in the north-central portion of LHAAP. Rocket motors were produced from 1954 to the early 1980s. The rocket motor production facilities were converted to produce pyrotechnic and illumination devices; this operation continued until 1997. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities.

Site Characteristics

LHAAP-47 is a mixture of asphalt paved roads, parking areas, building foundation remnants, old buildings, and areas overgrown with grass and trees. The topography in this area is relatively flat with the surface drainage flowing into tributaries of Goose Prairie Creek, which discharges into Caddo Lake. The groundwater at LHAAP-47 is divided into three zones: shallow, intermediate and deep. The shallow and intermediate groundwater zones are interconnected over much of the site and several wells have been designated as shallow/intermediate wells. The wells in the shallow zone range from 12.5 to 35.5 feet below ground surface (bgs); wells in the shallow/intermediate zone range from 25 to 51.7 feet bgs; wells in the intermediate zone range from 42 to 64.5 feet bgs; wells in the deep zone range from 83 to 95 feet bgs. The groundwater flow direction is to the northeast.

Summary of Investigation Activities

Investigations were conducted by several contractors and US Army Corp of Engineers from 1984 through 2009. Based on the findings of each investigation, more sampling was performed to further evaluate the nature and extent of contamination in the soil, sediment, surface water and groundwater. Each investigation was approved by TCEQ and USEPA. Samples have been analyzed for metals, cyanide, volatile organic compounds (VOCs), semi-volatile organic compounds, explosives, anions, pesticides/PCBs, metals and/or dioxins and furans. Between 2000 and 2002, additional samples were collected for the analysis of perchlorate in both the soil and groundwater. Surface water samples were also collected from Goose Prairie Creek for perchlorate analysis to check for potential perchlorate migration to Goose Prairie Creek. In summary, more than 550 soil/sediment samples have been collected from depths ranging from the surface to 10 feet bgs to evaluate and delineate soil and sediment contamination. The shallow and intermediate zones are interconnected over a wide area and the two groundwater zones have been treated as one combined groundwater zone called the shallow/intermediate zone. Several monitoring wells were installed in the groundwater zones (48 shallow wells, 10 shallow/intermediate wells, 6 intermediate wells, and 3 deep wells) and more than 265 groundwater samples were collected to evaluate the extent of groundwater contamination.

Investigation Findings

Samples collected from the investigation activities reported soil and groundwater contamination at LHAAP-47. The surface water samples collected from Goose Prairie Creek for perchlorate analysis have consistently been below TCEQ surface water contact recreation level and the groundwater medium specific concentration for residential use. The sample results were compared to both federal and state standards. A Baseline Human Health Risk Assessment (BHHRA) and Ecological Screening Evaluation was conducted in 2002 to evaluate risk to the hypothetical future maintenance worker and screen data to further assess if an ecological risk assessment was needed. Based on the ecological screening data, it was concluded that an ecological risk assessment was needed. A Baseline Ecological Risk Assessment (BERA) was conducted in 2007.

Human Health Risk Assessment

The Baseline Human Health Risk Assessment (BHHRA) was conducted for LHAAP-47 to determine current and future effects of contaminants on human health. Based on the BHHRA, it was concluded that soil does not pose any unacceptable cancer or non-cancer risk whereas the groundwater poses an unacceptable cancer risk and non-cancer hazard to a hypothetical future maintenance worker.

Ecological Risk Assessment

A Baseline Ecological Risk Assessment was conducted for LHAAP-47 to evaluate potential hazards to ecological resources. Ecological hazards were found to be within acceptable limits at LHAAP-47.

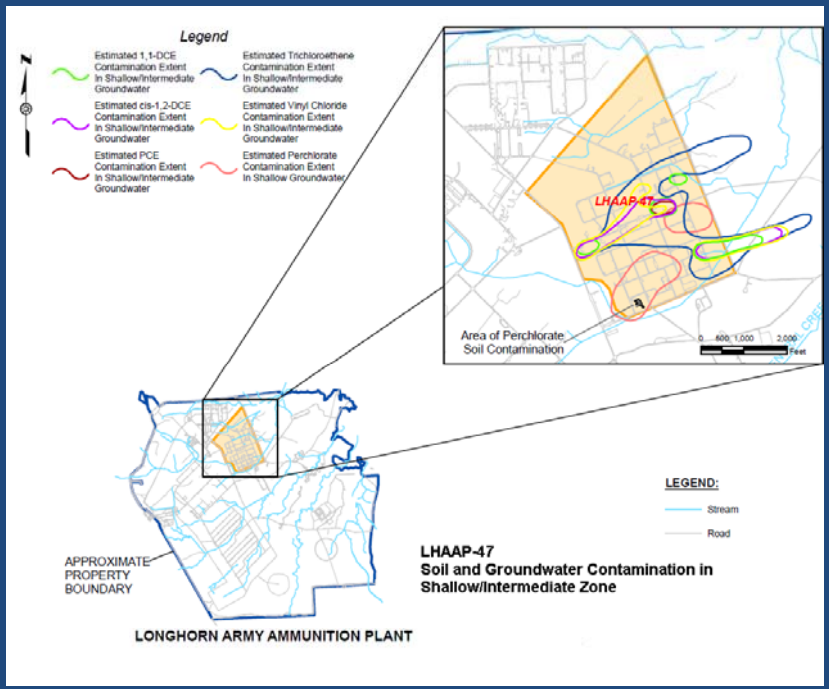
Areas of Contamination:

Soil

Based on the BHHRA and evaluation of data collected since the BHHRA, it was determined that soil at LHAAP-47 did not pose an unacceptable risk to human or ecological receptors. Though the risk assessment identified no risk from soil, an emerging contaminant perchlorate was detected in soil at elevated levels which could be acting as a potential source for groundwater contamination. As part of an interim action in November 1999, a plastic liner material was placed over the soil contaminated with perchlorate to prevent migration of perchlorate into Goose Prairie Creek.

Groundwater

The chemicals of concern (COCs) for shallow/intermediate groundwater at LHAAP-47 are perchlorate, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride (VC), 1,1-dichloroethene (1,1-DCE) and tetrachloroethene (PCE). The COCs were detected in shallow, shallow/intermediate and intermediate groundwater zones. The deep zone groundwater has not been impacted by contaminants.



June 10, 2010

00098283

NAME:_____

COMMUNITY INTEREST FORM

Restoration Advisory Board (RAB) members are expected to serve a 2-year term and attend all RAB meetings. Members who miss three of more consecutive meetings may be asked to resign. Duties and responsibilities will include reviewing and commenting on technical documents and activities associated with the environmental restoration program at the Longhorn Army Ammunition Plant. Members will be expected to be available to the community members and groups they represent to facilitate the exchange of information and/or concerns between the community and the RAB. Participation in the RAB is strictly voluntary and members will not be financially compensated. Members will be selected by a panel and will be representative of the diverse interests of the community.

Those who do not serve directly on the RAB can still participate in RAB activities. Interested members of the community will be included on the mailing list and invited to attend all RAB meetings, which are open to the public. Technical documents reviewed by the RAB will be made available to the public through information repositories. The public will be able to comment on the technical documents either in writing to the installation or at the RAB meetings during a time set aside for public comments and input.

NOTE: Priority for RAB membership will be given to local residents who are directly impacted affected.

1. Would you like to be considered for RAB membership? If so, please state why.

_____

_____

_____

_____

2. Have you had experience working as a member of a diverse group with common goals?

_____

_____

3. The community members of the RAB will select the Community Co-Chair. Please indicate if you are interested in being considered for the Community Co-Chair position by checking the box below:

____Yes, I would like to be considered.

4. If you responded yes to question 3, please state why you would be interested in being the Community Co-Chair.

_____

_____

_____

_____

5. By submitting this signed application, you:
   - are aware that being a RAB member would involve a set time commitment;
   - understand that being a RAB member entails a willingness to work cooperatively with other RAB members to ensure the efficient and effective use of RAB time;
   - understand that serving on the RAB will be voluntary and RAB members will not receive compensation for this service; and,
   - have read and understand that following Privacy Act information regarding providing your name, address and telephone number for this survey.
   - agree to permit my name to be published in news releases as a RAB member, if selected.

00098284

NAME:_____

COMMUNITY INTEREST FORM

PRIVACY ACT NOTICE

Authority : 10 U.S. Code (USC) 2705(c) and 42 USC 9620(f), state and local participation in restoration of Federal facilities.
Principal Purpose: To identify members of the local community who are interested in participation in the RAB.
Routine Uses: The Army will use the requested information to develop a list of interested persons from which it will select the community members of the RAB. The Army will also use the information to contact the individuals who are selected.
Disclosure of the requested information is voluntary. Failure to provide all the requested information may prevent selection to the RAB.

_____ _____
Applicant Signature **Date**

Name

_____

Best Way to Contact You ___ Email ___ Telephone ___ USPS Mail

Email Address:

_____

Telephone Number:

_____

Mailing Address:

_____

_____

Please return form to:

Rose M. Zeiler
Site Manager's Office
Longhorn Army Ammunition Plant
PO Box 220
Ratcliff, AR 72951

00098285

Restoration Advisory Board Rule Handbook

Office of the Secretary of Defense

February 2007

Executive Summary

The Department of Defense (DoD) encourages community involvement in the environmental restoration process through Restoration Advisory Boards (RABs). Since 1994, RABs have been established at over 300 installations and properties in the United States and its territories to encourage communities and installations to identify and discuss potential environmental restoration issues. By facilitating open communication and understanding, RABs serve as the anchor to relationships among the parties involved in the Defense Environmental Restoration Program (DERP) at environmentally impacted sites and installations. RABs provide a collaborative forum for the community, government agencies, tribes, and installation decision makers to discuss and identify the most efficient and productive means to restore the environment.

DoD developed this handbook as an accompaniment to the RAB Rule, which was issued on May 12, 2006 *(71 Federal Register 27610)*. The handbook is intended to supplement the rule. It is written to be flexible enough to guide individual RABs in addressing their own unique concerns and to offer suggestions to the communities and members involved in the RAB.

This handbook follows the structure of the RAB Rule using a question and answer format designed to serve as a quick reference manual for major topics that may be discussed by RABs and local communities. The RAB Handbook is composed of the following nine chapters:

1. What is a RAB?
2. How is a RAB established?
3. Who can participate in a RAB?
4. What are the roles and responsibilities of RAB participants?
5. How does a RAB operate?
6. How does a community or installation know when a RAB has completed its work and is no longer needed?
7. What happens if a RAB becomes ineffective?
8. Can an adjourned or dissolved RAB be reestablished?
9. What happens to RABs at installations that are closing or have been closed under BRAC?

DENIX RAB Rule Web site

Please refer to the RAB Rule for specific requirements of RABs. The rule may be found at: https://www.denix.osd.mil/denix/Public/News/OSD/RAB/rabrule.html.

1 What is a Restoration Advisory Board?

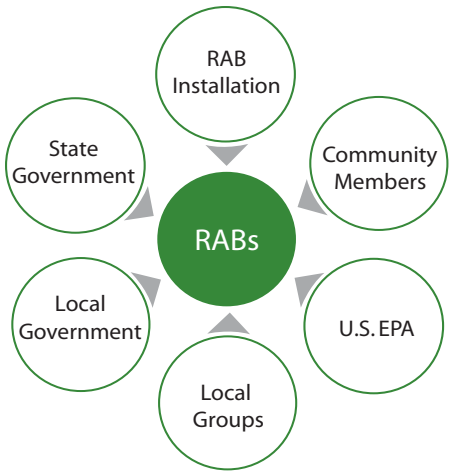
00098287

Each military installation is part of a community, and actions the installation undertakes in environmental restoration may impact its neighbors. Environmental restoration on DoD installations requires local community input and exchange of information. A RAB provides a forum for this input and exchange at operating and closing installations. Additionally, having a RAB at an operational installation often helps to ease the concern that neighbors might feel when an installation is undergoing environmental restoration.

What is a RAB?

A RAB is a stakeholder group that meets on a regular basis to discuss environmental restoration at a specific property that is either currently or was formerly owned by DoD, but where DoD oversees the environmental restoration process. RABs enable people interested in the environmental cleanup at a specific installation to exchange information with representatives of regulatory agencies, the installation, and the community. While the general public can comment on DoD's environmental restoration program, RABs offer a focused and interactive opportunity to participate in the environmental restoration process.

In most cases, a RAB addresses cleanup activities at one particular installation; however, there is no prohibition on convening a RAB to address cleanup activities at multiple installations, especially when the same community members are involved. A decision to have a RAB address multiple installations should include input from the communities involved as well as the installations and regulators.



What is the purpose of a RAB?

A RAB provides the community with the opportunity to become involved in the environmental restoration process at DoD installations either as a RAB member or through attendance at RAB meetings. RABs offer members the opportunity to influence cleanup decisions through discussion and to provide input to the installation decision makers. Because representatives of the environmental agencies overseeing cleanup participate in the RAB, the RAB offers members and the public the opportunity to share their questions, concerns, and ideas with agencies involved in the cleanup.

What is a Restoration Advisory Board?

Can a RAB's mission statement and goals be amended?

Establishing a RAB's mission statement and goals should be one of the first undertakings of a RAB. A mission statement and goals help to focus the RAB and give it direction. Since the RAB members generate the mission statement and goals, they have the ability to change them. The process for changing the mission statement and goals should be one of the items addressed by the operating procedures of the RAB. In all cases, the decision to change these items should be joint. If, after consultation, the installation and community co-chairs determine there is a valid need to alter the mission and goals, then these items may be amended using the process outlined in the operating procedures.

What issues do RABs address?

RABs may only address issues associated with environmental restoration activities. Funding for RABs is received from the Service's Environmental Restoration accounts; therefore, RABs may only discuss environmental restoration topics. If another issue of community interest arises in the course of a RAB's discussions, then the RAB installation co-chair should refer the issue to the appropriate offices or individuals at the installation. Limiting the RABs to discussions of environmental restoration helps to ensure that RABs remain focused and provides maximum opportunity to discuss issues related to environmental restoration activities.

What if I want to discuss other issues?

Individuals hoping to discuss activities other than environmental restoration, such as noise or water quality concerns, should contact the RAB installation co-chair. The co-chair will identify the point of contact (POC) or office responsible for handling the issues of interest and pass along the names of inquirers to the appropriate offices for resolution.

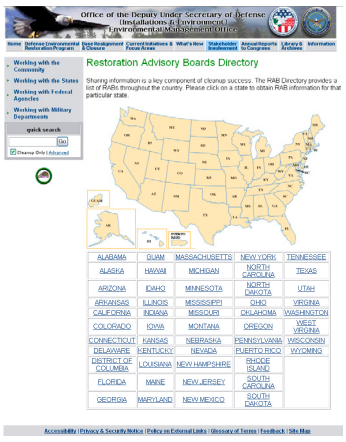
What activities can RABs undertake?

Examples of activities a RAB may undertake are:

- Reviewing and commenting on environmental restoration documents and activities, preliminary assessments, site inspections, remedial investigations and other documents;
- Providing information to the community;
- Receiving input from the community; and
- Obtaining information regarding the schedule, type, and status of environmental restoration activities.

How can I find out about a RAB's activities?

The RAB directory is located on DENIX at https://www.denix.osd.mil/denix/Public/Library/Cleanup/CleanupOfc/stakeholder/rabdirectory.html



DoD maintains records of RAB activities, procedures, and meeting minutes in an information repository (IR). This repository is publicly available and can be found in a local library or other community location. The location of the information repository should be based on information provided by the community. It should be accessible and convenient for the community. To find out where the RAB maintains its IR, contact the POC or co-chairs by browsing the RAB directory online.

In some cases, RAB activities are documented in meeting minutes posted on project web sites on the World Wide Web. The POC or RAB co-chairs can provide those Web sites to interested parties.

Are RABs required?

RABs fulfill a statutory requirement for DoD to establish, whenever possible and practical, a committee to review and comment on DoD actions and proposed actions regarding environmental restoration. DoD strongly encourages RABs at installations where environmental restoration activities occur and where there is community interest in establishing a RAB. Technical Review Committees (TRCs) satisfy the same statutory requirements as a RAB, but RABs are the preferred forum. If the community is not interested in establishing a RAB at the installation, then a RAB is not required; however, DoD must make the opportunity to establish a RAB available if the community becomes interested and must assess community interest every 24 months while environmental restoration activities are still ongoing.

Are RABs decision making bodies?

RABs provide valuable input to the installation and environmental agencies on environmental restoration decisions, but the installation retains ultimate decision making authority.

Is consensus necessary for a RAB?

No, consensus is not necessary. The Department of Defense is trying to make decisions based on input from as many constituencies as possible and appreciates advice from individuals.

Must an installation follow RAB recommendations?

The installation decision makers will listen closely to and consider the input RAB members provide, including any recommendations they may have regarding environmental restoration activities; however, the installation retains ultimate decision making authority. A RAB is a community stakeholder group that meets on a regular basis to discuss environmental restoration at a specific property that is either currently or was formerly owned by DoD, but where DoD oversees the environmental restoration process. RABs enable persons interested in the environmental cleanup at a specific installation to exchange information with representatives of regulatory agencies, the installation, and the community. While the general public can comment on DoD's environmental restoration program, RABs offer a focused and interactive opportunity to participate in the environmental restoration process.

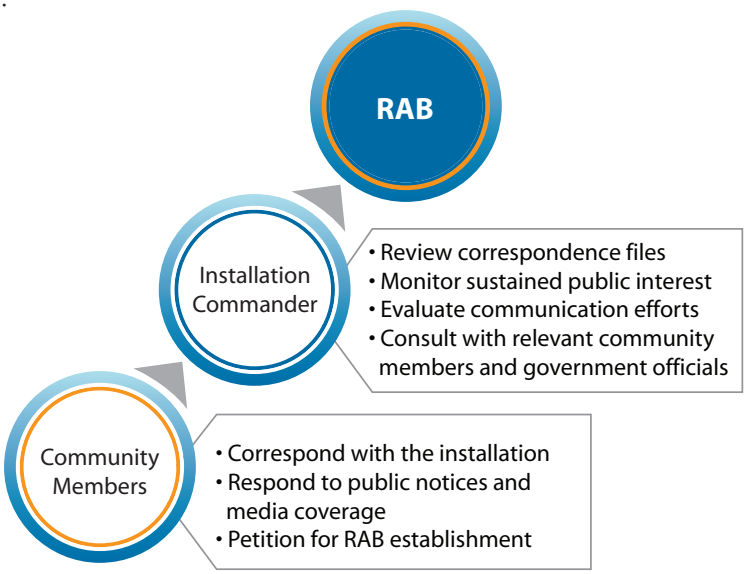
2 How is a RAB established?

00098290

The Department of Defense defined a process for establishing RABs to ensure consistency and fairness among communities and installations. This process defines authority to determine the need to establish a RAB, the criteria by which the need for a RAB is determined, and the actions necessary to form a RAB. A RAB ensures interested individuals and groups from the community have an opportunity to thoughtfully participate in the decision making process of environmental restoration activities in a timely manner.

Who determines the need to establish a RAB?

Two parties determine the need to establish a RAB: the public and the Installation Commander. The public plays a vital role in determining whether a RAB should be established by following the steps to establish a RAB. The Installation Commander reviews and considers input and sustained interest from the public when evaluating whether the criteria for establishing a RAB are met.



If I live near an installation without a RAB, how can I help establish one?

When environmental restoration activities, at installations where there is no RAB, are of interest to members of the public they should follow the steps for establishing a RAB by contacting the installation POC or Public Affairs (PA) Office. The Installation Commander will review community interest to establish a RAB at least every 24 months.

What can I do if I am only one of a few people interested in environmental restoration at the installation?

Individuals interested in environmental restoration at the installation should contact the installation POC or PA Office to express their interest in obtaining more information. Interested persons may also consider requesting a copy of the Community Relations Plan (CRP). Each installation is responsible for developing a CRP to outline cleanup actions and ways the community can participate. Through this plan, the public and community may become active participants in the environmental restoration process.

Interested individuals may also become involved by asking the installation whether a RAB or TRC is currently operating at an installation. If neither exist at an installation, an individual may contact the installation and ask about opportunities for involvement.

How is a RAB established?

00098291

What are the criteria for establishing a RAB?

The installation will form a RAB when there is sufficient and sustained community interest and one of the following criteria is met:

- The installation is closing and transferring property to the community;
- At least 50 local citizens have petitioned for a RAB;
- Federal, tribal, state, or local government representatives have requested a RAB; or
- The installation has determined the need for a RAB.

What if I live in a small community and less than 50 people are interested in establishing a RAB?

The installation will examine whether sufficient and sustained community interest to form a RAB has been demonstrated by individuals who represent various interests, diverse viewpoints, and different backgrounds within the community. The installation will determine whether any of the criteria for establishing a RAB are met by reviewing media files, reviewing correspondence with the installation, and consulting with potential stakeholders and government officials.

If an individual lives in a less populated area but sustained interest exists to establish a RAB, the community may still petition for the creation of a RAB. Those who are interested may contact the installation POC or PA Office expressing the desire to establish a RAB and ask about alternative opportunities for involvement. They may also contact EPA, the tribe with jurisdiction over the property (if any), or the state environmental regulatory agency.

Can circumstances require reevaluating the decision against establishing a RAB?

If an event occurs (e.g., a feature on the local news) to suddenly increase community interest at an installation where the decision has already been made not to establish a RAB, then the Installation Commander will determine whether to reevaluate the criteria. The Installation Commander will also examine the totality of evidence for diverse interests to determine whether the sudden increase in community interest is likely to be sustained or temporary.

Will evaluation depend on quantity, quality or both?

Both the number and content of correspondences will be evaluated against the establishment criteria. Sustained interest shows commitment from the community and is an important factor when deciding if a community is prepared to maintain a RAB during an installation's environmental restoration activities.

How often does the installation review community interest when a determination has been made not to establish a RAB?

An Installation Commander is required by the RAB Rule to evaluate criteria to establish a RAB at least once every 24 months while environmental restoration activities are still ongoing. However, there may be a need to review this criteria on a shorter schedule if the installation's cleanup status changes or if a new contaminant is found. The public can submit a petition for establishment at any time. Regulatory agencies may also recommend the installation review public interest or convene a RAB at any time.

How is a RAB established?

When establishing a RAB how will the base know which local community members to consult?

When an installation is preparing to establish a RAB, it will consult with individuals who were interviewed during the development of the CRP, as well as others who were identified within the community. The installation should also consult with individuals who served on the RAB selection panel. Former CRP participants and proposed panel members should represent a cross-section of organizations and professions. Examples of organizations and professions these individuals belong to may include:

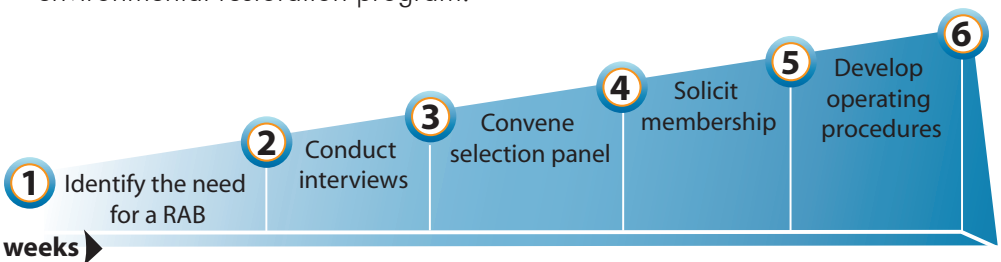
Organizations	Professions
Local Redevelopment Committees	Teachers
Technical Review Committees	Architects
Environmental Groups	Social Service Counselors
Civic Interest Organizations	Fire Fighters
Local Government	Game Wardens
Special Interest Groups	Engineers

How will the installation contact community members for consultation?

The installation will consult with community members through personal face-to-face meetings whenever possible. If geographic barriers limit personal interaction, it may be necessary to conduct consultation through electronic mail or phone interviews. An installation may post a notice in a local newspaper informing the community of its intent to contact community members for consultation purposes. The installation may also benefit from contacting the media prior to conducting interviews to give notice to the local community. This notice can provide the community with an overview of RAB establishment procedures and the goals the installation hopes to achieve with its RAB.

What is the timeline for establishing a RAB — e.g., how long does an installation have to assess sufficient and sustained community interest, as measured from the triggering event?

There is no timeline for RAB establishment. Typically, it may take the installation four to six weeks to notify the community, approve membership, and create operating procedures, but each installation may take a different amount of time to complete these steps. DoD recommends an installation begin the steps to establish a RAB as soon as possible following the discovery that the installation will be conducting cleanups under the environmental restoration program.



Tentative timeline to establish a RAB

How is a RAB established?

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How will the installation prepare for establishing a RAB?

To prepare for establishing a RAB, the installation will use fact sheets, press releases, public notices, public service announcements and newspaper ads to:

- Educate the community on a RAB's purpose;
- Inform the community of membership opportunities; and
- Discuss how the RAB relates to the installation's community involvement program.

In addition, the installation will solicit community input, interview affected community members, and consult with government agencies in the planning phase of the RAB. Regardless of whether or not the installation has a RAB, the installation should have a proactive, long term, and comprehensive community involvement program in place. The community involvement program details the activities the installation intends to undertake with help from the community and may also suggest community involvement methods. The installation will also sponsor an initial meeting to introduce RAB concepts to the community and begin the process of soliciting members.

Who will establish the RAB?

Once the evaluation is complete, the Installation Commander is responsible for establishing a RAB.

How does a RAB acquire members?

Once RAB establishment has been announced, the installation begins soliciting community members for participation. The installation will provide a person to fill the role of the RAB installation co-chair and begin the process of convening the selection panel to nominate individuals for membership on the RAB. EPA and tribal, state and local governments are also encouraged to participate in convening the selection panel as well as nominating representatives to the RAB.

How does a RAB solicit members at establishment?

The Installation Commander will consult with the DoD regulatory community and key local government officials to form a selection panel to identify community leaders and representatives for RAB membership. These potential members should represent the community based on diverse interests. The selection panel will review the Community Relations Plan, correspondence and media files to identify potential members. The panel will also evaluate interest forms from the community to determine the level of interest and diversity among the candidates. It is recommended that members of the selection panel not be selected as RAB members.

How does a potential new member indicate interest in belonging to a previously established RAB?

A potential new member to an established RAB may contact the remedial project manager (RPM), installation co-chair, PA Office, or other member of the RAB to inquire about membership. The RAB should discuss the mechanism for adding new members early in the process and outline the mechanism in the RAB's operating procedures.

How is a RAB established?

If I live near an installation with a RAB, how can I become involved?

RAB meetings are open to public participation and RABs welcome suggestions, concerns, or questions. If an individual lives and/or works in an area affected by the installation he/she may be eligible for membership. Individuals should contact the RAB or the installation co-Chair or PA office to inquire about the possibility of becoming a member.

What might be appropriate circumstances for a RAB to solicit new members?

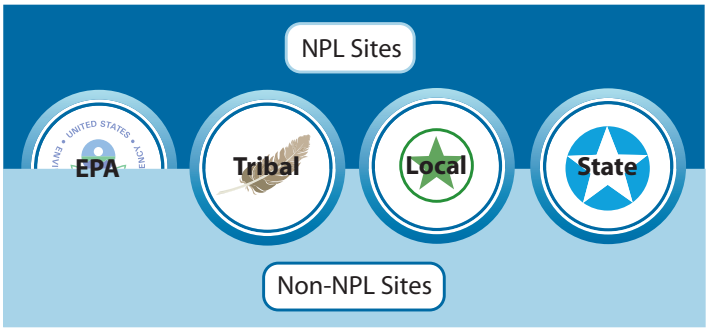
A RAB may need to solicit new members when major changes affect the installation or the environmental restoration activities at the installation, or when changes in the community result in a new constituency. Examples might include the addition of Military Munitions Response Program sites, the installation's placement on the National Priorities List (NPL) or a base realignment and closure (BRAC) list, new residential or commercial development, or the need to replace members who have moved away. In these cases, new members may be needed to ensure that diversity on the RAB is maintained. DoD should limit its representation to one member, who should be the DoD co-chair. Other DoD experts or specialists may attend meetings as necessary.

How will the RAB solicit new members?

During an update the RAB will solicit new members in accordance with its operating procedures. To maintain RAB diversity, replacement members will generally be sought from the same constituency as the former member.

How are regulatory members selected?

The regulatory agency with environmental restoration oversight responsibility at the installation will provide one representative to participate in the RAB. At NPL sites, EPA and tribal, state, and local governments each will have one representative. At non-NPL sites, EPA will generally not be represented, although representatives may participate if they desire.



3 Who can participate in a RAB?

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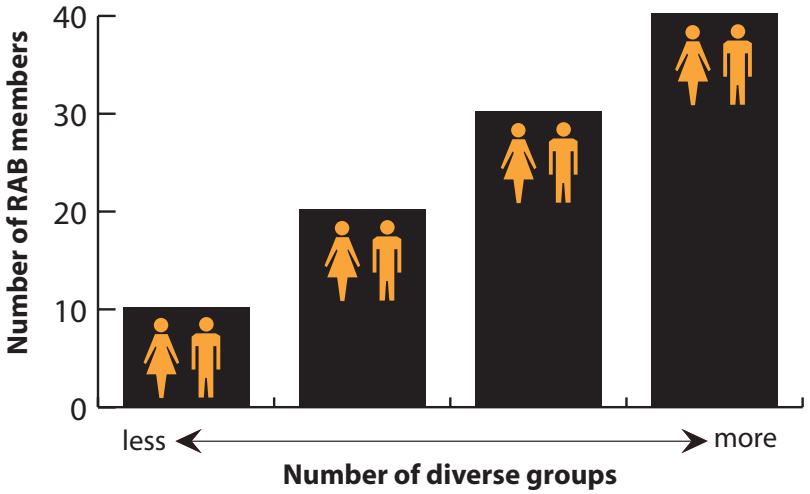
RABs are comprised of individuals from the community who are affected by the installation's environmental restoration activities because they live and/or work in close proximity to the installation. Anyone interested in restoration activities and willing to dedicate their time may participate in RAB meetings, although they may not actually be a RAB member. RABs also include representatives from the installation and regulatory agencies that oversee cleanup at the installation.

How big can a RAB be?

RAB size is an installation-specific issue and should be determined in the operating procedures unique to each RAB. Factors influencing the number of members are a reflection of diverse interests, issues affecting the surrounding communities, community interests, and population of the surrounding community.

To maintain a constructive dialogue, the Department suggests the RAB be no larger than 30 individuals, but not so small that diverse interests are not adequately represented. A RAB member may represent more than one group or interest.



How does the installation ensure that diverse interests are represented and that members fairly represent the local community?

The selection panel, which is made up of community members with varying backgrounds and interests, evaluates the candidates. The selection panel seeks out members using methods intended to reach a diverse audience. For example, the panel may post newspaper ads, distribute fliers in locations throughout the community, and have announcements made on the radio, in churches, schools, and community centers. Diversity determination is based on a candidate's responses to the evaluation forms, involvement in outside community groups and organizations, occupation, interests, and dedication to cleanup progress at the installation. The Commanding Officer of the installation will make the final judgment on the diversity of the candidates. He or she may reject the entire slate recommended by the selection panel based on the lack of diversity, but cannot reject individuals.

How are community interest forms distributed to the community?

Interest forms may be announced and distributed through several fora to ensure as many people as possible in the community are provided with the opportunity to respond. Installations can publish the evaluation forms in local newspapers and community newsletters; post them on the installation Web site, provide copies at local libraries and recreation centers; provide copies to local schools for children to take home to parents; make announcements at city hall meetings and during church services; or provide an information phone line at the installation.

Can I provide input into the selection criteria of new members if I am already a RAB member?

RAB members may provide input into the selection criteria of new RAB members to replace members who are leaving. This process is defined in the RAB's operating procedures. Each RAB's unique operating procedures should specify the nomination and selection process for replacement members.

The selection panel generally exists only once—during the creation of a new RAB or in some cases when an adjourned or dissolved RAB is reinstated. In these cases, former RAB members will generally not be involved in the creation of the new RAB.

Do I need to have environmental restoration experience to serve as a co-chair or community RAB member?

No. Environmental restoration experience may be beneficial, but is not required of either community co-chairs or community RAB members. Training is provided to RAB members to help explain environmental restoration processes and site-specific issues. A potential co-chair or member's interest in the community and environment, and commitment to dedicate time to the process are important factors. The selection panel will place greater emphasis on the diversity an individual would bring to the RAB, and the individual's expressed commitment toward achieving the RAB's goals, than to experience.

4 What are the roles and responsibilities of RAB participants?

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The following chapter outlines the roles and responsibilities of each RAB participant.

RAB Participant	Roles and Responsibilities
Installation Commander	• Establish a RAB when appropriate and periodically reevaluate community interest. • Approve RAB operating procedures, based on recommendation of co-chairs. • Periodically monitor RAB meetings. • Arbitrate disputes, if necessary. • Determine when and if the RAB should be adjourned, dissolved, or reestablished.
Installation co-chair	• Coordinate with the community co-chair to prepare and distribute agendas for meetings. • Ensure that DoD participates in an open, honest, constructive manner. • Discuss environmental matters in a manner that will ensure that lay members of the RAB can understand. • Attend all RAB meetings. • Ensure RAB members have the opportunity to provide input. • Ensure community issues and concerns related to restoration are addressed when raised. • Ensure documents distributed to the RAB are written in layman's terms when possible. • Ensure documents distributed to the RAB are made available to the general public. • Ensure an accurate list of interested parties is developed and maintained. • Provide relevant policies and guidance documents to the RAB. • Ensure that adequate administrative support is provided to the RAB. • Refer issues not related to restoration to the appropriate officials. • Report back to the commanding officer of the installation. • Ensure that RAB members receive necessary training.
Community co-chair	• Coordinate with installation co-chair and community members to prepare agendas. • Ensure that all RAB community members have the opportunity to participate in an open, honest, and constructive manner. • Ensure that community issues and concerns related to restoration are raised. • Coordinate with installation co-chair to ensure that periodic training assessments are conducted and training needs are met. • Assist with dissemination of information to the general public. • Report back to the community, and coordinate with other RAB members to ensure that they are adequately representing segments of the community at RAB meetings. • Serve without compensation on the RAB.

What are the roles and responsibilities of RAB participants?

00098298

RAB Participant	Roles and Responsibilities
Community members	• Attend meetings. • Provide individual input in an open, honest, and constructive manner. • Represent and communicate community concerns to the RAB. • Act as a conduit for exchange of information. • Review, evaluate and comment on documents and other materials related to restoration. • Represent and communicate RAB issues to the community. • Serve without compensation on the RAB.
Local and State government members	• Attend meetings. • Serve as a referral and resource on restoration. • Review documents and other materials related to restoration. • Ensure that state and local environmental standards and regulations are identified and addressed by the installation. • Facilitate flexible and innovative resolutions of environmental issues and concerns. • Assist in education and training for RAB members.
Tribal government members	• Attend meetings. • Serve as a referral and resource on restoration. • Review documents and other materials related to restoration. • Ensure that tribal environmental standards and regulations are identified and addressed by the installation. • Facilitate flexible and innovative resolutions of environmental issues and concerns. • Educate RAB members regarding tribal sovereignty, tribal laws and their application to the property. • Participate in the RAB without replacing the government-to-government relationship with the Federal government. • Assist in education and training for RAB members.
EPA member	• Attend meetings. • Serve as a referral and resource on restoration. • Facilitate flexible and innovative resolutions of environmental issues and concerns. • Ensure that federal environmental standards and regulations are identified and addressed by the installation. • Assist in education and training for RAB members.
Public	• Participate in community RAB meetings. • Observe rules and operating procedures when participating at RAB meetings or interacting with RAB members. • Ask questions to ensure understanding of RAB activities and impact on the community.

What are the roles and responsibilities of RAB participants?

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How will the RAB handle a co-chair or other RAB member who is not committed to the RAB's goals and objectives, or is not meeting their responsibilities?

Each RAB's operating procedures should provide guidelines for how to handle situations that hinder open participation and communication. The RAB's objective is to create a forum for discussion that facilitates completing environmental restoration activities at an installation in an open and cooperative environment. In cases where communication becomes tangled and members doubt the sincerity of one another, the best solution is to discuss these concerns within the RAB, in accordance with the operating procedures.

How can a RAB resolve disputes if an impasse cannot be broken within the operating procedures?

An independent facilitator may be brought to the RAB to explore disputes within the group. A meeting facilitator can be a useful tool to help RAB members focus on their goals for the installation.

5 How does a RAB operate?

Each RAB develops its own unique set of operating procedures based on the needs of the RAB and the installation. However, the RAB Rule does provide certain requirements. These requirements include, but are not limited to, developing a mission statement, providing training to members, and updating RAB information in the administrative record.

What is a RAB's mission statement?

A RAB's mission statement details the RAB's goals and describes its purpose. It also provides a focus for environmental restoration discussions to help the RAB stay on track during meetings.

Why should a RAB develop operating procedures?

RABs are encouraged to develop operating procedures to guide the RAB members during operation and make the RAB an effective and functioning advisory board. Operating procedures establish rules and guidelines for issues the RAB may address relating to membership, participation, restoration, training, roles and responsibilities, and reporting requirements.

Is there a standard outline for developing operating procedures?

The RAB Rule outlines standard operating procedures that could apply to all RABs regardless of geographic location or environmental restoration activities. Individual RABs are encouraged to develop their own unique and installation-specific operating procedures.

When should a RAB develop operating procedures?

A RAB should develop operating procedures as soon as it is officially formed. Official formation is complete when co-chairs and members have been selected from the community and appropriate government agencies.

How often should a RAB meet?

A RAB should meet as often as necessary. RAB members should decide on a schedule when they establish the RAB's operating procedures, and then add or delete meetings from the schedule as necessary. There are times when a flurry of activity occurs in planning or conducting environmental restoration and RABs may want to meet more often to review and provide input on relevant documents and ensure that they stay abreast of the activities. There are other times when the RAB may determine that infrequent meetings are adequate.

How does my RAB receive funding to operate?

Installations use their Environmental Restoration (ER) accounts to support RAB activities. The RAB itself will not receive funding for its activities.

Funded Activities	Non-Funded Activities
RAB establishment	Transportation costs
Membership selection	Compensation for volunteer time
Site-specific and relevant training	Meals and beverages at meetings
Meeting announcements, facilities, and facilitators	RAB member business cards
Mailing list maintenance and distribution	Computers, offices and other office/business materials
Meeting agenda materials	Member stationary

Are Web sites eligible administrative expenses?

RABs may include information on an installation- or Service-sponsored Web site, but may not claim Web sites or their maintenance as eligible administrative expenses.

How often can my RAB receive training?

RABs and community members can receive training whenever necessary. Installations should provide training during RAB orientation to provide information on what is expected of a RAB and to assist RAB members in gaining an understanding of installation-specific environmental and health issues. Other training should be tailored to site-specific issues and provided as necessary.

What are examples of training my RAB could receive?

RABs may receive training specific to environmental restoration activities at the installation.

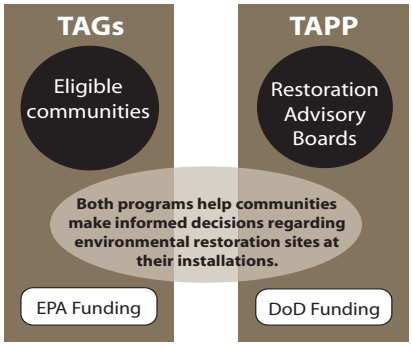
RAB Training Locations	Types of RAB Training
Meetings	Processes and vocabulary
Workshops	Prioritization
Briefings	Technology
Tours	Environmental restoration issues

Is there a training budget?

There is no dedicated funding source specific to RAB training. Any training that RABs receive from the installation is based on the availability of funds received from the Service's ER account. RABs seeking additional support could potentially qualify for a Technical Assistance Grant (TAG) or Technical Assistance for Public Participation (TAPP) or technical advice from EPA's Technical Outreach Services for Communities.

What are the purposes of TAGs and TAPP?

TAGs and TAPP are two separate programs that can provide communities with independent technical assistance to interpret scientific or engineering issues related to an installation's environmental restoration.



Why is it important to receive independent technical advice?

Independent technical advice can help the RAB community members understand environmental restoration activities at an installation including specific remedies and actions, therefore contributing to completing an environmental remedy at a site and closeout of environmental restoration projects at an installation.

Are TAGs and TAPP available to all RABs?

TAGs are provided by the EPA and are only available at NPL sites. TAPP is provided by DoD and is available to community members of the RAB at installations participating in the DERP. TAPP must be requested by a majority of community members of the RAB.

How do RABs receive TAGs and TAPP?

A RAB must follow an application process to apply for either a TAG or TAPP before either one can be obtained.

Before applying for a TAG, a group must first confirm its eligibility to receive funding from EPA. The following table highlights the groups who are eligible and not eligible to receive TAGs. If a group is eligible they must submit a letter of intent to EPA.

Eligible Groups for TAGs	Non-Eligible Groups for TAGs
Groups living near an NPL site	Potentially responsible parties
Groups affected by a release or threatened release of contaminants	Academic Institutions
Groups whose economic well-being, health, or enjoyment of the environment are threatened	City or county governments
All groups must be non-profit or working toward non-profit status	Groups established or supported by the government

Each group of TAG applicants must acknowledge dedication of time, resources, and management of its future TAG. Additionally, groups applying for TAGs must justify how the funds will be used once the TAG is awarded and establish an accounting system for reporting costs to EPA.

TAPP applicants should notify the installation of their intent to apply for TAPP. The RAB community members must demonstrate that the technical expertise gained through TAPP is not available through another government agency and that it will benefit the community's understanding of environmental restoration activities. The RAB must agree and certify by majority to apply for TAPP before the application can be considered. Once the request has been formally submitted to the Installation Commander, the TAPP project must be reviewed to ensure it meets eligibility requirements. The following table highlights eligible and non-eligible TAPP activities.

Eligible Activities for TAPP	Non-Eligible Activities for TAPP
Interpreting technical documents	Lawsuits or other legal activities
Assessing technologies	Political activities or lobbying
Participating in relative risk site evaluations	Collecting new data samples
Reviewing health risks	Epidemiological testing
Training	Community outreach efforts

Visit the EPA Web site for more information on TAGs at http://www.epa.gov/superfund/tools/tag/

DoD's TAPP information is available on the DENIX Web site at https://www.denix.osd.mil/denix/Public/Library/Cleanup/CleanupOfc/Documents/RAB/tapp_brochure.html

Are there funding ceilings on TAG and TAPP monies?

Yes, there are funding ceilings on TAG and TAPP monies. Each RAB is eligible for funding up to $100,000 or 1% of estimated restoration costs with a maximum of $25,000 allowed per year. EPA should be contacted for more specific information regarding TAGs.

Why do RABs keep records of their activities?

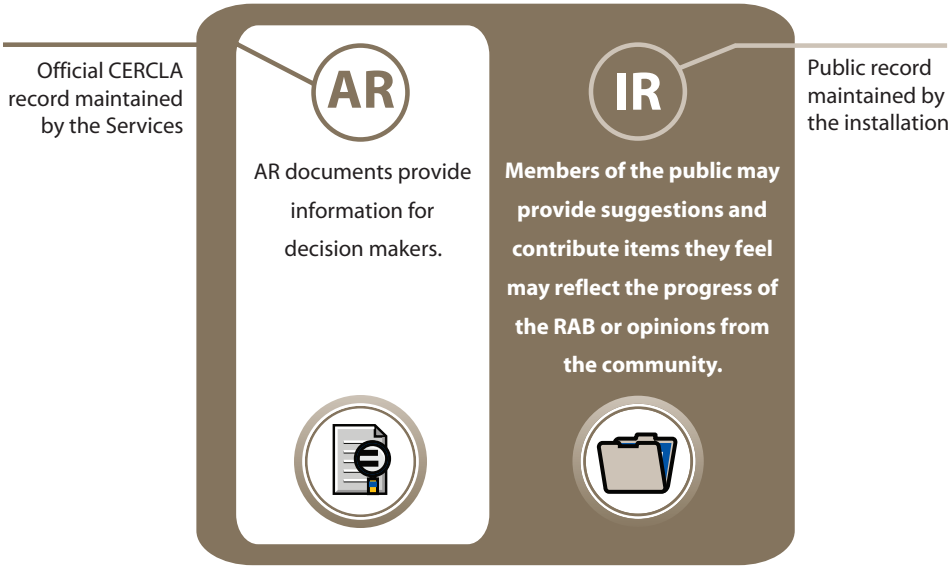
RABs keep records of their activities for historical purposes and to keep the community informed of their progress at the installation. Each year, the Office of the Secretary of Defense reports to Congress activities performed by RABs, advice they have provided, how much each RAB received for TAPP, and funds used by RABs for administrative support, which are all recorded in the administrative record and the information repository.

What is the difference between the administrative record and the information repository?

The administrative record (AR) is the official record of documents that form the basis for selecting a response action required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The information repository (IR) is the public record maintained by the installation that includes information beyond what is included in the AR. Members of the public may contribute comments, newspaper articles, or other items.

The IR and a copy (or copies) of the AR are generally made available at publicly accessible locations, such as libraries.



How often are the AR and IR updated?

The AR and IR are updated with relevant information as such information becomes available.

Who updates and reviews the AR and IR?

The AR is reviewed and maintained by the Component responsible for environmental restoration. Frequently the RPM is responsible for the AR. The IR is also maintained by the Component responsible official.

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6 How does a community or installation know when a RAB has completed its work and is no longer needed?

A RAB's work is complete when there are no longer any environmental restoration activities at an installation because the installation has either reached a remedy in place or response complete, or when the community is no longer interested. At that time the RAB should complete the documentation of its activities and begin the process of adjournment.

What is an example that may lead a RAB to adjourn?

An example of a situation that may lead a RAB to adjourn may include, but is not limited to, the completion of environmental restoration activities at the installation.

How long can a RAB be adjourned?

A RAB is considered permanently adjourned unless new conditions are discovered, which could lead a RAB to reestablish itself. Examples of these conditions are a change in the environmental restoration remedy or renewed community interest. For more information on reestablishment, please see Chapter 8: *Can an adjourned or dissolved RAB be reestablished?*

Does a RAB have to adjourn when land is transferred to a non-DoD entity?

If DoD relinquishes control of the cleanup and property, such as through property transfer to a non-DoD entity, then DoD will also relinquish support of the RAB. If the community wishes to continue its involvement, an independent group may be formed to continue the functions of the RAB or the community may work with EPA or the state environmental regulatory agency to establish a group equivalent to a RAB. DoD will not provide representatives to serve on these groups, nor the resources to support them when the Department is no longer involved in environmental restoration at the installation.

Can a RAB continue operating after environmental restoration activities are complete?

Under certain circumstances, it may be appropriate for a RAB to continue operating after environmental restoration activities are complete at an installation. For example, the RAB may meet to review the outcome of a CERCLA five-year review, or meet to discuss long-term management of land use controls implemented in connection with the environmental restoration activities at the installation.

What do community and installation members do if a RAB has to be adjourned because there is no sustained interest, but environmental restoration activities are ongoing?

Persons interested in ongoing environmental restoration activities should contact the installation POC to express their interest and seek information on any other community involvement programs available at the installation. Continued stakeholder feedback is important to the progress of restoration activities at installations, especially when they are ongoing. Following the decision to adjourn, the Installation Commander will also continue to evaluate community interest at least every 24 months while environmental restoration activities are still ongoing.

Does a RAB have to be formally adjourned?

No. A RAB may stop meeting without any formal adjournment if a community loses interest. However, the Department recommends that the RAB formally adjourn to provide community members an opportunity to participate in the decision to adjourn. Formally adjourning a RAB provides all parties with a sense of closure.

How does a community or installation know when a RAB has completed its work and is no longer needed?

00098305

RAB adjournment table

An installation may...	
Adjourn a RAB if...	• Lack of community interest, • Record of Decision is signed, • Response complete at all sites, • All remedies in place, • Achieved RAB goals • Land transferred to a non-DoD entity, and • No longer sufficient and sustained community interest.
And the Installation Commander...	Consults with, and considers all comments provided by: • Community, • EPA, • States, • Tribes, and • RAB members.
Then the Installation Commander may...	Adjourn the RAB.
And the Installation Commander shall...	• Notify RAB members and the public of the decision through writing and publication in a local newspaper. • Describe other ongoing public involvement opportunities. • Document the rationale for adjournment in a memorandum for inclusion in the administrative record.

7 What happens if a RAB becomes ineffective?

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A RAB can stop its activities in one of two ways—either by adjourning or dissolving. Dissolution is appropriate when the RAB has become ineffective and is no longer fulfilling the intended purposes of advising and providing community input to the installation and decision makers on environmental restoration projects.

What could lead a RAB to dissolve?

RABs dissolve when members are no longer able to offer input because the RAB has developed irreconcilable issues and cannot provide input in a constructive manner as intended. Dissolution may be necessary if RAB meetings are spent discussing unrelated issues or if members are unable to collectively discuss the environmental restoration activities affecting the installation and community.

Is dissolution permanent?

Dissolution of a RAB may be, but is not necessarily, permanent. A RAB may be reestablished if community interest increases or if environmental restoration activities are ongoing or reoccur. If a RAB was dissolved because of irreconcilable issues, it may be reestablished if the cause for dissolution has been resolved.

What does the community and installation do if a RAB is dissolved, but environmental restoration activities are ongoing?

Persons interested in ongoing environmental restoration activities should contact the installation POC to express their interest and seek information on other community involvement programs available at the installation. Continued stakeholder feedback is important to the restoration progress at installations, especially when restoration activities are ongoing. The Installation Commander will continue to evaluate community interest at least every 24 months following a RAB's dissolution. If the community interest in a RAB is reignited and sustainable, it is possible for a RAB to be reestablished. (See Chapter 8 for more details on reestablishing a RAB.)

Can a RAB receive conflict resolution support before deciding to dissolve?

Yes. Dissolution should be a last resort to resolve a RAB's ineffectiveness. The Installation Commander should explore all possible means to resolve the conflict by hiring a professional mediator, directly addressing membership issues, or involving the installation's PA Officer.

Is professional conflict resolution available and funded by DoD?

Yes. An installation may provide a professional facilitator to facilitate its RAB. Facilitators are paid with environmental restoration funding.

What happens if a RAB becomes ineffective?

RAB dissolution table

An installation may...	
Dissolve a RAB if...	RAB no longer fulfills purpose and responsibility.

And the Installation Commander...	• Notifies co-chairs, Deputy Assistant Secretary (DAS), and ODUSD(I&E) in writing.
	• Provides 30 day public comment period for RAB members and the public.
	• Consults with:
	  • Community,
	  • EPA,
	  • States,
	  • Tribes, and
	  • RAB members.
	• Reviews comments,
	• Provides supporting documents and recommends dissolution to the DAS.

And the DAS...	Notifies ODUSD(I&E) of the decision and rationale to approve or disapprove the dissolution request.
Then the DAS may...	Dissolve the RAB.

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8 Can an adjourned or dissolved RAB be reestablished?

RABs may be reestablished if they have been adjourned or dissolved. Reestablishment reflects community interest in an installation's environmental restoration activities and provides continued interaction between DoD and communities.

Can inactivity lead a RAB to never be reestablished?

No. It is always possible for an adjourned or dissolved RAB to be reestablished no matter how long it remained inactive. As long as there is sustained community interest and DoD continues to have control of the cleanup and/or property a RAB may always be reestablished.

How is membership determined when a RAB is reestablished?

The length of time the RAB has been adjourned or dissolved may affect how membership terms will be decided at reestablishment.

If a RAB is being reestablished following a short-term hiatus, the installation, community, and RAB may benefit from contacting former members and gauging their interest in resuming their positions with the RAB.

If there are members who choose not to return to the RAB following a short- or long-term break, or if the Installation Commander is no longer able to identify or contact former co-chairs and members, then the Installation Commander should follow the operating procedures and RAB Rule to establish new members and/or co-chairs. This process will follow membership procedures as if a new RAB were being established.

How are operating procedures affected when an adjourned or dissolved RAB is reestablished?

If a RAB is being reestablished following a short-term adjournment and the former RAB members will resume their positions, then the RAB should consider keeping their prior operating procedures. This will allow the RAB to resume responsibilities in the same capacity as when the RAB adjourned. If former RAB members are not interested in resuming their positions and new members are recruited into the RAB, then the new RAB members should develop new operating procedures.

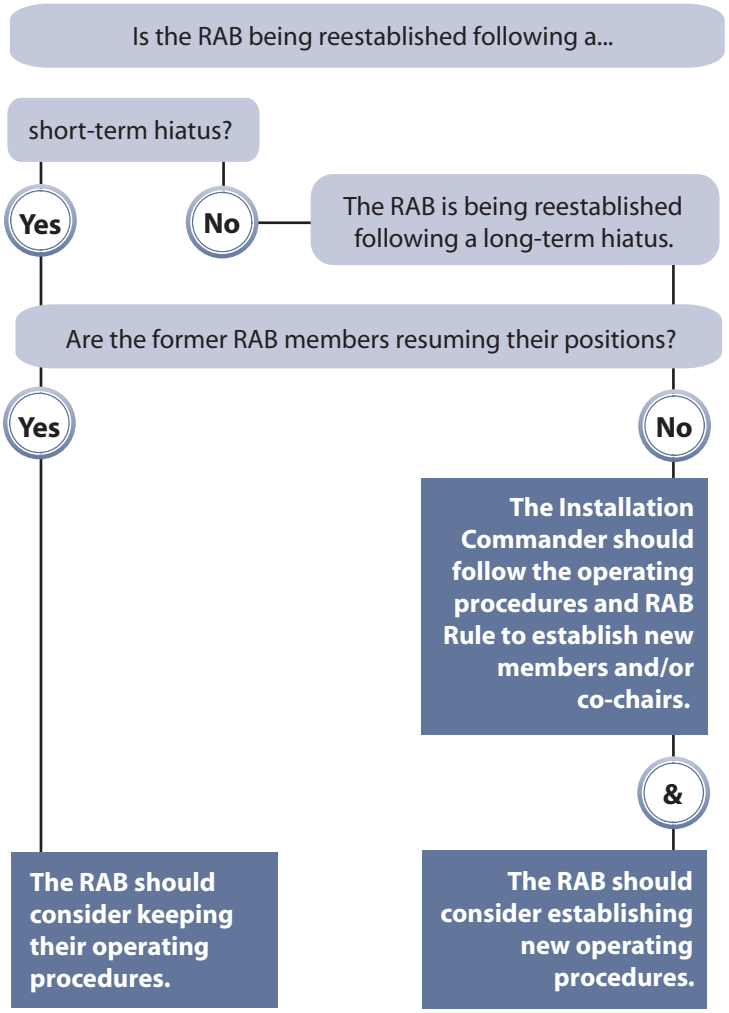
If a RAB is being reestablished following a long-term adjournment with either new or former members, the RAB may want to consider if it is necessary to establish new operating procedures based on the length of time the RAB was adjourned.

If a RAB is reestablished following either a short- or long-term dissolution, it may be necessary for the RAB to develop new operating procedures once membership is determined. The RAB may want to consider inserting language into the operating procedures that will help prevent the issues that caused dissolution to occur within the original RAB.

The following flow chart provides a summary of these determinations:

Can an adjourned or dissolved RAB be reestablished?

00098309



Should a RAB be reestablished if dissolution conditions still exist?

No, a RAB should not be reestablished if the dissolution conditions still exist. Reestablishing a dissolved RAB requires approval from the Component's Environmental DAS. (Please refer to Chapter 7 for conflict resolution support and availability.)

How will the community know if there are activities that may require reestablishment at a formerly dissolved or adjourned RAB?

The community should be informed of new activities or requirements through the community relations process. In addition, the Installation Commander will continue to evaluate community interest at least every 24 months following the decision to dissolve or adjourn a RAB. The installation will also provide status reports through mailings or local information repositories on issues that may interest the community and prompt reestablishment.

0009831

9 What happens to RABs at installations that are closing or have been closed under base realignment and closure (BRAC)?

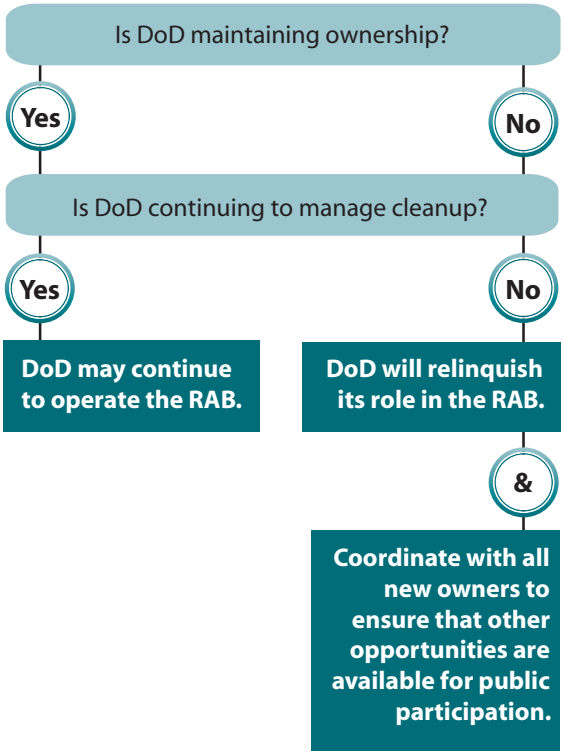
An installation may be closed or slated for closure under BRAC. When chosen for closure, DoD generally will transfer ownership of the installation to another person or entity at some point in the future. Because RABs are funded and supported by DoD, the transfer of the installation to a non-DoD entity will affect the continued existence and operation of the RAB.

Will the RAB on a closing installation continue to operate?

If a RAB exists at an installation that is closing under BRAC, DoD may continue to operate the RAB as long as DoD maintains ownership of the property and continues managing cleanup activities. Once the installation is transferred out of DoD control and DoD is no longer responsible for cleanup activities, DoD will relinquish its role in the RAB. DoD will work with the new owner, EPA, the tribe with jurisdiction over the property (if any), and the state environmental regulatory agency to encourage the availability of opportunities for members of the community if the community desires to continue to participate in the process.

Can the RAB on a closed installation continue to operate if DoD transfers the installation to a new owner under early transfer and continues to conduct the cleanup?

If DoD transfers the property but continues to manage the cleanup, DoD will continue to support the RAB. Community members should contact the new owner, EPA, the tribe with jurisdiction over the property (if any), and the state environmental regulatory agency for opportunities to provide input.



What happens to RABs at installations that are closing or have been closed under BRAC?

00098311

How can I provide input on environmental restoration activities after DoD has transferred ownership and cleanup responsibility?

Once DoD has transferred ownership and environmental restoration responsibility of the installation, community members who are interested in any ongoing environmental restoration activities at the former installation should contact the installation's new owner, EPA, the tribe with jurisdiction over the property (if any), and the state environmental regulatory agency to find out about opportunities to provide input and participate in the cleanup process. For example, the new owner may agree to meet with community members on a regular basis for their input or the EPA, tribe with jurisdiction over the property (if any), or the state environmental regulatory agency may decide to continue a forum similar to the RAB.

Can I form a group to provide input if DoD is no longer involved?

The Department will neither sanction nor support community groups interested in providing input for environmental restoration activities once it has withdrawn from active involvement at an installation. However, there may be other venues that interested community members can use.

Can I reestablish a RAB on a closed installation?

A RAB that has adjourned or dissolved may not be reestablished at a closed installation if it is no longer owned by or being actively cleaned up by DoD. However, if the installation is closing and DoD still owns the property and is carrying out environmental restoration activities at the installation, then a RAB may be reestablished.

See Chapter 8: *Can an adjourned or dissolved RAB be reestablished?* for membership and operating procedure questions regarding reestablishment of a RAB.

Can RABs be reestablished at installations that have been transferred out of DoD control?

A RAB may be reestablished at installations that have been transferred out of DoD control only if DoD reacquires the installation or continues to perform day-to-day environmental restoration response activities.

PUBLIC MEETING

JUNE 29, 2010

PROPOSED PLANS FOR LHAAP-17

LONGHORN AMMUNITION PLANT

KARNACK, TEXAS

Reported by:

Leigh G. Walker

Certified Court Reporter

ATTENDANCE

Rose Zeiler	United States Army
Aaron Williams	United States Army
Fay Duke	Texas Commission on Environmental Quality
Stephen Tzhone	Environmental Protection Agency
Praveen Srivastav	Shaw Environmental
Susan Watson	Shaw Environmental
Robert Duffield	Shaw Environmental
Kay Everett	Shaw Environmental
Vincent Chan	Shaw Environmental
Sowmya Suryanarayanan	Shaw Environmental

MS. ZEILER: The public meeting for LHAAP 17, an environmental site at Longhorn, commenced at 6:00 p.m. this evening and it is now ending at 8:00 p.m. No public were present.

STATE OF LOUISIANA:

PARISH OF CADDO :

I, Leigh G. Walker, Certified Court Reporter in and for the State of Louisiana, as the officer before whom this testimony was taken, do hereby certify that the preceding one page was reported by me in the stenotype reporting method, was prepared and transcribed by me or under my personal direction and supervision, and is a true and correct transcript to the best of my ability and understanding; that I am not related to Counsel or to the parties herein, nor am I otherwise interested in the outcome of this matter.

SUBSCRIBED AND SWORN TO on this the 30th day of June, 2010.

Leigh G. Walker
Certified Court Reporter
Louisiana No. 92210

OFFICIAL SEAL
LEIGH G. WALKER
Certified Court Reporter
State of Louisiana
Certificate Number 92210
Certificate expires 12-31-10

Shaw® Shaw Environmental, Inc.

Subject:	**Final Minutes, LHAAP-47 Onboard Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Federal Building, Dallas, TX**
Date of Meeting:	**July 20, 2010, 9:00 AM – 4:00 PM**

Meeting Participants:

LHAAP/BRAC	Rose M. Zeiler
USACE-Tulsa:	John Lambert, Aaron Williams
USAEC:	Matt Mechenes
Shaw Environmental:	Praveen Srivastav, Susan Watson, Robert Duffield
TCEQ:	Fay Duke, Dale Vodak
USEPA Region 6:	Steve Tzhone, Terry Burton
USGS:	Kent Becher
USFWS:	Paul Bruckwicki, Barry Forsythe

The meeting was held to resolve regulatory comments on the Draft Final Feasibility Study for LHAAP-47.

Shaw addressed comments by grouping them into seven categories. Figures and tables were distributed to participants as handouts. Maps and tables were also projected on a screen to facilitate discussion.

Category 1: Groundwater to surface water pathway (EPA comment 1; TCEQ comments 2, 11, 12)

TCEQ had expressed concern in their comments that there is a potential for groundwater to surface water pathway to be complete. Shaw discussed data showing that recently the groundwater levels have been lower than the base of Goose Prairie Creek. However, groundwater levels have been higher than the creek in the past as indicated in Jacobs RI report, and thus potential exists for groundwater to surface water pathway to be completed in the future. It was agreed to:

- Add protection of surface water from groundwater as a remedial action objective (RAO)

- Add monitoring of surface water for volatile organic compounds (VOCs) and perchlorate as a component of remedies
- Use GW-Res MSC as cleanup goal for perchlorate in surface water

Category 2: Cleanup Goals (TCEQ comment 13)

It was discussed that GW-Ind MSCs would be used as cleanup goals for chemicals that do not have MCLs. After discussing COCs, it was agreed that the cleanup goals should be calculated based on risk to an industrial maintenance worker for chemicals without MCLs.

Category 3: Contaminants of Concern (COCs) (EPA comment 2; TCEQ comments 5, 8, 24)

EPA and TCEQ had expressed concern over elimination of certain chemicals from the COC list based on either sporadic detection (e.g. acetone, chloroform) or geochemical analysis (metals). The agencies indicated that chemicals exceeding MCLs, GW-Ind MSCs, or posing unacceptable hazard (>0.1 hazard quotient) or carcinogenic risk (> 10^{-6}) should be retained as a COC. Shaw briefly discussed geochemical analysis and stated that it is based on natural association of metals such as iron and arsenic, e.g. arsenic concentrations tend to be high when iron concentrations are high. In order to resolve this comment it was agreed that:

- All chemicals included in Tables 2-1 and 2-2 will be retained as COCs
- Chemicals that have sporadic detections or are considered associated with corrosion of wells will be handled in the FS, record of decision (ROD) and remedial design (RD) with a monitoring program and exit strategy. The chemicals will be included in the ROD and RD and may be dropped from the COC list during 5-year reviews, if considered appropriate. Sampling frequency and exit strategy will be included in the RD and will be revisited during 5-year reviews.
- Clean up goals will be adjusted to allow for multiple contaminants
- Shaw will revise tables to show expanded list of COCs with cleanup goals

Category 4: Plume Definition/Stability (EPA comments 3, 8, 11, 12; TCEQ comments 1, 4, 9, 23)

Following are the highlights of the discussion:

- Shaw will revise the plume map for perchlorate in the shallow zone based on the recent detection of 63,600 µg/L in LHSMW60 and taking into account results from wells at LHAAP-50.
- TCEQ discussed concerns over false NDs when the old method was used. Shaw will select a number of samples to be analyzed by method recommended by TCEQ chemist. Fay will provide the method number.
- The Army or regulators may split samples with Shaw for QA analysis. Shaw will inform the team when sampling will occur.
- Perchlorate plume does not seem to have migrated as far as the TCE plume.
- Regulators expressed concern that there are several wells that have not been sampled since 1998 or only have a few sampling rounds. There are also several wells that have been dry recently, and thus not sampled. It was agreed that Shaw will attempt to collect samples from wells that have been dry in the past and may also collect samples from wells that may help in better definition of the plumes.
- TCEQ had commented that they are concerned with TCE contamination in a deeper zone near well 47WW25 because this well had a high concentration of TCE in the

shallow zone. They would like to see a deeper zone well installed at this location. Shaw agreed to install a new well near 47WW25.

- TCEQ had commented that they are concerned with perchlorate contamination in a deeper zone near well LHSMW60 because this well had a high concentration of perchlorate in the shallow zone. They would like to see a deeper zone well installed at this location. Shaw agreed to install a new well near LHSMW60.
- Shaw presented 2000 and 2009 TCE plume maps and made the argument that what looks like plume migration is a result of better plume definition in the past few years. TCEQ stated that several wells show increasing concentrations within the plume and the plume seems to be migrating.
- TCEQ stated that monitored natural attenuation (MNA) is not a feasible remedy by itself or a component for another remedy because there is no evidence of MNA currently occurring at the site. They insisted that MNA should not be carried forward in the FS at all as any part of an alternative. Shaw stated that there are parts of the plume, especially near the fringes of the plume, where MNA appears to be occurring even though there are areas showing increasing concentrations within the plume.
- EPA stated that MNA may be kept as a component of another remedy if Shaw is able to convince regulators that MNA is occurring in some portions of the plume and is a feasible remedy. Shaw agreed to review the data to see if this is possible.
- Some discussion occurred on the level of definition for the TCE plume in the intermediate zone. TCEQ felt that there were not enough wells in the north and south directions from the two branches of the plume. Shaw displayed a map showing intermediate zone wells at LHAAP-48 and LHAAP-67. Also discussed were cross-sections showing that shallow zone onsite merges with the intermediate zone to the east and that existing wells show downgradient extent of the plume.
- It was agreed that Shaw will sample the intermediate zone well LHSMW38 because it has not been sampled since 1998.
- TCEQ has commented that a shallow well may be needed in the area southwest of wells LHSMW60 and 47WW27. This will be revisited after groundwater flow map is redrawn.
- It was agreed that plume map boundaries will be drawn so they are proportional to concentrations in wells bounding them.
- It was agreed that the intermediate zone TCE plume will be redrawn so it is shown to be closer to the nondetect wells.

Category 5: Cross-sections and Groundwater Flow Maps (EPA comments 4, 5, 7, 8, 9; TCEQ comments 2, 3, 7, 9, 10)

Following are the highlights of the discussion:

- Shaw presented a few new cross-sections. These were drawn in response to a request from TCEQ. The cross-sections will be included in the FS.
- Discussion occurred on the 2007 water level from well 47WW23. The water level seems anomalously high compared to other wells in the surrounding area. There is no apparent reason for the anomalous reading but could be a high rain fall event or a typographical error. Water levels from this well have been lower and more consistent with surrounding wells in the past. It was decided to exclude water level elevation from this well and redraw the groundwater flow map for 2007. Plumes will also be revised based on the new groundwater flow map.

Category 6: Remedial Alternatives (EPA comment 1; TCEQ comments 1, 15, 17, 18, 19, 20, 21, 22, 23)

Following are the highlights of the discussion:

- Shaw presented a table showing possible new alternatives for the FS. These included in situ bioremediation, in situ oxidation, and extraction/ex situ treatment. The table showed that MNA would be a part of all of these alternatives as a mechanism to continue to reduce concentrations beyond the active part of the remedy.
- Shaw envisioned that treatment of some of the hotspots would remediate TCE/perchlorate in these areas and MNA would reduce concentrations in other portions of the plume. Some discussion occurred on how hot spots would be defined but no resolution was reached. Kent Becher suggested conducting a soil gas survey.
- Alternatives need to be reassessed after redrawing the plumes since volumes may increase.
- TCEQ opposed the inclusion of MNA as a part of any of the alternatives. They are not convinced that MNA is occurring. In TCEQ's opinion, MNA should not be included in the FS by itself or part of another alternative.
- It was suggested by EPA that MNA can be included as a component of another remedy if Shaw can demonstrate that it is a feasible remedy at the site or in certain portions of the plume.

Category 7: Miscellaneous (EPA comment 4, 6, 10; TCEQ comments 4, 6, 16)

This category included requests for additional information such as inclusion of tables showing filtered and unfiltered data. Also included in this category are request for explanation. Shaw will make these changes or provide explanation in the response to comments.

Path forward

- The weekly call will be re-initiated to discuss information as it becomes available to expedite subsequent reviews.
- Shaw will mobilize to the field for sampling and well installation at LHAAP-47 during the week of August 2, 2010. Shaw will keep the Army and regulators informed of the progress in sampling and well installation activities.
- Shaw will provide revised figures and tables for review as they become available. Shaw will also provide tracked-change document for Army and regulator y review to obtain concurrence before the document is finalized.
- It was agreed to change the date for Final FS to September 30, 2010. The Army will send EPA a written request for extension of schedule.

00098320

LONGHORN ARMY AMMUNITION PLANT
ON BOARD MEETING FOR LHAAP-47

Location		Dallas, Texas	
Date	20-Jul-2010	**Time**	9:00 – 4:00 pm.

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
Longhorn Team Members				
Rose M. Zeiler		BRAC	(479) 635-0110	rose.zeiler@us.army.mil
Matthew Mechenes		USAEC	(410) 436-1505	matthew.mechenes@us.army.mil
Aaron Williams *		USACE, Tulsa	(918) 669-4915	aaron.k.williams@usace.army.mil
John Lambert *		USACE, Tulsa	(918) 669-4992	john.r.lambert@SWT03.usace.army.mil
Stephen Tzhone		USEPA, Dallas	(214) 665-8409	tzhone.stephen@epa.gov
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Praveen Srivastav		SHAW, Houston	(281) 531-3188	praveen.srivastav@shawgrp.com
Susan Watson		SHAW, Houston	(281) 531-3107	susan.watson@shawgrp.com
Robert Duffield		SHAW, Houston	(281) 531-3157	robert.duffield@shawgrp.com
Kent Becker	Kent D. Becker	USGS, DFW	817)253-0356	KDBecker@usgs.gov

* Present but did not sign attendee list

Shaw® Shaw Environmental, Inc.

Subject:	**Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Santa Fe Building, Sycamore Room - No. 121 1114 Commerce Street, Dallas, Texas**
Date of Meeting:	**July 20, 2010; 8:30 AM – 9:00 AM**

Meeting Participants:

BRAC:	Rose M. Zeiler
USAEC:	Matthew Mechenes
USACE-Tulsa:	Aaron Williams, John Lambert
Shaw:	Praveen Srivastav, Robert Duffield, Susan Watson
USEPA Region 6:	Steve Tzhone, Terry Burton
TCEQ:	Fay Duke, Dale Vodak
USFWS:	Paul Bruckwicki, Barry Forsythe
USGS:	Kent Becher

This month's Monthly Manager's Meeting was informal and there was no agenda.

Action Items

None Discussed.

Defense Environmental Restoration Program (DERP) PBC Update **Praveen Srivastav**

Document Status/Environmental Sites (Table)

Praveen Srivastav briefly went over the document status/environmental sites table.

- The Draft Final Decision Document for LHAAP-02 is in review with BRAC legal.
- The draft work plan for soil removal at LHAAP-03 is in Army's review.
- The Draft Completion Report for LHAAP-04 is in regulatory review. A figure with the proposed locations for two wells to be installed at LHAAP-04 was submitted. Shaw reminded TCEQ and USEPA to review it. Shaw would like to install the wells in August when a rig is onsite.
- The Draft Final Proposed Plan for LHAAP-16 will be submitted this week.
- Comments from CLI were received on the Final Proposed Plan for LHAAP-17. Shaw is currently preparing draft responses for Army's review.
- The Draft Final Feasibility Study for LHAAP-18/24 is in regulatory review. EPA expected to send comments by the end of the month.
- The Draft Proposed Plan for LHAAP-29 is in Army review with BRAC and AEC.
- The Draft Record of Decision for LHAAP-46 Army comments are in resolution with Shaw.
- The Draft Final Focused Feasibility Study for LHAAP-47 comment resolution will be discussed in the onboard meeting that will held today following this meeting.
- The Draft Final ROD for LHAAP-49 is in regulatory review. EPA is expecting to send comments by the end of the month. TCEQ indicated their attorney is currently reviewing.
- The Draft ROD for LHAAP-50 is in Army review at BRAC and AEC.

- The Draft ROD for LHAAP-58 is in Army review at BRAC and AEC.
- Regulatory comments were received on the revised Draft Final Decision Document for LHAAP-35/36. Comments are currently being addressed.
- The Draft Final ROD for the Pistol Range is in regulatory review. EPA is expecting to send comments by the end of the month. TCEQ indicated their attorney is currently reviewing.

Groundwater Treatment Plant Update
There were no issues in the last month. The water extraction rate was increased and the FBR flow is running at about 30 gpm. About 700,000 gallons were extracted and treated since the last reporting period. The extraction is being maximized by operating on Saturdays. Previously, the pumps would shut off because the influent tank was full. By working Saturdays, the tank level can be lowered and automatic shutdown of the pumps will be minimized. The FBR will be increased to higher rates to about 40 gpm. The design rate was 50 gpm. There was some discussion about break through and testing to make sure that the microbes were able to reduce the concentrations. The flow has been going to the INF pond and injected into 18/24. The Army stated that as the FBR rate is increased that the discharge water should not be released into the INF pond until it is tested and results are received. This is because the land is being transferred without a restriction. Shaw will inform the Army about the plan to ensure that the INF pond is not contaminated with perchlorate.

DERP Total Environmental Restoration Contract (TERC) Update **Rose Zeiler**

LHAAP-37/67 – Draft Final ROD Status
The ROD for LHAAP-37/67 has been submitted to EPA and TCEQ. Fay indicated that it is en route for TCEQ's Executive Management signatures.

Sitewide Schedule Review—Critical Documents **Rose Zeiler**
A schedule extension will be requested for LHAAP-47 FS. The date will be dependent on the outcome of the onboard meeting.

The Draft Final ROD for LHAAP-46 should be submitted to EPA/TCEQ by the end of next week. TCEQ needs to receive it by August 5, 2010.

LHAAP-37/67 ROD was signed at the end of June.

RAB
Next RAB will be August 17, 2010.

The next monthly manager's meeting will be held August 17 at 2 PM at Longhorn.

Meeting Adjourned

Action Items

TCEQ/EPA
- Review well locations for LHAAP-04.

SHAW
- Review procedures for sampling of effluent at GWTP before increasing FBR rate

00098323

LONGHORN ARMY AMMUNITION PLANT
MONTHLY MANAGERS' MEETING

Location		Dallas, Texas	
Date	20-Jul-2010	**Time**	

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
Longhorn Team Members				
Rose M. Zeiler		BRAC	(479) 635-0110	rose.zeiler@us.army.mil
Matthew Mechenes		USAEC	(410) 436-1505	matthew.mechenes@us.army.mil
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Susan Watson		SHAW, Houston	(281) 531-3107	susan.watson@shawgrp.com
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Kent Becher	Kent Becher	USGS, DFW	(817) 253-0356	KdBecher@Sbcglobal.net

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
July 20, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
1	Final Decision Document, LHAAP-02	6/23/10	x	x	Final, signed	7/23/10	x	x		Regulator concurrence; electronic in Army's review (for signature)	
2	Draft Soil Removal Work Plan, LHAAP-03	7/15/10	x		Draft Final	7/29/10	x	x		In Army's review	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x	x	Final	7/29/10	x	x		In regulatory review.	
4	Final Feasibility Study Addendum,, LHAAP-16	3/31/10	x	x						Submitted 3/31/10	
5	Draft Proposed Plan, LHAAP-16	4/30/10	x		Draft Final	7/21/10	x	x		Comments resolved	
6	Final Feasibility Study, LHAAP-17	4/28/10	x	x						Submitted 4/28/10	
7	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
8	Draft Final Feasibility Study, LHAAP-18/24	5/13/09	x	x	Final	07/30/10	x	x		Draft final in regulatory review as of 5/13/10	

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
July 20, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	Remarks
9	Final Feasibility Study, LHAAP-29	04/30/09	x	x						Submitted 4/30/10	
10	Draft Proposed Plan, LHAAP-29	5/21/10	x		Draft Final Proposed Plan, LHAAP-29	7/30/10	x	x		In Army review	
11	Draft Record of Decision, LHAAP-46	04/30/10	x		Draft Final Record of Decision, LHAAP-46	7/23/10	x	x		In Army review	
12	Draft Final Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Final	TBD	x	x		In regulatory review as of 4/16/10	On Board Meeting July 20, 2010 in Dallas, TX with all stakeholders
13	Draft Final Record of Decision, LHAAP-49	6/17/10	x	x	Final	7/23/10				In regulatory review	
14	Draft Record of Decision, LHAAP-50	05/7/10	x		Draft Final	7/29/10	x	x		In Army review	
15	Draft Record of Decision, LHAAP-58	05/14/10	x		Draft Final	7/29/10	x	x	In progress	In Army review	
16	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	7/22/10	x	x	In progress	Addressing final regulatory comment	
17	Draft Final Record of Decision, Pistol Range	6/17/10	x							In regulatory review	

LONGHORN ARMY AMMUNITION PLANT,

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE:	Thursday, 17 August 2010
TIME:	2:00 p.m.
PLACE:	Caddo Lake National Wildlife Refuge Office Conference Room Teleconference, Call-in-Number Courtesy of Shaw: 866-797-9304/4155734

Welcome **RMZ**

Action Items

Shaw

- Review GWTP permit language regarding release of treated water to storage or stream

Defense Environmental Restoration Program (DERP) PBC Update **PS/GJ**

- Document Status/Environmental Sites (Table)
- LHAAP-47 update
- Response to Comments on multiple Proposed Plans
- Records of Decision
- INF Pond liner repair
- Groundwater Treatment Plant

DERP Total Environmental Restoration Contract Update **RMZ**

- LHAAP-37/67 – RTCs and Final ROD Status
- Remaining TERC Recordations

BRAC-Funded Environmental Restoration

- LHAAP-19 – Demolition Landfill Progress **JRL/AW**

MMRP Update

- Address EPA-TCEQ Responses to Perchlorate Memo **JRL/AW**

USFWS Update **RMZ/PB**

- Receipt of Documents for Review
- OPS and Proposed Remedies
- Transfer Issues Impact on Restoration Progress

Other Issues **RMZ**

- Sitewide Schedule Review – Critical Documents
- RAB

Adjourn

Shaw® Shaw Environmental, Inc.

Subject:	**Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**US Fish & Wildlife Service Caddo Lake National Wildlife Refuge Offices, Karnack, Texas**
Date of Meeting:	**August 17, 2010; 2:00 PM – 4:00 PM**

Meeting Participants:

BRAC:	Rose M. Zeiler
USAEC:	Matthew Mechenes, Andrew Maly
USACE-Tulsa:	Aaron Williams
Shaw:	Praveen Srivastav, Susan Watson, Kay Everett
USEPA Region 6:	Steve Tzhone, Terry Burton (phone)
TCEQ:	Fay Duke, Dale Vodak
USFWS:	Paul Bruckwicki, Mark Williams, Barry Forsythe
USGS:	Kent Becher

Welcome **Rose M. Zeiler**

Action Item Status:

Shaw

- Review GWTP ROD language regarding release of treated water to storage or stream - Praveen Srivastav mentioned that the requirement for storage of the effluent water is not defined in the ROD, but effluent levels are established and are based on the amount of flow in the creek at the time of discharge. A couple of the discharge parameters are usually exceeded when there is no flow in the creek since they are calculated based on the amount of flow in the creek. Thus, the lined INF pond has been used as a temporary storage for the effluent water when there is no flow in the creek. Before the effluent is diverted to the INF pond, it is sampled. Rose indicated that the pond is part of the next proposed transfer to USFWS and noted that Army was considering retaining the pond so that its continued use by the contractor was not an issue. Rose directed a question to USFWS if there were any concerns about the pond. There was some discussion and it was agreed that the liner is intended to prevent a release to groundwater and there is no reason to suspect that it is not functioning as intended with the possible exception of the perimeter that has been exposed. She also noted that Shaw will make repairs to the soil cover where the liner is exposed. Paul Bruckwicki indicated the liner is exposed all the way around. Paul said that if there is any way it can be verified that the liner has not been affected, since it has been exposed, then the USFWS will feel more comfortable. Paul also asked about the life expectancy of the liner. No response was provided to the question.

Defense Environmental Restoration Program (DERP) PBC Update **Praveen Srivastav**

Document Status/Environmental Sites
Praveen Srivastav went over the document status/environmental sites table.

- LHAAP-02: TCEQ is reviewing the final Decision Document and expect to send a concurrence letter soon.
- LHAAP-03: The draft work plan for soil removal is in Army's review.
- LHAAP-04: The Draft Completion Report for LHAAP-04 is in Army review.
- LHAAP-16: The Proposed Plan document for LHAAP-16 was submitted to the TCEQ and USEPA on July 20. Received TCEQ's comments and EPA will submit their comments shortly.
- LHAAP-17: The preliminary draft ROD is in preparation. The response to CLI comments received during the public comment period was submitted for review.
- LHAAP-18/24: Responses on the Draft (Final) Feasibility Study are being resolved. EPA and TCEQ comments were received August 5 and comments are currently being addressed. LHAAP-29: The Draft Proposed Plan is in comment resolution with the Army.
- LHAAP-46: The Draft Record of Decision is in progress with comment resolution with the Army.
- LHAAP-47: The Draft Final Feasibility Study for LHAAP-47 is in progress. Currently field investigations are being conducted as required by the regulators including installation of new wells, DPT soil sampling, and groundwater sampling.
- LHAAP-49/PR: The Final ROD for LHAAP-49 is in preparation. Comment responses to TCEQ and EPA are in the final phases. The Final RODs are expected to be submitted later in the day of the meeting. Rose will send a tracked-changes and a clean copy of the documents to the regulators. Fay said that there may be a hold up at her management in getting concurrence for the LHAAP-49 ROD. Steve said that typically EPA does not sign RODs without TCEQ's concurrence but he does not foresee a problem with LHAAP-49 that will hold up the Final ROD.
- LHAAP-50: Army comments to the preliminary Draft ROD is in progress.
- LHAAP-58: Army comments to the preliminary Draft ROD is in progress.
- LHAAP-35/36: The Final Decision Document is in progress with addressing final regulatory comment.

LHAAP-47
Early results from some of the groundwater samples collected at LHAAP-47 have started coming in from the field work. The southeast corner of LHAAP-47 still does not show any detections. The west side at 47DPT02, TCE was detected in the first water. This temporary well was co-located with an existing well that has been dry during sampling events attempted through the last several years. Results received so far have been consistent with historical data. Samples from 47DPT03 and 47DPT05 showed results of 12.5 U ug/L for TCE, indicating that the reporting limits were high and greater than the MCL of 5 ug/L. Shaw will investigate and report back why the reporting limits were high and if lower limits can be achieved.

Soil sampling around Building 25-D at LHAAP-47 has also been completed. Results are pending.

Response to Comments on Multiple Proposed Plans
Responsiveness summaries are in review.

Records of Decision
This was addressed above.

INF Pond Liner Repair
This was discussed above. Preparations are underway to repair the liner.

Groundwater Treatment Plant
The plant is running normally at about 40 gpm. The amount of water processed is lowered during the weekend and then increased during the week. All pumps are working at full capacity.

DERP Total Environmental Restoration Contract Update

LHAAP-37/67 – RTCs and Final ROD Status
Signature and concurrence has been completed. Copies will be provided to Fay and Steve.

Remaining TERC Recordations
Army received approval on the deed recordations.

BRAC-Funded Environmental Restoration

LHAAP-19 – Demolition Landfill Progress
The closure report has been completed but the final deed recordation documentation needs to be performed.

MMRP Update

Address EPA- TCEQ Responses to Perchlorate Memo
The discussion is ongoing.

USFWS Update

Receipt of Documents for Review
Paul Bruckwicki said that he was not having any problems receiving the environmental documents for the installation.

OPS and Proposed Remedies
This was not discussed.

Transfer Issues Impact on Restoration Progress
Steve indicated that EPA and CLI met on August 16. TCEQ was also present at the meeting. Steve said that EPA management wants to know if a joint transfer update meeting can be held for the public with EPA, with the Army and USFWS present. Rose reiterated that the RAB meetings are for environmental restoration and should not be driven into transfer issue or politics. A separate meeting for transfer issues can be conducted after the RAB, but not jointly. It is against the RAB rules. CLI has requested documents in process that EPA receives. Steve indicated that it is EPA's policy not to distribute draft documents to the public.

Rose indicated that she sent letters to both Marshall and Uncertain mayors with information on the RAB. She suggested that perhaps the public does not understand that when any property gets transferred, the Army still retains liability.

Steve informed the group that CLI has been awarded a technical advisory grant (TAG). EPA management indicated that CLI's participation in the RAB meetings is an appropriate mechanism for input into the environmental restoration program. Monthly managers' meetings will remain Army, TCEQ and EPA with USFWS in attendance. EPA may have separate technical meetings with CLI.

Other Issues

Site-wide Schedule Review – Critical Documents
Terminology needs to be re-aligned according to primary document versions. According to the FFA, there is an extra 30 days for dispute resolution. The EPA and TCEQ decided that an extra 30 days for dispute resolution is not necessary, therefore conformance with the FFA will not be implemented. The schedule will not be revised. It was decided that Shaw will submit a preliminary draft document for Army's review. Upon comment resolution, a draft document will be submitted to regulators. This document will become final after regulatory review and comment resolution.

In order to expedite schedule, the draft final version of brief documents such as proposed plans and RODs may be a tracked-change document submitted in electronic format.

Schedule
Steve indicated that he needs to submit enforceable schedule for FY11 by September 9, 2010. The Army should provide their FY11 commitments as soon as possible.

RAB
Aaron has tracked changes to the RAB charter and will show proposed changes to the RAB for discussion. Nine new RAB members will be seated at the RAB meeting this evening.

IAP Comments
There was nothing new to discuss.

Paul asked about the remaining waste piles of railway ties located in several areas. He indicated they were planning a burn in early November and was concerned about the public hazard regarding these piles catching fire since some are either in or near a burn designated area. The Army said they would check into the status of the contract for removal of the ties.

Action Items

Army

- Provide update on the sampling of two sumps at LHAAP-65.

  Provide FY11 schedule to EPA

Shaw

- Provide information on the high reporting limits for TCE at 47DPT03 and 47DPT05

Meeting Adjourned

Next meeting is set for September 21, 2010 as a teleconference.

00098331

LONGHORN ARMY AMMUNITION PLANT
MONTHLY MANAGERS' MEETING

Location	Longhorn Army Ammunition Plant		
Date	17-Aug-2010	**Time**	2:00 PM

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
Longhorn Team Members				
Rose M. Zeiler		BRAC	(479) 635-0110	rose.zeiler@us.army.mil
Matthew Mechenes		USAEC	(410) 436-1505	matthew.mechenes@us.army.mil
Aaron Williams		USACE, Tulsa	(918) 669-4915	aaron.k.williams@usace.army.mil
John Lambert		USACE, Tulsa	(918) 669-4992	john.r.lambert@SWT03.usace.army.mil
Stephen Tzhone		USEPA, Dallas	(214) 665-8409	tzhone.stephen@epa.gov
Terry Burton	On phone	USEPA, Dallas	(214) 665-7139	Burton.Terry@epa.gov
Raji Josiam		USEPA, Dallas	(214) 665-8529	josiam.raji@epa.gov
Fay Duke		TCEQ, Austin	(512) 239-2443	fduke@tceq.state.tx.us
Dale Vodak		TCEQ, Tyler	(903) 535-5147	dvodak@tceq.state.tx.us
Barry Forsythe		USFSW, Dallas	(214) 665-8467	forsythe.barry@epa.gov
Paul Bruckwicki		USFSW, Karnack	(903) 679-4536	paul_bruckwicki@fws.gov
Mark Williams		USFSW, Karnack	(903) 679-9144	mark_williams@fws.gov
Praveen Srivastav		SHAW, Houston	(281) 531-3188	praveen.srivastav@shawgrp.com
Susan Watson		SHAW, Houston	(281) 531-3107	susan.watson@shawgrp.com
Kay Everett		SHAW, Houston	(281) 531-3121	kay.everett@shawgrp.com
Andrew Maly		USAEC	210 424 8826	andrew.maly@us.army.mil
Kent Becher		USGS	(817)253-0346	KDbecher@usgs.gov

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
August 17, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
1	Final Decision Document, signedLHAAP-02	8/03/10	x	x	Final (signed and with Appendix A-concurrence letter)	8/24/10	x	x		Awaiting concurrence letter from TCEQ to insert in FINAL document	
2	Draft Soil Removal Work Plan, LHAAP-03	7/15/10	x		Draft Final	09/2/10	x	x		In Army's review	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x	x	Final	8/30/10	x	x		In regulatory review.	
4	Draft Proposed Plan, LHAAP-16	4/30/10	x		Final	9/20/10	x	x		Comments resolved; DF shipped to regulators 7/20/10	
5	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
6	Preliminary Draft Record of Decision, LHAAP-17	8/30/10	x							In preparation	
7	Draft (Final) Feasibility Study, LHAAP-18/24	5/13/09	x	x	Draft Final	08/30/10	x	x		Received EPA and TCEQ comments as of 8/5/10	Addressing comments to send by 8/20/10
8	(Preliminary) Draft Proposed Plan, LHAAP-29	5/21/10	x		Draft Proposed Plan	8/30/10	x	x	In progress	Received Army comments; DRAFT to regulators under preparation	

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
August 17, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
9	(Preliminary) Draft Record of Decision, LHAAP-46	04/30/10	x		**Draft** Record of Decision, LHAAP-46	8/30/10	x	x	In progress	Army comments received 8/10/10; resolution in progress	
10	Draft (Final) Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Draft to regulators	9/15/10	x	x	In progress. On Board Meeting July 20, 2010 in Dallas, TX with all stakeholders.	Currently field investigations in progress as required by regulators. Installing wells, and DPT soil and groundwater sampling	
11	Draft Final Record of Decision, LHAAP-49	6/17/10	x	x	Final	9/15/10	x	x	In progress	TCEQ comments received 7/29/10; EPA comments received 8/3/10	
12	(Preliminary) Draft Record of Decision, LHAAP-50	05/7/10	x		Draft	8/30/10	x	x	In progress	Army comments received. Currently resolving.	8/5/10
13	(Preliminary) Draft Record of Decision, LHAAP-58	05/14/10	x		Draft	8/30/10	x	x	In progress	Army comments received. Currently resolving.	8/5/10
14	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	9/15/10	x	x	In progress	Addressing final regulatory comment	
15	Draft Final Record of Decision, Pistol Range	6/17/10	x		Final	9/15/10			In progress	TCEQ comments received 7/29/10; EPA comments received 8/3/10	

Perchlorate Results for Creek Sampling

Longhorn Army Ammunition Plant, Karnack, Texas

Creek Sample ID	May 2007	Aug 2007	Dec 2007	Mar 2008	Jun 2008	Sep 2008	Dec 2008	May 2009	July 2009	Aug 2009	Sep 2009	Dec 2009	Mar 2010	Jun 2010
GPW-1	1U	0.5U	10.7	27	0.5U	0.5U	0.22U	16	4U	Not Sampled	1.2U	3.7	1.3J	0.6U
GPW-3	1U	0.5U	7.48	21.9	9.42	1.1	0.22U	8.9	4U	Not Sampled	0.6U	2.8	1.8J	0.6U
HBW-1	1U	122	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	Not Sampled	1.5U	0.275U	1.5U	0.6U
HBW-7	1U	1.02	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	24*	1.2U	0.275U	1.5U	0.6U
HBW-10	1U	0.5U	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	Not Sampled	1.5U	0.275U	1.2U	0.6U

NOTES:

all units in micrograms/liter (µg/L)

U undetected

J approximate value present below normal reporting limit

GP is Goose Prairie Creek

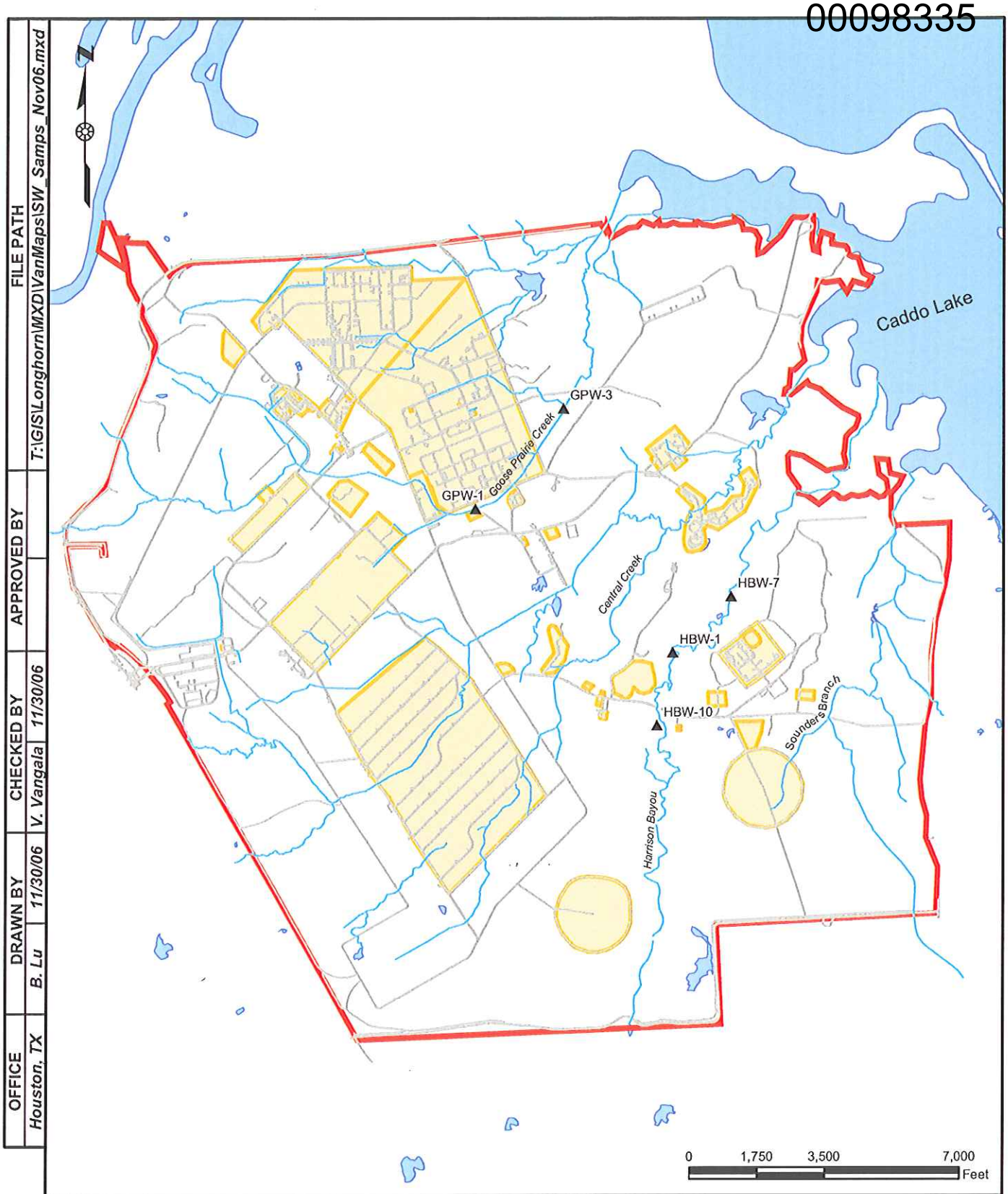
HB is Harrison Bayou

W is surface water

* Special sample taken during GWTP shutdown

June Conditions: Good flow at HBW1, HBW7, and HBW10; Slow flow at GPW1 and GPW3.

00098335



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Plot Date: 11/06

Legend

- ▲ Surface Water Sampling Location
- Stream
- Road
- Site
- Lake

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TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1

SURFACE WATER SAMPLING LOCATION

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

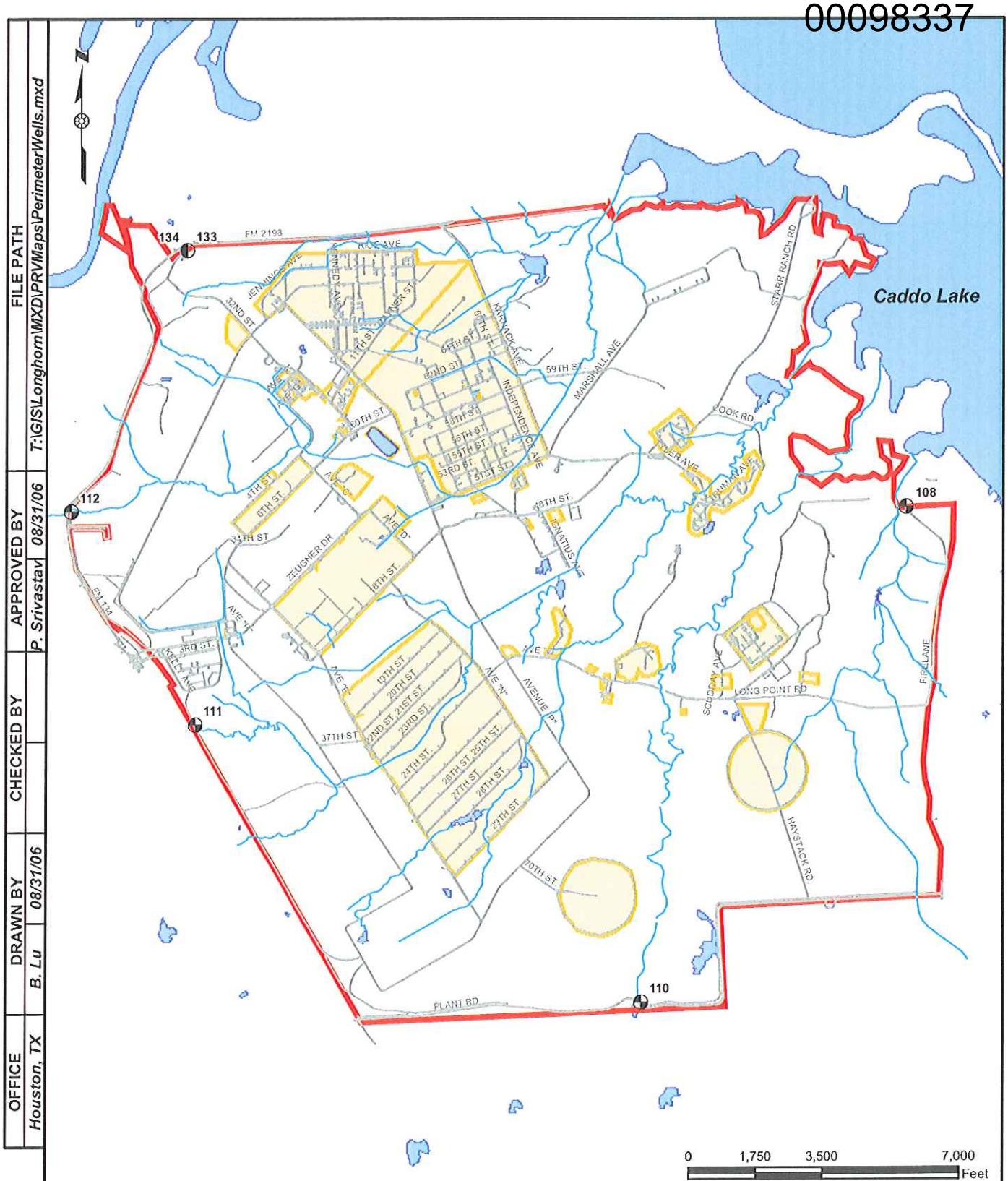
Perchlorate Results for Perimeter Well Sampling
Longhorn Army Ammunition Plant, Karnack, Texas

Well ID	Sep 2004	Dec 2004	Jun 2005	Sep 2005	Sep 2006	May 2007	Aug 2007	Dec 2007	Mar 2008	Sep 2008	May 2009	Sep 2009	Mar 2010
LHPMW108					10 U		0.5U			2.5 U		1.2U	
LHPMW110					10 U		10U			5.0 U		6.0U	
LHPMW111					4 U		0.5U			0.5 U		0.30U	
LHPMW112					5 U		3U			2.0 U		0.30U	
LHPMW133	0.542 JL	0.528	0.541	0.597	1.08	1 U	1.09	0.5 U	0.5 U	0.5 U	0.47 J	0.32J	0.30U
LHPMW134	0.809 JL	0.821	0.811	0.725	0.708 J	1 U	0.949 J	0.5 U	0.5 U	0.829 J	0.40 J	0.30U	0.30U

NOTES:
all units in µg/L

µg/L migrograms/liter
U undetected
J Present below normal reporting limit but greater than or equal to the MDL and the concentration is an approximate value.
L Result biased low.
MDL method detection limit

00098337



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Houston, TX	B. Lu	08/31/06		P. Srivastav	08/31/06	T:\GIS\Longhorn\MXD\PRVMaps\PerimeterWells.mxd

Plot Date: 08/06

Legend

- Shallow Perimeter Well
- Intermediate Perimeter Well
- Stream
- Road
- Site
- Lake/Pond
- LHAAP Approximate Boundary

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U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1

PERIMETER WELL LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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

August 4, 2010

Distribution (one copy each)

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Karnack, Texas 75661

Dear LHAAP RAB Member,

The next Restoration Advisory Board (RAB) meeting will be held on Tuesday, August 17, 2010, from 6:30 to 7:30 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661. We hope that you can attend this meeting. If you have any questions, please do not hesitate to contact me.

Shaw Environmental, Inc. (Shaw) is the contractor supporting the U.S. Army environmental restoration activities at the Longhorn Army Ammunition Plant (LHAAP), and will be coordinating the RAB meeting. A tentative agenda for the meeting is attached.

Regards,

Rose M. Zeiler

Dr. Rose Zeiler
Department of the Army
Longhorn Army Ammunition Plant
Box 220
Ratcliff, Arkansas 72951

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

AGENDA

DATE:	Tuesday, August 17, 2010
TIME:	6:30 – 7:30 PM
PLACE:	Karnack Community Center, Karnack, Texas

06:30 Welcome {RMZ & PF}

06:35 Open items {RMZ}
- New Members
- Charter Revision
- Comments on Proposed Plans

06:40 Programmatic Issues

06:45 Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update {Shaw}
- -Documents Status/ Environmental Sites
- -Groundwater Treatment Plant (GWTP) Update
- -LHAAP-04, LHAAP-17, LHAAP-47, and LHAAP-50 Field Work

06:55 DERP Total Environmental Restoration Contract Update {RMZ}
- -LHAAP-35B(37) and LHAAP-67

07:05 Military Munitions Response Program (MMRP) Update {USACE}

07:15 Other Environmental Restoration Issues/Concerns {RMZ)
- -Construction Debris Landfill
- - Upcoming Meetings

07:20 Transfer Update
- -Transfer status of Site 12
- -ECOP VI

07:30 Adjourn {RMZ}

Shaw® Shaw Environmental, Inc.

Subject:	**Draft Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Karnack Community Center, Karnack, Texas**
Date of Meeting:	**August 17, 2010, 6:30 – 07:30 PM**

Meeting Participants:

LHAAP/BRAC	Rose M. Zeiler
USACE-Tulsa:	John Lambert, Aaron Williams
USAEC:	Matt Mechenes, Andrew Maly
Shaw Environmental:	Praveen Srivastav, Kay Everett, Susan Watson
TCEQ:	Fay Duke
USEPA Region 6:	Steve Tzhone
USFWS:	Mark Williams, Paul Bruckwicki
USGS:	Kent Becher
RAB:	**Present:** Paul Fortune, Nigel Shivers, Tom Walker, Judith Johnson, Robert Cargill, W. Lee Guice, Kenneth Burkhalter, Jim Lambright, Richard LeTourneau, Judy VanDeventer, Carol Fortune **Absent:** Ted Kurz and Charles Dixon.
Community:	Richard and Pam Martinez, Richard Pruitt, Rick Lowerre, E.V. Wilson, Pickens Winters

An agenda for the RAB meeting was distributed prior to the meeting.

Welcome – Rose Zeiler and Paul Fortune
Paul Fortune called the meeting to order.

Open Items – Rose Zeiler
RAB Membership

New RAB members were approved by Tom Lederle, Army BRAC. Those in attendance were Carol Fortune, Judy VanDeventer, Lee Guice, Richard LeTourneau, Robert Cargill, Ken Burkhalter, and Jim Lambright. Also new to the RAB but unable to attend tonight's meeting are Ted Kurz and Charles Dixon. The new members were selected by the RAB members in accordance with the RAB Charter. Now that the RAB has expanded, it was suggested that a membership committee be established. There was a show of hands that agreed 3 members would be enough to be on a membership committee. Paul nominated Judy VanDeventer, Judy Johnson, and Carol Fortune to be on the committee. A majority of the RAB members agreed with the proposal and the motion was seconded. Judy VanDeventer, Judy Johnson, and Carol Fortune were elected as the RAB membership committee.

RAB Charter Revision

Changes to the RAB Charter are being reviewed and a revised Charter was provided to the RAB members so that they can identify, discuss, or suggest any additional changes that they would make to their Charter. At the next RAB meeting, the members will go over any changes and will vote on the revisions. Basically, the RAB is funded by the Army and one of the RAB's functions is to provide community awareness between the regulatory agencies and the community regarding environmental releases or history. The meetings themselves are open to the public. RAB members can answer questions to the community with confidence and have input into how the information is disseminated. Rose asked RAB members if a more technical format was wanted and to what degree. A discussion followed that favored more technical meetings but with more discussions explaining the technical aspects.

Paul asked about the TRC meetings that were conducted more than 5 years ago before the RAB was formed. These meetings were held on the base and were open to the public. He indicated that in just the last few years a number of activities have been going on at LHAAP, and it seemed to him some of these issues were not resolved. Paul asked U.S. Fish and Wildlife Service if they could provide an overview of the environmental history of Longhorn. Paul Bruckwicki agreed to do so at the next RAB.

A discussion regarding history of contamination at various sites and regular restoration plans ensued. The IAP website will be provided after the required Army reviews have been completed.

Comments on Proposed Plans

It was asked if there are any questions regarding the comment responses to CLI and Paul Fortune that were made. There were no questions.

Programmatic Issues

Nothing was discussed on EPA/TCEQ/DoD Policy issues.

Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update–Shaw

Document Status/Environmental Sites

Praveen Srivastav distributed copies of the document status table and discussed each site.

- Praveen indicated that the LHAAP-02 is a no further action site as there is no soil contamination; however, groundwater would be monitored. The final decision

document is in regulatory review awaiting state concurrence. Praveen explained that the site is a former parking lot within LHAAP-58, and soil samples were collected in the ditches surrounding the parking lot for metals.

- A soil removal work plan for LHAAP-03 is in Army review. Praveen indicated that LHAAP-03 was a former waste storage pad for a drum of waste paint. It is also located within LHAAP-58.
- The Draft Final Completion Report for LHAAP-04 is in regulatory review. This site is across from the Fire Station and was a former wastewater treatment area. Rose said that excavation activities for removal of contaminated perchlorate soil were going on during the Refuge opening last fall. Groundwater concerns are still being addressed, and it is proposed to install two more groundwater monitoring wells for this site.
- The Draft Final Proposed Plan for LHAAP-16 is in regulatory review. Hard copies and electronic copies of the FS are available.
- The Final Proposed Plan was submitted in May and the Public Meeting for the Final Proposed Plan for LHAAP-17 was held on June 29, 2010. Public comments to the Proposed Plan are being addressed and will be submitted soon. The preliminary draft Record of Decision for LHAAP-17 is in preparation. LHAAP-17 was a burning ground where waste materials were taken and burned. There is contamination in the soil and groundwater.
- Regulatory comments have been received on the Draft Final FS for LHAAP-18/24. Comment responses are in preparation. Historical operations indicated that wastes were brought here for disposal from other areas of the installation. An interim remedy to keep water from migrating was implemented at this site; the current extraction system and groundwater treatment plant.
- The FS has been finalized for LHAAP-29. This site was the TNT manufacturing area which consisted of 5 to 6 production lines. Army comments have been received on the Draft Proposed Plan for LHAAP-29 and a draft to regulators is in preparation.
- The Final Record of Decision (ROD) for LHAAP-46, Plant 2 Area, is in comment resolution with the Army.
- The Draft Final FS for LHAAP-47 is being revised. As required by regulators, field investigations are currently in progress. New data will be incorporated into the FS with a draft to regulators after field work has been completed and data received.
- Regulatory comments are being addressed for the Draft Final ROD for LHAAP-49. LHAAP-49 was used as an acid storage facility. It is the site where the huge saddles are remaining, which is where the storage tanks used to be. Paul Fortune asked if the mercury issue was resolved. USFWS said it had not. It was again reiterated that it has been resolved to TCEQ's and EPA's satisfaction.
- The preliminary Draft ROD for LHAAP-50 is in comment resolution with the Army. LHAAP-50 was a wastewater storage facility. Contamination is in the soil and groundwater.
- The preliminary Draft ROD for LHAAP-58 is in comment resolution with the Army.
- The final regulatory comment is being addressed for the Draft Final Decision Document for LHAAP-35/36. This site contains several sumps across LHAAP.
- Regulatory comments are being addressed for the Draft Final ROD for the Pistol Range.

Groundwater Treatment Plant (GWTP) Update
The GWTP has been operating normally since the last update. The GWTP has been removing more mass as the system is being optimized and increasing extraction rates.

LHAAP-04, LHAAP-17, LHAAP-47, and LHAAP-50 Field Work
These sites were discussed during the document status presentation and the schedule is as shown on the handout.

Perimeter Well/Surface Water Sampling Update
Questions regarding the historical sampling at the perimeter well/surface water sampling program were raised. The full suite of constituents was sampled at the perimeter wells and surface water (creek) locations for many years until about 4 years ago when all constituents, except perchlorate, were dropped because only perchlorate was required by the Dispute Resolution and because the results for the other constituents were either below laboratory detection limits or below the MCL. Perchlorate is the only constituent being sampled at the perimeter wells and designated surface water (creek) locations at the present time. The historical groundwater data is available in the Administration Record for LHAAP. Creek sample points were selected based on downgradient association with an environment site. Aaron Williams said he would look into it.

DERP Total Environmental Restoration Contract (TERC) Update – Rose Zeiler
LHAAP-35B(37) and LHAAP-67
The ROD for sites LHAAP-37 and -67 has been signed. The next phase is the development of the Remedial Design for MNA.

Military Munitions Response Program (MMRP) Update – USACE
Aaron briefly discussed that the MMRP sites, LHAAP-27 and -54. If you look at a map, these sites are the big circles. These are the open burning/open detonation areas where rocket motors were fired off. He mentioned that the areas are signed to say "no dig". He discussed the procedures such as gridding and the steps taken during the clearing phase of a site impacted with munitions.

Other Environmental Issues
Construction Debris Landfill
This is a 7-acre landfill that contains transite, concrete, debris, etc. and was capped. Although they do not have complete records from the period the landfill operated, friable asbestos was taken off site for appropriate disposal during the building demolition activities. At the present time, the landfill cap has been inspected, approved, and restoration of native grasses is being established. It is not an NPL site.

Upcoming Meetings
Rose asked the RAB what members wanted to see more of or what kind of information and how it is presented to them. She reminded everyone to look over the RAB charter and think about how often the group wants to meet. Tentatively scheduled every other month and additional meetings can be added if needed.

Rick Lowerre with Caddo Lake Institute indicated that CLI has just received grant money from EPA that would help with technical reviews. He said that this was for the community, and they would like someone from the community to be the main technical assistant. He discussed setting up a website where maps and meeting minutes would be available on the web for reference. Much of this information is found in the Administrative Record for Longhorn and is housed at the Marshall Public Library.

Transfer Update

Transfer Status of Site 12
Nothing was discussed.
ECOP VI
Nothing was discussed.

The next RAB meeting is scheduled for October 19, 2010.

Adjourn

August Meeting Attachments and Handouts:

- *Status of Technical Documents PBC*
- *Meeting Agenda*
- *Fact Sheet for LHAAP-47*
- *Perimeter Well/Surface Water (Creek) sample location maps and tables*

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Longhorn Army Ammunition Plant
Restoration Advisory Board Meeting

Location	Karnack Community Center, Karnack, Texas
Date	17-Aug-2010 6:30 PM **page 1 of 2**

Please sign in the space provided or add your name and address on next page if your name does not appear below.

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Longhorn Army Ammunition Plant
Restoration Advisory Board Meeting

Location	Karnack Community Center, Karnack, Texas
Date	17-Aug-2010 6:30 PM **page 2 of 2**

Please provide your address for future mailings or information.

ATTENDEES

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Andrew Mahy		USAEC, FSH, TX	210 424 8829	andrew.mahy@us.army.mil

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
August 17, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
1	Final Decision Document, signedLHAAP-02	8/03/10	x	x	Final (signed and with Appendix A-concurrence letter)	8/24/10	x	x		Awaiting concurrence letter from TCEQ to insert in FINAL document	
2	Draft Soil Removal Work Plan, LHAAP-03	7/15/10	x		Draft Final	09/2/10	x	x		In Army's review	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x	x	Final	8/30/10	x	x		In regulatory review.	
4	Draft Proposed Plan, LHAAP-16	4/30/10	x		Final	9/20/10	x	x		Comments resolved; DF shipped to regulators 7/20/10	
5	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
6	Preliminary Draft Record of Decision, LHAAP-17	8/30/10	x							In preparation	
7	Draft (Final) Feasibility Study, LHAAP-18/24	5/13/09	x	x	Draft Final	08/30/10	x	x		Received EPA and TCEQ comments as of 8/5/10	Addressing comments to send by 8/20/10
8	(Preliminary) Draft Proposed Plan, LHAAP-29	5/21/10	x		Draft Proposed Plan	8/30/10	x	x	In progress	Received Army comments; DRAFT to regulators under preparation	

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Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
August 17, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
9	(Preliminary) Draft Record of Decision, LHAAP-46	04/30/10	x		**Draft** Record of Decision, LHAAP-46	8/30/10	x	x	In progress	Army comments received 8/10/10; resolution in progress	
10	Draft (Final) Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Draft to regulators	9/15/10	x	x	In progress. On Board Meeting July 20, 2010 in Dallas, TX with all stakeholders.	Currently field investigations in progress as required by regulators. Installing wells, and DPT soil and groundwater sampling	
11	Draft Final Record of Decision, LHAAP-49	6/17/10	x	x	Final	9/15/10	x	x	In progress	TCEQ comments received 7/29/10; EPA comments received 8/3/10	
12	(Preliminary) Draft Record of Decision, LHAAP-50	05/7/10	x		Draft	8/30/10	x	x	In progress	Army comments received. Currently resolving.	8/5/10
13	(Preliminary) Draft Record of Decision, LHAAP-58	05/14/10	x		Draft	8/30/10	x	x	In progress	Army comments received. Currently resolving.	8/5/10
14	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	9/15/10	x	x	In progress	Addressing final regulatory comment	
15	Draft Final Record of Decision, Pistol Range	6/17/10	x		Final	9/15/10			In progress	TCEQ comments received 7/29/10; EPA comments received 8/3/10	

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FACT SHEET – Investigation and Risk Assessment Summary
LHAAP – 47 Plant 3 Area

Revised August 10, 2010

Site History: LHAAP-47 covers approximately 275 acres and is located in the north-central portion of LHAAP. Rocket motors were produced from 1954 to the early 1980s. The rocket motor production facilities were converted to produce pyrotechnic and illumination devices; this operation continued until 1997. Industrial solid wastes and possibly hazardous wastes such as parts cleaners and spent solvents may have been generated by these activities.

Site Characteristics: LHAAP-47 is a mixture of asphalt paved roads, parking areas, building foundation remnants, old buildings, and areas overgrown with grass and trees. The topography in this area is relatively flat with the surface drainage flowing into tributaries of Goose Prairie Creek, which discharges into Caddo Lake. The groundwater at LHAAP-47 is divided into three zones: shallow, intermediate and deep. The shallow and intermediate groundwater zones are interconnected over much of the site and several wells have been designated as shallow/intermediate wells. In some areas they are separated by a clay layer, whereas in other areas no clay layer is present. The wells in the shallow zone range from 12.5 to 35.5 feet below ground surface (bgs); wells designated as shallow/intermediate range from 25 to 51.7 feet bgs; wells in the intermediate zone range from 42 to 64.5 feet bgs; wells in the deep zone range from 83 to 95 feet bgs. The groundwater flow direction is to the northeast.

Summary of Investigation Activities: Investigations were conducted by several contractors and US Army Corp of Engineers from 1984 through 2009. Based on the findings of each investigation, more sampling was performed to further evaluate the nature and extent of contamination in the soil, sediment, surface water and groundwater. Each investigation was approved by TCEQ and USEPA. Samples have been analyzed for metals, cyanide, volatile organic compounds (VOCs), semi-volatile organic compounds, explosives, anions, pesticides/PCBs, metals and/or dioxins and furans. Between 2000 and 2002, additional samples were collected for the analysis of perchlorate in both the soil and groundwater. Surface water samples were also collected from Goose Prairie Creek for perchlorate analysis to check for potential perchlorate migration to Goose Prairie Creek. In summary, more than 550 soil/sediment samples have been collected from depths ranging from the surface to 10 feet bgs to evaluate and delineate soil and sediment contamination. The shallow and intermediate zones are interconnected over a wide area and the two groundwater zones have been treated as one combined groundwater zone called the shallow/intermediate zone. Several monitoring wells were installed in the groundwater zones (48 shallow wells, 10 shallow/intermediate wells, 6 intermediate wells, and 3 deep wells) and more than 295 groundwater samples were collected to evaluate the extent of groundwater contamination. Several areas have higher TCE concentrations within the TCE plume, including 13,300 µg/l at monitoring well 47WW25 and 6,240 µg/l at monitoring well LHSMW43, both near buildings where solvents were used. The highest perchlorate concentrations (63,600 µg/l) are found in monitoring well LHSMW60 near two buildings where rocket engines were tested. Investigations are currently ongoing (August 2010) to better define the nature and extent of contamination to support the development of alternatives for the Feasibility Study.

Investigation Findings: Samples collected from the investigation activities reported soil and groundwater contamination at LHAAP-47. The surface water samples collected from Goose Prairie Creek for perchlorate analysis have consistently been below TCEQ surface water contact recreation level and the groundwater medium specific concentration for residential use. The sample results were compared to both federal and state standards. A Baseline Human Health Risk Assessment (BHHRA) and Ecological Screening Evaluation was conducted in 2002 to evaluate risk to the hypothetical future maintenance worker and screen data to further assess if an ecological risk assessment was needed. Based on the ecological screening data, it was concluded that an ecological risk assessment was needed. A Baseline Ecological Risk Assessment (BERA) was conducted in 2007.

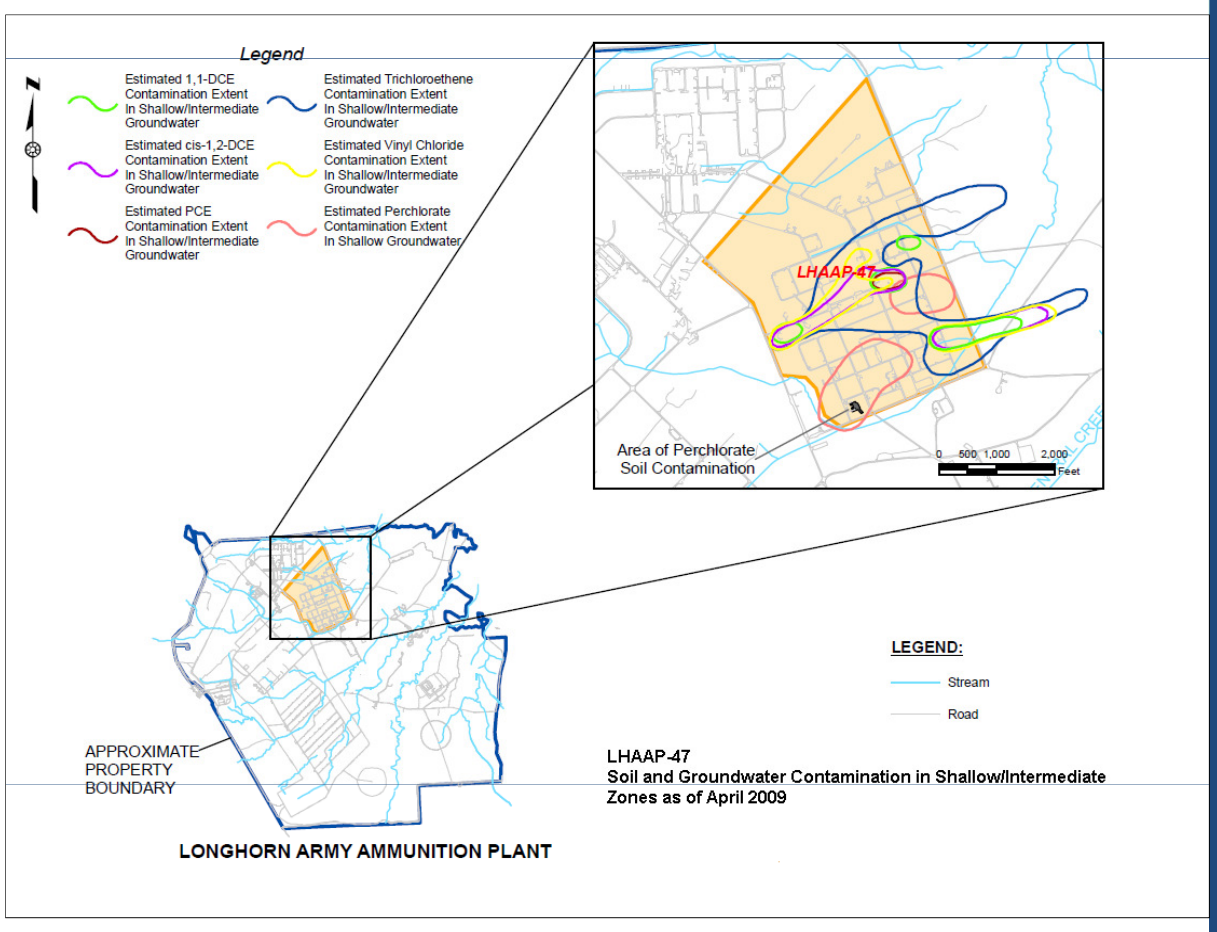
Human Health Risk Assessment: The Baseline Human Health Risk Assessment (BHHRA) was conducted for LHAAP-47 to determine current and future effects of contaminants on human health. Based on the BHHRA, it was concluded that soil does not pose any unacceptable cancer or non-cancer risk whereas the groundwater poses an unacceptable cancer risk and non-cancer hazard to a hypothetical future maintenance worker.

Ecological Risk Assessment: A Baseline Ecological Risk Assessment was conducted for LHAAP-47 to evaluate potential hazards to ecological resources. Ecological hazards were found to be within acceptable limits at LHAAP-47.

Chemicals of Potential Concern (COPCs):

Soil: Based on the BHHRA and evaluation of data collected since the BHHRA, it was determined that soil at LHAAP-47 did not pose an unacceptable risk to human or ecological receptors. Though the risk assessment identified no risk from soil, an emerging contaminant perchlorate was detected in soil at elevated levels which could be acting as a potential source for groundwater contamination. As part of an interim action in November 1999, a plastic liner material was placed over the soil contaminated with perchlorate to prevent migration of perchlorate into Goose Prairie Creek.

Groundwater: The COPCs identified in the BHHRA that contribute to a risk or hazard to the hypothetical future maintenance worker in groundwater at LHAAP-47 are perchlorate, trichloroethene (TCE), vinyl chloride (VC), 1,1-dichloroethene (1,1-DCE), chloroform, tetrachloroethene (PCE), pentachlorophenol, 1,2-dichloroethane (1,2-DCA), bis(2-ethylhexyl)phthalate, thallium, acetone, cadmium, nickel, cis-1,2-dichloroethene (cis-1,2-DCE), silver, tin, antimony, manganese, aluminum, strontium, vanadium, 2,4,6-trinitroluene (2,4-TNT), 2,4-dinitrotoluene (2,4-DNT), 2,6-DNT, 1,1,2-trichloroethane (1,1,2-TCA), 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), cobalt and chromium. The COPCs that are found to be widespread across LHAAP-47 include perchlorate, TCE, VC, 1,1-DCE, cis-1,2-DCE, and PCE and the extent as of April 2009 is indicated in the figure. The remaining COPCs have localized occurrence and are not widespread.



General Response Actions to be Evaluated:

The following general response actions that will be evaluated in the Feasibility Study:

- **No Action**: Provides a comparative baseline against which other alternatives can be evaluated.
- **Land Use Controls**: Establish access/administrative/physical controls that would eliminate/reduce access to the site
- **Removal**: Remove contaminated media or waste material to either relocate or prepare it for treatment or disposal. Some examples include excavation of soil or extraction of contaminated groundwater.
- **Long Term Monitoring**: Perform groundwater sampling to monitor groundwater for reduction in toxicity, mobility or volume of contaminated medium.
- **Monitored Natural Attenuation**: Monitors the natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions until contaminant concentrations are reduced to acceptable levels.
- **In Situ Treatment:** Addition of chemical or biological additives to soil/groundwater which modifies the physical/biological properties of the medium resulting in reduced toxicity, mobility or volume of the contaminant medium. Some examples are, in-situ chemical oxidation, permeable reactive barrier and enhanced bioremediation.
- **Ex Situ Treatment**: Provide varying levels of waste treatment following removal of waste to reduce volume, mobility or toxicity of the waste. Some examples include pump and treat systems.
- **Disposal**: Involves disposal of removed wastes at new or existing, permitted disposal facilities.

Perchlorate Results for Creek Sampling

Longhorn Army Ammunition Plant, Karnack, Texas

Creek Sample ID	May 2007	Aug 2007	Dec 2007	Mar 2008	Jun 2008	Sep 2008	Dec 2008	May 2009	July 2009	Aug 2009	Sep 2009	Dec 2009	Mar 2010	Jun 2010
GPW-1	1U	0.5U	10.7	27	0.5U	0.5U	0.22U	16	4U	Not Sampled	1.2U	3.7	1.3J	0.6U
GPW-3	1U	0.5U	7.48	21.9	9.42	1.1	0.22U	8.9	4U	Not Sampled	0.6U	2.8	1.8J	0.6U
HBW-1	1U	122	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	Not Sampled	1.5U	0.275U	1.5U	0.6U
HBW-7	1U	1.02	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	24*	1.2U	0.275U	1.5U	0.6U
HBW-10	1U	0.5U	0.5U	0.5U	0.5U	0.5U	0.22U	0.55U	4U	Not Sampled	1.5U	0.275U	1.2U	0.6U

NOTES:

all units in micrograms/liter (µg/L)

U undetected

J approximate value present below normal reporting limit

GP is Goose Prairie Creek

HB is Harrison Bayou

W is surface water

* Special sample taken during GWTP shutdown

June Conditions: Good flow at HBW1, HBW7, and HBW10; Slow flow at GPW1 and GPW3.

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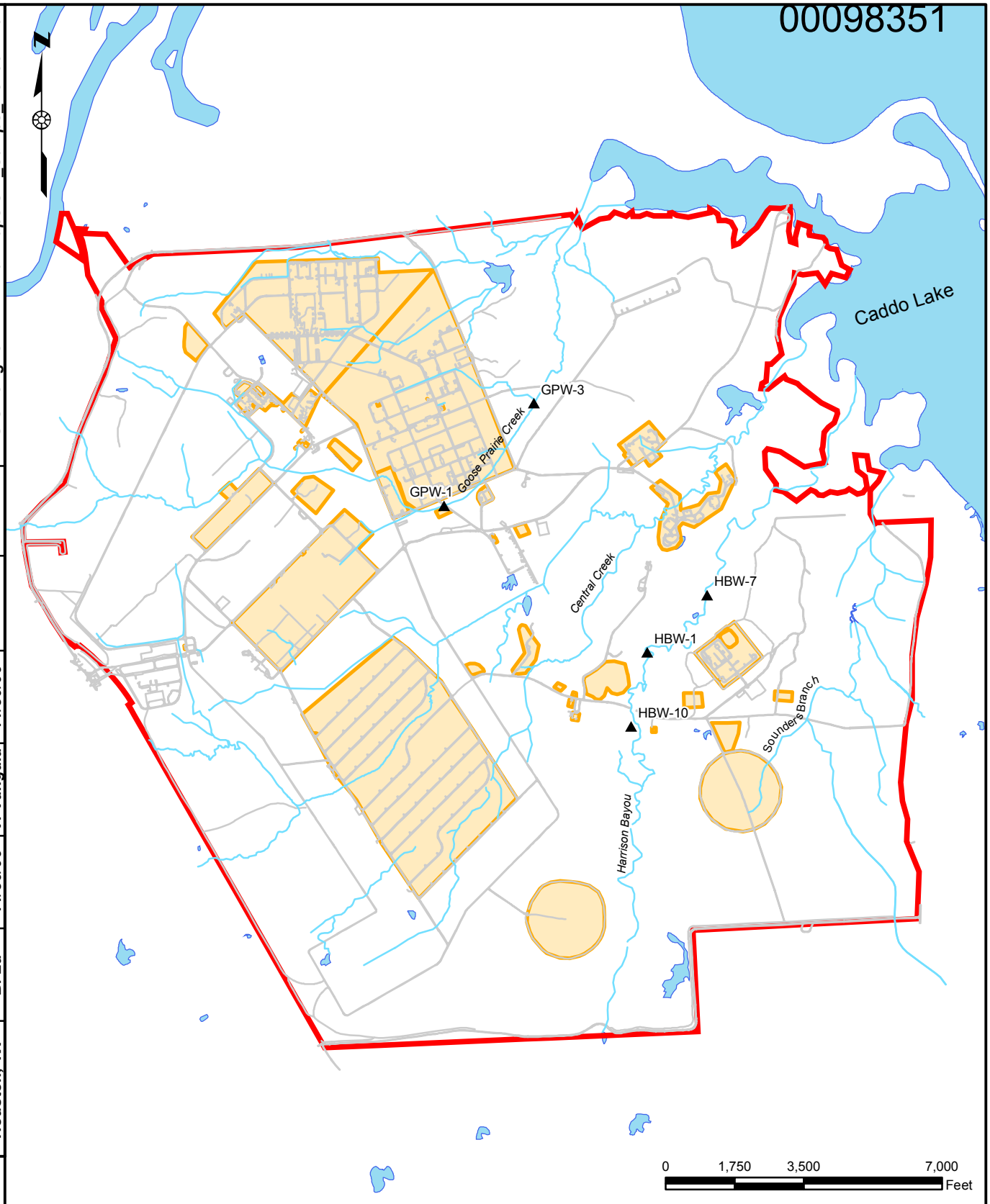

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Legend

- ▲ Surface Water Sampling Location
- Stream
- Road
- Site
- Lake

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TULSA DISTRICT
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FIGURE 1

SURFACE WATER SAMPLING LOCATION

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Plot Date: 11/06

Perchlorate Results for Perimeter Well Sampling
Longhorn Army Ammunition Plant, Karnack, Texas

Well ID	Sep 2006	May 2007	Aug 2007	Dec 2007	Mar 2008	Sep 2008	May 2009	Sep 2009	Mar 2010
LHPMW108	10 U		0.5U			2.5 U		1.2U	
LHPMW110	10 U		10U			5.0 U		6.0U	
LHPMW111	4 U		0.5U			0.5 U		0.30U	
LHPMW112	5 U		3U			2.0 U		0.30U	
LHPMW133	1.08	1 U	1.09	0.5 U	0.5 U	0.5 U	0.47 J	0.32J	0.30U
LHPMW134	0.708 J	1 U	0.949 J	0.5 U	0.5 U	0.829 J	0.40 J	0.30U	0.30U

NOTES:
all units in µg/L

µg/L migrograms/liter
U undetected
J Present below normal reporting limit but greater than or equal to the MDL and the concentration is an approximate value.
L Result biased low.
MDL method detection limit

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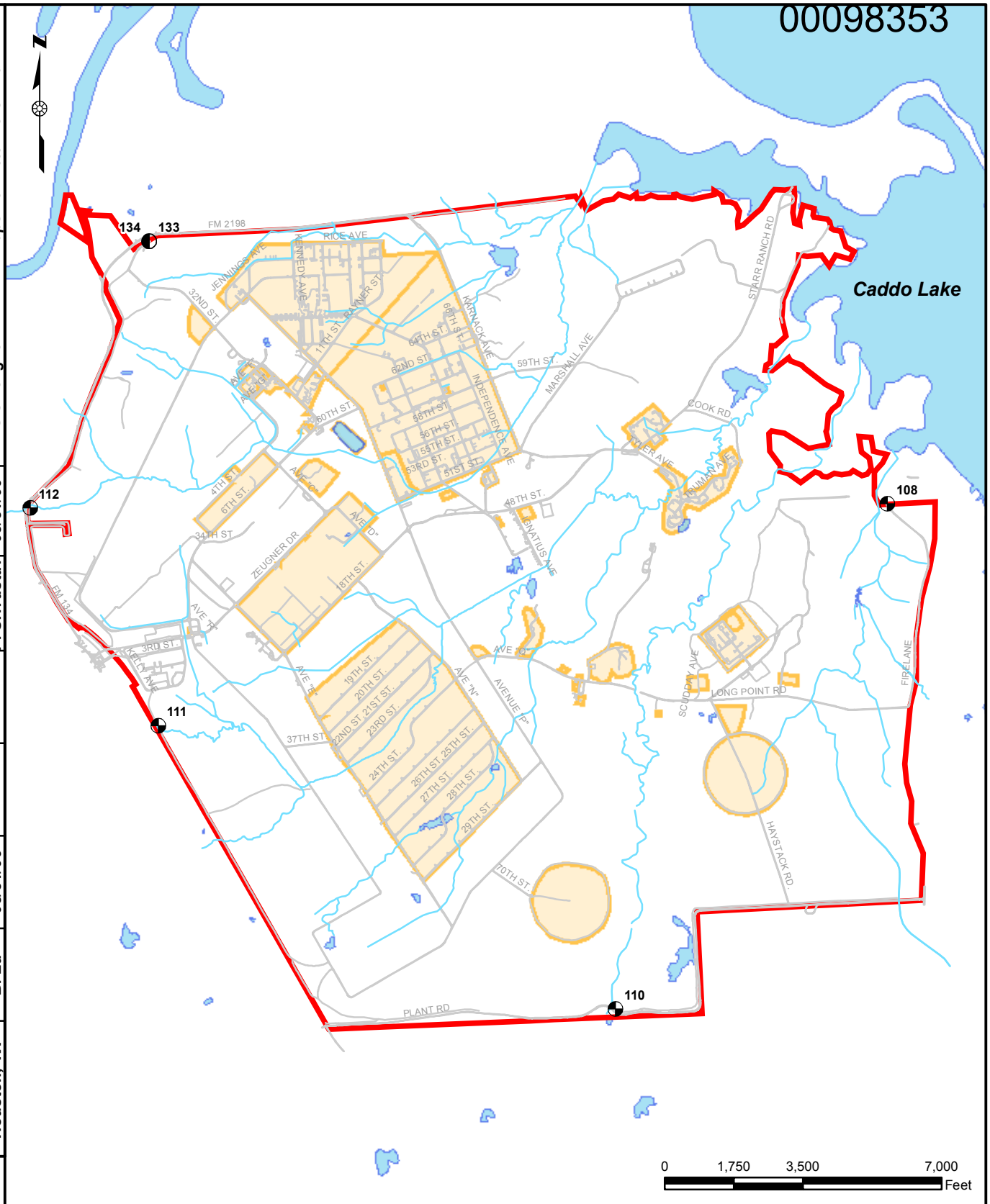

Legend

- Shallow Perimeter Well
- Intermediate Perimeter Well
- Stream
- Road
- Site
- Lake/Pond
- LHAAP Approximate Boundary

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TULSA, OKLAHOMA

FIGURE 1

PERIMETER WELL LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Houston, TX	B. Lu 08/31/06		P. Srivastav 08/31/06	T:\GIS\LonghornMXD\PRVMaps\PerimeterWells.mxd

Plot Date: 08/06

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

August 20, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Record of Decision Document for LHAAP-35B (37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm, Longhorn Army Ammunition Plant, Karnack, Texas, June 2010

Dear Mr. Tzhone,

The Final Record of Decision (ROD) for LHAAP-35B(37) and LHAAP-67, June 2010 with signatures by Thomas E. Lederle, Industrial Branch Chief, BRAC Division, ACSIM and by Pamela Phillips, Acting Director, Superfund Division, U.S. Environmental Protection Agency, Region 6 is enclosed for your file.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler

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

Copies furnished:
Fay Duke, TCEQ, Austin, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Aaron Williams, COE – Tulsa District, OK
John Lambert, COE – Tulsa District, OK
Matt Mechenes, AEC
Praveen Srivastav, Shaw – Houston, TX (Administrative Record)

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

August 20, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
Texas Commission on Environmental Quality
SSDAT/Superfund Section – Remediation Division
12100 Park 35 Circle
Austin, TX 78753

Re: Final Record of Decision Document for LHAAP-35B (37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm, Longhorn Army Ammunition Plant, Karnack, Texas, June 2010

SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your records. The Final Record of Decision (ROD) for LHAAP-35B(37) and LHAAP-67, June 2010 has been signed by Thomas E. Lederle, Industrial Branch Chief, BRAC Division, ACSIM and by Pamela Phillips, Acting Director, Superfund Division, U.S. Environmental Protection Agency, Region 6.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler

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

Copies furnished:
Stephen Tzhone, USEPA Region 6, Dallas, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Aaron Williams, COE – Tulsa District, OK
John Lambert, COE – Tulsa District, OK
Matt Mechenes, AEC
Praveen Srivastav, Shaw – Houston, TX (Administrative Record)

FINAL
RECORD OF DECISION
LHAAP-35B (37), CHEMICAL LABORATORY AND LHAAP-67, ABOVEGROUND STORAGE TANK FARM
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared for

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by

Shaw Environmental, Inc.
3010 Briarpark, Suite 400
Houston, Texas 77042

TERC No. DACA56-94-D-0020, Task Order No. 0109
Shaw Project No. 845714

June 2010

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Appendix A Public Announcements

Glossary of Terms

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Acronyms and Abbreviations

ABS	absorption fraction of chemicals through skin
AF	adherence factor (dermal exposure)/adjustment factor (inhalation exposure)
ARAR	applicable or relevant and appropriate requirement
AT	averaging time
BERA	baseline ecological risk assessment
Bgs	below ground surface
BRAC	Base Realignment and Closure
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm^2	square centimeters
cm/sec	centimeters per second
COC	chemicals of concern
DCA	Dichloroethane
DCE	Dichloroethene
CSM	conceptual site model
ECOP	environmental condition of property
ED	exposure duration
EF	exposure frequency
EPC	exposure point concentration
ERA	ecological risk assessment
FFA	Federal Facility Agreement
FI	Fraction absorbed by the ingestion pathway
FS	feasibility study
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IRIS	Integrated Risk Information System
Jacobs	Jacobs Engineering Group, Inc
kg	kilogram
Kp	permeability factor
LHAAP	Longhorn Army Ammunition Plant
LUC	land use control
MCL	maximum contaminant level
m^3/kg	cubic meters per kilogram
mg/cm^2	milligrams per square centimeters
mg/day	milligrams per day
mg/kg-day	milligrams per kilogram per day
mg/L	milligrams per liter
MNA	monitored natural attenuation

Acronyms and Abbreviations (continued)

MSC	medium specific concentration
Msl	mean sea level
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
NCEA	USEPA National Center for Environmental Assessment
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
PCB	polychlorinated biphenyl
PCE	Tetrachloroethene
PEF	particulate emission factor
p,p-DDE	Dichlorodiphenyltrichloroethane
p,p-DDT	Dichlorodiphenyldichloroethylene
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RFA	RCRA Facility Assessment
RfD	reference dose
RI	remedial investigation
RME	reasonable maximum exposure
ROD	record of decision
SA	surface area
SARA	Superfund Amendments and Reauthorization Act
SF	slope factor
Shaw	Shaw Environmental, Inc.
SVOC	semivolatile organic compounds
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCA	Trichloroethane
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
TPH	total petroleum hydrocarbon
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Material
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VF	volatilization factor
VOC	volatile organic compound

1.0 The Declaration

1.1 Site Name and Location

LHAAP-35B (37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm

Longhorn Army Ammunition Plant
Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System, U.S. Environmental Protection Agency (USEPA) Identification Number: TX6213820529.

1.2 Statement of Basis and Purpose

This decision document covers two sites, LHAAP-35B (37) and LHAAP-67, because of the similarity in specific site problems and because the set of actions (remedies) to be performed over time are similar and concurrent. This decision document presents the selected remedies for LHAAP-35B (37), Chemical Laboratory, and LHAAP-67, Aboveground Storage Tank Farm at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The remedy was chosen in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The remedy selection was based on the Administrative Record for these sites, including the remedial investigation (RI) and baseline risk assessment reports (Jacobs Engineering Group, Inc. [Jacobs] 2002a, 2002b, 2003), feasibility study (FS) (Shaw Environmental, Inc. [Shaw], 2005a, 2005b), the monitored natural attenuation (MNA) modeling report (Shaw, 2007a), the natural attenuation evaluation report (Shaw, 2007b), the installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007c), the Proposed Plan (U.S. Army, 2008a), and other related documents contained in the Administrative Record files for LHAAP-35B (37) and LHAAP-67.

This document is issued by the U.S. Army who is the lead agency for this installation. The USEPA (Region 6) and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected remedies.

1.3 Assessment of the Site

Implementing the response actions selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 Description of the Selected Remedy

The selected remedy for both LHAAP-35B (37) and LHAAP-67 includes utilizing land use controls (LUCs) and MNA. The remedy meets the remedial action objectives (RAOs) developed for these sites to protect human health and the environment by preventing human exposure to chlorinated solvents-contaminated groundwater [1,1-dichloroethene (DCE), trichloroethene (TCE), and tetrachloroethene (PCE) at LHAAP-35B (37) and 1,1,1-trichloroethane (TCA), 1,1,2-TCA, 1,2-dichloroethane (DCA), TCE, and 1,1- DCE at LHAAP-67], ensuring containment of the chlorinated solvents-contaminated groundwater for the protection of surface water, and returning the groundwater to its potential beneficial use as drinking water wherever practicable.

Due to the potential for chlorinated solvents-contaminated groundwater to migrate, MNA will be implemented to assure that the plumes will not migrate to nearby surface water bodies at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue until MCLs are achieved. Monitoring will be used to demonstrate that MNA is effective. Due to the unacceptable risk posed by chlorinated solvents in groundwater during the MNA remedy, LUCs are needed in the impacted areas to ensure the protection of human health by preventing human exposure to the contaminated groundwater. The selected LUCs will prevent human exposure to chlorinated solvents-contaminated groundwater through the restriction of groundwater use. The LUCs will remain in place until MCLs are achieved.

Based on groundwater modeling, groundwater MCLs are expected to be met at LHAAP-35B(37) through natural attenuation in 28 to 38 years for PCE, 39 to 43 years for TCE, and 16 to 21 years for 1,1-DCE. Considering the lithologic variability, particularly the lateral and vertical change from sand to clay, the times to MCL may range to an order of magnitude greater. For LHAAP-67, MCLs would be met through natural attenuation in 17 to 66 years for TCE, 20 to 34 years for 1,1-DCE, and 21 to 43 years for 1,2-DCA. Although the times to MCL attainment for 1,1,1-TCA and 1,1,2-TCA were originally calculated to be 22 and 20 years respectively, these two volatile organic compounds (VOCs) are no longer detected above MCLs at LHAAP-67 (Shaw, 2007e, U.S. Army, 2008b). The need to continue the LUCs to restrict groundwater use and MNA will be reviewed every five years.

The specific LUCs and implementation details will be included in the land use component of the remedial design (RD) and the LUCs are identified in Section 2.9.1. The MNA plan will also be

presented in the RD. Within 90 days of ROD signature, the Army will prepare and submit the RD to USEPA and TCEQ consistent with the schedule of Section XVI of the Federal Facility Agreement (FFA). The Army will be responsible for implementation, maintenance, periodic inspection, and enforcement of LUCs in accordance with the RD. Although the Army may transfer these responsibilities to another party through property transfer agreement or other means, the Army will remain responsible for: (1) CERCLA 121 (c) Five Year Reviews; (2) notification of the appropriate regulators of any known LUC deficiencies or violations; (3) access to the property to conduct any necessary response; (4) reservation of the authority to change, modify or terminate LUCs and any related transfer or lease provisions; and (5) confirming that the LUC objectives are met to protect the integrity of the selected remedy.

Army and regulators will consult to determine appropriate enforcement actions should there be a failure of a LUC objective at these sites after they have been transferred. The Army shall consult with TCEQ and obtain USEPA concurrence prior to termination or significant modification of a LUC, or land use change inconsistent with the LUC objectives and use assumptions of the remedy. In the event that TCEQ and/or EPA and the Army agree with respect to any modification of the selected remedy, including the LUC component of the selected remedy, the remedy will be changed consistent with the FFA and 40 C.F.R. §300.435 and 40 C.F.R. §300.430(f)(4)(iii)(B).

1.5 Statutory Determinations

The selected remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. Although the final selected remedy is not intended to address the statutory preference for treatment to the maximum extent practicable, the final selected remedy offers, within a reasonable time frame and at a lower cost, a similar level of protection to human health and the environment than those remedy alternatives which satisfy the preference for treatment. In addition, no source materials constituting principle threats will be addressed within the scope of this action. In addition, the remedy offers long-term effectiveness through the implementation of LUCs, which would minimize the potential risk posed by the contaminated groundwater. Further, evaluation of MNA including routine monitoring of the attenuation until MCLs are met would document the effectiveness of the selected remedy. The selected remedies are easily and immediately implementable and cost less than the other alternatives considered for LHAAP-35B (37) and LHAAP-67, with the exception of Alternative 1 (No Action).

The selected remedy of MNA would reduce the toxicity, mobility, or volume of contaminants in the groundwater through a passive remedial action. There is no known principal threat material or contaminant source in the LHAAP-35B (37) and LHAAP-67 groundwater.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review

will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 ROD Data Certification Checklist

The following information is included in the Decision Summary section of this ROD.

- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater as identified in the baseline risk assessment and ROD (**Section 2.6**).
- Potential land and groundwater use that will be available at the sites as a result of the Selected Remedy (**Section 2.6**).
- Chemicals of concern (COCs) and their respective medium specific exposure point concentrations (EPCs) (**Section 2.7**).
- Baseline risk represented by the COCs (**Section 2.7**).
- Cleanup levels established for COCs and the basis for these levels (**Section 2.7**).
- Discussion of how source materials constituting principle threats are addressed (**Section 2.11**).
- Key factor(s) that led to selecting the remedy (**Section 2.12**).
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (**Section 2.12.3**).

Additional information can be found in the Administrative Record file for these sites.

1.7 Authorizing Signatures

As the lead agency responsible for issuance of this ROD which documents the selected remedy, the United States Army issues this ROD for LHAAP-35B(37) and LHAAP-67. The undersigned is the appropriate approval authority for this decision.

Thomas E. Lederle 7 June 2010
(Name) *Date*
Thomas E. Lederle
Industrial Branch Chief
Base Realignment and Closure Division
United States Army

The United States EPA approves the selected remedy as provided in the ROD for LHAAP-35B(37) and LHAAP-67.

Pamela Phillips, Acting 6/28/10
(Name) *Date*
Samuel Coleman, P.E.
Director
Superfund Division
U.S. Environmental Protection Agency,
Region 6

2.0 Decision Summary

2.1 Site Name, Location, and Description

LHAAP-35B (37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm.

Longhorn Army Ammunition Plant
Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System USEPA Identification Number: TX6213820529

Lead Agency: U.S. Army, Department of Defense

Source of Cleanup Money: U.S. Army, Department of Defense

The former LHAAP is an inactive, government-owned, formerly contractor-operated and maintained Department of Defense facility located in central east Texas in the northeast corner of Harrison County. As shown on **Figure 2-1,** LHAAP is approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. The former U.S. Army installation occupied over 8,400 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake and is accessed by State Highways 43 and 134.

LHAAP was placed on the Superfund National Priorities List (NPL) on August 9, 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

LHAAP-35B (37), the Chemical Laboratory, encompasses approximately 12.2 acres and is located in the north-central portion of LHAAP near the southwestern corner of LHAAP-47 and south of the intersection of Avenue P and 59th Street (**Figure 2-2**). The surface features at LHAAP-35B (37) include a mixture of asphalt-paved roads and parking area, several administration buildings, the former Chemical Laboratory (Building 29-A), and a mixture of wooded and grassy vegetation-covered areas. The topography in this area is relatively flat with the surface drainage flowing into Goose Prairie Creek. The creek runs perpendicular to the western border of the site and then turns south through the east-central portion of the site and eventually drains into Caddo Lake.

LHAAP-67, a former aboveground storage tank farm, covers an area of approximately 1.9 acres and is located in the central portion of LHAAP on the southeast corner of 48th Street and Ignatius Avenue (**Figure 2-2**). The site is relatively flat. The nearest significant surface water body to LHAAP-67 is Central Creek located approximately 870 feet southeast of the site.

These sites are surrounded by an area (nearly 7,000 acres) that was transferred by the U.S. Department of the Army to the U.S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge. The U.S. Army is acting in partnership with USEPA Region 6 and TCEQ. As the lead agency for environmental response actions at LHAAP, the U.S. Army is charged with planning and implementing remedial actions at LHAAP-35B (37) and LHAAP-67.

2.2 Site History and Enforcement Activities

2.2.1 History of Site Activities

LHAAP was established in December 1941 with the primary mission of manufacturing trinitrotoluene (TNT). Production of TNT began at Plant 1 in October 1942 and continued through World War II until August 1945, when the facility was placed on standby status until February 1952. In 1952 the facility was reactivated and production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 millimeter ammunition continued at Plant 2, northeast of Plant 1, through 1956.

In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. Rocket motor production at Plant 3 continued to be the primary operation at LHAAP until 1965 when Plant 2 was reactivated for the production of pyrotechnic and illuminating ammunition. In the years following the Vietnam conflict, LHAAP continued to produce flares and other basic pyrotechnic or illuminating items for the U.S. Department of Defense inventory. From September 1988 to May 1991, LHAAP was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Force Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

LHAAP-35B (37): The Chemical Laboratory was built during the construction of Plant 3 (1953-1955) and was originally used to support the production activities at LHAAP. These support activities included research and testing of materials used in the production processes and quality assurance testing. Also, one waste rack sump was located at the site. In 1998, the site was used as a staging area in support of investigation activities.

LHAAP-67: When operational LHAAP-67 consisted of seven aboveground storage tanks of unknown size. The tanks were surrounded with earthen dikes designed to contain potential

spills. Site personnel indicated that the tanks were used for solvent storage. The tanks have been removed and the only structure remaining at the site is a railroad bed.

2.2.2 History of Investigative Activities

As part of the Installation Restoration Program, the U.S. Army began an environmental investigation in 1976 at LHAAP followed by installation wide assessments/investigations that included the following:

- In 1980, U.S. Army Toxic and Hazardous Material Agency (USATHAMA, 1980) conducted a record search to assess the impact of the LHAAP installation activities including usage, storage, treatment, and disposal of toxic and hazardous materials on the environment, and define conditions that may have adversely affected human health and the environment.
- Contamination Survey – In 1982 as part of the LHAAP contamination survey, Environmental Protection Systems collected six groundwater samples for laboratory analyses. Subsequently in 1987, as part of the Resource Conservation and Recovery Act (RCRA) permit application process, and as a continuation of the contamination survey, U.S. Army Environmental Hygiene Agency (USAEHA) identified, described, and evaluated all solid waste management units at LHAAP (USAEHA, 1987). Units requiring further sampling, investigation and corrective action were delineated.
- RCRA Facility Assessment (RFA) – In 1988, a preliminary RFA was conducted by the U.S. Army (Maley, 1988). Waste at the various sites was characterized but no samples were collected.

In addition to the installation wide investigations, site-specific investigations were conducted for LHAAP-35B (37) and LHAAP-67 and included the following:

LHAAP-35B (37)

- Between 1993 and 1998 several investigations were conducted in a phased approach to identify the presence and extent of contamination in soil and groundwater at LHAAP-35B (37). Four monitoring wells were installed; three wells were completed in the shallow groundwater zone, and one well was installed in the intermediate groundwater zone. Soil samples were collected from the waste rack sump location, well borings, and two additional borings. Groundwater samples were collected from the four wells and analyzed for VOCs, semivolatile organic compounds (SVOCs), metals, and explosive compounds. Later samples were analyzed for pesticides, polychlorinated biphenyls (PCB), herbicides, total petroleum hydrocarbon (TPH), perchlorate and cyanide. Soil samples were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides, PCBs, and dioxin/furans. **Figure 2-3** shows the monitoring and sampling locations. Investigation results indicated that there was no significant contamination in the surrounding soils. Multiple constituents were detected in the groundwater; primarily DCE, TCE, and PCE.

- One additional monitoring well was installed in the intermediate groundwater zone in 2004 as part of a groundwater data gaps investigation. The concentrations of the primary contaminants detected in groundwater during this investigation were lower than historical concentrations (Shaw, 2007d). In December 2006, three new monitoring wells were installed at the site. The purpose of the newly installed wells was to define the downgradient extent of contamination, determine whether the contamination was in the upper or lower shallow groundwater zone, and evaluate natural attenuation in groundwater. COCs were not detected in the lower shallow groundwater zone suggesting that PCE and TCE are only present in the upper shallow groundwater zone. 1,1-DCE was either not detected or was below the MCL in all monitoring wells (Shaw, 2007a).

- In 2005, an FS was conducted for LHAAP-35B (37) to present an analysis of remedial approaches and provide a basis for remedy selection consistent with the intended future use of the site as a wildlife refuge (Shaw, 2005b).

- Baseline Risk Assessment – From 1998 to 2007, a baseline human health risk assessment (HHRA) and a BERA were conducted (Jacobs, 2003; Shaw, 2007c). The HHRA indicated that the future maintenance worker exposure to on-site soil generated an acceptable cancer risk and non-cancer hazard. However, the groundwater posed an unacceptable cancer risk and non-cancer hazard to a future maintenance worker from hypothetical groundwater consumption. The BERA concluded that no unacceptable risk was present for the ecological receptors.

LHAAP-67

- Between 1998 and 2000 RI activities were conducted to identify the presence and extent of contamination in soil and groundwater at LHAAP-67. Seven monitoring wells were installed in the shallow groundwater zone. Soil samples were collected from three borings. Groundwater samples were collected from the wells and analyzed for VOCs, SVOCs, metals, explosive compounds and perchlorate. Soil samples were analyzed for VOCs, SVOCs, explosive compounds, and metals. **Figure 2-4** shows the monitoring and sampling locations. Investigation results indicated that there were metals and methylene chloride in the surrounding soils. Multiple constituents were detected in the groundwater; primarily 1,1,1-TCA, 1,1,2-TCA, 1,2-DCA, TCE, and 1,1- DCE.

- In 2004, as part of the groundwater data gaps investigation, additional groundwater sampling was conducted at the site. Groundwater analytical results indicate that chlorinated compounds detected above the MCLs were present in only one shallow monitoring well and at concentrations that were lower than those reported during the RI (Shaw, 2007d). In December 2006, additional groundwater sampling was conducted at the site. Analytical results indicated that only one well (67WW01) exhibited concentrations of TCE, 1,1-DCE, and 1,2-DCA exceeding their respective MCLs. Currently, 1,1,1-TCA and 1,1,2-TCA are not exceeding the MCLs (Shaw, 2007a).

- In 2005, an FS was conducted for LHAAP-67 to present an analysis of remedial approaches and provide a basis for remedy selection consistent with the intended future use of the site as a wildlife refuge (Shaw, 2005a).

- Baseline Risk Assessment – From 1998 to 2007, a baseline HHRA and a BERA were conducted (Jacobs, 2003; Shaw, 2007c). The HHRA indicated that the future maintenance worker exposure to on-site soil generated an acceptable cancer risk and non-cancer hazard. However, the groundwater posed an unacceptable cancer risk and non-cancer hazard to a future maintenance worker from hypothetical groundwater consumption. The BERA concluded that no unacceptable risk was present for the ecological receptors.

2.2.3 History of CERCLA Enforcement Activities

Due to the release of hazardous substances, pollutants, and contaminants from O&M activities at the facility, LHAAP was placed on the NPL on August 9, 1990. Activities to remediate contamination associated with the listing of LHAAP as a NPL site began in 1990. After the listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991. Although not specifically listed as NPL sites, LHAAP-35B (37) and LHAAP-67 are considered NPL caliber by USEPA, TCEQ and Army and are addressed as such.

In order to evaluate a remedy for the sites, final FS reports were issued for LHAAP 35B (37) and LHAAP-67 (Shaw 2005a and 2005b). A Proposed Plan (U.S. Army, 2008a) facilitating public involvement in the selection of the remedy for LHAAP 35B (37) and LHAAP-67 was issued in June, 2008.

2.3 Community Participation

The U.S. Army, USEPA, TCEQ and the Restoration Advisory Board (RAB) have provided public outreach to the surrounding community concerning LHAAP 35B(37) and LHAAP-67 and other environmental sites at LHAAP. The outreach program has included fact sheets, media interviews, site visits, invitations to attend quarterly technical and regulatory review meetings, and public meetings consistent with its public participation responsibilities under CERCLA Sections 113 (k)(2)(b), 117(a), and 121(f)(1)(g).

The Final Proposed Plan (U.S. Army, 2008a) for the selection of the remedy for LHAAP 35B(37) and LHAAP-67 was released to the Administrative Record, that is publically available in the Marshall Public Library, in June 2008 for public review and comment. A notice of availability of the Proposed Plan and other related documents in the Administrative Record file was published in *The Shreveport Times* and the *Marshall News Messenger* on June 16, 2008. A 30-day public comment period for the Proposed Plan began on June 17, 2008. The public

meeting was held on June 23, 2008. No comments were received during the public comment period. The Proposed Plan was re-opened for comment in March 2010 to address an administrative concern. A notice of availability of the Proposed Plan and other related documents in the Administrative Record file was published in the *Marshall News Messenger* and *The Shreveport Times* on February 21, 2010 and February 22, 2010, respectively. The public comment period was held from March 8 to April 8, 2010. The public meeting was held on March 9, 2010. A member of the RAB requested a public comment period extension of 30 days. Because the Proposed Plan was already open to public comment for a total of 60 days including the original 2008 public comment period, an additional 14 days were granted and the public comment period was extended to April 22, 2010. Written comments are addressed in the Responsiveness Summary, which is included in this ROD as **Section 4.0**.

Copies of the Administrative Record documents were made available to the public at several information repository locations, including LHAAP, USEPA Region 6 Library, TCEQ, and Marshall Public Library. Currently, the public repository of the Administrative Record may be found at the following location:

Public Library

Location: Marshall Public Library
300 S. Alamo
Marshall, Texas, 75670

Business Hours: Monday – Thursday 10:00 a.m. – 8:00 p.m.
Friday – Saturday 10:00 a.m. – 5:00 p.m.

2.4 Scope and Role of Response Action

The recommended action at LHAAP-35B (37) and LHAAP-67 will prevent potential risks associated with exposure to contaminated groundwater. Although groundwater at Longhorn is not currently being used as drinking water, nor may it be used in the future based on its reasonably anticipated use as a national wildlife refuge, when establishing the remedial action objectives for this response action, the U. S. Army has considered the NCP's expectation to return usable groundwaters to their potential beneficial uses wherever practicable and has also considered the State of Texas designation of all groundwater as potential drinking water, unless otherwise classified, and consistent with 30 TAC 335.563(h)(1). The Army intends to return the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial uses, which for the purposes of this ROD is considered to be attainment of the Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, the NCP expectation is to prevent further migration of the plume, prevent exposure to the contaminated

groundwater, and evaluate further risk reduction. The preferred remedial action will also ensure containment of the plume to prevent potential impact to surface water. The potential exists for contaminated shallow groundwater to migrate toward and discharge into Goose Prairie Creek adjacent to LHAAP-35B (37) and Central Creek near LHAAP-67, which could ultimately affect Caddo Lake, a source of drinking water.

In addition, the preferred action will include groundwater monitoring to demonstrate that the plume is not migrating at levels that present a potential impact to nearby surface water bodies and to verify that contaminant levels are being reduced to drinking water standards (MCLs) when LUCs may be terminated.

The selected remedy will ensure protection of human health and the environment. The selected remedy will include LUCs that restrict groundwater use. Groundwater monitoring will be implemented to demonstrate that the plumes are not migrating and to verify that contaminant levels are being reduced. LUCs may be terminated when contaminant levels are reduced to MCLs.

2.5 Site Characteristics

This section of the ROD presents an overview of the characterization of LHAAP-35B (37) and LHAAP-67 with respect to known or suspected sources of contamination, types of contamination, and affected media. Known or potential routes of contaminant migration are also discussed.

LHAAP-35B (37)

LHAAP-35B (37), a Chemical Laboratory, approximately 12.2 acres in size, is located in the north-central portion of LHAAP (**Figure 2-2**) near the southwestern corner of LHAAP-47 (**Figure 2-3**). The nearest significant surface water body is Goose Prairie Creek. The creek runs perpendicular to the western border of the site and then turns south through the east-central portion of the site and eventually drains into Caddo Lake. Caddo Lake is a source of drinking water for several communities in Louisiana.

Topsoil at LHAAP-35B(37) ranges in thickness from 0 to 4 feet and consists of the Quaternary silty clay underlain by alternating layers of clayey sand, silty sand, and poorly sorted sand of the Wilcox Group. The sand layers are laterally discontinuous and separated by silty clay.

Groundwater at the site was encountered at 12 to 33 feet below ground surface (bgs) in the upper shallow zone, to 47 feet in the lower shallow zone, and at about 70 feet in the intermediate zone. December 2007 shallow and intermediate groundwater data indicated that flow at the site was to

the south-southeast (Figure 2-5), although the shallow groundwater flow direction may vary locally during high water table conditions due to the influence of Goose Prairie Creek.

For the shallow groundwater zone, hydraulic conductivity values in the sand units ranged from a minimum value of 4.3×10^{-4} centimeters per second (cm/sec) in the northwest portion of the site to a maximum value of 7.7×10^{-4} cm/sec east of the site. The average groundwater flow rate is 1.74 feet/day for LHAAP-35B(37), based on the average hydraulic conductivity, hydraulic gradient, and effective porosity (Shaw, 2007e).

LHAAP-67

LHAAP-67, a former Aboveground Storage Tank Farm, approximately 1.9 acres in size, is located in the central portion of LHAAP on the southeast corner of 48th Street and Ignatius Avenue (**Figure 2-2**). The nearest significant surface water body to LHAAP-67 is Central Creek located approximately 870 feet southeast of the site (**Figure 2-4**). Runoff from LHAAP-67 could potentially discharge to surface water in Central Creek which flows into Caddo Lake. The lake is a source of drinking water supply for several neighboring communities in Louisiana.

Across the site, below the surficial fill, lies a silty clay of the Wilcox Group ranging in thickness from about 2 to 15 feet. The clay grades into a fine-grained silty sand thickening toward the east-southeast.

Groundwater at the site, encountered at depths of 17 to 20 feet bgs, has an easterly and southeasterly flow (**Figure 2-6**). For the shallow groundwater zone, hydraulic conductivity values of the sand units ranged from a minimum value of 1.2×10^{-5} cm/sec to a maximum value of 1.0×10^{-2} cm/sec. The average groundwater flow rate is 14.7 feet/day for LHAAP-67, based on the average hydraulic conductivity, hydraulic gradient and effective porosity (Shaw, 2007e).

2.5.1 Conceptual Site Model

LHAAP-35B (37)

The overall conceptual site model (CSM) for LHAAP-35B (37) is illustrated in **Figure 2-7**. The model presents those pathways that have been demonstrated to be complete, as evidenced by the presence of contamination and an expected receptor or hypothetical receptor. The U.S. Army has also considered the NCP's expectation to return usable groundwaters to their potential beneficial uses wherever practicable and the State of Texas designation of all groundwater as potential drinking water, unless otherwise classified, and consistent with 30 TAC 335.563(h)(1). Although the groundwater is not currently being used, nor is it expected to be used in the future, the groundwater pathway is being considered for remediation because it has the potential to

present an unacceptable risk to the maintenance worker. Those pathways that are likely incomplete or have negligible impact are not being considered for remediation.

Except for a single detection of acetone at 21 micrograms per kilogram (µg/kg), there were no detections of VOCs in the soil samples taken from LHAAP-35B (37). Although low concentrations of SVOCs, metals, dioxins, furans, and pesticides were detected, the carcinogenic risk and non-carcinogenic hazard for soil was acceptable for a future maintenance worker.

Groundwater contamination was detected in monitoring wells LHSMW58, 35BWW04, and 35BWW05, and in monitoring well LHSMW59 and its replacement well 35BWW08, located several hundred feet and potentially upgradient from LHSMW58. The contamination in monitoring wells LHSMW59 and 35BWW08 may be due to an unidentified historic source in the vicinity of these wells. Alternatively, potential variations in local groundwater flow direction may have caused contamination from a historic source located within the vicinity of monitoring well LHSMW58 to migrate to monitoring wells LHSMW59 and 35BWW08. Eleven different VOCs were detected in monitoring well LHSMW58 and six different VOCs were detected in monitoring well LHSMW59 during the sampling events. The groundwater COCs include 1,1-DCE, TCE, and PCE and they are contained entirely within the upper shallow groundwater sands. The maximum 1,1-DCE, TCE, and PCE concentrations detected in groundwater at LHAAP-35B(37) are 58 micrograms per liter (µg/L), 330 µg/L, and 34 µg/L, respectively, which exceed the MCLs of 7 µg/L, 5 µg/L, and 5 µg/L, respectively. There is no groundwater contamination of the intermediate zone, and although there is likely limited interconnectivity between the shallow and intermediate zones because of the laterally and vertically discontinuous nature of the channel sands, flow is predominantly horizontal through these units.

Although not indicated by the data, there is a concern that the COCs present in shallow groundwater beneath LHAAP-35B (37) could potentially discharge to surface water in Goose Prairie Creek which flows to Caddo Lake, a drinking water source. The LHAAP-35B(37) potentiometric map generated from the December 2007 water level measurements indicates that the groundwater flow at LHAAP-35B (37) has a predominantly south-southeasterly flow direction, although the overall trend in groundwater flow direction at Longhorn is east-northeast toward Caddo Lake. Surveyed elevation of the Goose Prairie Creek bed is 186.86 feet above mean sea level (msl), and the water level elevation in the shallow groundwater zone is 186.31 feet msl (measured in September 2004). These data indicate that the shallow zone water table is below the creek and does not discharge to the Goose Prairie Creek during certain parts of the year. Additional creek and groundwater elevation data is provided in Table 2, Appendix M of the Shaw Final Modeling Report Derivation of Soil and Groundwater Concentrations Protective of Surface Water and Sediment LHAAP Revision I, February 2007. However, due to uncertainties regarding the seasonal variations in the water table elevation it is assumed that the shallow groundwater may discharge into the creek when the water table is higher. Because the

intermediate zone is deeper than the shallow zone, it is improbable that the groundwater from the intermediate zone would discharge to Goose Prairie Creek.

Modeling calculations were completed to assess the potential for the COCs present in shallow groundwater at LHAAP-35B (37) to migrate toward and discharge to Goose Prairie Creek. The modeling assumes an instantaneous source (i.e., contaminant plume) with no contaminant leaching from vadose zone soil to groundwater. Based on the results of the instantaneous source model, PCE and 1,1-DCE will not appear at detectable levels where groundwater discharges into Goose Prairie Creek. The maximum concentration of TCE (3.63 µg/L) appears at the point of entry of the groundwater into Goose Prairie Creek after approximately 39 to 43 years (Shaw, 2007e), and is below the MCL for TCE of 5 µg/L. TCE would be diluted further after entry into the surface water, most likely to undetectable levels. Note that the TCE concentration used for the modeling was the historical maximum of 330 µg/L detected at monitoring well LHSMW59. It is, therefore, concluded that contaminants present in the shallow groundwater at LHAAP-35B (37) will not adversely impact Goose Prairie Creek surface water during intermittent periods of discharge to the creek.

LHAAP-67

The overall conceptual model for LHAAP-67 is illustrated in **Figure 2-8**. The model presents those pathways that have been demonstrated to be complete, as evidenced by the presence of contamination, and an expected receptor or hypothetical receptor. The U.S. Army has also considered the NCP's expectation to return usable groundwaters to their potential beneficial uses wherever practicable and the State of Texas designation of all groundwater as potential drinking water, unless otherwise classified, and consistent with 30 TAC 335.563(h)(1). Although the groundwater is not currently being used, nor is it expected to be used in the future, the groundwater pathway is being considered for remediation because it has the potential to present an unacceptable risk to the maintenance worker. Those pathways that are likely incomplete or have negligible impact are not being considered for remediation. It is assumed that in the past, releases from the tanks contaminated the soil and then leached from the soil into the groundwater. Previous soil investigation indicated the presence of methylene chloride at a relatively low concentration of 5.9 µg/kg in the 0- to 5-foot-depth interval. Based on the soil sampling investigation, residual contamination is likely not present in the soils at significant levels. This is believed to be due to the volatilization and vertically downward migration of the contaminants that might have been present in the vadose zone. A relatively small area of contamination is observed in the shallow groundwater, with the extent of contamination defined, both laterally and vertically. The groundwater contamination poses an unacceptable carcinogenic risk and non-carcinogenic hazard to a future maintenance worker under an industrial scenario. There is no groundwater contamination of the intermediate zone, and although there is likely limited interconnectivity between the shallow and intermediate zones

because of the laterally and vertically discontinuous nature of the channel sands, flow is predominantly horizontal through these units.

Although not indicated by the data, there is a concern that the COCs (1,1-DCE, 1,2-DCA, 1,1,1-TCA, 1,1,2-TCA, and TCE) present in groundwater beneath LHAAP-67 could potentially discharge to surface water in Central Creek located to the southeast of the site, which flows to Caddo Lake, a drinking water source. The shallow groundwater potentiometric surface indicates that the groundwater from LHAAP-67 has an easterly and southeasterly flow and may discharge into Central Creek. Surveyed elevation of the Central Creek bed is 168.54 feet above mean sea level (msl), and the water level elevation in the shallow groundwater zone is 168.05 feet msl (measured in September 2004). These data indicate that the shallow zone water table is below the creek and does not discharge to the Central Creek during certain parts of the year. Additional creek and groundwater elevation data is provided in Table 3, Appendix M of the Shaw Final Modeling Report Derivation of Soil and Groundwater Concentrations Protective of Surface Water and Sediment LHAAP Revision I, February 2007. However, due to uncertainties regarding the seasonal variations in the water table elevation it is assumed that the shallow groundwater may discharge into the creek when the water table is higher. Because the intermediate zone is deeper than the shallow zone, it is improbable that the groundwater from the intermediate zone would discharge to Central Creek.

Modeling calculations were completed to assess the potential for groundwater COCs at LHAAP-67 to migrate toward and discharge to nearby Central Creek (Shaw, 2007e). Two different scenarios were modeled using a total simulation period of 100 years, which was long enough to capture the maximum contaminant concentrations where groundwater discharges into Central Creek. The first scenario assumes an instantaneous source in which there is no contaminant leaching from vadose zone soil to groundwater. The second scenario, which is more conservative and less likely, assumes a continuous source of contaminant leaching from the vadose zone soil to groundwater over time. This scenario was considered in order to account for a case where a VOC source may be present in the soil in an area or depth that was not sampled during the RI. Based on the results of the instantaneous source model, the maximum COC concentrations were below their respective MCLs where groundwater discharges into Central Creek. Furthermore, based on the results of the continuous source model, multiple groundwater COCs could eventually exceed their respective MCLs where groundwater discharges into Central Creek in less than 16, but up to 29 years. Therefore, additional modeling was completed with calculated dilution within Central Creek. The resultant concentrations of the COCs in Central Creek after dilution were less than 3 percent of their respective MCLs. It is, therefore, concluded that contaminants present in the groundwater at LHAAP-67 will not adversely impact the surface water.

2.5.2 Nature and Extent of Contamination

2.5.2.1 LHAAP-35B (37)

From April 1993 to October 1998, RI activities were conducted in three phases at LHAAP-35B (37). The RIs were conducted to define the nature and extent of contamination at LHAAP-35B (37) by Jacobs (Jacobs, 2002a). During the three phases of investigation, soil and groundwater samples were collected and analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides, PCBs, and dioxins/furans. In addition, groundwater samples from Phase III were analyzed for herbicides, TPH, and cyanide. The sampling locations are shown on **Figure 2-3**. **Tables 2-1** and **2-2** present summaries of the analytical data. Analytical results indicated that environmental contamination exists at LHAAP-35B (37).

Soil. During RI activities, 10 soil samples were collected from six locations including a waste rack sump location. The soil analytical results indicated that metals, VOCs, SVOCs, pesticides, and dioxins/furans were detected in soils samples. Metals including aluminum, arsenic, barium, beryllium, cadmium, calcium, total chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, strontium, vanadium, and zinc were detected at low concentrations in soil. Acetone was the only VOC detected at a low concentration in one of the ten soil samples. Ten SVOCs were detected infrequently and at low concentrations in the surface soil samples including benzo(a)anthracene, benzo(b)pyrene, benzo(b)fluoranthene, benzo(g,h,i)pyrene, chrysene, fluoranthene, indeno(1,2,3-c,d)pyrene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate. Three pesticides including aldrin, p,p-DDT (dichlorodiphenyldichloroethylene), and p,p-DDE (dichlorodiphenyltrichloroethane) and dioxins/furans were also detected. Despite the number of contaminants found, none of the contaminants were determined to pose unacceptable risk to the industrial maintenance worker (Jacobs, 2003).

Groundwater. Between 1993 and 1998, ten groundwater samples were collected from four monitoring wells to characterize the shallow and intermediate groundwater at LHAAP-35B (37). Metals, VOCs, SVOCs, explosives, and furans were detected in groundwater at the site. Twenty metals, including aluminum, antimony, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, strontium, thallium, vanadium, and zinc were detected in multiple monitoring wells. Of the 13 VOCs detected in groundwater, four VOCs were only detected once in monitoring well LHSMW58 including 1,1-DCE, benzene, chloroform, and total 1,2-DCA. 1,2,4-trichlorobenzene, acetone, and carbon disulfide were each also only detected once in monitoring wells LHSMW59, 35BWW02 and 35BWW03, respectively. Other VOCs detected at the site included 1,1,1-TCA, 1,1-DCE, chlorobenzene, PCE, TCE, trichlorofluoromethane, and cis-1,2-DCE. The primary VOC contaminants detected in groundwater at the site; 1,1-DCE, TCE, and PCE were detected at maximum concentrations of 58, 330, and 34 parts per billion, respectively.

Only two SVOCs, di-n-octylphthalate and bis(2-ethylhexyl)phthalate and two explosive compounds 1,3-dinitrobenzene and tetryl were detected at low concentrations in monitoring wells LHSMW58 and LHSMW59. Two furans, total hexachlorinated dibenzofurans and 1,2,3,4,7,8-hexachlorodibenzofuran, were each detected once in monitoring well LHSMW59. Anions including chloride, nitrate, nitrite, and sulfate exhibited a degree of variability across the site.

Sampling for perchlorate was first performed at 35BWW02 in 1998. Two samples for perchlorate analysis were collected from LHSMW58 in 2000.

In 2004, as part of the groundwater data gaps investigation, an additional monitoring well, 35BWW03, was installed in the intermediate groundwater zone, and additional groundwater sampling was conducted at the site (Shaw, 2007d). Groundwater samples were collected from four monitoring wells (35BWW01, 35BWW03, LHSMW58, and LHSMW59) (35BWW02 was dry), and analyzed for VOCs. A total of five VOCs were detected in monitoring wells 35BWW03, LHSMW58, and LHSMW59. Carbon disulfide was detected in monitoring well 35BWW03 at a concentration of 8 µg/L, and chlorobenzene was detected in monitoring well LHSMW58 at 2J µg/L. 1,1-DCE, PCE, and TCE were also detected in monitoring well LHSMW58 at concentrations of 4J µg/L, 20 µg/L, and 33 µg/L, respectively. PCE and TCE were detected in monitoring well LHSMW59 at concentrations of 3J µg/L and 180 µg/L, respectively. The concentrations of the primary contaminants detected during this investigation were lower than historical concentrations.

In August 2006, groundwater samples were collected from the existing four monitoring wells (35BWW01, 35BWW03, LHSMW58 and LHSMW59); one well (35BWW02) was dry. The water samples were analyzed for the primary VOCs contaminants, TCE, PCE and 1,1-DCE. TCE, PCE and 1,1-DCE were detected in the shallow groundwater zone in monitoring wells LHSMW58 and LHSMW59 at maximum concentrations of 135, 21.8 and 2.11 µg/L, respectively. These concentrations were lower than the Jacobs data. PCE at 21.8 µg/L was higher than the 2004 data.

In December 2006, three new monitoring wells were installed at the site. The purpose of these wells was to define the downgradient extent of contamination, determine whether the contamination was in the upper or lower shallow groundwater zone, and evaluate natural attenuation in groundwater (Shaw, 2007b). VOCs were not detected in the lower shallow groundwater zone suggesting that PCE and TCE are only present in the upper shallow groundwater zone. TCE, PCE and 1,1-DCE were detected in monitoring wells LHSMW58, LHSMW59, and 35BWW04 at maximum concentrations of 166, 30.1 and 3.34 µg/L, respectively. Results of the groundwater monitoring indicated that LHAAP-35B (37)

contaminants are confined in the shallow groundwater zone and have not migrated into the intermediate zone.

In September 2007, two monitoring wells, 35BWW07 and 35BWW08, were installed at the site. The purpose of monitoring well 35BWW07 was to define the downgradient extent of contamination. The purpose of monitoring well 35BWW08 was as a replacement well for monitoring well LHSMW59. Monitoring well LHSMW59 was plugged and abandoned. Monitoring well LHSMW59 had been completed in both the upper and lower shallow groundwater zones at LHAAP-35B (37). Both of the new monitoring wells were completed in the upper shallow groundwater zone. The two monitoring wells were sampled for VOCs. Four VOCs (Acetone, cis-1,2-DCE, PCE, and TCE) were detected in monitoring well 35BWW08 at concentrations of 6.04, 0.407, 0.981, and 150 µg/L, respectively. VOCs were not detected in monitoring well 35BWW07. Results of the groundwater sampling indicate that the elevated VOC concentrations are located in the upper shallow groundwater zone at LHAAP-35B (37).

In addition, natural attenuation has effectively controlled plume migration and appears to have stabilized the VOC plume. The groundwater data collected at LHAAP-35B (37) indicated a decrease in PCE and TCE concentrations from their historical high values over the 12 year monitoring period. The MNA evaluation demonstrated that natural attenuation mechanisms, including reductive biodegradation, dilution, dispersion, sorption, and volatilization, may all be contributing to the observed reduction in COC concentrations at LHAAP-35B (37). Biodegradation pathways such as cometabolic or oxidative dechlorination may also have contributed to the reduction of COCs at the site (Shaw, 2007a). **Table 2-2** presents the maximum concentrations of all constituents detected in groundwater at LHAAP-35B (37) during the RI and subsequent investigations.

Groundwater was determined by the baseline risk assessment to pose an unacceptable risk or hazard to a hypothetical future maintenance worker at LHAAP-35B (37) under an industrial scenario (Jacobs, 2003). The primary COCs for LHAAP-35B (37) groundwater are TCE, PCE, and 1,1-DCE due to their significant contribution to the total risk. Additionally, hazardous substances present in LHAAP-35B (37) groundwater could also potentially discharge to surface water in Goose Prairie Creek, which flows to Caddo Lake, a drinking water supply.

2.5.2.2 LHAAP-67

Soil

During RI activities, nine soil samples were collected from three soil borings that were completed immediately adjacent to the existing monitoring well locations. The soil borings were sampled for VOC, SVOCs, metals, and explosive compounds. Soil analytical results indicated that metals and one VOC were detected in soil samples. Metals including aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium,

manganese, nickel, potassium, selenium, silver, sodium, strontium, vanadium, and zinc were detected at low concentrations in soil. Methylene chloride was the only VOC detected at a maximum concentration of 5.9 µg/kg in the soil samples. No SVOCs or explosive compounds were detected in the soil. **Table 2-3** presents maximum concentrations of the constituents detected in soil at LHAAP-67. None of the detected compounds were determined to pose unacceptable risk to the industrial maintenance worker (Jacobs, 2003).

Groundwater

Between 1998 and 2000, groundwater samples were collected from seven monitoring wells to characterize the shallow and intermediate groundwater at LHAAP-67. Metals, VOCs, and anions were detected in groundwater at the site. Nineteen metals, including aluminum, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, strontium, thallium, and zinc were detected in multiple monitoring wells. Of the metals detected, only thallium and barium, having maximum concentrations of 0.0021 and 3.3 milligrams per liter (mg/L), exceeded their respective MCLs of 0.002 and 2 mg/L, respectively. Out of the twelve VOCs detected in groundwater, five VOCs 1,1,1-TCA, 1,1,2-TCA, 1,2- DCA, TCE, and 1,1-DCE were detected at maximum concentrations of 1,800, 33, 27, 6.3, and 380 µg/L, respectively, levels that exceeded their respective MCLs. No SVOCs were detected in the groundwater samples.

In 2004, as part of the groundwater data gaps investigation, additional groundwater sampling was conducted at the site. Groundwater samples were collected from the seven existing monitoring wells and analyzed for VOCs. Groundwater analytical results indicate that only three VOCs were detected above the MCLs. TCE, 1,1-DCE, and 1,2-DCA at concentrations of 6, 280, and 13 µg/L, respectively, were present in only one shallow monitoring well 67WW01 and at concentrations that were lower than those reported during the RI.

In August 2006, groundwater samples were collected from the existing six monitoring wells (67WW01, 67WW02, 67WW03, 67WW05, 67WW06, and 67WW07). The water samples were analyzed for the primary VOCs contaminants. Contaminants were only detected in monitoring well 67WW01 except for 1,2-DCA that was detected at a concentration of 3.02J µg/L in monitoring well 67WW06. TCE, 1,1-DCE, 1,2-DCA, and 1,1,2-TCA were detected in well 67WW01 at concentrations of 5.38, 153, 5.57, and 0.035J µg/L, respectively. These concentrations were lower than the levels detected during the previous RI activities.

In December 2006, additional groundwater sampling was conducted at the site including monitoring and evaluation of the natural attenuation process. Analytical results indicated that only one well (67WW01) exhibited concentrations of TCE (5.99 µg/L), 1,1-DCE (179 µg/L), 1,2-DCA (6.1 µg/L) and vinyl chloride (2.34 µg/L) exceeding their respective MCLs. During

both the 2004 and 2006 sampling events, 1,1,1-TCA and 1,1,2-TCA were detected below their respective MCLs.

At LHAAP-67, the evaluation of historical VOC trends provided strong evidence that natural attenuation processes have contributed to a significant reduction in COC concentrations and prevented plume migration. This data also suggested that natural attenuation mechanisms other than reductive biodegradation such as dilution, dispersion, sorption, and volatilization are likely the primary contributors to the reduction in COC concentrations at LHAAP-67. Other biodegradation pathways such as cometabolic or oxidative dechlorination may also have contributed to the reduction of COCs (Shaw, 2007a). **Table 2-4** presents the maximum concentrations of all constituents detected in groundwater at LHAAP-67 during the RI and subsequent investigations.

Groundwater was determined by the baseline risk assessment to pose an unacceptable risk or hazard to a hypothetical future maintenance worker at LHAAP-67 under an industrial scenario (Jacobs, 2003). The primary COCs for LHAAP-67 groundwater are TCE, 1,1-DCE, and 1,2-DCA, 1,1,1-TCA and 1,1,2-TCA due to their significant contribution to the total risk. Additionally, hazardous substances present in LHAAP-67 groundwater could also potentially discharge to surface water in Central Creek, which flows to Caddo Lake, a drinking water source.

2.6 Current and Potential Future Land and Resource Uses

2.6.1 Current and Future Land Uses

LHAAP is located near the unincorporated community of Karnack, Texas. Karnack is a rural community with a population of 775 people. The incorporated community of Uncertain, Texas, population 205, is located to the northeast of LHAAP on the edge of Caddo Lake and is a resort area and an access point to Caddo Lake. The industries in the surrounding area consist of agriculture, timber, oil and natural gas production, and recreation.

LHAAP has been an industrial facility since 1942. Large production activities continued until the facility was determined to be in excess of the Army's needs in 1997. The plant area has been relatively dormant since that time. Selected areas of the plant were used for waste management (e.g., treatment or disposal). LHAAP is surrounded by a fence (except on the border with Caddo Lake), and current security measures at the LHAAP preclude unlimited public access to areas within the fence. Approved access for hunters is very limited.

The anticipated future use is as a part of a wildlife refuge, which is consistent with an industrial use scenario for risk assessment purposes (U.S. Army, 2004). The U.S. Army has already transferred nearly 7,000 acres, including LHAAP-67, to the USFWS for management as The

Caddo Lake National Wildlife Refuge. LHAAP-35B (37) and LHAAP-67 sites are surrounded by an area that has already been transferred to the USFWS.

2.6.2 Current and Future Surface Water Uses

Streams on LHAAP currently support wildlife and aquatic life. While humans may have limited access to some streams during annual hunts, there is no routine human use of streams on LHAAP. The streams do not carry adequate numbers and size of fish to support either sport or subsistence fishing. The streams discharge into Caddo Lake. Caddo Lake is a large recreational area that covers 51 square miles and has a mean depth of 6 feet. The watershed of the lake encompasses approximately 2,700 square miles. It is used extensively for fishing and boating. Caddo Lake is a drinking water supply for multiple cities in Louisiana including Vivian, Oil City, Mooringsport, South Shore, Blanchard, Shreveport, and Bossier City.

The anticipated future uses of the streams and lake are the same as the current uses.

2.6.3 Current and Future Groundwater Uses

Groundwater in the deep aquifer (250-430 feet bgs) near LHAAP is currently used as a drinking water source. There are currently five active water supply wells near LHAAP. One well is located in and owned by Caddo Lake State Park. The well is completed to a depth of 315 feet and has been in use since 1935. A second well owned by the Karnack Water Supply Corporation services the town of Karnack and is located approximately 2 miles southeast of town. This well is approximately 430 feet deep and has been in use since 1942. The Caddo Lake Water Supply Corporation has three wells located both north and northwest of LHAAP. These wells are identified as Caddo Lake Water Supply Corporation Wells 1, 2, and 3 and are all hydraulically upgradient of LHAAP. Because of the large distance between these wells and LHAAP, their location upgradient of LHAAP, and the completion of the wells in a zone stratigraphically lower than the depth of groundwater contamination at LHAAP, water removal from these wells is not expected to affect groundwater flow at the site, nor be impacted by LHAAP's contaminated groundwater. In addition, there are several livestock and domestic wells located in the vicinity of LHAAP with depths averaging approximately 250 feet.

There are three deep water supply wells located on LHAAP (**Figure 2-2**) and all three supply water to the buildings currently in use at the installation. All three wells supply water to the tap, but none are used for drinking water, even though uncontaminated. These wells are located upgradient of LHAAP-35B (37) and LHAAP-67. One well is located at the Fire Station/Security Office approximately 0.35 miles and 1.0 mile northwest of LHAAP-35B (37) and LHAAP-67, respectively. The second well is located approximately one-half mile southwest of the Fire Station/Security Office, 0.6 miles west of LHAAP-35B (37) and 1.14 miles west-northwest of LHAAP-67. The third well is located north of the administration building, near the entrance to LHAAP approximately 1.42 miles southwest of LHAAP-35B (37) and 1.97 miles west-

southwest of LHAAP-67. Two additional wells previously supplied water to the installation, but these have been plugged and abandoned. None of the water supply wells are associated with or in imminent danger from the localized contaminated groundwater at LHAAP-35B (37) and LHAAP-67.

Although the anticipated future use of the facility as a wildlife refuge may not include the use of the groundwater at LHAAP-35B(37) and LHAAP-67 as a drinking water source, the State of Texas designates all groundwater as potential drinking water, unless otherwise classified, and consistent with 30 TAC 335.563(h)(1). To be conservative, a hypothetical industrial use scenario was evaluated for risk. The future industrial scenario for LHAAP assumes limited use of groundwater as a drinking water source.

2.7 Summary of Site Risks

This section summarizes the results of the baseline human health and ecological risk assessments conducted for LHAAP-35B (37) and LHAAP-67 (Jacobs, 2003; Shaw, 2007c). Certain changes to the ecological portion of the assessment were made since 2002 and are discussed below. Risk assessments were conducted during the RI for LHAAP-35B (37) and LHAAP-67 in accordance with USEPA risk assessment guidance (USEPA, 1989). The assessments provide a basis for taking action, if any, and identifying the chemicals and exposure pathways that should be addressed by a remedial action. The data used for the HHRA was collected prior to 2003. The occurrence of COCs and the toxicity data used in the HHRA are shown in **Tables 2-5** through **2-8**. The results of the HHRA for LHAAP-35B (37) and LHAAP-67 are summarized in **Tables 2-9** through **2-12**.

Figures 2-7 and **2-8** present the CSM for exposure pathways associated with LHAAP-35B (37) and LHAAP-67. The CSM illustrate the contaminant source medium, release mechanisms, exposure pathways, migration routes, and potential receptors at the site.

The risk assessments consist of an HHRA (Jacobs, 2003) and an ecological risk assessment (ERA) (Shaw, 2007c). The overall goal of both the HHRA and the ERA is to furnish information to risk managers and stakeholders to assist in the evaluation of options for closure, biomonitoring, and/or remediation of a site to mitigate the risks.

2.7.1 Human Health Risk Assessment Summary

An HHRA is based on a conservative estimate of the potential cancer risk or noncancer hazard from potential exposure. The following three factors were considered in the evaluation:

- Nature and extent of contamination at LHAAP-35B (37) and LHAAP-67
- Exposure pathways through which human receptors are or may be exposed to those contaminants at the site

- Potential toxic effects of those contaminants

Risk from exposure to soil and groundwater are presented in the summary of risks for these sites. Potential risks to human health were determined according to USEPA guidance to ensure that conservative estimates of potential health effects are obtained. The risk estimates reflect the anticipated uses of the land.

A conservative estimate of risk was developed incorporating the potential exposure pathways, which included direct skin contact with contaminated soil, incidental ingestion of soil, inhalation of contaminated chemical vapors and soil particles, ingestion of groundwater, dermal contact with both soil and groundwater, and inhalation of vapors during non-ingestion groundwater use. Plausible human receptors that may be exposed to soil and/or groundwater at the sites included maintenance workers under future land use conditions consistent with the anticipated use as a national wildlife refuge (industrial scenario), and on-site trespassers under current site conditions. It was assumed that trespassers would not have contact with groundwater.

The HHRA was performed to determine potential health impacts of human exposure to chemicals detected in soil between 0 to 2 feet bgs (for the maintenance worker) and 0 to 6 inches bgs (for the trespasser). Health impacts from groundwater were also evaluated for hypothetical use of the groundwater underlying LHAAP-35B (37) and LHAAP-67 as a potable water source (Jacobs, 2003).

2.7.1.1 Identification of Chemicals of Concern

LHAAP-35B (37)

The HHRA for LHAAP-35B (37) was based on ten soil samples that were collected from five locations (**Table 2-1**). Thirty-three groundwater samples were collected from eight wells (**Table 2-2**) (Jacobs, 2003). The frequency of detections shown in **Table 2-1** and **Table 2-2** varies as a result of the different lists of analytes specified by the various groundwater sampling efforts described in the Jacobs (2003) risk assessment, and subsequent sampling events.

The soil analytical results indicated that metals, VOCs, SVOCs, pesticides, and dioxins/furans were detected in soil samples. Of these detected chemicals, the risk assessment identified no COCs in soil from both 0 to 0.5 feet bgs and 0 to 2 feet bgs (Jacobs, 2003).

Metals, VOCs, SVOC, explosives, and dioxin/furans were detected in groundwater (**Table 2-2**). The risk assessment identified antimony, thallium, 1,1-DCE, PCA, and TCE as COCs in groundwater. The ranges of detected concentrations, frequency of detection, and EPC of each COC in groundwater are shown in **Table 2-5**.

LHAAP-67

The assessment for LHAAP-67 was based on 11 soil samples that were collected from three soil borings (**Table 2-3**). The frequency of detections shown in **Table 2-3** varies as a result of the different lists of analytes specified by the various sampling efforts described in the Jacobs (2003) risk assessment.

The soil analytical results indicated that metals, VOCs, SVOCs, pesticides, and dioxins/furans were detected in soil samples. Of these detected chemicals, the risk assessment identified no chemicals as COCs in soil from both 0 to 0.5 feet bgs and 0 to 2 feet bgs (Jacobs, 2003).

Metals and VOCs were detected as COCs in groundwater. The risk assessment identified barium, manganese, strontium, thallium, 1,1,1-TCA, 1,1,2-TCA, 1,1-DCE, 1,2-DCA, and TCE as COCs. The ranges of detected concentrations, frequency of detection, and EPC of each COC in groundwater are shown in **Table 2-6**.

2.7.1.2 Exposure Assessment

The exposure assessment evaluated potential exposure of current trespassers and future maintenance workers at each site. Each assessment involved assumptions of a high reasonable maximum exposure (RME). The RME assumptions were designed to provide high estimates of exposure and lead to a conservatively high estimate of related risk. The exposure pathways evaluated in the risk assessment are shown for LHAAP-35B (37) and LHAAP-67 in **Figures 2-7** and **2-8**, respectively. The HHRA by Jacobs (2003) evaluated the current trespasser and future maintenance workers at each site.

Current Trepasser Scenario

Exposure of the trespasser at either site was evaluated only for chemicals contained in soil within 0 to 0.5 feet bgs. The exposures evaluated incidental soil ingestion, dermal contact with soil, inhalation of particulates generated from soil, and the inhalation of volatile emissions from soil. Access to the groundwater is only at the active areas of the plant, which does not include either LHAAP-35B (37) or LHAAP-67. The trespasser to either site was assumed to be a 70 kilogram (kg) adult with an averaging time (AT) of 70 years for cancer risk. The trespasser was assumed to visit either site at an exposure frequency (EF) of 50 days/year. The trespasser was assumed to visit either site for exposure duration (ED) of 12 years. The AT for non-cancer hazard equals the ED value.

The assumed soil ingestion rate was 100 milligrams per day (mg/day) for both sites and the fraction absorbed by the ingestion pathway (FI) was 1.0, that is to indicate that it was assumed that ingested chemicals were completely absorbed into the body.

For the dermal exposure assessment, the exposed skin surface area (SA) value of 3,500 square centimeters (cm^2) was assumed. The value of the adherence factor of soil to skin (AF) for the absorption was 0.1 milligrams per square centimeter (mg/cm^2). The values of the absorption

fraction of chemicals through the skin (ABS) are chemical specific and the same values were used for both sites. The details of the ABS calculations are provided in the risk assessment document (Jacobs, 2003).

For the dust inhalation exposure assessment, the particulate emission factor (PEF) was assumed to equal 4.63×10^9 cubic meters per kilogram (m^3/kg) at both sites. Chemical specific volatilization factors (VFs) were calculated for each volatile chemical. Details of these calculations are provided in the risk assessment document (Jacobs, 2003).

Groundwater ingestion was considered to be an incomplete exposure pathway in the risk assessment for the trespasser scenario at both sites (**Figures 2-7** and **2-8**).

Future On-Site Maintenance Worker Scenario

Exposure of the maintenance worker at either site was evaluated for chemicals contained in soil within 0 to 2 feet bgs and groundwater. The exposures evaluated incidental soil ingestion, dermal contact with soil, inhalation of particulates generated from soil, and the inhalation of volatile emissions from soil.

The maintenance worker was assumed to be a 70 kg adult with an AT of 70 years for cancer risk. The assumed EF for the maintenance worker was 250 days/year, and the assumed ED was 25 years. The AT for noncancer hazard equals the ED value.

The assumed soil ingestion rate was 100 mg/day and the FI was 1.0. For the dermal exposure assessment, the SA value was 3,200 cm^2 and the AF value was 0.2 mg/cm^2. The values of the ABS are chemical specific and the same values were used for both sites. The details of the ABS calculations are provided in the risk assessment document (Jacobs, 2003).

For the dust inhalation exposure assessment, the PEF was assumed to equal 4.63×10^9 m^3/kg at both sites. Chemical specific VFs were calculated for each volatile chemical. Details of these calculations are provided in the risk assessment document (Jacobs, 2003).

Exposures to groundwater were evaluated for the maintenance worker scenario. The maintenance worker was assumed to ingest groundwater at a rate of 1 liter per day. Dermal exposures and inhalation of volatiles from groundwater were assumed to occur during showering.

For the dermal exposure assessment, the SA value was 23,000 cm^2 and the exposure time was 0.20 hours/day. The EF and ED values assumed for ingestion exposures were used in the dermal exposure evaluation. The calculations of permeability factor (K_p) that describe absorption of chemicals in water through skin are chemical specific and are described in the risk assessment document (Jacobs, 2003).

For the inhalation exposure to vapors from groundwater, an AF of 0.5 was made to the EF to account for the reduced time that the maintenance worker spends indoors. The volatilization factor (K) of 0.5 liter per cubic meter was used in the vapor inhalation assessment.

2.7.1.3 Toxicity Assessment

The toxicity factors used to evaluate cancer and non-cancer risk from exposure to COCs are shown in **Tables 2-7** and **2-8,** respectively. The cancer slope factors, or inhalation unit risk factors, and noncancer reference doses (RfDs), or inhalation reference concentrations, were selected from the USEPA Integrated Risk Information System (IRIS). If no value was available in the IRIS, then values from the USEPA National Center for Environmental Assessment (NCEA) or the TCEQ were used.

2.7.1.4 Risk Characterization

For carcinogens, risks are generally expressed as the incremental probability of an individual to develop cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated form the following equation:

$$\text{Risk} = \text{chronic daily intake (CDI)} \times \text{SF}$$

Where: Risk = the probability of an individual's developing cancer

CDI = chronic daily intake averaged over 70 years (milligrams per kilogram per day [mg/kg-day])

SF = slope factor, expressed as $(\text{mg/kg-day})^{-1}$

These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an exposed individual has a 1 in 1,000,000 chance of developing cancer as a result of the exposure. This is referred to as the "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. USEPA's generally acceptable risk range for site-related exposures is 10^{-6} to 10^{-4}.

The potential for noncancer effects is evaluated by comparing an exposure level over a specified time with an RfD derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ<1 indicates that a receptor's dose of a single contaminant is less than the RfD and that toxic noncarcinogenic effects from that chemical are unlikely. The hazard index (HI) is generated by adding the HQs for all COCs that affect the same target organ or act through the same mechanism of action within a medium or across all media to which the individual may reasonably be exposed. An HI<1 indicates that,

based on the sum of all HQs from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI>1 indicates that site-related exposures may present a hazard to human health.

The HQ is calculated s follows:

$$Noncancer\ HQ = CDI/RfD$$

Where: CDI = chronic daily intake

RfD = reference dose

The CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short term).

LHAAP-35B (37)

Current Trespasser Scenario

All cancer risks associated with potential exposure of the trespasser to COCs in soil by all exposure pathways is 4×10^{-7} when rounded to 1 significant figure as specified in USEPA (1989) guidance, which is below the 1×10^{-6} to 1×10^{-4} acceptable range (USEPA, 1990). The calculated noncancer HI for potential exposure to COCs by all exposure pathways is 0.02 rounded to 1 significant figure as specified in USEPA (1989) guidance, which is below the acceptable value of 1 (USEPA, 1990).

Future On-Site Maintenance Worker Scenario

Cancer risks associated with potential exposure of the future maintenance worker to COCs in surface soil (0 to 0.5 feet bgs) and groundwater are summarized in **Table 2-9**. The calculated cancer risk for potential exposure to COCs in soil at LHAAP-35B (37) is 5×10^{-6} when rounded to 1 significant figure, which is within the 1×10^{-6} to 1×10^{-4} acceptable range (USEPA, 1990).

The calculated cancer risk for potential exposure to COCs in groundwater is 6×10^{-4}, which is above the 1×10^{-6} to 1×10^{-4} acceptable ranges (USEPA, 1990). The risk is predominantly associated with exposure to 1,1-DCE (4.6×10^{-4}) by the ingestion pathway, which is above the acceptable range. Additional risk was estimated for PCE, TCE, and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), with a cumulative risk above 1×10^{-4}, although estimates for the individual chemicals are within the acceptable range. Significant risk was associated with inhalation exposures to 1,1-DCE and TCE.

The calculated noncancer HQ and HI values associated with exposures to surface soil and groundwater are summarized in **Table 2-10**. The HI value for all COCs in soil is 0.1, rounded to 1 significant figure, and is below the acceptable value of 1 (USEPA, 1990).

The HI that was calculated for potential exposure to COCs in groundwater is 20, which is above the acceptable value of 1 (USEPA, 1990). The HI is predominantly associated with exposure to thallium and antimony by the groundwater ingestion route. Additional HI above the acceptable value of 1 is associated with TCE by the combined exposures of groundwater ingestion and dermal contact while showering.

Summary of LHAAP-35B (37) Site Risks and Hazards

No unacceptable cancer risk or noncancer hazard was identified for exposures of the trespasser or the future maintenance worker to chemicals in surface soil or subsurface soil at this site. All unacceptable risks or hazards were associated with potential exposures of the future maintenance worker to chemicals detected in groundwater.

Cancer risks above acceptable USEPA criteria are predominantly associated with exposure of the future maintenance worker to 1,1-DCE, PCE, TCE, and 2,3,7,8-TCDD by the direct groundwater ingestion and dermal contact pathways, but significant risk was associated with inhalation exposures to 1,1-DCE and TCE while showering.

Noncancer hazards above acceptable USEPA criteria are predominantly associated with exposure to thallium and antimony by the groundwater ingestion route and to TCE by the combined exposures of groundwater ingestion and dermal contact while showering.

Chemicals were identified as COCs in groundwater based on a comparison of the acceptable cancer risk range of 1×10^{-6} to 1×10^{-4} or an HI limit of 1, as described in USEPA (1990) guidance. No COCs were identified by this method for the current trespasser scenario. For the future maintenance worker scenario, thallium, antimony, 1,1-DCE, PCE, TCE, and 2,3,7,8-TCDD were identified as COCs in groundwater at LHAAP-35B (37) (**Table 2-9** and **Table 2-10**).

Although it was reported that thallium and antimony contributed to the groundwater noncarcinogenic hazard, only 2 of 10 samples detected thallium and antimony in the 1996 sampling event and the detections were J-qualified (i.e., the reported values were estimated values since they were below the reporting limit). The conclusions of the 2002 RI (Jacobs, 2002a) were that thallium and antimony had not been detected in the follow-on 1998 sampling event and that the groundwater at Site 35B(37) was not considered to be contaminated with metals (Jacobs, 2002a).

LHAAP-67

Current Trespasser Scenario

All cancer risks associated with potential exposure of the trespasser to COCs in soil by all exposure pathways is 2×10^{-8}, when rounded to 1 significant figure as specified in USEPA (1989) guidance, which is well below the 1×10^{-6} to 1×10^{-4} acceptable range (USEPA, 1990).

The calculated noncancer HI for potential exposure to COCs by all exposure pathways is 0 rounded to 1 significant figure as specified in USEPA (1989) guidance, which is below the acceptable value of 1 (USEPA, 1990).

Future On-Site Maintenance Worker Scenario

Cancer risks associated with potential exposure of the future maintenance worker to chemicals of potential concern in surface soil (0 to 0.5 feet bgs) and groundwater are summarized in **Table 2-11**. The calculated cancer risk for potential exposure to COCs in soil at LHAAP-67 is 3×10^{-7} rounded to 1 significant figure, which is below the 1×10^{-6} to 1×10^{-4} acceptable range (USEPA, 1990).

The calculated cancer risk for potential exposure to COCs in groundwater is 3×10^{-3}, which is above the 1×10^{-6} to 1×10^{-4} acceptable range (USEPA, 1990). The risk is predominantly associated with exposure to 1,1-DCE inhalation and dermal contact pathways while showering, and ingestion (**Table 2-11**). Cancer risks from exposures to all other compounds in groundwater are within the acceptable risk range.

The calculated noncancer HQ and HI values associated with exposures to surface soil and groundwater are summarized in **Table 2-12**. The calculated noncancer HI for potential exposure to COCs in groundwater is 4, which is above the acceptable HI value of 1. The HI is predominantly associated with exposure to 1,1-DCE, 1,2-DCA, 1,1,1-TCA, and 1,1,2-TCA by inhalation and dermal contact pathways while showering. The noncancer HI associated with barium, manganese, strontium, and thallium exposure by groundwater ingestion is also above the USEPA acceptable level.

Summary of LHAAP-67 Site Risks and Hazards

No unacceptable cancer risk or noncancer hazard was identified for exposures of the trespasser or the future maintenance worker to chemicals in surface soil or subsurface soil at this site. All unacceptable risks or hazards were associated with potential exposures of the future maintenance worker to chemicals detected in groundwater.

Cancer risks at LHAAP-67 that are above acceptable USEPA criteria are predominantly associated with exposure of the future maintenance worker to 1,1-DCE by the groundwater ingestion and dermal contact pathways, and ingestion.

Noncancer hazards above acceptable USEPA criteria are predominantly associated with exposure to 1,1-DCE, 1,2-DCA, 1,1,1-TCA, 1,1,2-TCA by inhalation and dermal contact pathways while showering, and with barium, manganese, strontium, and thallium exposure by groundwater ingestion.

Chemicals were identified as COCs in groundwater based on a comparison the acceptable cancer risk range of 1 × 10-6 to 1 × 10-4 or an HI limit of 1, as described in USEPA (1990) guidance. No COCs were identified by this method for the current trespasser scenario. For the future maintenance worker scenario, 1,1,1-TCA, 1,1,2-TCA, 1,2-DCA, 1,1-DCE, barium, manganese, strontium, and thallium were identified as COCs in groundwater at LHAAP-67 (**Table 2-11** and **Table 2-12**).

Although the Jacobs (2003) risk assessment reported that barium, manganese, strontium, and thallium contributed to the groundwater noncancer HI, barium and thallium have MCL values that govern requirements for further remedial actions. As described in Section VI.1 of the TCEQ Consistency Memorandum (TCEQ, 1998 as updated through 2006), the MCL specified in the Safe Drinking Water Act represents the cleanup level (GW-Ind MSC) for chemicals having an MCL, and those chemicals are not included in the cumulative risk estimate for groundwater. The metals without MCLs, manganese and strontium represent HQ values of 7.2E-01 and 1.2E-01, respectively. Because these values, and their sum, are below the acceptable HI value of 1, manganese and strontium do not represent unacceptable noncancer hazards for groundwater use as drinking water.

Barium was detected in five of nine groundwater samples with the maximum concentration of 3.3 mg/L (Appendix C of Jacobs, 2002b) that exceeds the MCL (2 mg/L). All other detections were below the MCL. Thallium was detected in three of nine groundwater samples (Appendix C of Jacobs, 2002b). Two detections, 0.0012 mg/L and 0.0015 mg/L, were below the MCL (0.002 mg/L). One concentration of 0.0021 mg/L was approximately equal to the MCL.

The concentration of barium was detected in only one of multiple groundwater sampling events that occurred between 1998 and 2000. The concentration of thallium equals the MCL within the precision of duplicated measurements (± 0.0005 mg/L), and occurs in only one of nine groundwater samples.

2.7.1.5 Uncertainty

Uncertainties in the risk estimates are associated with the use of J-qualified (estimated) values in the assessment. This uncertainty could result in either high or low risk estimates. The use of the maximum soil and groundwater concentrations in all assessments is expected to result in highly conservative risk estimates in accordance with USEPA policy to ensure that the resulting estimates are protective of human health.

2.7.1.6 Notification and Recordation Requirements

A notification will be filed in the county record to comply with the non-residential soil requirements for Texas Administrative Code (TAC) Risk Reduction Rule (RRR) Std 2 closure. The notification will include a survey of the area evaluated for risk and will indicate that future land use is considered suitable for non-residential use only because it has not been evaluated for unrestricted use. This notification will accompany transfer documents. Certification of the non-residential use of the two sites will be transmitted to USEPA and TCEQ every five years by the Army, and after transfer, by the Army or the transferee. For as long as five year reviews are required at the sites, the certification may be included in that document.

2.7.2 Ecological Risk Assessment Summary

An installation-wide BERA has been completed for LHAAP (Shaw 2007c). A BERA is a process that evaluates the likelihood that adverse ecological effects may occur, or are occurring, as a result of exposure to one or more stressors. A stressor is any physical, chemical, or biological entity that can induce an adverse ecological response. The BERA for LHAAP focuses only on chemical stressors.

Ecological risk does not exist unless:

- The stressor has the inherent ability to cause adverse effects
- It co-occurs with or contacts an ecological component (i.e., organism, populations, communities, or ecosystem) long enough and at sufficient intensity to elicit an adverse effect

For the BERA, the entire Installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. The individual sites at LHAAP were grouped into one of these sub-areas, which were delineated based on commonalities of historical use, habitat type, and spatial proximity to each other. Therefore, any conclusions regarding the potential for chemicals detected at individual sites to adversely affect the environment must be made in the context of the overall conclusions of the sub-area in which the site falls. Sites LHAAP-35B (37) and LHAAP-67 lie within the Industrial Sub-Area. The BERA concluded that no unacceptable risk was present in the Industrial Sub-

Area (Shaw, 2007c) and therefore, no further action is needed at these two sites for the protection of ecological receptors.

2.8 Remedial Action Objectives

Army recognizes USEPA's policy to return all groundwater to beneficial uses, based upon the non-binding programmatic expectation in the NCP. The RAOs for LHAAP-35B (37) and LHAAP-67, which address contamination associated with the media at the sites and take into account the future uses of LHAAP streams, land, and groundwater include:

- Protection of human health by preventing human exposure to the contaminated groundwater
- Protection of human health and the environment by preventing contaminated groundwater from migrating into nearby surface water
- Return of groundwater to its potential beneficial uses as drinking water, wherever practicable

2.9 Description of Alternatives

Under a hypothetical industrial use scenario, groundwater was found to present an unacceptable risk or hazard at LHAAP-35B (37) and LHAAP-67. Thus the purpose of the remedial alternatives is to present the decision maker with technical and economic options for mitigation of risk from the groundwater at LHAAP-35B (37) and LHAAP-67. The alternatives were developed to achieve the RAOs and the statutory requirements under CERCLA; however, each alternative is unique in its strategy and approach and presents a reasonable spectrum of final conditions. The four alternatives considered for LHAAP-35B (37) and LHAAP-67 are discussed in the following sections.

2.9.1 Common Elements

Because contamination would be left in place at LHAAP-35B (37) and LHAAP-67 for Alternative 2 Monitored Natural Attenuation (MNA), and because contamination would be present for the duration of remedial activities in Alternatives 3, In Situ Bioremediation, and 4, Groundwater Extraction, 0n Site Treatment, Surface Water Discharge, LUCs would be common to these alternatives. The LUCs would support the RAOs. The Army intends to provide details of the LUCs implementation actions in a RD document for the two sites.

The LUCs to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health:

- Ensure no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing

The U.S. Army would be responsible for implementation, maintenance, inspection, reporting, and enforcement of the LUCs. The Army intends to provide details of the LUCs implementation and maintenance actions in an RD for LHAAP-35B (37) and LHAAP-67. The groundwater restriction LUCs shall be maintained until the concentrations of contaminants in groundwater have been reduced to levels below their respective MCLs. In addition, the Texas Department of Licensing and Regulation responsible for notifying well drillers of groundwater restrictions would be notified and a notification and/or recordation with the Harrison County Courthouse would include a map showing the areas of groundwater restriction at the site.

In order to transfer this property (LHAAP-35B (37) and LHAAP-67), an Environmental Condition of Property (ECOP) document will be prepared and attached to the letter of transfer. The property will be transferred subject to the land use and restriction covenants that are identified in the ECOP. These restrictions would prohibit or restrict property uses that may result in exposure to the contaminated groundwater (e.g., drilling restrictions, residential/ agricultural land use restrictions, drinking water well restrictions).

Alternatives 2, 3, and 4 also include inspection and long-term groundwater monitoring activities. Monitoring would be continued as required to demonstrate effectiveness of the remedies, compliance with MCLs, to-be-considered requirements, RAOs, and to support CERCLA Five-Year Reviews.

Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity.

2.9.2 Description of Remedy Components

Alternative 1 – No Action. As required by the NCP, the no action alternative provides a comparative baseline against which the action alternatives can be evaluated. Under this alternative, the groundwater would be left "as is" without implementing any additional containment, removal, treatment, or other mitigating actions. No other actions, such as LUCs, would be implemented to prevent potential human exposure to contaminated groundwater or to demonstrate that nearby surface water bodies are protected from groundwater impacts.

LHAAP-35B (37):
Estimated Capital Cost: $0
Estimated O&M Cost: $0
Estimated Duration: -
Estimated Present Worth Cost: $0

LHAAP-67:
Estimated Capital Cost: $0

Estimated O&M Cost: $0
Estimated Duration: -
Estimated Present Worth Cost: $0

Alternative 2 – Land Use Controls and Monitored Natural Attenuation. Alternative 2 is the preferred alternative. The objectives of this alternative are to prevent contaminated groundwater from migrating into nearby surface water, to return groundwater to its potential beneficial use as drinking water, wherever practicable, and to ensure no use of the groundwater as a drinking water source. MNA is a passive remedial action that relies on natural biological, chemical, and physical processes that act to reduce the mass and concentration of groundwater COCs under favorable conditions.

This alternative returns the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial uses, which for the purposes of this ROD is considered to be attainment of the Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, this alternative would still meet the NCP expectation to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction. This alternative also includes LUCs to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health. The groundwater restriction LUCs shall be maintained until the concentration of contaminants in groundwater have been reduced to levels below their respective MCLs and any residual contamination has been sufficiently reduced to allow unrestricted use of the groundwater at LHAAP-35B (37) and LHAAP-67. Based on groundwater modeling, groundwater MCLs are expected to be met through natural attenuation in 28 to 38 years for PCE, 39 to 43 years for TCE, and 16 to 21 years for 1,1-DCE at LHAAP-35B (37) (Shaw, 2007e and U.S. Army, 2008b). Considering the lithologic variability, particularly the lateral and vertical change from sand to clay, the times to MCL may range to an order of magnitude greater. For LHAAP-67, MCLs would be met through natural attenuation in 17 to 66 years for TCE, 20 to 34 years for 1,1-DCE, and 21 to 43 years for 1,2-DCA. Although the times to MCL for 1,1,1-TCA and 1,1,2-TCA were originally modeled to be 22 and 20 years respectively, these two VOCs are no longer detected above MCLs at LHAAP-67 (Shaw, 2007b; U.S. Army, 2008b).

Monitoring activities associated with 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.

LHAAP-35B (37):
Estimated Capital Cost: $79,000

Estimated O&M Cost: $393,000
Estimated Duration: 30 years
Estimated Present Worth Cost: $282,000

LHAAP-67:

Estimated Capital Cost: $47,000
Estimated O&M Cost: $607,000
Estimated Duration: 30 years
Estimated Present Worth Cost: $316,000

Alternative 3 – In Situ Bioremediation, Land Use Controls (Short Term). The objectives of this alternative are to prevent contaminated groundwater from migrating into nearby surface water, to return groundwater to its potential beneficial use as drinking water, wherever practicable, and to ensure no use of the groundwater as a drinking water source.

This alternative returns the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, which for the purposes of this ROD is considered to be attainment of the Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, this alternative would still meet the NCP expectation to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction. To achieve these objectives, this alternative utilizes in situ bioremediation to reduce groundwater contaminant concentrations to the MCLs, and maintains LUCs only until such time that the MCLs are met for groundwater contaminants through remediation. Based on estimates from the Feasibility Study, groundwater MCLs are expected to be met through in situ bioremediation in 6 years. Considering the lithologic variability, particularly the lateral and vertical change from sand to clay, the times to MCL may range to an order of magnitude greater.

LHAAP-35B (37):

Estimated Capital Cost: $2,535,000
Estimated O&M Cost: $317,000
Estimated Duration: 6 years
Estimated Present Worth Cost: $2,664,000

LHAAP-67:

Estimated Capital Cost: $1,691,000
Estimated O&M Cost: $367,000
Estimated Duration: 6 years
Estimated Present Worth Cost: $1,793,000

Alternative 4 – Groundwater Extraction, On-Site Treatment, Surface Water Discharge, and Land Use Controls (Short Term). The objectives of this alternative are to prevent contaminated groundwater from migrating into nearby surface water, to return groundwater to its

potential beneficial use as drinking water, wherever practicable, and to ensure no use of the groundwater as a drinking water source.

This alternative returns the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, wherever practicable, which for the purposes of this ROD is considered to be attainment of the Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, this alternative would still meet the NCP expectation to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction. To achieve these objectives, this alternative uses groundwater extraction to remove contaminants from groundwater for treatment and maintains LUCs only until such time that the MCLs are achieved for groundwater contaminants. The extracted groundwater would be piped to the existing groundwater treatment plant. Based on estimates from the Feasibility Study, groundwater MCLs are expected to be met through groundwater extraction and on-site treatment at some point beyond 30 years. Further study would be required to more accurately quantify this timeframe. Considering the lithologic variability, particularly the lateral and vertical change from sand to clay, the times to MCL may range to an order of magnitude greater.

LHAAP-35B (37):
Estimated Capital Cost: $1,271,000
Estimated O&M Cost: $1,764,000
Estimated Duration: 30 years
Estimated Present Worth Cost: $2,095,000

LHAAP-67:
Estimated Capital Cost: $1,211,000
Estimated O&M Cost: $1,904,000
Estimated Duration: 30 years
Estimated Present Worth Cost: $1,957,000

2.10 Summary of Comparative Analysis of Alternatives

Nine criteria identified in the NCP are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FSs for the two sites (Shaw, 2005a; 2005b). **Table 2-13** summarizes the comparative analysis of the alternatives presented in this ROD.

1. Overall Protection of Human Health and the Environment

The four alternatives provide varying levels of human health protection. Alternative 1, no action, does not achieve the RAOs and provides the least protection of all the alternatives; it provides no reduction in risks to human health or the environment because no measures would be implemented to eliminate the hypothetical pathway for maintenance worker exposure to the groundwater contamination, and potential groundwater impacts to Goose Prairie Creek and Central Creek would not be addressed.

Alternatives 2, 3, and 4 all satisfy the RAOs for LHAAP-35B (37) and LHAAP-67. Alternatives 2, 3 and 4 also provide confirmation that human health and the environment will be protected because the monitoring will be conducted to ensure that MNA is returning the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial uses as a drinking water, wherever practicable, and to document that the plumes are contained and prevented from impacting Goose Prairie Creek and Central Creek at levels that could present a risk to human health and the environment. Furthermore, LUCs would protect human health by preventing access to the contaminated groundwater until contaminants in the groundwater attain the Safe Drinking Water Act MCLs for all contaminants above the MCLs and attain the MCLs for all contaminants by-products (daughter contaminants) above the MCLs.

2. Compliance with ARARs

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) requires that remedial actions at CERCLA sites attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs" unless such ARARs are waived under CERCLA Section 121(d)(4).

Because contaminated groundwater has the potential to discharge to Central Creek and Goose Prairie Creek, downgradient surface water features that flow to Caddo Lake, a drinking water supply, chemical specific ARARs for surface water consumption are appropriate and relevant. Specifically, Texas surface water quality standards are set forth in 30 TAC 307.6(d)(1) for TCE (5 ppb), PCE (5 ppb) and 1,1-DCE (1.63 ppb) for LHAAP-35B (37), and TCE, 1,1-DCE, and 1,2-DCA (5 ppb) for LHAAP-67. These standards are equivalent to the MCLs for the contaminants.

Alternative 1 does not comply with chemical-specific ARARs because no additional remedial action would be implemented. Alternatives 2, 3, and 4 all return the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, wherever practicable, which for the purposes of this ROD is considered to be attainment of the relevant and appropriate Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, these alternatives would still meet the NCP expectation to

prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction. Alternative 2 does comply with surface water ARARs because modeling results indicate MNA will reduce the TCE concentrations in groundwater to the MCL prior to discharge as base flow into Goose Prairie Creek and Central Creek and monitoring would be used to confirm it. Alternatives 3 and 4 also comply with surface water chemical specific ARARs because they are active remedial processes that will reduce contaminant levels in groundwater to levels below water quality standards prior to discharge as baseflow into surface water.

Location-specific and action-specific MCLs would not apply to Alternative 1 since no remedial activities would be conducted. Alternatives 2, 3, and 4 comply with all location-specific and action-specific ARARs.

3. Long-Term Effectiveness and Permanence

Alternative 1 would be the least effective and permanent in the long term because no contaminant removal or treatment would take place and no measures would be implemented to control exposure risks posed by contaminated site groundwater. Also, there is a concern that the potential exists for contaminated groundwater to migrate toward and discharge into Goose Prairie Creek and Central Creek and then subsequently into Caddo Lake, a drinking water supply. The results of plume migration modeling indicate that through MNA the maximum concentrations of the COCs within Goose Prairie Creek and Central Creek if such discharge occurred would be below groundwater MCLs and surface water ARARs, which also would be protective of Caddo Lake. Alternatives 3 and 4 are also active treatments that would permanently reduce contaminant levels in groundwater over time with Alternatives 2 and 4 taking the longest and approximately equal amount of time and Alternative 3 taking the least amount of time.

Although different mechanisms are prevailing at LHAAP-35B (37) and LHAAP-67, MNA effectively controls plume migration and has stabilized the size of the areas exhibiting COC concentrations exceeding MCL values. Alternatives 3 and 4 would also work to control plume migration through contaminant reduction. However, uncertainty exists regarding the ability of in situ bioremediation or groundwater extraction to reduce contaminant concentrations beyond what would naturally occur, and therefore further evaluation would be required. Should in situ bioremediation or groundwater extraction be considered ineffective after implementation, the remedy may need to be reevaluated. Alternatives 2, 3 and 4 rely on LUCs for the protection of human health until the MCLs are achieved. For purposes of this ROD, the long-term protection of human health and the environment will be served by returning the contaminated groundwater to its potential beneficial uses, which includes the attainment of the Safe Drinking Water Act

MCLs for all contaminants above the MCLs and attainment of MCLs for all contaminants by-products (daughter contaminants) above the MCLs.

The time period to achieve the groundwater remediation levels is the most significant difference between Alternative 3 versus Alternatives 2 and 4. Alternative 3 is expected to take less time to achieve RAOs, provided treatability testing for in situ bioremediation is favorable. The implementation of Alternatives 2 and 4 would require a significant amount of more time than Alternative 3 in returning the contaminated groundwater to its potential beneficial use as drinking water, wherever practicable.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 does not employ treatment and would not result in a reduction of toxicity, mobility, or volume of contaminants.

MNA, in situ biodegradation, and groundwater extraction are irreversible treatment processes that would permanently reduce the mass and concentration of contaminants and, therefore, the volume, toxicity and mobility of the contaminants. Alternatives 2 and 3, however, include the generation of daughter products that may temporarily increase toxicity or mobility of the contaminant plume, with in situ biodegradation working in a shorter time frame, but with MNA at a lower cost. Both alternatives include monitoring so that daughter products would be quantified, documented, and evaluated.

Alternative 4 could provide the greatest degree of permanent reduction in toxicity, mobility and volume of the groundwater contaminants because no daughter products are generated in situ since the contaminant plume is extracted and treated ex situ.

It is noted, however, that pre-design testing and further evaluations of in situ bioremediation or groundwater extraction will be required to evaluate the potential effectiveness of these alternatives.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during the construction and operation of the remedy until cleanup levels are achieved.

Alternative 1 does not involve any remedial measures and, therefore, no short-term risk to workers, the community, or the environment would exist. The activities associated with Alternative 2 would have little potential for short-term risk to workers or the environment, other than the negligible risks to workers associated with the exposure to contaminants during groundwater monitoring activities.

Alternatives 3 and 4 both involve potential short-term negligible risks to workers associated with exposure to contaminated groundwater and operation of drilling/construction equipment.

Additionally, because there is no current use of groundwater as drinking water and contaminated groundwater does not currently impact surface water, none of the alternatives present a short-term risk to the community and the environment.

6. Implementability

Under the no action alternative, no remedial action would be taken. Therefore, no difficulties or uncertainties would be associated with its implementation. Alternative 2 is easily implemented from a technical standpoint because no construction activities would be performed, although the Army would be responsible for long-term maintenance and enforcement of LUCs, long-term evaluation of MNA, long-term sampling; and long-term maintenance and operation of sampling equipment.

Alternatives 3 and 4 are also technically implementable, although less so than Alternative 2 because of the uncertainties associated with the ability of in situ bioremediation or groundwater extraction to further lower contaminant levels beyond what is achievable with Alternative 2. Alternative 3 would be somewhat more difficult to implement than Alternative 4 from a technical standpoint due to the specialized expertise required to design and construct the in situ bioremediation treatment elements.

Administratively, all of the alternatives are implementable.

7. Cost

Cost estimates are used in the CERCLA FS process to eliminate those remedial alternatives that are significantly more expensive than competing alternatives without offering commensurate increases in performance or overall protection of human health or the environment. The cost estimates developed are preliminary estimates with an intended accuracy range of +50 to –30 percent. Final costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final scope, final schedule, final engineering design, and other variables.

Costs developed are capital costs (including fixed-price remedial construction) and long-term O&M costs (post-remediation). Overall 30-year present worth costs are developed for each alternative assuming a discount rate of 7 percent.

The progression of present worth costs from the least expensive alternative to the most expensive alternative is as follows: Alternative 1, Alternative 2, Alternative 3, and Alternative 4. No costs are associated with Alternative 1 because no remedial activities would be conducted.

Alternative 2 has the lowest present worth and capital costs of the remedial alternatives. The present worth cost for Alternatives 2 and 3 is lower than that of Alternative 4, primarily due to O&M of the groundwater extraction system under Alternative 4. The highest capital cost is associated with Alternative 3 primarily due to the activities associated with the injection phase of in situ bioremediation.

8. State/Support Agency Acceptance

The USEPA and TCEQ have reviewed the Proposed Plan. Comments received from the USEPA and TCEQ during the Proposed Plan development have been incorporated as appropriate. The USEPA and TCEQ concur with the selected remedy.

9. Community Acceptance

Community acceptance is an important consideration in the final evaluation of the remedy. There were no public comments received during the 30-day public comment period held from June 17 to July 16, 2008 and no public comments were made at the June 23, 2008 public meeting. The Proposed Plan comment period was re-opened from March 8 to April 22, 2010. No public comments were made at the March 9, 2010 public meeting. Written comments from an individual were received by the U.S. Army within the public comment period. The comments expressed reservations about the Proposed Plan. Responses to concerns have been provided and can be found in the Responsiveness Summary (**Section 3.0** of the ROD) and the U.S. Army's response to written comments that have been filed in the Administrative Record.

2.11 Principal Threat Wastes

Contaminated groundwater at LHAAP-35B (37) and LHAAP-67 is not a principal threat waste. It does not serve as a contaminant source, nor is there any other identifiable non-aqueous free phase material or contaminated soil that functions as a source for contaminant migration to soil, groundwater, surface water, or air. There is no indication that the existing groundwater plume will serve as a source for surface water or air contaminant migration above applicable standards or pose a risk to human health or the environment. (See Sections 2.5.1 and 2.7.) The feasibility study nonetheless considered various levels of active and passive treatment alternatives for groundwater.

2.12 The Selected Remedy

2.12.1 Summary of Rationale for the Selected Remedy

Alternative 2, LUCs with MNA, is the preferred alternative for LHAAP-35B (37) and LHAAP-67 and is consistent with the intended future use of the sites as a wildlife refuge. This alternative satisfies the RAOs for the sites through MNA and LUCs. MNA and LUCs serve to protect human health and the environment by monitoring the contaminated groundwater to ensure that

MNA returns the contaminated groundwater at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, wherever practicable, and to document that the plumes are contained and prevented from impacting Goose Prairie Creek and Central Creek at levels that could present a risk to human health and the environment. Furthermore, LUCs would protect human health by preventing access to the contaminated groundwater until contaminants in the groundwater attain the Safe Drinking Water Act MCLs for all contaminants above MCLs and attain the MCLs for all contaminant by-products (daughter contaminants) above the MCLs. The selected alternative offers a high degree of long-term effectiveness, can be easily and immediately implemented, and costs less than the other alternatives.

Based on information currently available, the U.S. Army believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the CERCLA criteria used to evaluate remedial alternatives.

The Army intends to present details of the LUCs implementation plan, groundwater monitoring plan, and MNA remedy implementation in a RD for the two sites.

2.12.2 Description of the Selected Remedy

The standards required by the preferred alternative are to monitor the contaminated groundwater to ensure that MNA returns the contaminated groundwater at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, wherever practicable, and to document that the plumes are contained and prevented from impacting Goose Prairie Creek and Central Creek at levels that could present a risk to human health and the environment. Furthermore, LUCs would protect human health by preventing access to the contaminated groundwater until contaminants in the groundwater attain the Safe Drinking Water Act MCLs for all contaminants above MCLs and attain the MCLs for all contaminant by-products (daughter contaminants) above the MCLs. MNA constitutes a passive remedial action that relies on natural biological, chemical, and physical processes that act to reduce the mass and concentration of groundwater COCs under favorable conditions. These natural attenuation processes include biodegradation, dispersion, dilution, adsorption, volatilization, and abiotic destruction of contaminants.

Based on groundwater modeling, groundwater MCLs are expected to be met through natural attenuation in 28 to 38 years for PCE, 39 to 43 years for TCE, and 16 to 21 years for 1,1-DCE at LHAAP-35B (37) (Shaw, 2007e; U.S. Army, 2008b). Considering the lithologic variability, particularly the lateral and vertical change from sand to clay, the times to MCL may range to an order of magnitude greater. For LHAAP-67, MCLs would be met through natural attenuation in 17 to 66 years for TCE, 20 to 34 years for 1,1-DCE, and 21 to 43 years for 1,2-DCA. Although the times to MCL for 1,1,1-TCA and 1,1,2-TCA were originally modeled to be 22 and 20 years respectively, these two VOCs are no longer detected above MCLs at LHAAP-67 (Shaw, 2007b; U.S. Army, 2008b). The groundwater flow rates are within the normal range for the formation

material at these sites. Thus, no adverse impact is expected to the surface water during the time it would take natural attenuation to reduce contaminant concentrations to MCLs.

This alternative includes LUCs to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health. The LUC objective is:

- Ensure no withdrawal or use of LHAAP-35B (37) and LHAAP-67 groundwater for other than environmental monitoring and testing.

The U.S. Army would be responsible for implementation, maintenance, inspection, reporting, and enforcement of the LUCs. Although the Army may transfer these responsibilities to another party through property transfer agreement or other means, the Army will remain responsible for: (1) CERCLA 121(c) Five Year Reviews; (2) notification of the appropriate regulators of any known LUC deficiencies or violations; (3) access to the property to conduct any necessary response; (4) reservation of the authority to change, modify or terminate LUCs and any related transfer or lease provisions; and (5) ensuring that the LUC objectives are met to protect the integrity of the selected remedy. In the event that TCEQ and/or EPA and the Army agree with respect to any modification of the selected remedy, including the LUC component of the selected remedy, the remedy will be changed consistent with the FFA and 40 C.F.R. §300.435 and 40 C.F.R. §300.430(f)(4)(iii)(B).

LUC implementation and maintenance actions would be described in the RD for LHAAP-35B (37) and LHAAP-67. The selected LUCs will prevent human exposure to chlorinated solvents-contaminated groundwater through the restriction of groundwater use. The groundwater restriction component of the LUCs shall be maintained until the concentrations of contaminants and by-product (daughter) contaminants have been reduced to below their respective MCLs under the SDWA to allow unrestricted use and unlimited exposure at LHAAP-35B (37) and LHAAP-67. LUCs would be included in the property transfer documents. In addition, the Texas Department of Licensing and Regulation responsible for notifying well drillers of groundwater restrictions would be notified and a recordation of the area of groundwater restriction would be filed in the Harrison County Courthouse.

Monitoring activities associated with the LUCs and MNA would be undertaken to ensure that groundwater is not being used, and to demonstrate containment of the plume and the eventual reduction of contaminates to levels below MCLs.

Long-term operational requirements under this alternative would include maintenance of the LUCs. The need for continued monitoring will be evaluated every five years during the reviews. Sampling frequency and analytical requirements will be presented as an appendix to the RD for LHAAP-35B (37) and LHAAP-67.

2.12.3 Summary of the Estimated Remedy Costs

Table 2-14 and **Table 2-15** present detailed cost estimates for the preferred alternative, Alternative 2. The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the course of implementation of the remedial alternative. The costs included in this ROD are estimated to be within +50 to -30 percent of the actual project cost. The total project present worth cost of this alternative is approximately $282,000 and $316,000 for LHAAP-35B (37) and LHAAP-67, respectively. The total direct capital cost is estimated at $79,000 and $47,000 for LHAAP-35B (37) and LHAAP-67, respectively. No indirect capital costs are required for this alternative. The total O&M cost is estimated at approximately $393,000 and $607,000 for LHAAP-35B (37) and LHAAP-67, respectively. The O&M cost includes evaluation of MNA, maintenance of LUCs, and long-term monitoring through year 30. The long-term monitoring would support the required CERCLA Five-Year Reviews.

2.13 Statutory Determinations

Under CERCLA §121 and the NCP, the U.S. Army must select remedies that are protective of human health and the environment, compliant with ARARs, are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. Although the final selected remedy is not intended to address the statutory preference for treatment to the maximum extent practicable, the final selected remedy offers, within a reasonable time frame and at a lower cost, a similar level of protection to human health and the environment than those remedy alternatives which satisfy the preference for treatment. In addition, no source materials constituting principle threats will be addressed within the scope of this action. The following sections discuss how the selected remedy meets the statutory requirements.

Protection of Human Health and the Environment

The selected remedy, Alternative 2, will achieve the RAOs for LHAAP-35B (37) and LHAAP-67. Although this alternative does not provide for human intervention to remediate groundwater, the alternative is a passive subsurface remedial action conducted by natural processes and mechanisms. At LHAAP-35B (37) and LHAAP-67, the evaluation of historical groundwater contaminant trends provides strong evidence that natural attenuation processes have contributed to a significant reduction in contaminant concentrations and prevented plume

migration. This alternative provides adequate confirmation that human health and the environment will be protected because the monitoring will be conducted to ensure that MNA is returning the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial uses as a drinking water, wherever practicable, and to document the effectiveness of MNA.

LUCs would prevent human access to the contaminated groundwater. The results of plume migration modeling for LHAAP-35B (37) indicated that the maximum concentrations of the COCs at the point of entry of the groundwater into Goose Prairie Creek, after plume impact, would be below surface water ARARs, which would also be protective of Caddo Lake. Therefore, based on these modeling results, contaminants present in groundwater at the site will not adversely impact Goose Prairie Creek surface water. In addition, plume migration modeling results for LHAAP-67 indicated that the maximum concentrations of the COCs were below their respective MCLs where groundwater discharges into Central Creek. Furthermore, calculated dilution within Central Creek indicated that the resultant concentrations of the COCs in Central Creek after dilution were less than 3 percent of their respective MCLs. Therefore, based on these modeling calculations, contaminants present in the groundwater at LHAAP-67 will not adversely impact Central Creek which also would be protective of Caddo Lake. The monitoring activities associated with LUCs 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.

Hazardous substances detected in soil at these sites were considered to represent a low threat to the environment, and it was determined that no remediation for the protection of ecological receptors was necessary at LHAAP-35B (37) and LHAAP-67.

Compliance with ARARs

Chemical-Specific ARARs

This alternative will return the contaminated shallow groundwater zone at LHAAP-35B(37) and LHAAP-67 to its potential beneficial use as drinking water, wherever practicable, which for the purposes of this ROD is considered to be attainment of the relevant and appropriate Safe Drinking Water Act (SDWA) MCLs to the extent practicable, and consistent with 40 C.F.R. § 300.430(e)(2)(i)(B&C). If a return to potential beneficial uses is not practicable, this alternative would still meet the NCP expectation to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction. This alternative will comply with surface water ARARs as recent modeling results indicate MNA has contributed to a significant reduction of COC concentrations in groundwater and will likely continue reducing COC concentrations to below their respective MCLs. Because modeling results indicate that maximum concentrations of COCs were below their respective MCLs where

groundwater discharges into nearby surface water bodies, nearby surface water bodies will be protected from ARAR exceedances.

Location-Specific ARARs
There are no location-specific ARARs associated with this alternative.

Action-Specific ARARs
There are no action-specific ARARs applicable to this alternative.

Cost-Effectiveness
Alternative 2 has the lowest present worth and capital costs of the remedial alternatives. Alternative 2 offers a high degree of long-term effectiveness, and costs less than the other alternatives.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy does not address the issue of permanent solution though disposal, treatment, or recovery of contaminants. However, the selected remedy provides the best balance of trade offs in terms of five balancing criteria and considering State and community acceptance. Alternative 2 would document effectiveness through the confirmation of MNA and the routine monitoring of the attenuation and migration of the contaminants in groundwater. Natural attenuation effectively controls plume migration and has stabilized the size of the area exhibiting COC and by-product (daughter) contaminant concentrations exceeding MCL values. Natural biodegradation is an irreversible treatment process that would reduce the mass and concentration of contaminants. Alternative 2 would provide almost immediate protection because the LUCs would be implemented relatively quickly. Maintenance of these controls would be required until natural attenuation processes reduce COC and by-product (daughter) contaminant concentrations to below MCLs. Alternative 2 is easily implemented from a technical standpoint because no remedial activities would be performed, although routine maintenance of the LUCs, evaluation of MNA, and sampling would be required. Alternative 2 has the lowest present worth and capital costs of the remedial alternatives. The community supports the selected remedy (Alternative 2) as detailed in the Proposed Plan.

Preference for Treatment as a Principal Element

The remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. Although the final selected remedy is not intended to address the statutory preference for treatment to the maximum extent practicable, the final selected remedy offers, within a reasonable time frame and at a lower cost, a similar level of protection to human health and the environment than those remedy alternatives which satisfy the preference for treatment. In addition, no source materials constituting principle threats will be addressed within the scope of

this action. The selected remedy of MNA reduces the toxicity, mobility, or volume of contaminants in the groundwater through a passive remedial action. There is no known principal threat material in the groundwater.

Five-Year Review Requirements

Section 121(c) of CERCLA and NCP§300.430(f)(5)(iii)(c) provide the statutory and legal bases for conducting Five-Year Reviews. Because this remedy will result in contaminants that remain on site above levels that allow unlimited use and unrestricted exposure, a review will be conducted at least every five years to ensure that the remedy continues to provide adequate protection of human health and the environment.

2.14 Significant Changes from the Proposed Plan

The Proposed Plan for LHAAP-35B (37) and LHAAP-67 was released for public comments in June 2008. The Proposed Plan identified Alternative 2, LUC and MNA as the Preferred Alternative for the chlorinated solvent contaminated groundwater. No comments were received during the public comment period. No significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

The Proposed Plan for LHAAP-35B (37) and LHAAP-67 was reopened for public comments in March 2010 for 45 days. The Proposed Plan identified Alternative 2, LUC and MNA as the Preferred Alternative for the chlorinated solvent contaminated groundwater. The U.S. Army reviewed the written comments submitted during the public comment period. After careful consideration it was determined that no significant changes to the remedy, as identified in the original Proposed Plan, were necessary or appropriate.

Table 2-1
Summary of Soil Analytical Data LHAAP-35B (37)

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location	Frequency of Detections
Volatile Organic Compounds (µg/kg)					
Acetone	21	21	6/23/93	LH-WRS19-01	1/9
Semivolatile Organic Compounds (µg/kg)					
Benzo(a)anthracene	420	420	7/27/98	35BSB01	1/8
Benzo(a)pyrene	390	390	7/27/98	35BSB01	1/8
Benzo(b)fluoranthene	530	530	7/27/98	35BSB01	1/8
Benzo(g,h,i)pyrene	250	250	7/27/98	35BSB01	1/8
Chrysene	450	450	7/27/98	35BSB01	1/8
Fluoranthene	760	760	7/27/98	35BSB01	1/10
Indeno(1,2,3-c,d)pyrene	350	350	7/27/98	35BSB01	1/10
Phenanthrene	370	370	7/27/98	35BSB01	1/10
Pyrene	560	560	7/27/98	35BSB01	1/10
Bis(2-ethylhexyl)phthalate	49J	560J	1/11/95	LHS-330	5/10
Metals (mg/kg)					
Aluminum	2250	13,000	7/27/98	35BSB01	10/10
Arsenic	1.05	7.5J	1/11/95	LHS330	10/10
Barium	33.2	190	10/05/94	LHSMW59	8/10
Beryllium	0.593J	0.845	9/25/06	WRS019-SB01	4/10
Cadmium	0.115	7.5	1/11/95	LHS330	3/10
Calcium	444	51,800	9/25/06	WRS019-SB01	10/10
Chromium (total)	3.75	42.9J	1/11/95	LHS330	10/10
Cobalt	2.65	24.1	10/05/94	LHSMW59	8/10
Copper	3.3	10.8	1/11/95	LHS330	7/10
Iron	6,200	73,100	9/25/06	WRS019-SB01	10/10
Lead	8.03	62.4	6/23/93	LH-WRS-19-01	9/10
Magnesium	113	1940	9/25/06	WRS019-SB01	7/8
Manganese	2.34	1,860	10/05/94	LHSMW59	8/8
Mercury	0.0186	0.60	1/11/95	LHS330	4/10
Nickel	6.9J	18.2	9/26/06	WRS019-SB01	5/5
Potassium	115	810	7/27/98	35BSB01	9/10
Selenium	0.21	4.12	7/27/98	35BSB01	7/10
Sodium	15.7J	120	9/25/06	WRS019-SB01	2/5
Strontium	6.3	31.9	1/11/95	LHS330	5/8
Thallium	0.0265	0.0828	9/25/06	WRS019-SB01	2/8
Vanadium	25J	62.5	9/25/06	WRS019-SB01	5/5
Zinc	7	1,100	1/11/95	LHS330	10/10
Pesticides (µg/kg)					
Aldrin	170	170	7/27/98	35BSB01	1/3
p,p-DDE	11	130J	7/27/98	35BSB01	3/3
p,p-DDT	6.1J	37J	7/27/98	35BSB01	2/3
Dioxins (ng/kg)					
Octachlorodibenzo-p-dioxin	133.977	6,692.92	8/07/98	35BSB01	3/3
Heptachlorinated dibenzo-p-dioxins (total)	3.553	69.33	7/27/98	35BSB01	4/4
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.063	33.263	7/27/98	35BSB01	5/5
Hexachlorinated dibenzo-p-dioxins (total)	0.574	11.141	7/27/98	35BSB01	3/5

Table 2-1 *(Continued)*
Summary of Soil Analytical Data LHAAP-35B (37)

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location	Frequency of Detections
Furans (ng/kg)					
Octachlordibenzofuran	0.626	15.485	7/27/98	35BSB01	4/5
Heptachlorinated dibenzofurans (total)	0.584	6.02	7/27/98	35BSB01	4/5
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.236	5.765	7/27/98	35BSB01	5/5
Hexachlorinated dibenzofurans (total)	0.234	5.299	7/27/98	35BSB01	4/5
1,2,3,4, 7,8-Pentachlorodibenzofurans	0.219	0.373	7/27/98	35BSB01	2/5
Pentachlorinated dibenzofurans (total)	1.017	6.501	7/27/98	35BSB01	2/5
1,2,3,7,8-Pentachlorodibenzofuran	0.259	2.008	7/27/98	35BSB01	2/5
Tetrachlorinated dibenzofurans (total)	0.506	2.56J	7/27/98	35BSB01	3/5
2,3,7,8-Tetrachlorodibenzofuran	0.273	0.506	7/27/98	35BSB01	3/7

Notes:

J The analyte was not positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

Frequency of detections shown varies because the different lists of analytes specified by the various groundwater sampling efforts described in the Jacobs (2003) risk assessment, and subsequent sampling events.

µg/kg micrograms per kilogram
mg/kg milligrams per kilogram
ng/kg nanograms per kilogram

Table 2-2
Summary of Groundwater
Analytical Data LHAAP-35B (37)

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location for Maximum Concentration	Frequency of Detections
Volatile Organic Compounds (µg/L)					
1,1,1-Trichloroethane	0.96	37	12/11/94	LHSMW58	5/26
1,2,4-Trichlorobenzene	1.5	1.5	8/21/96	LHSMW58	1/33
1,1-Dichloroethane	0.436	2.1	8/21/96	LHSMW58	4/25
1,1-Dichloroethene	2.11	58	12/11/94	LHSMW58	9/26
1,2-Dichloroethane (total)	0.24J	7	12/11/94	LHSMW58	3/28
cis-1,2-Dichloroethene	0.52	2.1	8/21/96	LHSMW58	8/23
1,3 Dinitrobenzene	0.1J	0.1J	2/10/96	LHSMW59	1/10
Acetone	2.4	8.31	12/14/06	35BWW06	4/23
Benzene	3J	3J	12/11/94	LHSMW58	1/25
Carbon Disulfide	8	8	9/10/04	35BWW03	1/23
Chlorobenzene	0.152	2.6	8/21/96	LHSMW58	7/26
Chloroform	0.356	0.38	8/21/96	LHSMW58	3/26
Chloromethane	0.347J	0.347J	12/16/06	35BWW03	1/25
Ethylene	0.571	3.44	12/16/06	35BWW03	1/25
Tetrachloroethene	0.955	34	12/11/94	LHSMW58	20/32
Toluene	0.533J	0.533J	12/14/06	35BWW05	1/25
Trichloroethene	9	330	5/20/98	LHSMW59	17/27
Trichlorofluoromethane	2.3	2.7	8/21/96	LHSMW59	2/9
Xylenes (total)	0.594J	0.594J	9/14/07	35BWW08	1/22
Semivolatile Organic Compounds (µg/L)					
Di-n-octylphthalate	1.6	3.6	8/21/96	LHSMW58	3/20
Bis(2-ethylhexyl)phthalate	1J	1.4	2/10/96	LHSMW59	3/10
Metals (mg/L)					
Aluminum	106J	4,700	12/11/94	LHSMW59	7/9
Antimony	55J	80J	8/21/96	LHSMW58	2/10
Barium	70J	299	2/10/96	LHSMW59	6/10
Cadmium	0.3	0.3	2/10/96	LHSMW58	1/10
Calcium	3,300	43,100J	8/21/96	LHSMW59	8/10
Chromium (total)	4.3	25	12/11/94	LHSMW58	5/10
Copper	3.3	23	2/10/96	LHSMW59	4/10
Iron	45J	7,300	12/11/94	LHSMW58	10/10
Lead	3.7	3.9	12/11/94	LHSMW59	2/10
Magnesium	1,400	19,000	5/20/98	LHSMW59	7/10
Manganese	16	380	12/11/94	LHSMW59	10/10
Mercury	0.04J	0.04J	8/21/96	LHSMW58	1/10
Nickel	23J	68	2/10/96	LHSMW59	3/8
Potassium	670	2,500	12/11/94	LHSMW59	5/10
Selenium	2.4	2.4	2/10/96	LHSMW59	1/10
Sodium	7,900	92,000	5/20/98	LHSMW59	3/4
Strontium	96	1,900	5/20/98	LHSMW59	8/10
Thallium	1.8J	98J	8/21/96	LHSMW58	2/10
Vanadium	3.2	3.2	2/10/96	LHSMW58	1/8
Zinc	21	40	12/11/94	LHSMW58	7/10
Explosive Compounds (µg/L)					
1,3-dinitrobenzene	0.1J	0.1J	2/10/96	LHSMW59	1/11
Tetryl	0.072J	0.41	2/10/96	LHSMW58	2/10

Table 2-2 *(Continued)*
Summary of Groundwater
Analytical Data LHAAP-35B (37)

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location for Maximum Concentration	Frequency of Detections
Furans (pg/L)					
1,2,3,4,7,8-Hexachlorodibenzofuran	10.051	10.051	8/26/96	LHSMW59	1/1
Hexachlorinated dibenzofurans (total)	5.225J	5.225J	8/26/96	LHSMW59	1/1

Notes:

J The analyte was not positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

Frequency of detections shown varies because the different lists of analytes specified by the various groundwater sampling efforts described in the Jacobs (2003) risk assessment, and subsequent sampling events.

µg/L micrograms per liter
mg/L milligrams per liter
pg/L picograms per liter

Table 2-3
Summary of Soil Analytical Data LHAAP-67

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location	Frequency of Detections
Volatile Organic Compounds (µg/kg)					
Methylene chloride	2BJ	5.9	12/6/00	67SB01	4/11
Metals (mg/kg)					
Aluminum	6,360	15,800J	12/6/00	67SB02	9/9
Arsenic	2.24	8.86	12/6/00	67SB01	9/9
Barium	45.1J	837J	12/7/00	67SB03	9/9
Beryllium	0.478	1.28	12/6/00	67SB01	9/9
Cadmium	0.164J	0.298	12/6/00	67SB01	4/9
Calcium	510	9,460	12/7/00	67SB03	9/9
Chromium	11	32.3J	12/14/00	67SB02	9/9
Cobalt	3.2	8.86	12/6/00	67SB02	9/9
Copper	3.46	6.26	12/6/00	67SB02	9/9
Iron	9,280	27,400	12/14/00	67SB02	9/9
Lead	10.6	55.8	12/6/00	67SB01	9/9
Magnesium	406J	1,620J	12/6/00	67SB02	9/9
Manganese	31.1	271J	12/14/00	67SB02	9/9
Nickel	3.61J	14.7	12/7/00	67SB03	9/9
Potassium	246J	536J	12/7/00	67SB03	9/9
Selenium	0.599J	1.09J	12/6/00	67SB01	7/9
Silver	0.145J	0.297J	12/14/00	67SB01	3/9
Sodium	142J	452	12/7/00	67SB03	5/9
Strontium	9.62	40.7	12/7/00	67SB03	9/9
Vanadium	17.4	40.5	12/14/00	67SB02	9/9
Zinc	14.3	34.9	12/6/00	67SB01	9/9

Notes:

J The analyte was not positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

Frequency of detections shown varies because the different lists of analytes specified by the various groundwater sampling efforts described in the Jacobs (2003) risk assessment, and subsequent sampling events.

µg/kg micrograms per kilogram
mg/kg milligrams per kilogram

Table 2-4
Summary of Groundwater
Analytical Data LHAAP-67

Parameter/Units	Minimum Concentration Detected	Maximum Concentration Detected	Date Sampled	Location for Maximum Concentration	Frequency of Detections
Volatile Organic Compounds (µg/L)					
1,1,1-Trichloroethane	100	1800	12/8/98	67WW03	3/30
1,1,2-Trichloroethane	0.28J	33	12/8/98	67WW01	6/30
1,1-Dichloroethane	0.236J	14	12/8/98	67WW01	6/26
1,1-Dichloroethene	2.4	380	12/8/98	67WW01	6/30
1,2-Dichloroethene (total)	1.62J	27	12/8/98	67WW01	9/30
cis-1,2-Dichloroethene	0.71J	1J	9/12/04	67WW01	5/30
Acetone	2.82J	10	12/8/98	G4SB01	5/30
2-Butanone	55	61	12/8/98	67WW01	2/30
Chloroform	2.83	2.83	12/19/00	67WW06	1/30
Methylene chloride	1JB	1.37	12/19/00	67WW06	2/30
Naphthalene	0.59J	7.5	11/9/98	G4SB02	3/23
Toluene	9.3	91	12/8/98	67WW03	3/30
Trichloroethene	0.14J	6.3	12/8/98	67WW01	8/30
Vinyl chloride	1J	2.34J	12/18/06	67WW01	3/30
Metals (mg/L)					
Aluminum	0.114	6	12/8/98	67WW01	7/7
Barium	0.13	3.31	12/19/00	67WW07	4/7
Beryllium	0.0006	0.0008	12/19/00	67WW07	3/7
Cadmium	0.0008	0.0026	12/19/00	67WW07	2/7
Calcium	90.7	373	12/19/00	67WW06	9/9
Chromium	0.02	0.09	12/19/00	67WW05	6/7
Cobalt	0.025	0.12	12/19/00	67WW06	3/7
Copper	0.026	0.027J	12/19/00	67WW07	2/7
Iron	0.53	9.6	12/8/98	67WW02	7/7
Lead	0.0035	0.007	12/8/98	67WW01	3/7
Magnesium	46.7	190	12/19/00	67WW06	7/7
Manganese	0.41	3.45	12/19/00	67WW06	7/7
Nickel	0.05	0.18J	12/19/00	67WW07	7/7
Potassium	1.2J	7.5	12/19/00	67WW06	3/7
Selenium	0.011	0.014	12/19/00	67WW06	3/7
Sodium	450	870	12/8/98	67WW03	7/7
Strontium	0.99	7.6	12/8/98	67WW03	7/7
Thallium	0.0012	0.0021	12/8/98	67WW03	2/7
Zinc	0.011J	0.054J	12/19/00	67WW07	7/7
Anions (mg/L)					
Chloride	818	2,360	8/9/06	67WW03	15/15
Sulfate (as SO_4)	12.3	297	12/18/06	67WW03	15/15

Notes:

J The analyte was not positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

Frequency of detections shown varies because the different lists of analytes specified by the various groundwater sampling efforts described in the Jacobs (2003) risk assessment, and subsequent sampling events.

µg/L micrograms per liter
mg/L milligrams per liter
pg/L picograms per liter

Table 2-5
Occurrence, Distribution, and Selection of Chemicals of Concern
LHAAP-35B (37) Groundwater

Scenario Timeframe: Current and Future
Medium: Groundwater
Exposure Medium: Groundwater

Chemical	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
	Min	Max					
Volatile Organic Compounds							
1,1-Dichloroethene	2.11E-03	5.80E-02	mg/L	9 / 15	5.80E-02	mg/L	max
Tetrachloroethene	1.00E-03	3.40E-02	mg/L	14 / 16	3.40E-02	mg/L	max
Trichloroethene	9.40E-03	3.30E-01	mg/L	13 / 15	3.30E-01	mg/L	max
Metals							
Antimony	5.50E-02	8.00E-02	mg/L	2 / 11	8.00E-02	mg/L	max
Thallium	1.20E-03	9.80E-02	mg/L	3 / 11	9.80E-02	mg/L	max
Dioxin/Furans							
2,3,7,8-TCDD TEQ	NA	NA	mg/L	NA	4.59E-09	mg/L	max

Notes:

QC samples were utilized during the risk assessment if the values (QC) were higher than the actual field sample results.

max maximum value
mg/L milligrams per liter
min minimum value
NA not applicable.
TCDD tetrachlorodibenzo-p-dioxin
TEQ toxicity equivalent concentration

Table 2-6
Occurrence, Distribution, and Selection of Chemicals of Concern
LHAAP-67 Groundwater

Scenario Timeframe:	Current and Future						
Medium:	Groundwater						
Exposure Medium:	Groundwater						
Chemical	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
	Min	Max					
Volatile Organic Compounds							
1,1,1-Trichloroethane	1.00E-01	1.80E+00	mg/L	4 / 9	1.80E+00	mg/L	max
1,1,2-Trichloroethane	5.90E-03	3.30E-02	mg/L	4 / 9	3.30E-02	mg/L	max
1,1-Dichloroethene	2.40E-03	3.80E-01	mg/L	3 / 9	3.80E-01	mg/L	max
1,2-Dichloroethane	2.28E-03	2.70E-02	mg/L	4 / 9	2.70E-02	mg/L	max
Trichloroethene	1.40E-04	6.30E-03	mg/L	3 / 9	6.30E-03	mg/L	max
Metals							
Barium	1.33E-01	3.31E+00	mg/L	5 / 9	3.31E+00	mg/L	max
Manganese	3.88E-01	3.48E+00	mg/L	9 / 9	3.48E+00	mg/L	max
Strontium	9.93E-01	7.60E+00	mg/L	9 / 9	7.60E+00	mg/L	max
Thallium	1.20E-03	2.10E-03	mg/L	3 / 9	2.10E-03	mg/L	max

Notes:

QC samples were utilized during the risk assessment if the values (QC) were higher than the actual field sample results.

max maximum value

mg/L milligrams per kilogram

min minimum value

NA not applicable

TCDD tetrachloro-p-dibenzodioxin toxicity equivalent concentration

Table 2-7
Cancer Toxicity Data Summary - LHAAP-35B (37) and LHAAP-67

Pathway: Ingestion, Dermal						
Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (YYYY)
Metals						
Barium	NC	NC	–	D	EPA IRIS	2001
Manganese	NC	NC	–	D	EPA IRIS	2001
Strontium	NTV	NTV	–	not classified	–	–
Thallium	NC	NC	–	not classified	–	–
Volatile Organics						
1,1,1-Trichloroethane	NC	NC	–	D	EPA IRIS	2001
1,1,2-Trichloroethane	5.70E-02	7.04E-02	$(mg/kg\text{-}day)^{-1}$	C	EPA IRIS	2001
1,1-Dichloroethene	6.00E-01	6.00E-01	$(mg/kg\text{-}day)^{-1}$	C	EPA IRIS	2001
1,2-Dichloroethane	9.10E-02	9.10E-02	$(mg/kg\text{-}day)^{-1}$	B2	EPA IRIS	2001
Tetrachloroethene	5.20E-02	5.20E-02	$(mg/kg\text{-}day)^{-1}$	B2	EPA NCEA EPA IRIS	2001
Trichloroethene	1.10E-02	1.10E-02	$(mg/kg\text{-}day)^{-1}$	B2	EPA NCEA EPA IRIS	2001
Dioxin/Furan						
2,3,7,8-TCDD	1.50E+05	3.00E+05	$(mg/kg\text{-}day)^{-1}$	not classified	EPA HEAST	1997

Table 2-7 (*Continued*)
Cancer Toxicity Data Summary - LHAAP-35B (37) and LHAAP-67

Pathway: Inhalation

Chemical of Concern	Unit Risk Factor	Units	Inhalation Cancer Slope Factor	Units	Weights of Evidence/Cancer Guideline Description	Source	Date (YYYY)
Metals							
Barium	NC	–	–	–	D	EPA IRIS	2001
Manganese	NC	–	–	–	D	EPA IRIS	2001
Strontium	NTV	–	–	–	not classified	–	–
Thallium	NC	–	–	–	not classified	–	–
Volatile Organics							
1,1,1-Trichloroethane	NC	–	–	–	D	EPA IRIS	2001
1,1,2-Trichloroethane	1.60E-05	$(mg/m^3)^{-1}$	–	–	C	EPA IRIS	2001
1,1-Dichloroethene	5.00E-02	$(mg/m^3)^{-1}$	–	–	C	EPA IRIS	2001
1,2-Dichloroethane	2.60E-02	$(mg/m^3)^{-1}$	–	–	B2	EPA IRIS	2001
Tetrachloroethene	5.80E-07	$(mg/m^3)^{-1}$	–	–	B2	EPA NCEA EPA IRIS	2001
Trichloroethene	1.70E-03	$(mg/m^3)^{-1}$	–	–	B2	EPA NCEA EPA IRIS	2001
Dioxin/Furan							
2,3,7,8-TCDD	3.30E+04	$(mg/m^3)^{-1}$	–	–	not classified	EPA HEAST	1997

Key

— : No information available
EPA: U.S. Environmental Protection Agency
IRIS: Integrated Risk information System, EPA
mg/kg-day: milligrams per kilogram per day
mg/m^3: milligrams per cubic meter
NC: Chemical not classified as a carcinogen
NCEA: National Center for Environmental Assessment
NTV: no toxicity value available
TCDD: tetrachlorodibenzo-p-dioxin

EPA Group:
A - Human carcinogen
B1- Probable human carcinogen – Indicates that limited human data are available
B2- Probable human carcinogen – Indicates sufficient evidence in animals and inadequate or no evidence in humans
D - Not classifiable as a human carcinogen

References

EPA-IRIS, 2001. United States Environmental Protection Agency Online Database for Toxicity Information Hazardous Chemicals.

EPA-NCEA, 2001. EPA Region II Risk-Based Concentration Tables (5/8/2001). Referenced values from National Center for Environmental Assessment (NCEA).

EPA-HEAST, 1997. Human Health Effects Summary Tables (HEAST). FY-1995, Annual. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/R-95-036.

EPA, 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, Office of Research and Development, EPA/600/R-93/089, July.

Table 2-8
Non-Cancer Toxicity Data Summary – LHAAP-35B (37) and LHAAP-67

Pathway: Ingestion, Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Dermal RfD	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Source of RfD Target Organ	Dates of RfD: Target Organ (YYYY)
Metals									
Barium	chronic	7.00e-02	mg/kg-day	4.90E-03	mg/kg-day	kidney	3/1	EPA-IRIS	2001
Manganese	chronic	4.70E-02	mg/kg-day	2.82E-03	mg/kg-day	CNS	1/1	EPA-IRIS	2001
Strontium	chronic	6.00E-01	mg/kg-day	1.20E-01	mg/kg-day	bone	300/1	EPA-IRIS	2001
Thallium	chronic	8.00E-05	mg/kg-day	8.00E-05	mg/kg-day	blood	3000/1	EPA-IRIS	2001
Volatile Organics									
1,1,1-Trichloroethane	chronic	2.80E-01	mg/kg-day	2.52E-01	mg/kg-day	NA	NA	EPA-NCEA	2001
1,1,2-Trichloroethane	chronic	4.00E-03	mg/kg-day	3.24E-03	mg/kg-day	blood	1000/1	EPA-IRIS	2001
1,1-Dichloroethene	chronic	9.00E-03	mg/kg-day	9.00E-03	mg/kg-day	liver	1000/1	EPA-IRIS	2001
1,2-Dichloroethane	chronic	3.00E-02	mg/kg-day	3.00E-02	mg/kg-day	NA	NA	EPA-NCEA	2001
Tetrachloroethene	chronic	1.00E-02	mg/kg-day	1.00E-02	mg/kg-day	liver	1000/1	EPA-IRIS	2001
Trichloroethene	chronic	6.00E-03	mg/kg-day	6.00E-03	mg/kg-day	NA	NA	–	–
Dioxin/Furan									
2,3,7,8-TCDD	–	NTV	–	NTV	NTV	skin	–	EPA-NCEA	2001

Table 2-8 (*Continued*)
Non-Cancer Toxicity Data Summary – LHAAP-35B (37) and LHAAP-67

Pathway: Inhalation									
Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Source of RfC/RfD Target Organ	Dates (YYYY)
Metals									
Barium	chronic	0.00049	mg/kg-day	–	–	fetus	1000/1	EPA-HEAST	1997
Manganese	chronic	0.00005	mg/kg-day	–	–	CNS	1000/1	EPA-NCEA	2001
Strontium	NTV	–	–	–	–	–	–	–	–
Thallium	chronic	0.0001	mg/kg-day	–	–	NA	NA	TCEQ	2001
Volatile Organics									
1,1,1-Trichloroethane	chronic	2.205	mg/kg-day	–	–	NA	NA	EPA-NCEA	2001
1,1,2-Trichloroethane	NTV	–	–	–	–	–	–	–	–
1,1-Dichloroethene	NTV	–	–	–	–	–	–	–	–
1,2-Dichloroethane	chronic	0.005	mg/kg-day	–	–	NA	NA	EPA-NCEA	2001
Tetrachloroethene	chronic	0.049	mg/kg-day	–	–	NA	NA	EPA-NCEA	2001
Trichloroethene	NTV	–	–	–	–	–	–	–	–
Dioxin/Furan									
2,3,7,8-TCDD	NTV	–	–	–	–	–	–	–	–

Key

—: No information available
CNS; Central nervous system
EPA: U.S. Environmental Protection Agency
IRIS: Integrated Risk information System, EPA
mg/kg-day: milligrams per kilogram per day
NA: Information not available
NC: Chemical not classified as a carcinogen
NCEA: National Center for Environmental Assessment
NTV: no toxicity value available
RfD: Reference dose
TCDD: tetrachlorodibenzo-p-dioxin
TCEQ: Texas Commission on Environmental Quality

Summary of Toxicity Assessment

This table provides carcinogenic risk information relevant to the contaminants of concern in ground water. The chronic toxicity data available for chronic exposures have been taken from U. S. EPA or TCEQ sources.

References

ATADR, 1997: Agency for Toxic Substances and Disease Registry, Minimal Risk Levels (MRLs) for Hazardous Substances.

EPA-HEAST, 1997. Health Effects Summary Table (HEAST). FY 1995, Annual Office of Emergency and Remedial Response. Washington, D.C. EPA/340/R-95-036.

EPA-IRIS, 2001. Integrated Risk Information System (IRIS). United States Environmental Protection Agency Online Database for Toxicity Information on Hazardous Chemicals, 2001.

EPA-NCEA, 2001. EPA Region III Risk-Based Concentration Tables (3/8/2001). Referenced values from National Center for Environmental Assessment (NCEA).

TCEQ, 2001. Update to 1998 Consistency Memorandum. Toxicity Factors Table, 15 March, 2001.

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information relevant to the contaminants of concern in ground water. The chronic toxicity data available for chronic exposures have been taken from U. S. EPA or TCEQ sources.

Table 2-9
Risk Characterization Summary – LHAAP-35B (37)
Carcinogens in Surface Soil and Groundwater

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogen Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil (0 to 0.5 feet bgs)						Total Soil Risk =	5E-06

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogen Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater		*Dioxin/Furan*				
		Ingestion or Showering	2,3,7,8-TCDD	2.6E-06	NE	2.1E-05	2.4E-05
			Volatile Organic Compounds				
		Ingestion or Showering	1,1-Dichloroethene	1.2E-04	1.8E-04	1.6E-04	4.6E-04
		Ingestion or Showering	Tetrachloroethene	6.2E-06	1.2E-09	2.5E-05	3.1E-05
		Ingestion or Showering	Trichloroethene	1.3E-05	3.4E-05	1.7E-05	6.3E-05
						Total Groundwater Risk =	6E-04
						Total Soil + Groundwater Risk =	6E-04

Key

NE Not evaluated through this exposure pathway. Chemical is not identified as a volatile

References

EPA, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual, (Part A)*, OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, Washington, DC, 1989.

EPA, *National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 40 CFR Part 300*, March 8, 1990.

EPA, *Supplemental Region VI Risk Assessment Guidance, May 5, 1995*.

Jacobs, 2003, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites (Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, Central Creek, and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* June.

Summary of Risk Characterization

Calculated cancer risks for potential exposure to chemicals of concern in soil at LHAAP-35B(37) are 5E-06, rounded to 1 significant figure as specified in EPA guidance (EPA, 1989). The calculated cancer risk from all chemicals in soil by all exposure pathways is within the 1E-06 to 1E-04 acceptable range (EPA, 1990).

Calculated cancer risks for potential exposure to chemicals of concern in groundwater are 6E-04. The calculated cancer risk from exposure to all chemicals in groundwater by all exposure pathways is above the 1E-06 to 1E-04 acceptable range (EPA, 1990). The risk is predominantly associated with exposure to 1,1-dichloroethene (4.6×10^{-4}) by the direct contact pathway, which is above the acceptable range. Additional risk was estimated for tetrachloroethene, trichloroethene, and 2,3,7,8-TCDD, with a cumulative risk above 1×10^{-4}, although estimates for the individual chemicals are within the acceptable range. Significant risk was associated with inhalation exposures to 1,1-dichloroethene and trichloroethene.

Table 2-10
Risk Characterization Summary – LHAAP-35B (37)
Non-Carcinogens in Surface Soil and Groundwater

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil (0 to 0.5 feet bgs)						Total Soil Noncancer Hazard Index (HI) =	1E-01

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater		*Metals*				
		Ingestion or Showering	Antimony	2.0E+00	NE	NE (Kp<=0.01)	2.0E+00
		Ingestion or Showering	Thallium	1.2E+01	NE	NE (Kp<=0.01)	1.2E+01
			Volatile Organic Compounds				
		Ingestion or Showering	Trichloroethene	5.3E-01	NTV	7.1E-01	1.2E+00
						Total Groundwater Noncancer Hazard Index (HI) =	2E+01
						Total Soil + Groundwater Noncancer Hazard Index (HI) =	2E+01

Key

NE	Not evaluated through this exposure pathway. Chemical is not identified as a volatile
NE (Kp<=0.01)	Based on EPA 6 guidance, COCs with a Kp<=0.01 were not evaluated for dermal contact while showering (EPA, 1995).
NTV	No toxicity value available to quantitatively address this exposure

References

EPA, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual, (Part A)*, OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, Washington, DC, 1989.

EPA, *National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 40 CFR Part 300*, March 8, 1990.

EPA, *Supplemental Region VI Risk Assessment Guidance, May 5, 1995*.

Jacobs, 2003, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites (Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, Central Creek, and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* June.

Summary of Risk Characterization

Calculated noncancer hazards for potential exposure to chemicals of concern in soil at LHAAP-35B (37) are 0.1, rounded to 1 significant figure as specified in EPA guidance (EPA, 1989). The calculated HI for all chemicals by all exposure pathways is below the acceptable value of 1 (EPA, 1990).

Calculated noncancer hazard index for potential exposure to chemicals of concern in groundwater are 20. The calculated HI from all chemicals in groundwater all exposure pathways is above the acceptable value of 1 (EPA, 1990). The HI is predominantly associated with exposure to thallium and antimony by the groundwater ingestion route. Additional HI above the acceptable value of 1 is associated with trichloroethene by the combined exposures by groundwater ingestion and dermal contact while showering.

Table 2-11
Risk Characterization summary – LHAAP-67
Carcinogens in Surface Soil and Groundwater

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogen Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil (0 to 0.5 feet bgs)						Total Soil Risk =	3E-07
Groundwater	Groundwater	Ingestion or Showering	1,1-Dichloroethene	8.0E-04	1.2E-03	1.1E-03	3.0E-03
						Total Groundwater Risk =	3E-03
						Total Soil + Groundwater Risk =	3E-03

References

EPA, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual, (Part A)*, OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, Washington, DC, 1989.

EPA, *National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 40 CFR Part 300*, March 8, 1990.

EPA, *Supplemental Region VI Risk Assessment Guidance, May 5, 1995*.

Jacobs, 2003, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites (Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, Central Creek, and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* June.

Summary of Risk Characterization

Calculated cancer risks for potential exposure to chemicals of concern in soil at LHAAP-67 are 3E-07, rounded to 1 significant figure as specified in EPA guidance (EPA, 1989). The calculated cancer risk from all chemicals in soil by all exposure pathways is below the 1E-06 to 1E-04 acceptable range (EPA, 1990).

Calculated cancer risks for potential exposure to chemicals of potential concern in groundwater are 3E-03, which is above the 1E-06 to 1E-04 acceptable range. The risk is predominantly associated with exposure to 1,1-dichloroethene inhalation and dermal contact pathways while showering. The cancer risk associated with 1,1-dichloroethene ingestion of groundwater is also above the EPA acceptable cancer risk level. Cancer risks from exposures to all other compounds in groundwater are within the acceptable risk range.

Table 2-12
Risk Characterization Summary – LHAAP-67
Non-Carcinogens in Surface Soil and Groundwater

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil (0 to 0.5 feet bgs)			Total Soil Hazard Index (HI) =				0E+00
Groundwater	Groundwater		*Metals*				
		Ingestion or Showering	Barium	4.6E-01	NE	NE (Kp<=0.01)	4.6E-01
		Ingestion or Showering	Manganese	7.2E-01	NE	NE (Kp<=0.01)	7.2E-01
		Ingestion or Showering	Strontium	1.2E-01	NE	NE (Kp<=0.01)	1.2E-01
		Ingestion or Showering	Thallium	2.6E-01	NE	NE (Kp<=0.01)	2.6E-01
			Volatile Organic Compounds				
		Ingestion or Showering	1,1,1-Trichloroethane	6.3E-02	1.4E-01	1.0E-01	3.0E-01
		Ingestion or Showering	1,1,2-Trichloroethane	8.1E-02	NTV	7.3E-02	1.5E-01
		Ingestion or Showering	1,1-Dichloroethene	4.1E-01	NTV	5.5E-01	9.6E-01
		Ingestion or Showering	1,2-Dichloroethane	8.8E-03	9.2E-01	4.1E-03	9.4E-01
						Total Groundwater Hazard Index (HI) =	4E+00
						Total Soil + Groundwater Hazard Index (HI) =	4E+00

Key

NE	Not evaluated through this exposure pathway. Chemical is not identified as a volatile
NE (Kp<=0.01)	Based on EPA 6 guidance, chemicals of potential concern with a Kp<=0.01 were not evaluated for dermal contact while showering (EPA, 1995).
NTV	No toxicity value available to quantitatively address this exposure

References

EPA, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual, (Part A)*, OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, Washington, DC, 1989.

EPA, *National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 40 CFR Part 300*, March 8, 1990.

EPA, *Supplemental Region VI Risk Assessment Guidance, May 5, 1995*.

Jacobs, 2003, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites (Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, Central Creek, and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* June.

Summary of Risk Characterization

The calculated noncancer HI for potential exposure to chemicals of potential concern in soil at LHAAP-67 is 0, which is below the EPA acceptable HI value of 1(EPA, 1990).

The calculated noncancer HI for potential exposure to chemicals of potential concern in groundwater is 4E+00, which is above the acceptable HI value of 1. The HI is predominantly associated with exposure to 1,1-dichloroethene, 1,2-dichloroethane, 1,1,1-trichloroethane, and 1,1,2-trichloroethane by inhalation and dermal contact pathways while showering. The noncancer HI associated with barium, manganese, strontium, and thallium exposure by groundwater ingestion is also above the EPA acceptable level.

Table 2-13
Comparative Analysis of Alternatives

Criteria	Alternative 1 No Action,	Alternative 2 Land Use Controls and Monitored Natural Attenuation	Alternative 3 In-Situ Bioremediation, Land Use Controls (Short Term)	Alternative 4 Groundwater Extraction, Surface Water Discharge, and Land Use Controls (Short Term)
Overall protection of human health and the environment	No protection. Does not achieve RAOs.	Achieves RAOs. Protection of human health and environment provided by maintenance of land use controls. Monitoring activities would demonstrate that surface water is not impacted by groundwater contaminants. MNA would return groundwater to beneficial use, where practicable.	Achieves RAOs. Protection of human health and environment provided by remediation of groundwater COCs to MCLs. Protection of surface water provided by groundwater return to beneficial use, where practicable.	Achieves RAOs. Protection of human health and environment provided by remediation of groundwater COCs to MCLs. Protection of surface water provided by groundwater return to beneficial use, where practicable.
Compliance with ARARs	No compliance with ARARs.	Complies with all ARARs.	Complies with all ARARs.	Complies with all ARARs.
Long-term effectiveness and permanence	Not effective.	Land use controls would be effective and reliable so long as they are maintained until natural attenuation processes reduce COCs to their respective MCLs.	Should be effective and permanent; however, uncertainty exists concerning the effectiveness of in-situ biological treatment for reducing groundwater contaminant concentrations to remediation levels. Treatability and pilot studies would be required to further assess the effectiveness of this treatment method.	Should be effective and permanent, but uncertainty exists whether groundwater extraction would sufficiently lower contaminant concentrations to remediation levels. A pre-design study would be required to determine the optimum extraction technique/configuration.
Reduction of toxicity, mobility, or volume through treatment	No active reduction.	Passively reduces the volume, toxicity, and mobility of the contaminants.	Provides permanent and irreversible reduction only if the results of biological treatability and pilot studies prove favorable.	Extraction and treatment of contaminated groundwater reduces toxicity, mobility, and volume of groundwater contaminants in this area.

Table 2-13 (*Continued*)
Comparative Analysis of Alternatives

Criteria	Alternative 1 No Action,	Alternative 2 Land Use Controls and Monitored Natural Attenuation	Alternative 3 In-Situ Bioremediation, Land Use Controls (Short Term)	Alternative 4 Groundwater Extraction, Surface Water Discharge, and Land Use Controls (Short Term)
Short-term effectiveness	No short-term impacts from the Alternative. Continued risk to community and environment through No Action.	No short term impacts to the community and the environment and negligible impacts tp workers, from short-term activities. Provides almost immediate protection.	No short term impacts to the community and the environment and negligible impacts to workers from short-term activities. Provides almost immediate protection.	No short term impacts to the community and the environment and negligible impacts to workers from short-term activities. Provides almost immediate protection.
Implementability	Inherently implementable.	Readily implemented.	Implementable, but uncertainty exists whether in-situ bioremediation would sufficiently lower contaminant concentrations to remediation levels. Further studies would be required. Specialized knowledge required for implementation.	Implementation straightforward, but uncertainty exists whether groundwater extraction would sufficiently lower contaminant concentrations to remediation levels. A pre-design study would be required.
Cost* LHAAP-35B (37)				
• Capital	$0	$79,000	$2,535,000	$1,271,000
• O&M	$0	$393,000	$317,000	$1,764,000
Estimated Duration** (years)	—	30	6	30
• Present worth	$0	$282,000	$2,664,000	$2,095,000
Cost* LHAAP-67				
• Capital	$0	$47,000	$1,691,000	$1,211,000
• O&M	$0	$607,000	$367,000	$1,904,000
Estimated Duration** (years)	—	30	6	30
• Present worth	$0	$316,000	$1,793,000	$1,957,000

Notes and Abbreviations:

**Costs have been rounded off to three significant figures.*

ARAR applicable or relevant and appropriate requirement
COC chemical of concern
FS feasibility study
LHAAP Longhorn Army Ammunition Plant
MCL maximum contaminant level
MNA monitored natural attenuation

NA *not applicable*
O&M *operation and maintenance*
RAO *remedial action objective*

Table 2-14
Remediation Cost Table – LHAAP-35B (37)
Alternative 2

WBS	Summary Description	Costs
Capital Costs		
1.20.10	Regulatory Documents	
1.20.20	Remedial Design	
1.20.20.10	Remedial Design Documents	
1.20.20.20	Treatability Studies	
	Subtotal Indirect Costs	$0
1.20.30	**Remedial Action**	
1.20.30.10	General Contractor Construction Management	
1.20.30.20	**Remediation**	
1.20.30.20.10	**Groundwater Remediation Cost**	
1.20.30.20.10.10	Land Use Controls (Access Controls)	$16,035
1.20.30.20.10.20	Groundwater Extraction System Installation	
1.20.30.20.10.30	In Situ Bioremediation	
1.20.30.20.10.40	Monitoring Well Installation	$62,983
	Subtotal Direct Costs	$79,018
	Subtotal Capital Cost	$79,018
Operations and Maintenance		
1.20.40	**O&M**	
1.20.40.10	**Groundwater Treatment O&M Cost**	
1.20.40.10.10	Long Term Monitoring	$393,109
1.20.40.10.20	Extraction Wells O&M	
	Subtotal O&M Cost	$393,109
Total Cost		$472,127
Present Value for Capital		$79,018
Present Value for O&M		$203,444
Present Value Total		$282,462

Table 2-15
Remediation Cost Table - LHAAP-67
Alternative 2

WBS	Summary Description	Costs
Capital Costs		
1.20.10	Regulatory Documents	
1.20.20	Remedial Design	
1.20.20.10	Remedial Design Documents	
1.20.20.20	Treatability and Pilot Studies	
	Subtotal Indirect Costs	$0
1.20.30	Remedial Action	
1.20.30.10	General Contractor Construction Management	
1.20.30.20	Remediation	
1.20.30.20.10	Groundwater Remediation Cost	
1.20.30.20.10.10	Institutional Controls (Access Controls)	$16,035
1.20.30.20.10.20	Groundwater Extraction System Installation	
1.20.30.20.10.30	In Situ Bioremediation	
1.20.30.20.10.40	Monitoring Well Installation	$31,111
	Subtotal Direct Costs	$47,146
	Subtotal Capital Cost	$47,146
Operations and Maintenance		
1.20.40	O&M	
1.20.40.10	Groundwater Treatment O&M Cost	
1.20.40.10.10	Long Term Monitoring with MNA Analyses	$606,976
1.20.40.10.20	Extraction Well O&M	
	Subtotal O&M Cost	$606,976
Total Cost		$654,122
Present Value for Capital		$44,062
Present Value for O&M		$271,560
Present Value Total		$315,622

Note: WBS is work breakdown structure

Figure 2-1
Location of Longhorn Army Ammunition Plant

Figure 2-2
Site Location Map, LHAAP-35B(37) and LHAAP-67

Figure 2-3
Sampling Locations LHAAP-35B(37)

Figure 2-4
Site Map with Sampling Locations, Record of Decision, LHAAP-67, Group 4

Figure 2-5
Groundwater Elevation Map, Shallow Zone, Record of Decision, LHAAP-35B(37), Group 4

Figure 2-6
Groundwater Elevation Map, Shallow Zone, Record of Decision, LHAAP-67, Group 4

Figure 2-7
Conceptual Site Model, Record of Decision, LHAAP-35B(37), Group 4

Figure 2-8
Conceptual Site Model, Record of Decision, LHAAP-67, Group 4

00098432

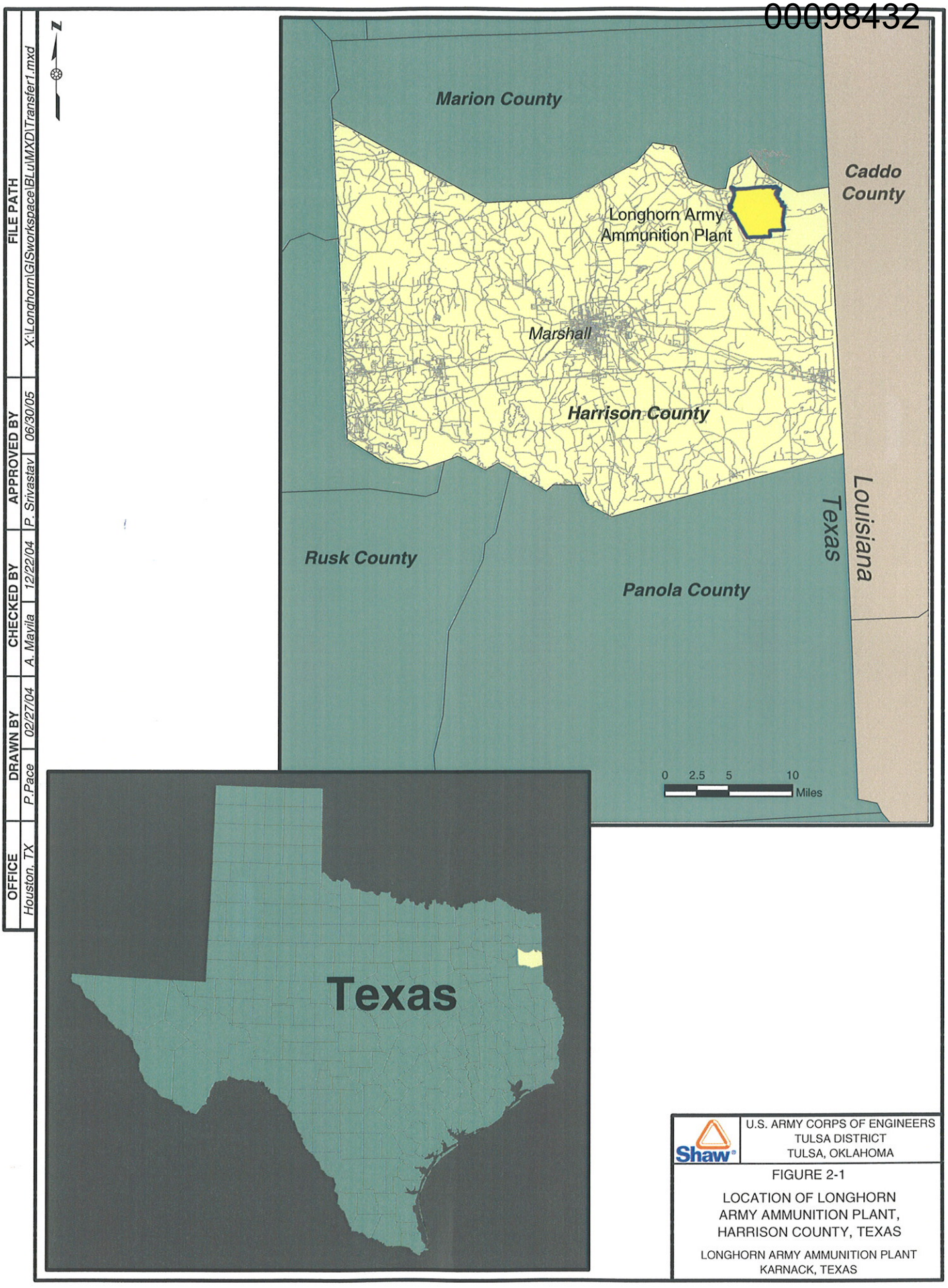

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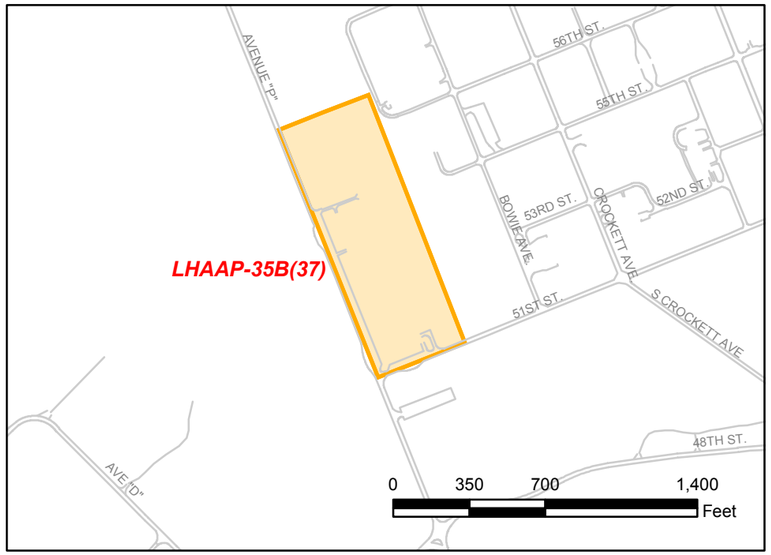
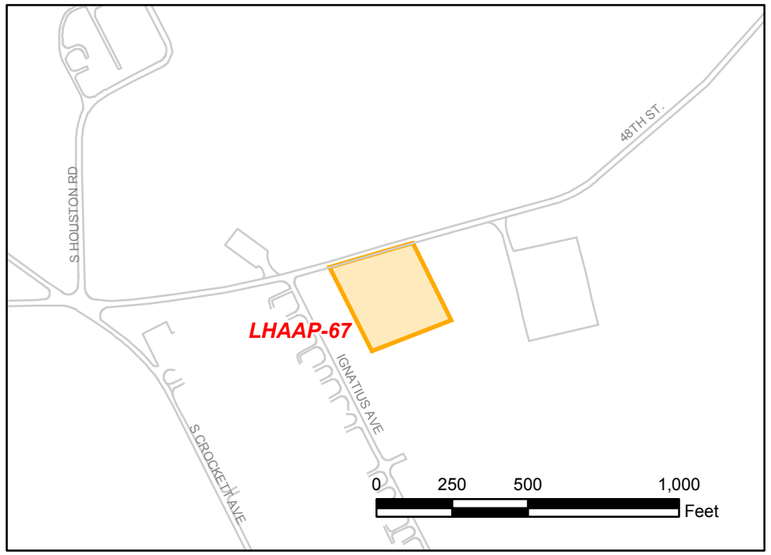
FIGURE 2-1

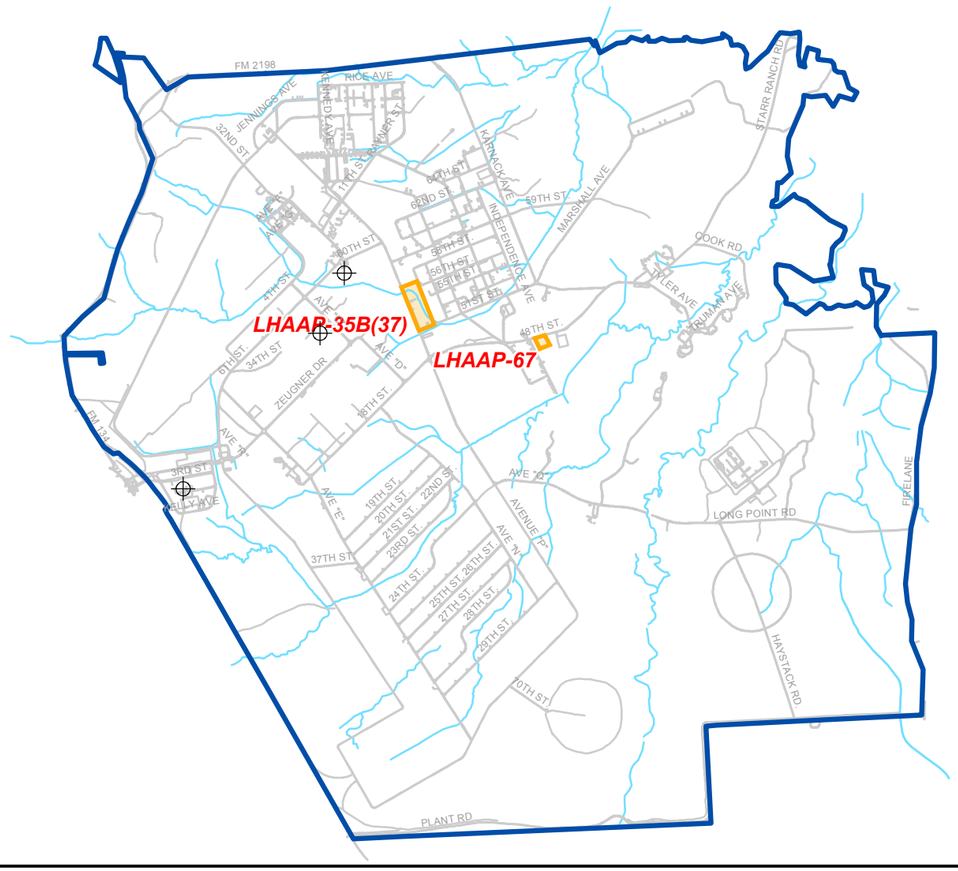
LOCATION OF LONGHORN ARMY AMMUNITION PLANT, HARRISON COUNTY, TEXAS

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098433







LEGEND

- Road
- Stream
- Site
- Approximate LHAAP Boundary
- LHAAP Water Supply Well

LEGEND

- Approximate LHAAP Boundary
- Road
- Stream
- Site
- LHAAP Water Supply Well

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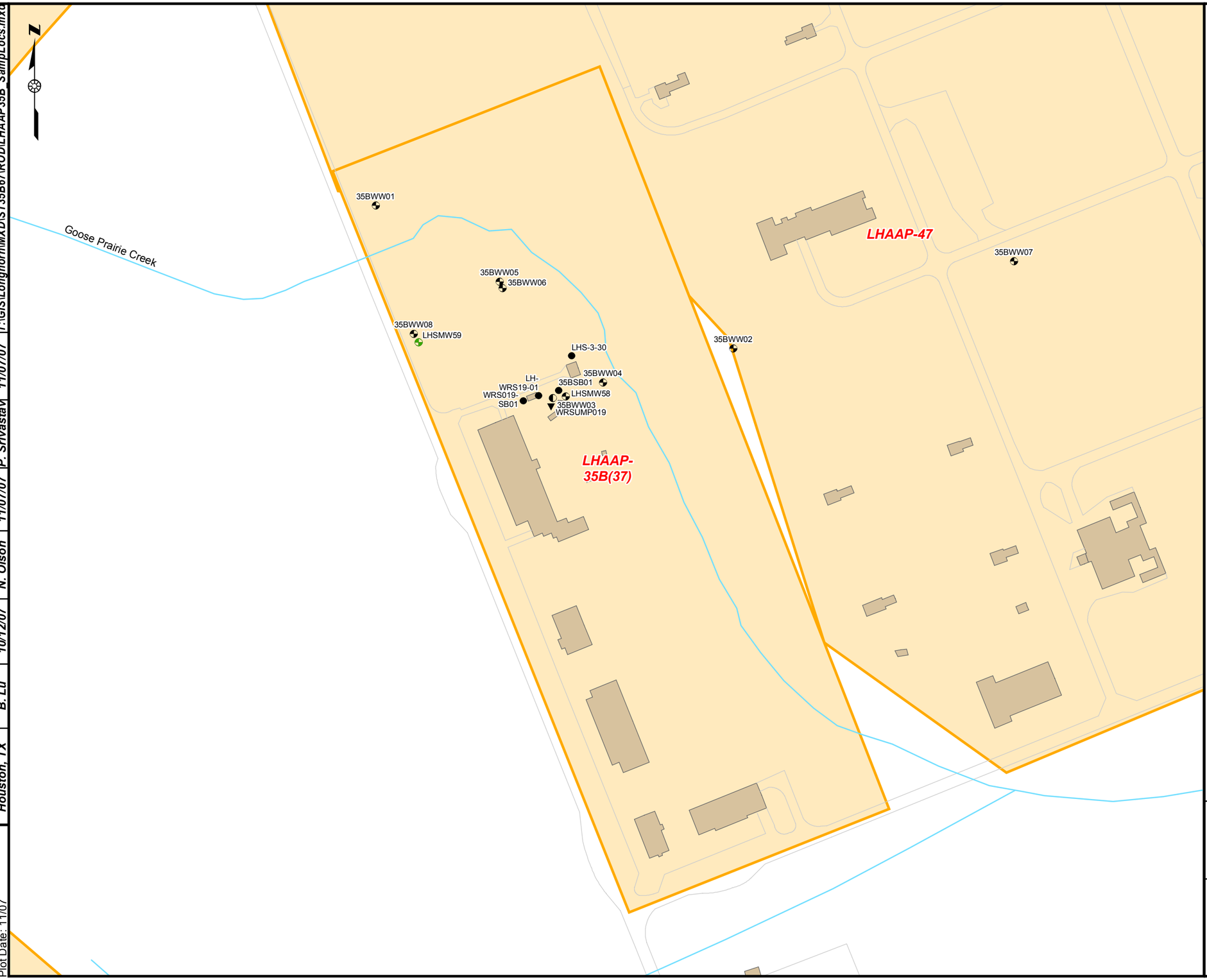
FIGURE 2-2
SITE LOCATION MAP
RECORD OF DECISION
LHAAP-35B(37) AND LHAAP-67, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098434



Legend

- Soil Boring
- Sump
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Abandoned Shallow Monitoring Well
- Stream
- Road
- Former Building or Concrete Slab
- Site

0 75 150 300 Feet

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FIGURE 2-3
SITE MAP WITH SAMPLING LOCATIONS
RECORD OF DECISION
LHAAP-35B(37), GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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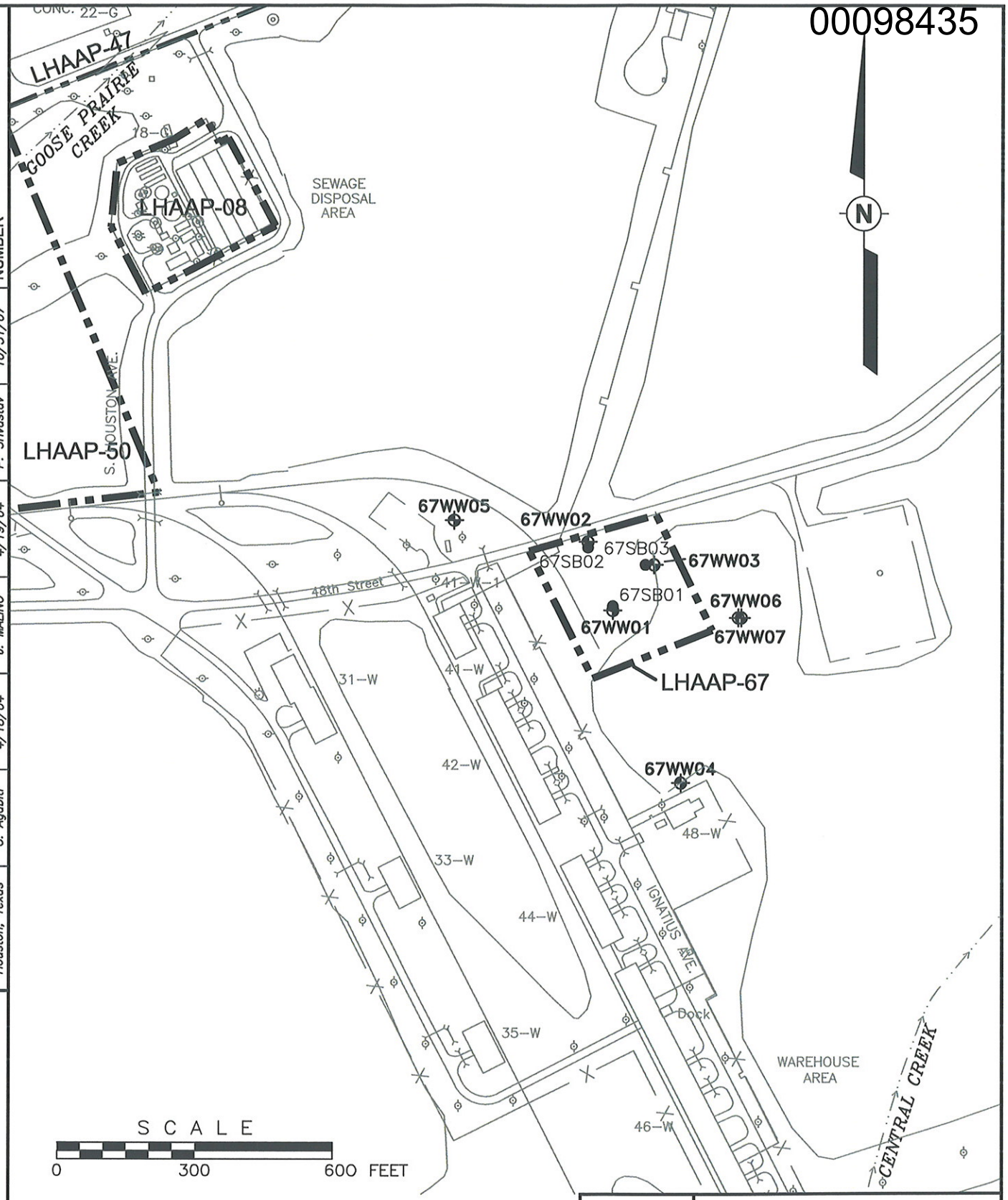

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Plotted by: colette.agabiti

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TULSA, OKLAHOMA

FIGURE 2-4
SITE MAP WITH SAMPLING LOCATIONS
RECORD OF DECISION, LHAAP-67,
GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098436

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LHAAP-05

LHAAP-29

Goose Prairie Creek

35BWW01
184.64

35BWW05
182.22

35BWW08
182.53

35BWW04
182.04

35BWW02
DRY

35BWW07
180.69

LHSMW58
181.15

LHAAP-47

LHAAP-35B(37)

184

183

182

181

Legend

- Upper Shallow Zone Monitoring Well
- Groundwater Elevation Contours (1 Ft)
- Stream
- Road
- Former Building or Concrete Slab
- Site

0 75 150 300
Feet

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FIGURE 2-5
GROUNDWATER ELEVATION MAP,
SHALLOW ZONE, RECORD OF DECISION,
LHAAP-35B(37), GROUP 4

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098437

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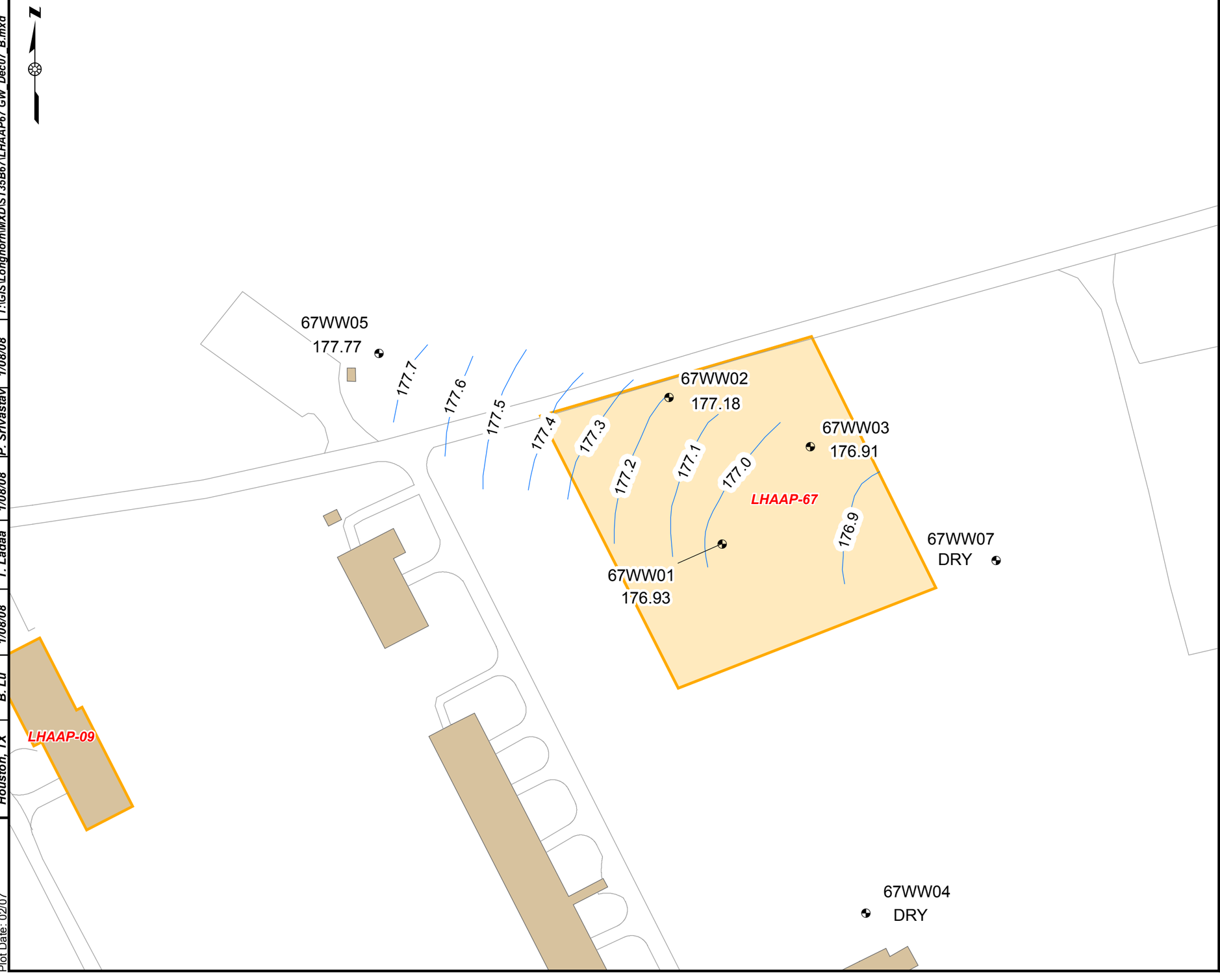

Legend

- Shallow Monitoring Well
- Groundwater Elevation Contours (0.1ft)
- Stream
- Road
- Former Building or Concrete Slab
- Site

0 50 100 200 Feet

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FIGURE 2-6
GROUNDWATER ELEVATION MAP,
SHALLOW ZONE, RECORD OF DECISION,
LHAAP-67, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098438

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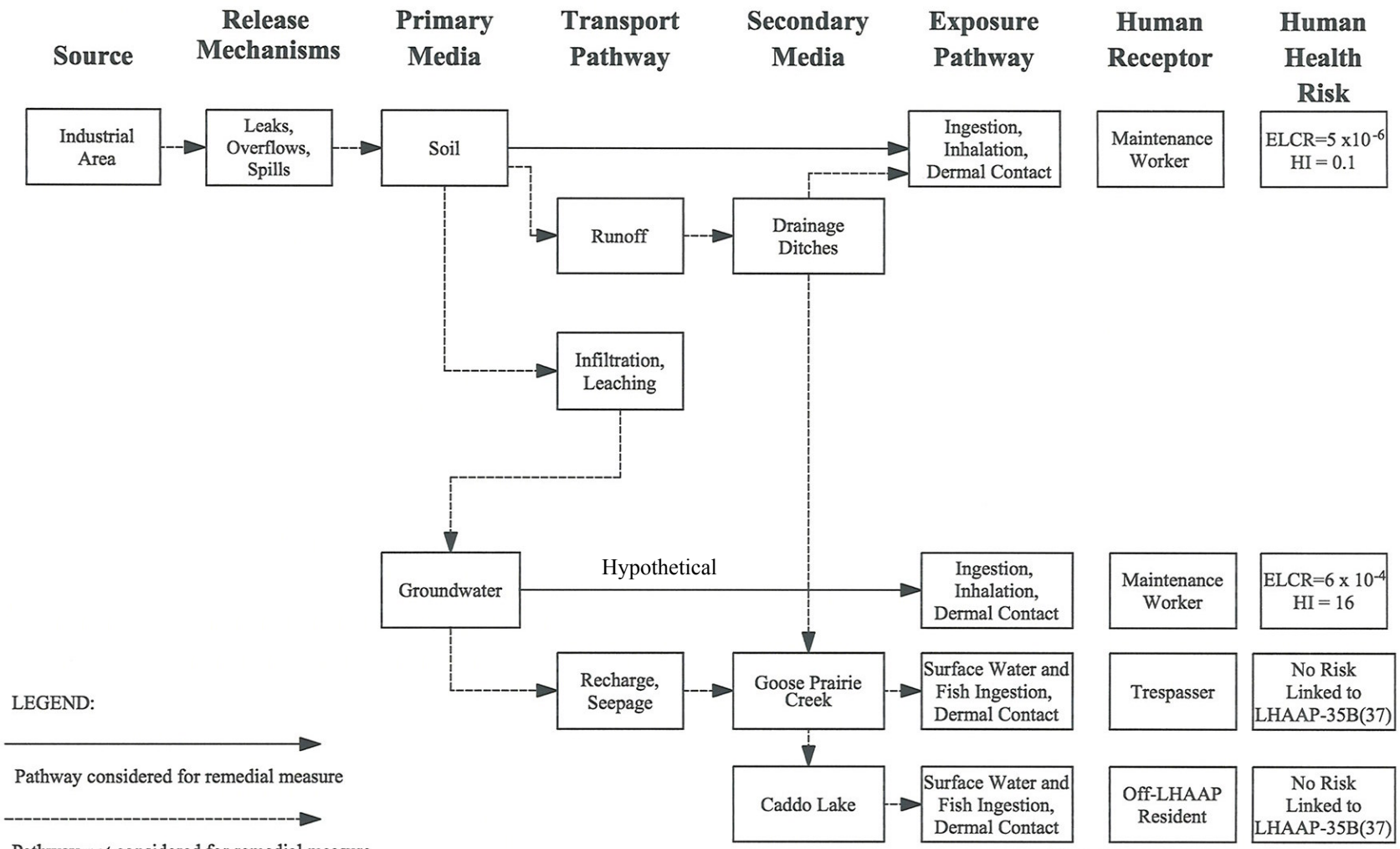

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FIGURE 2-7
CONCEPTUAL SITE MODEL
RECORD OF DECISION, LHAAP-35B(37), GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098439

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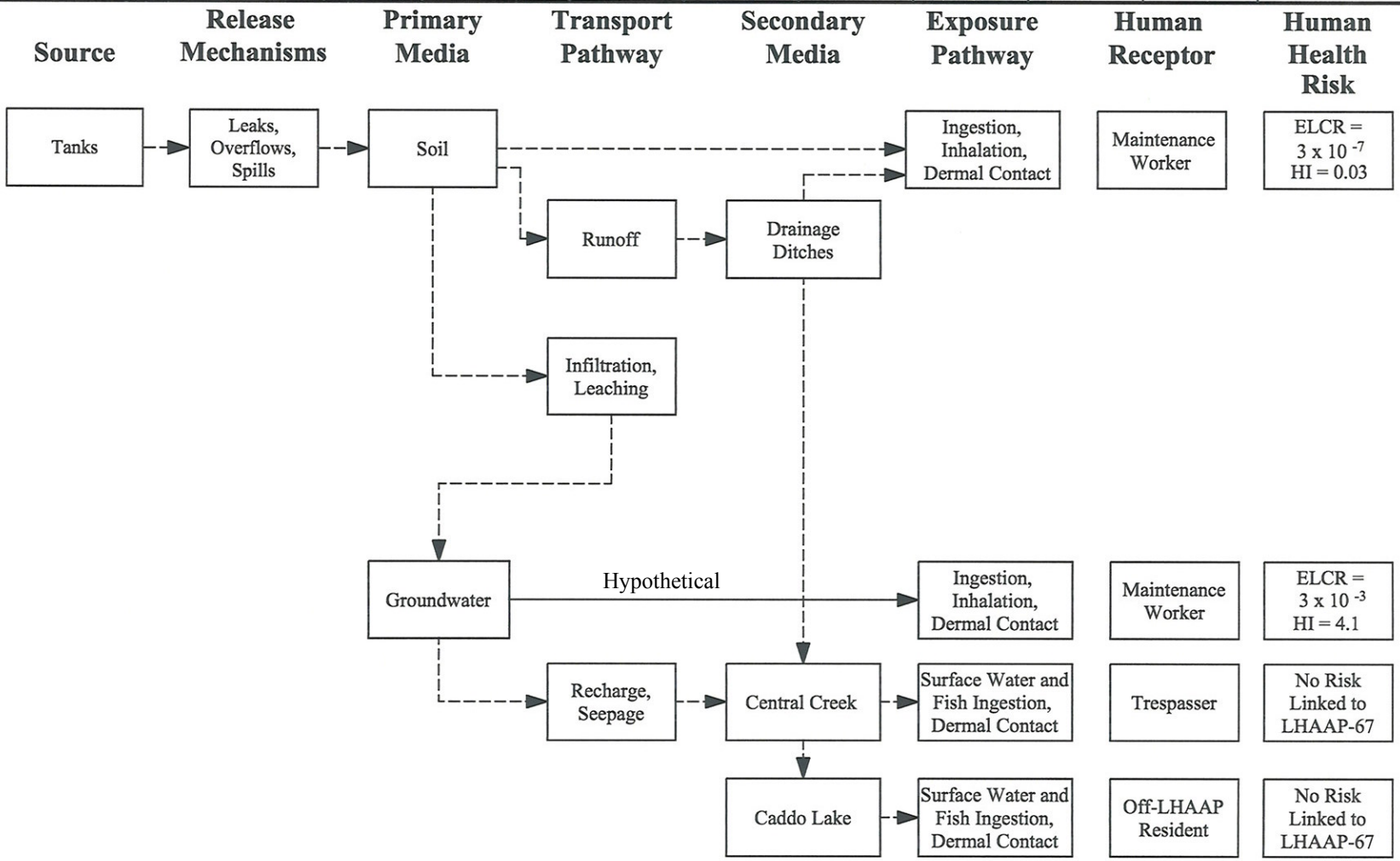

Pathway considered for remediation

Pathway *not* considered for remediation

ELCR - EXCESS LIFETIME CANCER RISK
HI - HAZARD INDEX

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FIGURE 2-8
CONCEPTUAL SITE MODEL
RECORD OF DECISION, LHAAP-67, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

3.0 References

Jacobs, 2002a, *Final Remedial Investigation Report for the Group 4 Sites, Sites 35A, 35B, 35C, 46, 47, 48, 50 60, and Goose Prairie Creek, Longhorn Army Ammunition Plant, Karnack, TX*, January.

Jacobs, 2002b, *Final Remedial Investigation Report Addendum for the Group 4 Sites (Sites 04, 08, 67) at the Longhorn Army Ammunition Plant, Karnack, Texas,* February.

Jacobs, 2003, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites (Sites 04, 08, 35A, 35B, 35C, 46, 47, 48, 50, 60, 67, Goose Prairie Creek, Saunder's Branch, Central Creek, and Caddo Lake), Longhorn Army Ammunition Plant, Karnack, Texas,* June.

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Shaw 2007d, *Final Data Gaps Investigation Report, Longhorn Army Ammunition Plant, Karnack, Texas*, April.

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U.S. Army, 2008a, *Final Proposed Plan for LHAAP-35B(37), Chemical Laboratory and LHAAP-67, Aboveground Storage Tank Farm, Longhorn Army Ammunition Plant, Karnack,* Texas, June.

U.S. Army, 2008b, Letter with enclosures from LHAAP Site Manager, Rose M. Zeiler, to TCEQ Remediation Division Project Manager, Fay Duke, *Revised MNA Modeling Results for Time to MCL, LHAAP-35B (37) and LHAAP-67, Longhorn Army Ammunition Plant, Karnack, Texas,* June 5.

U.S. Army Environmental Hygiene Agency (USAEHA), 1987, *Final Groundwater Contamination Survey No. 38-26-0851-89, Evaluation of Solid Waste Management Units, Longhorn Army Ammunition Plant, Karnack, Texas,* May.

U.S. Environmental Protection Agency (USEPA), 1989, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual, (Part A),* OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, Washington, DC.

USEPA, 1990, *National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 40 CFR Part 300,* March.

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4.0 Responsiveness Summary

The Responsiveness Summary serves three purposes. First, it provides the U .S. Army, USEPA, and TCEQ with information about community concerns with preferred alternative for LHAAP-35B (37) and LHAAP-67 presented in the Proposed Plan. Second, it shows how the public's comments were factored into the decision-making process for selection of the final remedy. Third, it provides a formal mechanism for the U.S. Army to respond to public comments.

The U.S. Army, USEPA, and TCEQ provide information regarding LHAAP-35B(37) and LHAAP-67 through public meetings, the Administrative Record file for the facility, and announcements published in the Shreveport Times and Marshall News Messenger newspapers. **Section 2.3** discusses community participation on LHAAP-35B(37) and LHAAP-67, including the dates for the public comment period, the date, location, and time of the public meetings, and the location of the Administrative Record. The following documents related to community involvement were added to the Administrative Record:

- Transcript of the public meeting on March 9, 2010
- Questions and comments from the public during the public comment period, and the response to comments from the U.S. Army dated June 3, 2010.

This Community Responsiveness Summary provides written responses to comments submitted by the community regarding the Proposed Plan of Action for the final remedy for the Chemical Laboratory (LHAAP-35B (37)) and the former aboveground storage tank farm (LHAAP-67) at Longhorn Army Ammunition Plant, Karnack, Texas. The summary is presented in two sections:

- Background of Community Involvement
- Summary and Responses to Comments Received

BACKGROUND OF COMMUNITY INVOLVEMENT

Community interest in LHAAP-35B (37) and LHAAP-67 dates back to 1992 when local officials and community members in the technical review committee began holding quarterly meetings at LHAAP. Beginning December 2004, the technical reviews have been conducted by the Restoration Advisory Board.

SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND U.S. ARMY RESPONSES

Summary of Questions/Comments: The community presented four main concerns related to the proposed remedial action at LHAAP-35B(37) and LHAAP-67: sampling, time required for

maintenance of LUCs, metals (antimony and thallium) and remedial design. The questions/comments can be summarized as: 1) The Army should establish a regular monitoring schedule and should not use reporting limits that are greater than MCLs or other values established to protect human health or the environment. 2) It is not reasonable to propose plans that could require the maintenance of LUCs for such lengths of time. 3) Several wells were never sampled for antimony and thallium and the Army's rationale for not considering antimony and thallium to be COCs is weak. 4) It is difficult to evaluate effectiveness of any proposed plan without also evaluating the Remedial Design (RD).

Responses:

Sampling frequency and reporting limits: The preferred remedial action (MNA) in the proposed plan will include a monitoring schedule, to be established in the remedial design, but likely will be similar to: quarterly monitoring for two years, semi-annual monitoring for 3 years and annual monitoring until the next five-year review. The results from monitoring will be reviewed during the Five-Year Review to determine if more or less frequent monitoring is required for the sites. For reporting limits, it should be noted that method detection limits have improved with decreases over the years as laboratory methods and equipment evolve. As detection limits decrease, in many cases, the values protective of human health and the environment also decrease. Results that are estimated and flagged with J and have reporting limits greater than twice the detection limits can occur for several reasons; reporting limits adjusted for dilution factors and sample size, the duplicate relative percent difference (RPD) >20% or differences greater than the reporting limit. Despite the value being estimated and the high reporting limit, the detections were still considered in the remedial investigation.

Maintenance of LUCs: Several factors are evaluated to determine a reasonable timeframe for a remedy. Maintenance of the LUCs for groundwater use restrictions would require minimal effort and be reasonable for extended lengths of time. The land use controls will include a county recordation that will restrict access to the groundwater until MCLs are met. The maintenance of the LUCs are believed to be reasonable for the following reasons: 1) access of groundwater through well installation requires a permit from the Texas Department of Licensing and Regulation or Texas Water District authority, the department will be provided a copy of the LUC on the groundwater at the site as required by the ROD, 2) the Army will conduct reviews every five years, which is required by law and the ROD and at which time the protectiveness and effectiveness of the remedies applied, including the LUCs, will be evaluated by Army for regulatory review and approval, 3) the property is proposed for transfer into a national wildlife refuge, which by its very nature includes physical access and use restrictions and is subject to control and continual inspection by Refuge personnel, and 4) the property is intended to remain under ownership and management of a federal government agency.

Antimony and Thallium: (Sampling Wells) The historical uses for sites LHAAP-35B(37) and LHAAP-67 do not identify an operation that would include Antimony or Thallium. No munitions production took place in these two areas. LHAAP-35B(37), Chemical Laboratory Waste Pad (Building 29-A), served as a collection point for spent solvents from the Chemical Lab (Building 29-A) from 1985-1997. The suspected/reported contaminants for LHAAP-35B(37) are VOCs; 1,1-dichloroethene and trichloroethene. LHAAP-67, Above Ground Storage Tanks, consisted of seven ASTs containing No.2 fuel oil, kerosene, or solvents that have been removed. The suspected/reported contaminants for LHAAP-67 are POL and solvents; 1,1-dichloroethene. In addition, at LHAAP-35B(37), monitoring wells 35BWW03-06 were installed after the decision was made in 2002 that antimony and thallium were not groundwater contaminants. Therefore metals were not included as analytes in subsequent sampling.

(COCs) The rationale for not considering antimony and thallium to be COCs for LHAAP-35B(37) is based on conclusions drawn in the remedial investigation report from 2002. These conclusions state that while only 2 of 10 groundwater samples had detections of antimony and thallium in 1996, neither of these metals were detected in samples from wells taken in 1998. Additionally see response to sampling wells above, the use of site LHAAP-35B(37) does not identify historical uses of antimony or thallium, nor were they detected in soil samples. Thus, the 1994, 1996 and 1998 sampling events were considered sufficient for metals analyses for nature and extent. However, in reviewing the data for LHAAP-35(B)37, the basis for the 2002 decision was found not fully documented. Therefore, groundwater sampling for antimony and thallium will be integrated into the Remedial Design phase for LHAAP-35B(37) in order to confirm the previous decision not to include these two metals as COCs.

(COCs) The rationale for not considering antimony and thallium to be COCs for LHAAP-(67) is based on conclusions drawn in the remedial investigation report from 2002. Of the three monitoring wells sampled in 1998, one well detected thallium at 0.1 ug/L above the MCL, which is not significant enough to consider thallium as a COC. Follow-on sampling of three monitoring wells in 2000 did not detect thallium. The results from 1998 and 2000 sampling concluded that no metals or anion results exceeded the MCL. Additionally see response to sampling wells above, the use of site LHAAP-67 does not identify historical uses of antimony or thallium and thus does not warrant sampling or consideration of metals as COCs for the site.

Remedial Design: The Army will provide the public with updates on remedial design (RD) and remedial action status through the RAB meeting and any concerns can be addressed through this forum. The RD will include performance objectives, schedule and other design criteria and will follow established regulatory guidance for MNA.

Appendix A contains the public announcements for the public comment period as well as the reopening of the public comment period. These announcements also provide notification of the Open House on June 23, 2008 and the Public Meeting on March 9, 2010.

Glossary of Terms

Administrative Record File – The body of reports, official correspondence, and other documents that establish the official record of the analysis, clean up, and final closure of a site.

ARARs – Applicable or relevant and appropriate requirements. Refers to the federal and state requirements that a selected remedy will attain.

Attenuation - The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution, and/or transformation.

Background Levels – Naturally-occurring concentrations of inorganic elements (metals) that are present in the environment and have not been altered by human activity.

Characterization – The compilation of all available data about the waste unit to determine the rate and extent of contaminant migration resulting from the waste site, and the concentration of any contaminants that may be present.

Chemicals of Concern (COC) – Those chemicals that significantly contribute to a pathway in an exposure model of a hypothetical receptor (e.g., a child that resides on a site). They exceed either the calculated numerical limit for cumulative site cancer risk (1 in 10,000 exposed individuals) or the calculated numerical limit of 1 for noncancer effects, a value proposed by the USEPA.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – CERCLA was enacted by Congress in 1980 and was amended by the Superfund Amendments and Reauthorization Act in 1986. CERCLA provides federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites and established the Superfund Trust Fund.

Contaminant Plume – A column of contamination with measurable horizontal and vertical dimensions that is suspended and moves with groundwater.

Exposure – Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

Federal Facility Agreement – A legal binding agreement among USEPA, TCEQ, and U.S. Army that sets the standards and schedules for the comprehensive remediation of Longhorn Army Ammunition Plant.

Groundwater – Underground water that fills pores in soil or openings in rocks to the point of saturation.

Human Health Risk Assessment – A study conducted as part of a remedial investigation to determine the risk posed to human health by site-related chemicals.

National Priorities List (NPL) – The USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. USEPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

Organic Compounds – Carbon compounds such as solvents, oils, and pesticides. Most are not readily dissolved in water.

Record of Decision – A legal document presenting the remedial action selected for a site or operable unit. It is based on information and technical analyses generated during the remedial investigation/feasibility study and consideration of public comments on the statement of basis/proposed plan and community concerns.

Remedial Investigation – A study designed to gather data needed to determine the nature and extent of contamination at a Superfund site.

Resource Conservation and Recovery Act (RCRA) – Gives USEPA the authority to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA focuses only on active and future facilities and does not address abandoned or historical sites.

Responsiveness Summary – A summary of oral and/or written comments received during the proposed plan comment period and includes responses to these comments. The responsiveness summary is a key part of a ROD highlighting community concerns.

Screening-Level Ecological Risk Assessment – The initial phase of a baseline ecological risk assessment in which conservative concentrations of site chemicals are quantitatively compared to chemical- and media-specific generic effect levels. Those chemicals selected as chemicals of potential ecological concern are further refined through quantitative comparison to chemical- and species-specific effect doses, as well as qualitative examination. Those chemicals identified as chemicals of concern may be investigated further, remediated, or left in place per the decision of the risk managers.

Proposed Plan – A plan for a site cleanup that proposes a recommended or preferred remedial alternative. The Proposed Plan is available to the public for review and comment and the preferred alternative may change based on public and other stakeholder input.

Superfund Amendments and Reauthorization Act (SARA) – Amended CERCLA in 1986. SARA resulted in more emphasis on permanent remedies for cleaning up hazardous waste sites, increased the focus on human health problems posed by hazardous waste sites, and encouraged greater citizen participation in making decisions on how sites should be cleaned up.

Surface Media – The soil (surface or subsurface), surface water, and sediment present at a site as applicable. The source material in the surface media may be contributing to groundwater contamination.

Superfund – The common name used for CERCLA; also referred to as the Trust Fund. The Superfund Program was established to help fund cleanup of hazardous waste sites. It also allows legal action to force those responsible for sites to clean them up.

Trichloroethene (TCE) – TCE is a colorless or blue liquid with an odor similar to ether. It is man made and does not occur naturally in the environment. TCE was once commonly used to remove oils and grease from metal parts and is used in the dry cleaning industry.

Appendix A

Public Announcements

PUBLIC NOTICE
OPEN HOUSE ON JUNE 23, 2008
THE UNITED STATES ARMY INVITES PUBLIC COMMENT
ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITES LHAAP-35B (37) and -67,
LONGHORN ARMY AMMUNITON PLANT, TEXAS

The U.S. Army, as lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP), in partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, has developed a proposed plan for the following sites: LHAAP-35B (37) and LHAAP-67. An open house forum for the public to view information and ask questions will be held on Monday, June 23, 2008 from 6:00 to 8:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas. The meeting will be an open house format with no set or formal presentations.

LHAAP-35B (37), the Chemical Laboratory, is located in the north-central portion of LHAAP and covers an area of 12.2 acres. LHAAP-35B (37) was built during the construction of Plant 3 (1953-1955) and was originally used to support the production activities at LHAAP. These support activities included research and testing of materials used in the production processes and quality assurance testing. Also, one waste rack sump was located at the site. In 1998, the site was used as a staging area in support of investigation activities. LHAAP-35B (37) was active through 1999.

LHAAP-67, a former aboveground storage tank farm, is located in the central portion of LHAAP and covers an area of approximately 1.9 acres When operational, LHAAP-67 consisted of seven aboveground storage tanks of unknown sizes. The tanks were surrounded with earthen dikes designed to contain potential spills. Site personnel indicated that the tanks were used for solvent storage. The tanks have been removed and the only structure remaining at the site is a railroad bed.

The Proposed Plan identifies the selected remedy for LHAAP-35B (37) and LHAAP-67 which includes utilizing land use controls (LUCs) and Monitored Natural Attenuation (MNA). The remedy meets the remedial action objectives (RAOs) developed for these sites to protect human health and the environment by preventing human exposure to chlorinated solvents-contaminated groundwater and preventing chlorinated solvents-contaminated groundwater from migrating into nearby surface water bodies.

The U.S. Army is soliciting public review and comment on the selected remedy for LHAAP-35B (37) and LHAAP-67. Copies of the Proposed Plan and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670.

The U.S. Army encourages the public to participate in the decision-making process by offering comments on the Proposed Plan. Public comment period begins June 17, 2008 and concludes July 16, 2008. The public information forum will be held on Monday, June 23, 2008 from 6:00 – 8:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661. Interested parties are invited to attend. For further information, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 903-679-3192 or e-mail rose.zeiler@us.army.mil.

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT
ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITES LHAAP-35B (37) and -67,
LONGHORN ARMY AMMUNITON PLANT, TEXAS
PUBLIC MEETING AT KARNACK COMMUNITY CENTER MARCH 9, 2010

The U.S. Army, as lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP), in partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, has reopened a proposed plan comment period for the following sites: LHAAP-35B (37) and LHAAP-67. Although the Proposed Plan identifies the preferred remedy for each of the sites, the U.S. Army welcomes the public's review and comments. The public comment period begins March 8, 2010 and concludes April 8, 2010. On Tuesday, March 9, 2010, from 7:00 to 9:00 p.m., the U.S. Army is inviting all interested parties to attend a public presentation of the proposed remedy for these sites and to ask questions and provide comments on the Proposed Plan. Questions, comments, and responses on the Proposed Plan will be recorded by a court reporter. This public meeting will be held at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas. Copies of the Proposed Plan and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. Summaries of each of the sites, including discussion of various alternatives that were evaluated, are provided below.

LHAAP-35B (37), the Chemical Laboratory, is located in the north-central portion of LHAAP and covers an area of 12.2 acres. LHAAP-35B (37) was built during the construction of Plant 3 (1953-1955) and was originally used to support the production activities at LHAAP. These support activities included research and testing of materials used in the production processes and quality assurance testing. Also, one waste rack sump was located at the site. In 1998, the site was used as a staging area in support of investigation activities. LHAAP-35B (37) was active through 1999.

LHAAP-67, a former aboveground storage tank farm, is located in the central portion of LHAAP and covers an area of approximately 1.9 acres When operational, LHAAP-67 consisted of seven aboveground storage tanks of unknown sizes. The tanks were surrounded with earthen dikes designed to contain potential spills. Site personnel indicated that the tanks were used for solvent storage. The tanks have been removed and the only structure remaining at the site is a railroad bed.

Four alternatives were evaluated for addressing the contaminated groundwater at sites LHAAP-35B (37) and LHAAP-67: 1) no action; 2) MNA and LUCs; 3) in situ bioremediation and LUCs; and 4) groundwater extraction, on-site treatment, and LUCs. Based on available information, the preferred remedy at this time is the second alternative. The Proposed Plan identifies the selected remedy for LHAAP-35B (37) and LHAAP-67 which includes utilizing land use controls (LUCs) and Monitored Natural Attenuation (MNA). The remedy meets the remedial action objectives (RAOs) developed for these sites to protect human health and the environment by preventing human exposure to chlorinated solvents-contaminated groundwater, preventing chlorinated solvents-contaminated groundwater from migrating into nearby surface water bodies, and returning groundwater to its potential beneficial use as drinking water, wherever practicable.

The U.S. Army is soliciting public review and comment on the selected remedy for LHAAP-35B (37) and LHAAP-67. Copies of the Proposed Plan and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670.

The U.S. Army encourages the public to participate in the decision-making process by offering comments on the Proposed Plan. Public comment period begins March 8, 2010 and concludes April 8, 2010. The public information forum will be held on Tuesday, March 9, 2010 from 7:00 – 9:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661. Interested parties are invited to attend. For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil. E-mailed comments must be submitted by close of business on April 8, 2010.

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 14, 2010

Mr. Thomas E. Lederle, Industrial Branch Chief
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BD (Tom Lederle)
600 Army Pentagon
Washington, D.C. 20310-0600

Re: Record of Decision for LHAAP-49, Former Acid Storage Area
Longhorn Army Ammunition Plant Superfund Site TX6213820529
Karnack, Harrison County, Texas

Dear Mr. Lederle:

The Texas Commission on Environmental Quality (TCEQ) received the final Record of Decision (ROD) for the LHAAP-49, Former Acid Storage Area, at the Longhorn Army Ammunition Plant Superfund Site in Karnack, Texas on August 19, 2010. The TCEQ has completed the review of the above referenced document and concurs that the response action described in the ROD is the most appropriate remedy for LHAAP-49.

Sincerely,

Mark R. Vickery, P.G.
Executive Director

MV/FD/

cc: Mr. Sam Coleman, P.E., Director, Superfund Division, US Environmental Protection Agency, Region 6

00098453

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 14, 2010

Mr. Thomas E. Lederle, Industrial Branch Chief
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BD (Tom Lederle)
600 Army Pentagon
Washington, D.C. 20310-0600

Re: Record of Decision for the Former Pistol Range
Longhorn Army Ammunition Plant Superfund Site TX6213820529
Karnack, Harrison County, Texas

Dear Mr. Lederle:

The Texas Commission on Environmental Quality (TCEQ) received the final Record of Decision (ROD) for the Former Pistol Range at the Longhorn Army Ammunition Plant Superfund Site in Karnack, Texas on August 19, 2010. The TCEQ has completed the review of the above referenced document and concurs that the response action described in the ROD is the most appropriate remedy for the Former Pistol Range.

Sincerely,

Mark R. Vickery, P.G.
Executive Director

MV/FD/

cc: Mr. Sam Coleman, P.E., Director, Superfund Division, US Environmental Protection Agency, Region 6

Shaw® Shaw Environmental, Inc.

Date: ***September 21, 2010***

Project No.:117591

TRANSMITTAL LETTER:

To: Mr. Aaron Williams

Address: US Army Corps of Engineers - Tulsa
CESWT-PP-M
1645 South 101st East Ave
Tulsa, Oklahoma 74128

Re: **Final Decision Document for LHAAP-02, Vacuum Truck Overnight Parking**
Contract No. W912QR-04-D-0027/DS02

For: Review ____ As Requested ____ Approval ____ Corrections ____ Submittal ____ Other X ____

Item No:	*No. of Copies*	*Date:*	*Document Title*
1	2	July 2010	**Final Decision Document for LHAAP-02, Vacuum Truck Overnight Parking, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron– Enclosed are two copies of Shaw's final version of the above-named document. Copies have been distributed as indicated below.

Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert– USACE, Tulsa (sent to A. Williams for distribution)
Mr. M. Mechenes– USAEC
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

00098455

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

September 21, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Decision Document for LHAAP-02, Vacuum Truck Overnight Parking
Longhorn Army Ammunition Plant, Karnack, Texas, July 2010

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw – Houston, TX (for project files)

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

September 21, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Decision Document for LHAAP-02, Vacuum Truck Overnight Parking
Longhorn Army Ammunition Plant, Karnack, Texas, July 2010
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
S. Tzhone, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw, Houston, TX (for project files)

FINAL

DECISION DOCUMENT FOR LHAAP-02 VACUUM TRUCK OVERNIGHT PARKING LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

Prepared for

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma

Prepared by

Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

MARC No. W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591

July 2010

1.0 Declaration

1.1 Statement of Basis and Purpose

This document presents the basis for the decision for actions that are necessary for site LHAAP-02, Vacuum Truck Overnight Parking, at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The decision was made by LHAAP and the Texas Commission on Environmental Quality (TCEQ) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Resource Conservation and Recovery Act (RCRA), and Army Regulation (AR) 200-1, as applicable. Although there are several Superfund National Priorities List (NPL) environmental sites at LHAAP, LHAAP-02 is not among them. This site is being addressed under CERCLA as a non-NPL environmental site.

1.2 Description of Selected Remedy

Site investigations were conducted through which it was determined by LHAAP, TCEQ, and U.S. Environmental Protection Agency (USEPA) that no CERCLA remediation is necessary for LHAAP-02. It is agreed that no action is necessary because this site does not present unacceptable risks for the reasonably anticipated future use as part of the Caddo Lake National Wildlife Refuge which is considered an industrial use scenario. The risk evaluation does not address unrestricted use. In accordance with 30 Texas Administrative Code (TAC) §335.566, a notification will be recorded in the Harrison County office stating that the land is suitable for nonresidential use. Limited monitoring will be conducted to ensure that the use of this site remains consistent with the industrial/recreational exposure scenario evaluated in the risk evaluation and documented in the form of Letters of Certification transmitted every 5 years to TCEQ. Although the Army may later pass these procedural responsibilities to the designated transferee, U.S. Fish and Wildlife Service (USFWS), in conjunction with the property transfer, the Army shall retain ultimate responsibility for future environmental response actions. Because levels of arsenic and lead in soil exceed the State of Texas standards protective of groundwater, groundwater monitoring will be implemented semiannually for 3 years following finalization of this document. If the results of these six sampling events conducted at LHAAP-02 indicate concentrations of arsenic and lead in the groundwater are below maximum contaminant levels (MCLs), then groundwater monitoring will cease at LHAAP-02.

1.3 Statutory Determinations

None of the CERCLA §121 statutory determinations are applicable in this action since no remedy is being selected. No remedial actions are necessary to ensure protection of human

health and the environment. Limited groundwater monitoring will be conducted to confirm that no contaminant leaching to groundwater will occur.

The only costs associated with the decision for this site are for semiannual monitoring of groundwater for arsenic and lead for 3 years and limited monitoring in the form of Letters of Certification to the State of Texas every 5 years to certify proper land use. In addition, in accordance with TAC §335.566, a notification that the site is suitable for nonresidential use will be recorded in Harrison County records. The undersigned is the appropriate approval authority for this decision.

1.4 Authorizing Signature

APPROVED BY:

Thomas E Lederle — 29 July 2010

(Name) *(Date)*

Thomas E. Lederle
Industrial Branch Chief
BRAC Division, ACSIM
United States Army

2.0 Decision Summary

2.1 Site Name, Location, and Description

LHAAP-02, the former vacuum truck overnight parking area, is a small site located within LHAAP-35A(58), the former shops area of LHAAP. LHAAP is a former Army installation that occupies approximately 1,400 of its former 8,416 acres between State Highway 43 in Karnack, Texas, and the southwestern shore of Caddo Lake. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the southeast (**Figure 1**).

LHAAP was placed on the NPL on August 9, 1990, and several environmental sites within LHAAP were specifically listed. Activities to remediate the contamination began in 1990. After LHAAP's listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission, currently known as TCEQ, entered into a CERCLA Section 120 Federal Facility Agreement (FFA) for remedial activities at the installation. The FFA became effective December 30, 1991.

LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property. In 2003, LHAAP was placed under the administrative control of the Base Realignment and Closure (BRAC) Division as a Non-BRAC Excess property. Environmental activities at LHAAP are conducted in accordance with CERCLA and funded through the Defense Environmental Restoration Program. The Army is the party responsible for environmental restoration.

Although several environmental sites at LHAAP are on the NPL, LHAAP-02 is a non-NPL site. Army is the lead agency for all environmental restoration activities. For non-NPL sites, such as LHAAP-02, the State of Texas is the lead regulatory agency.

2.2 Site History

LHAAP was established in December 1941 with the primary mission of manufacturing trinitrotoluene (TNT). TNT manufacture (Plant 1) activities ended after World War II. In 1952, the facility began production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 mm ammunition at Plant 2; that production continued through 1956. In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. Rocket motor production at Plant 3 continued to be the primary operation at LHAAP until 1965 when Plant 2 was reactivated for the production of pyrotechnic and illuminating ammunition. In the years following the Vietnam conflict, LHAAP continued to produce flares and other basic pyrotechnic or illuminating items for the U.S. Department of Defense inventory. From September 1988 to May 1991, LHAAP was also used for the static

firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Forces Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

The site addressed in this document, LHAAP-02, is located in the northwestern portion of LHAAP within the shops area known as LHAAP-35A(58). LHAAP-02 was a parking lot for trucks that were used to pump out various sumps around LHAAP (**Figure 2**). It was in use beginning approximately in 1942 through 1997 (Plexus Scientific Corporation, Inc., 2005).

Environmental restoration activities at LHAAP-02, a non-NPL site, have progressed through the remedial investigation, at which point it was agreed by the Army and the TCEQ that no significant releases had occurred and the site could be closed under TAC Risk Reduction Rule Standard 3. Concurrence by TCEQ with this Decision Document is attached as **Appendix A**.

2.3 Public Participation

The U. S. Army, USEPA, TCEQ and the Restoration Advisory Board (RAB) have provided public outreach to the surrounding community concerning LHAAP-02 and other environmental sites at LHAAP. The outreach program has included fact sheets, media interviews, site visits, invitations to attend quarterly RAB and regulatory review meetings, and public meetings consistent with its public participation responsibilities under Sections 113(k)(2)(b), 117(a), and 121(f)(1)(g) of CERCLA.

The decision for no action for soil and limited monitoring of groundwater at LHAAP-02 was discussed at the RAB meeting on March 9, 2010, at LHAAP. Reports supporting the determination for this site are included in the Administrative Record for LHAAP, which is available for public review at the Marshall Public Library, (903) 935-4465, 300 South Alamo, Marshall, Texas 75670. The hours of operation are Monday through Thursday 10:00 a.m. – 8:00 p.m. and Friday through Saturday from 10:00 a.m. – 5:00 p.m.

2.4 Site Characteristics

Nearby surface features include asphalt paved roads and a grass-lined ditch. Runoff from the area is generally toward the southeast and is collected by the drainage ditches as shown in **Figure 2**. Spills from the trucks were expected to run to the soil at the perimeter of the lot (USACHPPM, 2000) and consequently to the ditches. The potential source of contaminants at LHAAP-02 was soil at the perimeter of the lot or the ditches. That soil had the potential to contain metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), explosives, and perchlorate. Subsequent analysis of samples collected in the ditch areas have identified specific metals as the contaminants of concern due to the potential for leaching from soil into the groundwater.

2.5 Current and Potential Future Site Uses

LHAAP was active from the early 1940s to the late 1990s for the manufacture of explosives, pyrotechnics, and rocket motors for World War II, the Korean War, and the Cold War. LHAAP was placed on inactive status in 1997; the production facilities have been demolished. Aside from the abundant wildlife, the installation is predominantly unoccupied. LHAAP consists of a heavily vegetated landscape with flat to slightly undulating terrain. The anticipated future use of LHAAP is based on a Memorandum of Agreement (MOA) (U.S. Army, 2004) between the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army. The MOA formally establishes the process for transferring the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge. Approximately 7,000 acres have been transferred to USFWS and are operated as the Caddo Lake National Wildlife Refuge. Future use of LHAAP-02 will be industrial, consistent with its use as part of a national wildlife refuge. LHAAP-02 will be transferred to the USFWS at the conclusion of restoration activities.

2.6 Site Risk

In July 2000, USACHPPM collected ten surface soil samples (0 to 6 inches below ground surface [bgs]) and eight subsurface soil samples (12 to 18 inches bgs). Surface soil samples were analyzed for metals, SVOCs, explosives, and perchlorate. Subsurface soil samples were analyzed for VOCs, SVOCs, explosives, perchlorate, and metals (USACHPPM, 2000). There were no explosives or perchlorate detected in any of the samples at LHAAP-02. Several metals, VOCs, and SVOCs were detected in the subsurface samples. Concentrations of these chemicals in individual samples were evaluated by comparison to TCEQ risk-based soil screening values (RBSVs) specified in the Texas Risk Reduction Rules (RRR) (30TAC§335 and updates) (TCEQ, 2006) that were developed to be protective of human health by the direct contact exposure pathways (ingestion, inhalation, and dermal contact). A second comparison was made for metals, which were subjected to statistical and geochemical comparisons to background. The evaluation showed that the concentrations of most organic and inorganic chemicals detected at LHAAP-02 are either below the regulatory human health criteria or are within the range of LHAAP soil background concentrations (Shaw, 2004). A few chemicals detected at LHAAP-02 (i.e., arsenic, copper, and four polycyclic aromatic hydrocarbon compounds) exceeded the screening criteria and differed from the LHAAP background data set. Such deviations occurred in only a few samples at isolated locations and are of little concern at LHAAP-02. None of the chemicals in the soil pose a human health risk to a receptor via direct exposure, and thus no action is recommended for this pathway (Shaw, 2009).

A few metals detected at LHAAP-02 (i.e., arsenic, cadmium, copper, lead, and mercury) exceed Applicable Standard 3 MSC (soil to groundwater pathway) values in at least one sample. To further evaluate the potential for soil-to-groundwater leaching, five soil samples were collected in July 2009 from the original soil sampling locations (**Figure 2**) for Synthetic Precipitation

Leaching Procedure (SPLP) analyses on the most elevated metals concentrations to evaluate the potential for metals to leach into the groundwater at LHAAP-02. The SPLP results for arsenic and lead exceeded the TCEQ GW-Ind values and indicate the potential for leaching arsenic and lead to the groundwater (Shaw, 2010). The SPLP results for other metals were below TCEQ GW-Ind. Historical groundwater sampling results collected in 1998 from nearby well 35AWW03 (**Figure 2**) indicated that arsenic and lead concentrations were below MCLs. The well has since been dry in 2008 and 2009.

The ecological risk for site LHAAP-02 was addressed in the installation-wide Baseline Ecological Risk Assessment (BERA) (Shaw, 2007). For the BERA, the entire installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. The sub-areas were delineated based on commonalities of historical use, habitat type, and spatial proximity to each other and the individual sites at LHAAP were grouped into one of these sub-areas. The conclusions regarding the potential for chemicals detected at individual sites to adversely affect the environment must be made in the context of the overall conclusions of the sub-area in which the site falls. Site LHAAP-02 lies within the Industrial Sub-Area. The BERA concluded that no unacceptable risk was present in the Industrial Sub-Area (Shaw, 2007). Therefore, no action is needed at LHAAP-02 for the protection of ecological receptors.

2.7 Remedy

No remedy is required for LHAAP-02. TCEQ concurs with this decision.

Semiannual groundwater monitoring will be conducted at one well at LHAAP-02 for 3 years. If the results of these six sampling events conducted at LHAAP-02 indicate concentrations of arsenic and lead in the groundwater are below maximum contaminant levels, then sampling at LHAAP-02 will cease.

None of the CERCLA §121 statutory determinations are applicable in this action because no remedial action is necessary to ensure protection of human health and the environment. In accordance with 30 TAC §335.566, a notification will be filed with Harrison County, stating that the site is suitable for nonresidential use, and five year reviews will be required. Limited monitoring will take place in the form of letters of certification from the Army (or the transferee) to TCEQ every 5 years to document that that use of LHAAP-02 remains consistent with the nonresidential use scenarios.

PRIMARY BACKGROUND DOCUMENTS FOR SITE LHAAP-02

Plexus Scientific Corporation (Plexus), 2005, *Environmental Site Assessment Phase I and II Report, Final, Production Areas, Longhorn Army Ammunition Plant, Karnack, Texas*, February.

Shaw Environmental, Inc. (Shaw), 2004, *Final Background Soil Study Report, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, July.

Shaw, 2007, *Installation-Wide Baseline Ecological Risk Assessment, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, November.

Shaw, 2009, *Final Site Investigation Report, LHAAP-02, Vacuum Truck Overnight Parking Lot, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, January.

Shaw, 2010, *Memo to Aaron Williams, U.S. Army Corps of Engineers: Additional Sampling at Site LHAAP-02 (Former Vacuum Truck Overnight Parking), Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, February.

TCEQ, 2006, *Texas Risk Reduction Rules* (30TAC§335) tables as updated through March 2006.

U.S. Army, 2004, *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas*, Signed by the Department of the Interior on April 27, 2004 and the Army on April 29, 2004.

U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM), 2000, *Hazardous and Medical Waste Study NO: 37-EF-5506-00, Response Complete Verification and Relative Risk Site Evaluation for Longhorn Army Ammunition Plant, Karnack, Texas, Vols. I and II*, July.

U.S. Environmental Protection Agency (USEPA), 1994, *National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations Part 300, 59 Federal Register 47384*, 10 October.

ACRONYMS

AR	Army Regulation
BERA	baseline ecological risk assessment
bgs	below ground surface
BRAC	Base Realignment and Closure Commission
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
FFA	Federal Facility Agreement
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
MCL	maximum contaminant level
MOA	Memorandum of Agreement
MSC	medium-specific concentration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	Superfund National Priorities List
PLEXUS	Plexus Scientific Corporation
RAB	Restoration Advisory Board
RBSV	risk-based screening values
RCRA	Resource Conservation and Recovery Act
RRR	Texas Risk Reduction Rules
SARA	Superfund Amendments and Reauthorization Act
SVOCs	semivolatile organic compounds
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNT	trinitrotoluene
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

Figures

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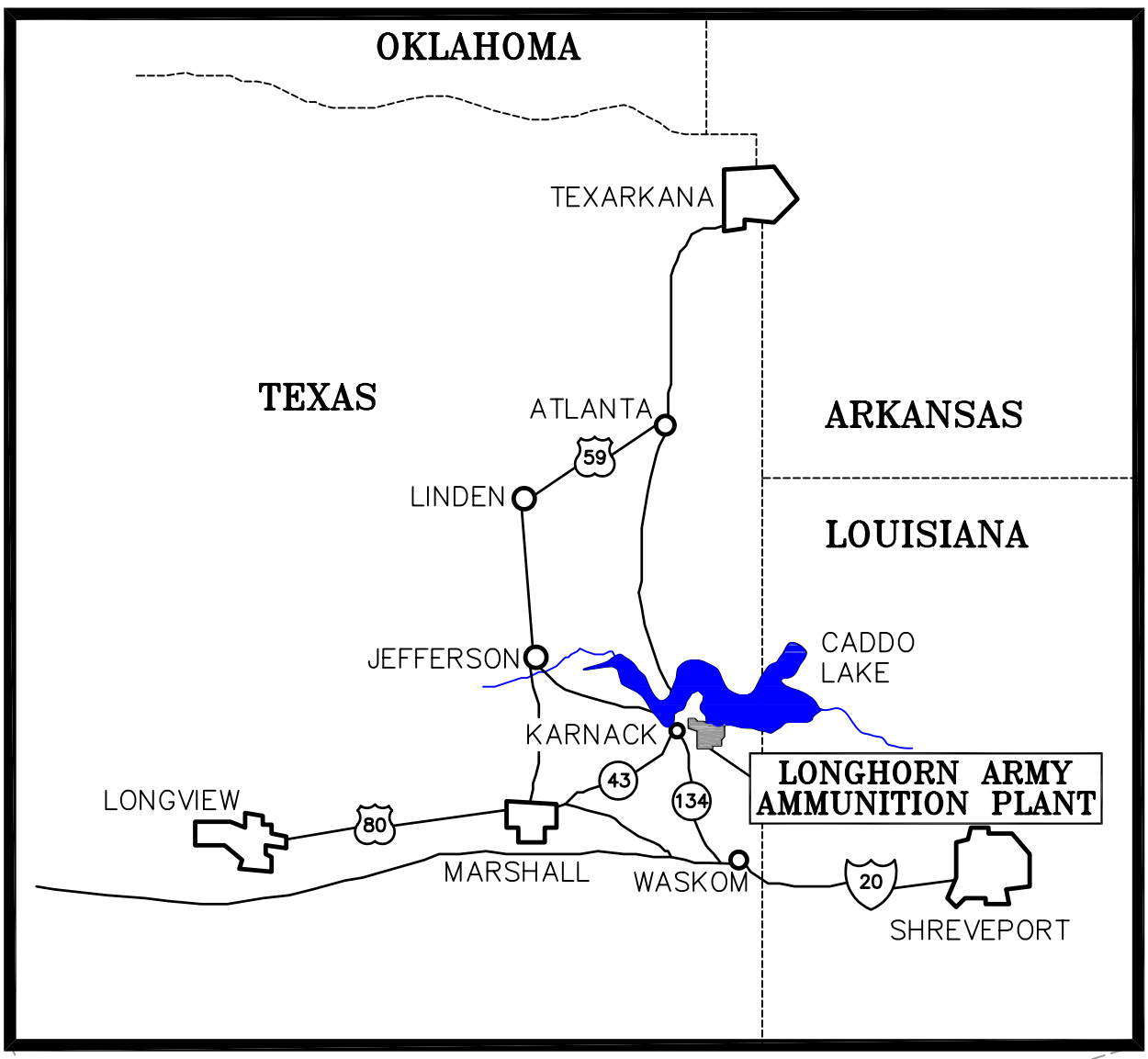

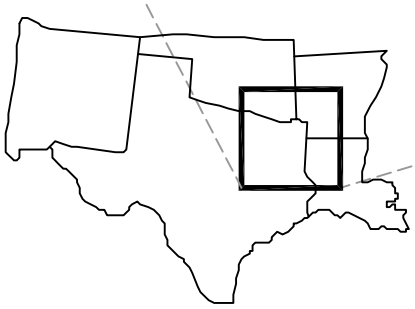

"DRAWING NOT TO SCALE"

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1

LHAAP LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	Houston, Texas	J. RDZ	12/17/03	G. JONES	04/08/05	P. SRIVASTAV	04/08/05	845714-A4

PLOT DATE: 04/08/05
FORMAT REVISION 3/25/99

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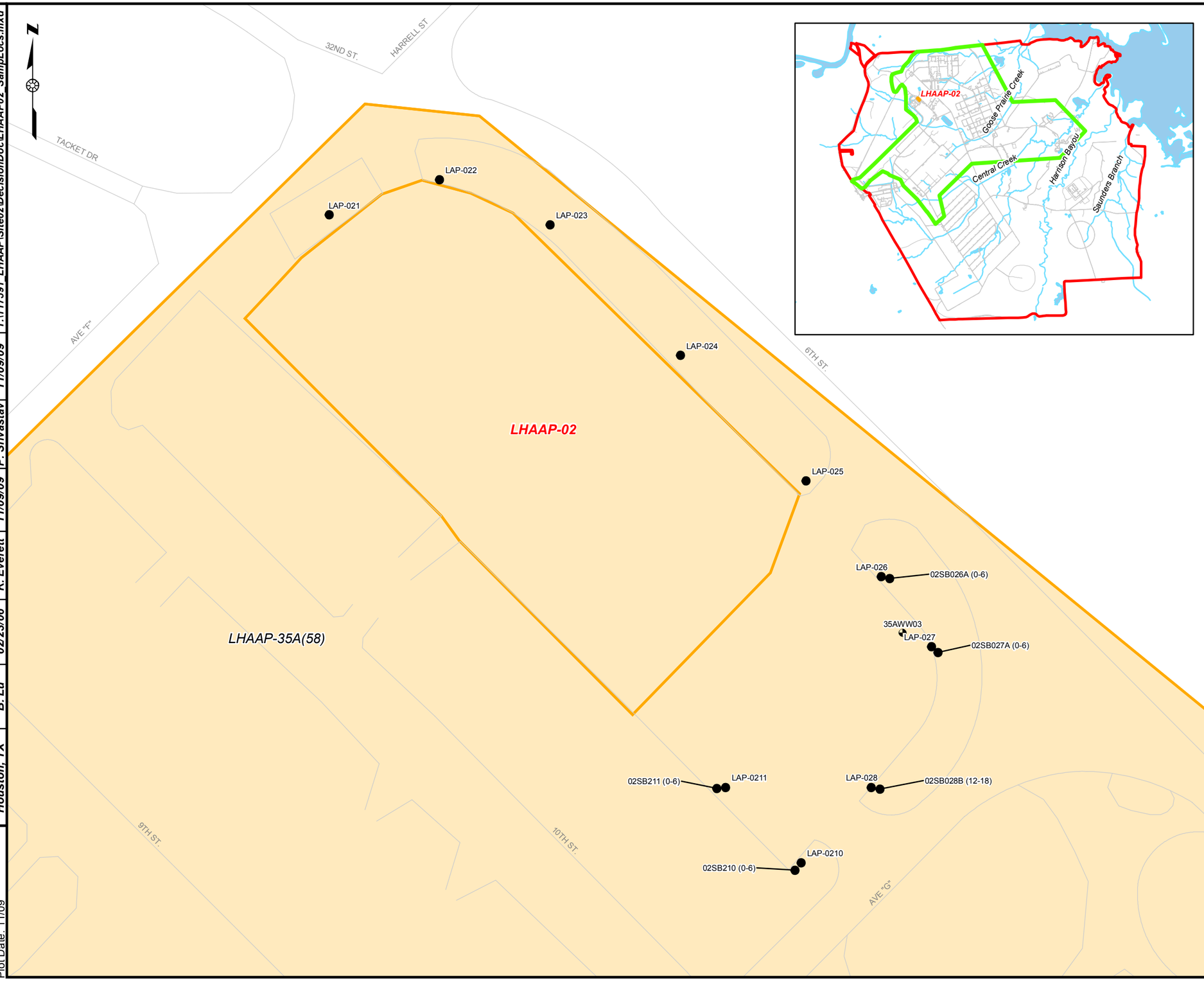


LEGEND

- Monitoring Well
- Soil Sample Location
- Road
- Industrial Sub-area
- Site
- Approximate LHAAP Boundary

NOTE:

1.) Surface samples (0-6 inches below ground surface) were collected at all ten locations. Subsurface samples (12-18 inches below ground surface) were collected at locations LAP-021 through LAP-028.

2.) "LAP" boring locations from U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) *Hazardous and Medical Waste Sudy No. 37-EF-5506-00, Response Verification and Relative Risk Site Evaluation for Longhorn Army Ammunition Plant, Karnack, Texas* July 10-12, 2000.

0 25 50 100 Feet

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Lu 02/23/06	K. Everett 11/09/09	P. Srivastav 11/09/09	T:\117591_LHAAP\Site02\DecisionDoc\LHAAP02_SampLocs.mxd

Plot Date: 11/09

Shaw®

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2

SOIL SAMPLE LOCATION MAP
LHAAP-02

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Appendix A

Correspondence of Regulatory Concurrence

00098470

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 1, 2010

Mr. Thomas E. Lederle, Industrial Branch Chief
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BD (Tom Lederle)
600 Army Pentagon
Washington, D.C. 20310-0600

Re: Decision Document for LHAAP-02, Vacuum Truck Overnight Parking
Longhorn Army Ammunition Plant Superfund Site TX6213820529
Karnack, Harrison County, Texas

Dear Mr. Lederle:

The Texas Commission on Environmental Quality (TCEQ) received the final Army Decision Document for the LHAAP-02, Vacuum Truck Overnight Parking, at the Longhorn Army Ammunition Plant Superfund Site in Karnack Texas on August 3, 2010. The TCEQ has completed the review of the above referenced document and concurs that the response actions described in the Decision Document are the most appropriate remedies for LHAAP-02.

Sincerely,

Brent Wade, Director
Remediation Division

BW/FD/

Shaw® Shaw Environmental, Inc.

Date: ***September 21, 2010***

Project No.: ***117591***

TRANSMITTAL LETTER:

To: Mr. Aaron Williams

Address: US Army Corps of Engineers - Tulsa
CESWT-PP-M
1645 South 101st East Ave
Tulsa, Oklahoma 74128

Re: Final Proposed Plan for LHAAP-16
Contract No. W912QR-04-D-0027/DS02

For: Review ____ As Requested ____ Approval ____ Corrections ____ Submittal ____ Other X ____

Item No:	***No. of Copies***	***Date:***	***Document Title***
1	2	September 2010	**Final Proposed Plan for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron– Enclosed are two copies of Shaw's final version of the above-named document. Copies have been distributed as indicated below.

Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert– USACE, Tulsa (sent to A. Williams for distribution)
Mr. M. Mechenes – USAEC
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

1401 Enclave Parkway, Suite 250, Houston, Texas 77077 ***Phone: (281) 531-3100/Fax: (281) 531-3143***

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

September 21, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Proposed Plan for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas, September 2010

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your review. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw – Houston, TX (for project files)

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

September 21, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Proposed Plan for LHAAP-16, Longhorn Army Ammunition Plant, Karnack, Texas, September 2010
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your review. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
S. Tzhone, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw, Houston, TX (for project files)

00098474

FINAL
PROPOSED PLAN
FOR
LHAAP-16

ISSUED BY: U.S. ARMY

Longhorn Army Ammunition Plant
Karnack, Texas

September 2010

INTRODUCTION

The purpose of this Proposed Plan is to present for public review the Preferred Remedial Alternative for LHAAP-16, also known as the Old Landfill. LHAAP-16 is a capped landfill of approximately 20 acres in size and is located in the south-central part of the Longhorn Army Ammunition Plant (LHAAP) in central-east Texas. This plan includes summaries of other potential remedial alternatives evaluated for implementation at the site. The primary purpose of the Proposed Plan is to facilitate public involvement in the remedy selection process. The Proposed Plan provides the public with basic background information about LHAAP-16, identifies the preferred final remedy for potential threats posed by the chemical contamination at the site, explains the rationale for the preference, and describes other remedial options that were considered. The preferred alternative for LHAAP-16 is Alternative 7: maintenance of existing landfill cap; land use controls (LUCs); in situ enhanced bioremediation; passive biobarriers; and monitored natural attenuation (MNA).

The U.S. Army is issuing this Proposed Plan for public review, comment, and participation to fulfill part of its public participation responsibilities under Sections 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986, and under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The CERCLA prescribes a step-wise progression of activities to respond to risk posed by contaminated sites **(Figure 1)**.

The preparation and review of a Proposed Plan is a distinct step required by CERCLA. This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation (RI) Report, the Feasibility Study (FS) Report, the Addendum to the FS Report (which includes the Natural Attenuation Evaluation Report), the Baseline Human Health Risk Assessment (BHHRA), the Installation-Wide Baseline Ecological Risk Assessment (BERA), and other supporting documents that are contained in the Administrative Record for LHAAP-16 that is publicly available in the Marshall Public Library. The project management team, including the U.S. Army, U.S. Environmental Protection

Dates to remember: October 10, 2010, to November 8, 2010
MARK YOUR CALENDER

PUBLIC COMMENT PERIOD:
October 10, 2010, to November 8, 2010
The U.S. Army will accept written comments on the Proposed Plan during the public comment period.

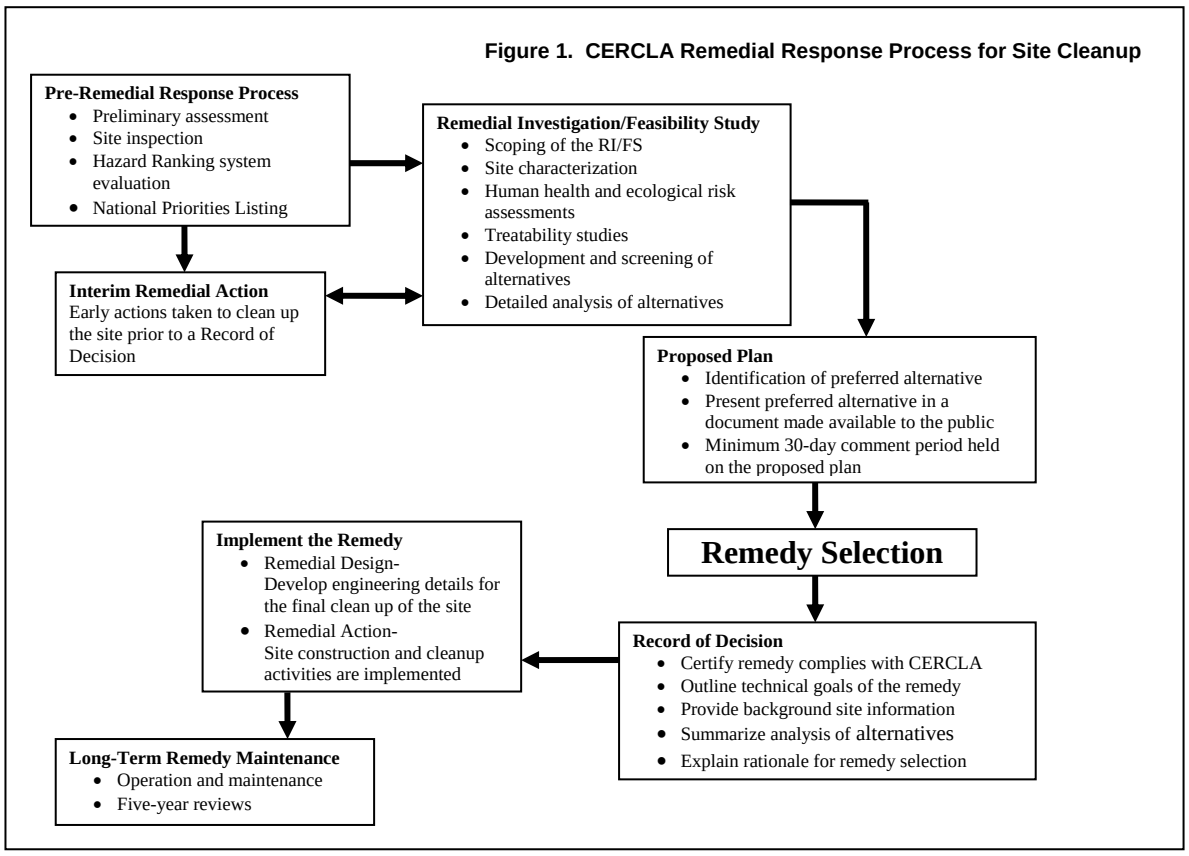
PUBLIC MEETING: The U.S. Army will hold a public meeting to explain the Proposed Plan for LHAAP-16. Oral and written comments will be accepted at the meeting. The meeting will be held on October 19, 2010, from 7:00 p.m. to 9.00 p.m. at the Caddo Lake State Park Group Recreation Hall Center.

For more information, see the Administrative Record at the following location:

Marshall Public Library
300 S. Alamo
Marshall, Texas 75670

Business Hours:
Monday – Thursday (10:00 a.m. – 8:00 p.m.)

For further information on LHAAP-16, please contact:
Dr. Rose M. Zeiler
Site Manager
Longhorn Army Ammunition Plant
P.O. Box 220
Ratcliff, Arkansas 72951
Phone No.: 903-679-3192
Direct No.: 479-635-0110
E-mail address: rose.zeiler@us.army.mil



Agency (USEPA), and the Texas Commission on Environmental Quality (TCEQ), encourages the public to review these documents and to review and comment on the alternatives presented in this Proposed Plan.

The U.S. Army is acting in partnership with USEPA Region 6 and TCEQ. As the lead agency for environmental response actions at LHAAP-16, the U.S. Army is charged with planning and implementing remedial actions at LHAAP. The regulatory agencies assist the U.S. Army by providing technical support, project review, project comment, and oversight in accordance with CERCLA and the NCP as well as the Federal Facility Agreement (FFA). The FFA is discussed further in the next section.

The proposed plan summarizes the site characteristics, scope and role of response action, and summary of site risks. This is followed by a presentation of the remedial action objectives (RAOs) and summary of remedial alternatives for LHAAP-16. Finally, an evaluation of alternatives and a summary of the preferred alternative are presented.

SITE BACKGROUND

LHAAP is located in central-east Texas in the northeastern corner of Harrison County **(Figure 2)**. The installation occupies approximately 1,400 of its former 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the southeast. Caddo Lake, a large freshwater lake situated on the Texas-Louisiana border, bounds LHAAP to the north and east.

The U.S Army has transferred nearly 7,000 acres to the U.S. Fish and Wildlife Service

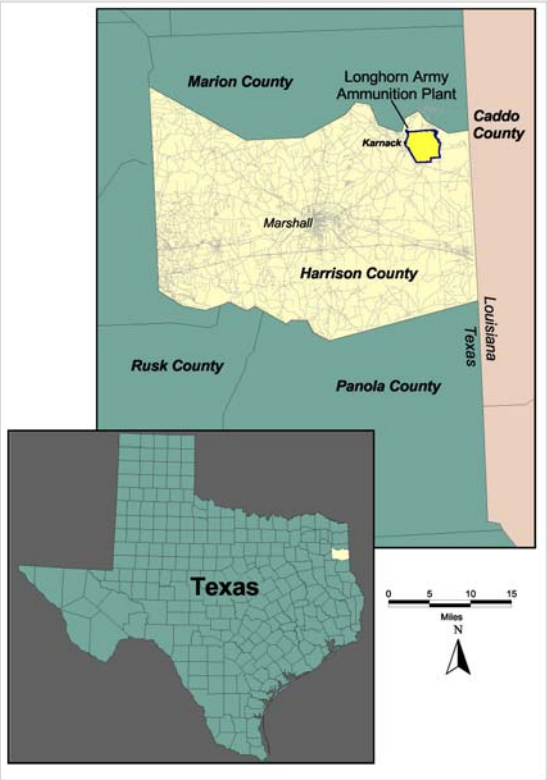


Figure 2 Location of the Longhorn Army Ammunition Plant, Harrison County, Texas

(USFWS) for management as the Caddo Lake National Wildlife Refuge. The property transfer process is continuing as response is completed at individual sites. The local restoration advisory board has been kept informed of previous investigations at this site through regularly held quarterly meetings. Additionally, the administrative record is updated at least twice per year and is available at the local public library.

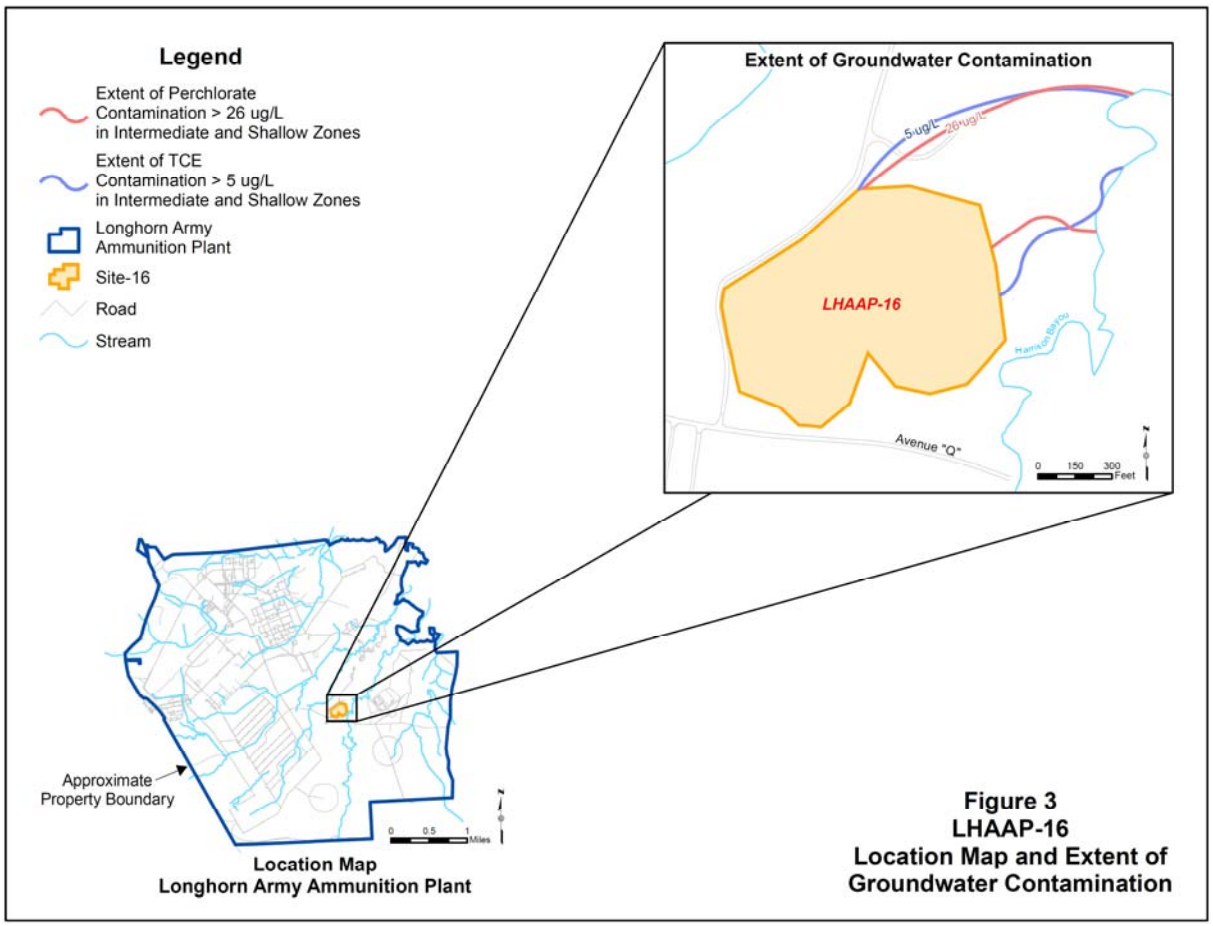
Due to releases of chemicals from operations at the facility, LHAAP was placed on the Superfund National Priorities List on August 9, 1990. Activities to remediate contamination associated with the National Priorities List listing of LHAAP began in 1990. The U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) have entered into a CERCLA Section 120 FFA since that time for remedial activities at LHAAP. Referred to as the Old Landfill, LHAAP-16 was specifically identified in the FFA as an area "having threatened releases of hazardous substances or pollutants or contaminants." The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

LHAAP-16, a capped landfill, is located in the south-central portion of LHAAP and covers an area of approximately 20 acres **(Figure 3)**. Harrison Bayou runs along the northeastern edge of LHAAP-16. The landfill was established in the 1940s and was used for the disposal of solid and industrial wastes until the 1980s when disposal activities were terminated.

The USEPA has established containment as the presumptive remedy under CERCLA for municipal landfills (USEPA, 1993) and for military landfills (USEPA, 1996). The construction of a landfill cap over the site was completed in 1998 as part of an interim remedial action (IRA). The IRA is consistent with the USEPA presumptive remedy guidance. The capped area is fenced.

A groundwater extraction system was voluntarily installed by the Army in 1996 and 1997 as a treatability study to prevent the groundwater plume from migrating to Harrison Bayou. Groundwater is extracted at LHAAP-16 and pumped to the existing groundwater treatment plant at LHAAP-18/24.

Between 1980 and 2009, numerous investigations were conducted to determine if the releases of potential contamination from landfill operations had affected the environmental media.



These investigations included Pre-Phase I investigations in 1980, 1982 and 1987; Phase I through III RIs conducted in 1993, 1995 to 1996, and 1997 to 1998 (Jacobs, 2000); quarterly Harrison Bayou surface water sampling initiated in 1995; the groundwater treatability study initiated in 1996; and perchlorate investigations conducted by Jacobs in 2000 and 2001. Media investigated included soil, surface water, sediment, and groundwater. Based on the results from the investigations and the completion of the landfill cap, no further investigation was recommended for the soil, sediment and surface water. Multiple constituents were detected in the underlying groundwater. The groundwater contamination was likely caused by historic leaching of contaminants from the landfill waste to the groundwater via rainwater infiltration prior to the capping of the landfill.

The Final BHHRA (Jacobs, 2001) used data from the investigations conducted through 2001. Additional investigations were conducted between 2002 and 2009, after the BHHRA was finalized, to provide additional information regarding LHAAP-16 groundwater contamination identified during previous sampling events. The results of the 2002 perchlorate investigation were presented in the Plant-wide Perchlorate Investigation Report (STEP, 2005). Groundwater monitoring results from sampling conducted during Spring 2003, Spring 2004, and Winter 2004 were presented in the Groundwater Monitoring Report (USACE and ALL Consulting, 2007). Natural attenuation and geochemical evaluation in 2007,

installation and sampling of wells near Harrison Bayou in 2007, installation and sampling of wells to address data gaps in 2008, and groundwater sampling for metals, perchlorate, and volatile organic compounds in 2009 are included in the Final Addendum to Final FS (Shaw, 2010). The Addendum to the FS also included the findings of the BERA.

SITE CHARACTERISTICS

Much of LHAAP-16 is relatively flat. The outer edges of the site are forested, and the land becomes steeper near Harrison Bayou. Much of the site was a disposal area and is now capped and covered with grass. Surface drainage from LHAAP-16 flows mostly through small gullies and ditches to Harrison Bayou. Harrison Bayou flows into Caddo Lake to the northeast of the site. The lake is a source of drinking water for several neighboring communities in Louisiana.

The subsurface at the site is composed of medium plastic sandy silt, fine sands, and clay. The clay layers tend to separate the groundwater into shallow, intermediate, upper deep and deep zones. While flow is primarily horizontal in these zones, vertical interaction between the shallow and intermediate zones is evidenced by pumping test results as well as the presence of contamination in both zones. Such interconnection is consistent with soil layers formed in fluvial depositional environments. The groundwater flow direction is northeast toward Harrison Bayou in the shallow, intermediate and deep zones, while flow direction is southeast toward Harrison Bayou in the upper deep groundwater zone. Overall, the groundwater flow is toward Caddo Lake.

Groundwater flow between the landfill and Harrison Bayou is also influenced by the presence of an extraction well system consisting of four wells in the shallow groundwater zone and four wells in the intermediate groundwater zone. The wells were installed in 1996 and 1997 as part of a treatability study.

The contaminated media at LHAAP-16 include buried source material (landfill waste under the cap) and the shallow and intermediate groundwater beneath the landfill. Prior to the construction of the cap, the landfill was a known disposal site with contaminated groundwater beneath it and potential to contaminate nearby surface water by surface runoff or groundwater discharge. To mitigate the risk to human and ecological receptors, the U.S. Army and USEPA determined that an early interim action was warranted to address the contamination present at LHAAP-16.

The early interim action included placement of a multilayer cap at the LHAAP-16 landfill. That cap prevents rainfall from infiltrating and leaching contaminants from principal threat wastes within the landfill. However, groundwater with elevated levels of contamination appears still to be migrating from beneath the landfill.

The major chemicals of concern (COCs) for LHAAP-16 identified in the FS are volatile organic compounds (VOCs), including trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride and perchlorate in the shallow and intermediate groundwater. The approximate extent of VOC and perchlorate contamination in the shallow and intermediate zones is shown in **Figure 3**. Data collected from the upper deep groundwater zone indicate that no groundwater contamination has been detected since 1997. Data also confirm that VOCs have not migrated down to the deep zone.

Four metals (arsenic, chromium, manganese, and nickel) had sporadic elevated detections and were retained as COCs. While the occurrence of these chemicals does not appear to be associated with widespread contamination from the landfill, further monitoring is warranted.

SCOPE AND ROLE OF THE PROPOSED ACTION

The scope and role of the action discussed in this proposed plan includes all remedial actions planned for this site. In 1995, the U.S. Army and USEPA signed a Record of Decision (ROD) establishing an early interim remedial action for LHAAP-16 to mitigate potential risks posed by buried source material at the site (U.S. Army and EPA, 1995). The interim RAO stated in the ROD was to provide long-term protection by minimizing vertical infiltration of water into the landfill and to reduce the possibility of contaminant transport into surface water bodies. The IRA included the construction of a landfill cap. The cap construction began in 1996 and was completed in 1998.

A multilayer cap and cover system was constructed using a double barrier consisting of a sodium bentonite geocomposite liner and a geosynthetic membrane liner. Placement of a multilayer cap isolated the wastes in the LHAAP-16 landfill. In addition, the U.S. Army implemented land use controls by properly maintaining and routinely inspecting the landfill cap and cover system to protect the remedy and monitor the effectiveness of the cap. A groundwater extraction system was installed as a treatability study to prevent the groundwater plume from migrating to Harrison Bayou.

The potential exists for the landfill waste material to pose an unacceptable risk to human health should the existing cap be allowed to deteriorate. The potential also exists for groundwater contaminants to pose an unacceptable human health risk and to discharge to the nearby surface water body, which could ultimately affect Caddo Lake, should the extraction system prove ineffective in preventing the plume migration.

The groundwater at LHAAP is not currently being used as drinking water and may not be used in the future based on its reasonably anticipated use as a national wildlife refuge. When establishing the RAOs for this response action, the U.S. Army has considered the NCP's expectation to return useable groundwater to its potential beneficial use wherever practicable. The U.S. Army has also considered the State of Texas designation of all groundwater as potential drinking water, unless otherwise classified, consistent with Texas Administrative Code, Title 30, §335.563 (h)(1). The Army intends to return the groundwater in the contaminated shallow and intermediate zones at LHAAP-16 to its potential beneficial uses, which is considered to be the attainment of Safe Drinking Water Act maximum contaminant levels (MCLs) to the extent practicable, and consistent with Code of Federal Regulations, Title 40, §300.430(e)(2)(i)(B&C). If an MCL is not available for a chemical, the promulgated TCEQ medium-specific concentration for groundwater that could be used for residential purposes will be used. If a return to potential beneficial uses is not practicable, the NCP expectation is to prevent further migration of the plume, prevent exposure to contaminated groundwater, and evaluate further risk reduction.

The preferred final remedial action at LHAAP-16 will address the protection of the existing landfill cap, prevent potential exposure risks associated with the

contaminated groundwater, and demonstrate through groundwater and surface water monitoring activities that the nearby surface water body, Harrison Bayou, is protected from exceedances of cleanup levels. Land use controls (LUCs) may be terminated when there is no further threat of releases of contaminated groundwater into surface water and when the groundwater contaminants are reduced to cleanup levels.

SUMMARY OF SITE RISKS

The construction of the cap under the IRA eliminated the direct exposure pathway to source area waste material, prevented contaminant transport to surface water via surface runoff, and reduced leaching of contaminants to the groundwater, resulting in an overall reduction of risk to human and ecological receptors.

The reasonably anticipated future use of this site is nonresidential as part of the Caddo Lake National Wildlife Refuge. This anticipated future use is based on a Memorandum of Agreement (U.S. Army, 2004) between the USFWS and the Army which documents the transfer process of the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge. Presently the Caddo Lake National Wildlife Refuge occupies nearly 7,000 acres of the former installation. The property must be kept as a National Wildlife Refuge unless there is an act of Congress which removes the parcel or the land is exchanged in accordance with the National Wildlife Refuge System Administration Act of 1966 and the National Wildlife Refuge System Act Amendments of 1974.

As part of the RI/FS, a baseline human health risk assessment and a baseline ecological risk assessment were conducted for LHAAP-16 to determine current and future effects of contaminants on human health and the environment to support technical review and risk management decisions.

Human Health Risks

The baseline risk assessment estimates the risk that the site poses if no action is taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The applicable receptor scenario for future use as a national wildlife refuge is a hypothetical future maintenance worker. For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen and are expressed in scientific notation (e.g., 1×10^{-6}). USEPA's acceptable risk range for site-related exposures is 1×10^{-4} to 1×10^{-6}, i.e., one-in-ten thousand to one-in-one million. The potential for non-cancer effects is expressed by a ratio of the exposure to the toxicity. An individual chemical ratio less than 1 indicates that toxic non-cancer effects from that chemical are unlikely. A non-cancer hazard index (HI) is calculated when the ratios for the individual chemicals are summed. An HI greater than 1 indicates that site-related exposures may present a risk to human health. Thus, an HI of less than 1 is acceptable since it indicates toxic non-cancer effects are unlikely.

Using data presented in the RI, the cancer risk and the non-cancer HI were calculated based on hypothetical future maintenance worker exposure to the site environmental media (e.g., soil, groundwater, and Harrison Bayou surface water and sediment) under an industrial scenario. The human health risk assessment did not include contaminant concentrations in the waste material within the landfill because

the exposure pathway to the waste material has been eliminated. The baseline human health risk assessment indicated that the cancer risk for the hypothetical maintenance worker was at the lower end of or below the target risk range for surface soil (1.3×10^{-6}), surface/subsurface soil (8.1×10^{-6}) and Harrison Bayou sediment (1.0×10^{-6}). The non-carcinogenic risk estimates were below 1 for surface soil, surface/subsurface soil, Harrison Bayou surface water, sediment and fish ingestion. The carcinogenic risk estimates were driven almost entirely by arsenic. A soil background evaluation indicated that when inorganic constituents that were detected on-site below background levels (including arsenic) were eliminated as constituents of interest from the soil risk estimates, all soil risk estimates were well below the cancer risk and non-cancer hazard thresholds of 1×10^{-6} and 1.0, respectively. However, the groundwater was determined to pose an unacceptable cancer risk of 1.4×10^{-1} and a hazard index of 1,230 to the hypothetical future maintenance worker. Groundwater analytical results obtained from post risk assessment groundwater samples do not alter the conclusion that groundwater poses risk.

The primary COCs in groundwater contributing to cancer risk and non-cancer hazard are TCE, cis-1,2-DCE, and vinyl chloride. The primary contributor to the cancer risk is vinyl chloride. The primary contributors to the non-cancer hazard are cis-1,2 DCE and TCE. Perchlorate concentrations in the groundwater at the site exceed the recommended screening level, therefore, perchlorate is identified as a COC.

MCLs are proposed as groundwater cleanup levels for the COCs. Perchlorate does not have an MCL, but perchlorate concentrations in the groundwater at LHAAP-16 exceed the TCEQ promulgated perchlorate groundwater medium-specific concentration for residential use. Perchlorate was detected at a maximum concentration of 5,990 micrograms per liter (µg/L) which exceeds the groundwater medium-specific concentration of 26 µg/L for residential use. The maximum detected concentration of TCE was 70,600 µg/L which exceeds the MCL of 5 µg/L, a federal and state drinking water standard. The maximum concentrations of cis-1,2-DCE and vinyl chloride were observed at 275,000 and 11,000 µg/L, which exceed the MCLs of 70 µg/L and 2 µg/L, respectively.

The State of Texas requires that a notification be filed with Harrison County per Texas Administrative Code §335.566, stating that the site is suitable for nonresidential use, because the risk evaluation exposure to surface soil was based on the reasonably anticipated future use of the site as a part of a national wildlife refuge. Additionally, limited monitoring in the form of Five-Year Reviews will serve to document that the use of the site remains consistent with the industrial/recreational exposure scenario evaluated in the risk assessment.

Ecological Risks

The ecological risk for site LHAAP-16 was addressed in the installation-wide BERA (Shaw, 2007b). For the BERA, the entire installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. The individual sites at LHAAP were grouped into one of these sub-areas, which were delineated based on commonalities of historic use, habitat type, and spatial proximity to each other. The conclusions regarding the potential for chemicals detected at individual sites to adversely

affect the environment must be made in the context of the overall conclusions of the sub-area in which the site falls. Site LHAAP-16 lies within the Waste Sub-Area.

The BERA evaluated potential ecological risk to a number of endpoint receptors, as well as terrestrial plant and invertebrate communities. Endpoint receptors were evaluated using a food chain model that estimated a daily dose intake, which was subsequently compared with toxicity reference values to generate a hazard quotient. Terrestrial communities were evaluated through comparisons of detected concentrations to conservative benchmarks. Multiple lines of evidence (e.g., spatial distribution of concentrations, etc.) were also considered. After evaluating all lines of evidence, the BERA concluded that there were potential ecological concerns in the Waste Sub-Area associated with barium, 2,4-dinitrotoluene (DNT), 2,6-DNT, 2,4,6-trinitrotoluene, and dioxin (Shaw, 2007b). The BERA evaluated eleven soil samples collected during the RI from outside the landfill. Results indicated that the ecological preliminary remediation goal was exceeded by barium in only one sample in surface soil but not in total soil. Removal or treatment of barium-impacted soil at LHAAP-16 would not appreciably lower the 95 percentile upper confidence limit for the barium exposure point concentration in the Waste Sub-Area (Shaw, 2010). Therefore, it was concluded that barium within the Waste Sub-Area will be addressed at LHAAP-17, another site within the Waste Sub-Area. Trinitrotoluene and DNT were below detection limits; therefore, these explosive compounds do not contribute to ecological risk at the Waste Sub-Area. Based on detected congeners, dioxins and furans in the soil at the LHAAP-16 do not exceed ecological criteria (Shaw, 2007b). In summary, no action is needed at LHAAP-16 for the protection of ecological receptors.

It is the current judgment of the U.S. Army that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Within the FS (Jacobs, 2002), interim RAOs were established for LHAAP-16. The interim RAOs did not address ecological risk or the extent of groundwater remediation at the site. The final RAOs for LHAAP-16 were developed within the Addendum to the FS (Shaw, 2010), which incorporated the findings of the BERA and addressed the aquifer as a potential source of drinking water. The final RAOs largely focus on goals to protect human health, since the need to address ecological risk is only to ensure that ecological receptors do not come in contact with landfill wastes that are currently covered by the cap at LHAAP-16. The final RAOs also focus on protecting the surface water adjacent to LHAAP-16.

The Army recognizes USEPA's policy to return all groundwater to potential beneficial uses, based on the non-binding programmatic expectation in the NCP. The final RAOs for LHAAP-16, which address contamination associated with the media at the site and take into account the future uses of LHAAP streams, land, and groundwater, are:

- Protection of human health and the environment by preventing exposure to landfill contents.
- Protection of human health and the environment by reducing leaching and migration of landfill hazardous substances into the groundwater.
- Protection of human health by preventing human exposure to groundwater contaminated with COCs.
- Protection of human health and the environment by preventing groundwater contaminated with COCs from migrating into nearby surface water.
- Return groundwater in the shallow and intermediate zones to its potential beneficial use as drinking water, wherever practicable, within a reasonable time period given the particular site circumstances.

SUMMARY OF REMEDIAL ALTERNATIVES

The FS (Jacobs, 2002) identified and screened remedial technologies and associated process options that may be appropriate for satisfying the interim RAOs for LHAAP-16 with respect to effectiveness, implementability, and cost. Within the Addendum to the FS (Shaw, 2010), the interim RAOs were replaced with final RAOs and additional remedial alternatives were developed to meet the final RAOs. The following remedial alternatives were developed from the retained remedial technologies carried forward after the initial screening:

- Alternative 1 – No Further Action
- Alternative 2 – Cap, Enhanced Groundwater Extraction, and LUCs
- Alternative 3a – Cap, Monitored Natural Attenuation (MNA), and LUCs
- Alternative 3b – Cap, Hot spot Extraction, MNA, and LUCs
- Alternative 4 – Cap, Passive Groundwater Treatment, and LUCs
- Alternative 5a – Landfill Hot Spot Removal, Passive Groundwater Treatment, and LUCs
- Alternative 5b – Complete Landfill Removal, Passive Groundwater Treatment, and LUCs
- Alternative 6 – Landfill Source Treatment (in situ), MNA, and LUCs
- Alternative 7 – Cap, MNA, LUCs, In Situ Enhanced Bioremediation, Passive Biobarriers.

Common Elements. LUCs are common to all alternatives, MNA is common to Alternatives 3, 6, and 7 and inspection/long-term monitoring (LTM) is common to Alternatives 2 through 7. These elements are described below.

Land Use Controls

Because contamination would be left in place at LHAAP-16 for Alternatives 1, 2, 3, 4, 6, and 7 and because contamination would be present for the duration of remedial activities in Alternatives 5, LUCs would be a common component of all alternatives. The LUCs include groundwater use restriction, and protection and maintenance of the existing landfill cap. The LUCs would prevent human exposure to landfill contents and residual groundwater contamination that may present an unacceptable risk to human health, and would ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing. LUCs would support the RAOs.

The U.S. Army would be responsible for implementation, maintenance, inspection, reporting, and enforcement of the LUCs. The details of the LUCs implementation and maintenance actions are provided in the remedial design of the LHAAP-16 cap

(Final Project Work Plans, Interim Remedial Action, Landfills 12 & 16 Caps Report, June 1996). The Final FS for LHAAP-16 further expands on the description of the LUCs (Shaw 2010). Access controls would include land use and groundwater use restrictions. The groundwater restriction LUCs would be maintained until there is no further threat of releases of contaminated groundwater into the surface water and the groundwater can be used without restrictions. In addition, the Texas Department of Licensing and Regulation responsible for notifying well drillers of groundwater restrictions would be notified and the LUCs recorded in the Harrison County Courthouse would include a map showing the areas of groundwater restriction at the site.

In order to transfer LHAAP-16, an Environmental Condition of Property (ECOP) document would be prepared and attached to the letter of transfer. The ECOP will include land use and groundwater use restrictions as part of the Environmental Protection Provisions. The property would be transferred subject to the land use controls that are identified in the ECOP. These restrictions would prohibit or restrict property uses that may result in damage to the existing remedy (landfill cap) or exposure to the contaminated groundwater (e.g., drilling restrictions, drinking water well restrictions).

Monitored Natural Attenuation

MNA is common to Alternatives 3, 6, and 7. MNA is a passive remedial action that relies on natural biological, chemical, and physical processes to reduce the mass and concentration of groundwater COCs under favorable conditions. A preliminary natural attenuation evaluation indicates that MNA is a feasible remedy for certain portions of the site but not as a sole remedy due to migration concerns for the shallow groundwater zone at LHAAP-16 (Shaw, 2010). Natural attenuation would reduce contaminant concentrations to groundwater cleanup levels. The LUCs would remain in effect until there is no further threat of releases of contaminated groundwater into the surface water and the contaminants in groundwater have been reduced to cleanup levels.

Inspection and Long-Term Monitoring

Alternatives 2 through 7 include inspection and long-term groundwater monitoring activities. The long-term reliability of the LHAAP-16 landfill cap to control infiltration, contaminant runoff, and contaminant exposure depends on adequate long-term inspection and maintenance. Further groundwater and surface water monitoring would be used to evaluate contaminant migration, ensure that the COCs in the groundwater plumes continue to degrade or remain stable, and verify that contaminant levels in Harrison Bayou do not exceed the cleanup levels. The eventual groundwater concentration goal is to reduce COC concentrations to below groundwater cleanup levels. The LUCs, cap maintenance, and long-term monitoring would be continued as required to demonstrate effectiveness of the remedy, compliance with applicable or relevant and appropriate requirements (ARARs), to-be-considered requirements, and RAOs, and to support CERCLA Five-Year Reviews. The Five-Year Reviews may indicate the need for components of the alternatives to be maintained, modified, or replaced.

Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity.

Alternative 1 – No Further Action.
A No Further Action alternative is required by the NCP to provide a comparative baseline against which the action alternatives can be evaluated. At LHAAP-16, an interim remedy (landfill cap) has already been implemented and maintenance of that remedy is a legal requirement per the 1995 ROD. Therefore, the comparative baseline is considered to be "No Further Action." Under this alternative the existing landfill cap would be left in place and the landfill waste material, surface water, and groundwater would be left "as is," without implementing additional containment, removal, treatment, or other mitigating actions. The existing landfill cap would be maintained to hydraulically isolate the landfill, and land use controls would be implemented to protect the existing remedy (landfill cap). The existing groundwater extraction process and media monitoring would be discontinued. No other actions, including monitoring, would be implemented to reduce existing or potential future exposure to human and ecological receptors.

Estimated Capital Cost: $0

Estimated Operation and Maintenance (O&M) Present Worth Cost: $630,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost: $630,000

Alternative 2 – Maintenance of Existing Landfill Cap, Enhanced Groundwater Extraction and Land Use Controls.

The goals of this alternative are to protect the industrial worker by protecting the existing remedy (landfill cap), preventing exposure to landfill waste and contaminated groundwater and to prevent further degradation of Harrison Bayou water quality through groundwater extraction. In addition to maintenance of the cap (similar to Alternative 1), Alternative 2 includes enhanced groundwater extraction and LUCs. The existing groundwater extraction system would be enhanced to increase reliability of the extraction wells and related equipment to treat contaminated groundwater from the shallow and intermediate groundwater plumes before it discharges to Harrison Bayou preventing surface water from exceeding water quality standards in Harrison Bayou. Because the landfill source term would remain in place and groundwater upgradient of the groundwater extraction system would remain contaminated, LUCs would be maintained to protect the existing remedy (landfill cap) and prevent human exposure to landfill waste and residual groundwater contamination within untreated areas.

Estimated Capital Present Worth Cost: $760,000

Estimated O&M Present Worth Cost: $9,050,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost: $9,820,000

Alternative 3a – Maintenance of Existing Landfill Cap, Monitored Natural Attenuation and Land Use Controls.

Alternative 3b – Maintenance of Existing Landfill Cap, Hot spot Extraction, Monitored Natural Attenuation and Land Use Controls.

The goals of this alternative are to protect the industrial worker by protecting the existing remedy (landfill cap), preventing exposure to landfill waste and contaminated groundwater, and to prevent further degradation of Harrison Bayou water quality by natural attenuation of

contaminated groundwater. Alternative 3a includes maintenance of the existing cap to hydraulically isolate the landfill, discontinued use of the existing groundwater extraction system, and monitored natural attenuation to assure the protection of human health and the environment by documenting that the contaminated shallow and intermediate groundwater zones remain localized with minimal migration and that contaminant concentrations are being reduced to groundwater cleanup levels before discharging to Harrison Bayou. Because the landfill source term would remain in place and groundwater contamination would remain until natural biological and chemical processes degrade the contaminants in the groundwater to cleanup levels, LUCs would be maintained to protect the existing remedy (landfill cap) and prevent human exposure to landfill waste and residual groundwater contamination that may present an unacceptable risk to human health.

Alternative 3b is identical to Alternative 3a except an extraction well network would be operated in the groundwater hot spot for approximately 5 years to reduce contaminant mass followed by MNA throughout the rest of the O & M period.

Estimated Capital Present Worth Cost:
(a) $620,000
(b) $1,290,000

Estimated O&M Present Worth Cost:
(a) $2,100,000
(b) $2,140,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost:
(a) $2,710,000
(b) $3,430,000

Alternative 4 – Maintenance of Existing Landfill Cap, Passive Groundwater Treatment and Land Use Controls.

The goals of this alternative are to protect the industrial worker by protecting the existing remedy (landfill cap), preventing exposure to landfill waste and contaminated groundwater and to prevent further degradation of Harrison Bayou water quality through groundwater treatment. Alternative 4 includes maintenance of the existing cap, discontinued use of the groundwater extraction system and installing an in situ permeable reactive barrier across the heart of the shallow groundwater plume that is discharging to Harrison Bayou. The permeable reactive barrier would consist of a gravel-filled groundwater collection trench with a reactive media bed located at the downslope discharge point of the collection trench. The highly permeable gravel in the trench would channel the shallow groundwater to the reactive media contained in a buried treatment vessel. The collection trench would be sized to intercept only that part of the shallow groundwater plume with the highest contaminant concentrations, likely having the greatest impact on contaminant levels in Harrison Bayou. Installation of the trench would create a preferential flow path. The actual size and location of the trench would be determined during design. The collection trench would be placed upgradient to Harrison Bayou near the discharge location.

A perforated pipe would be buried at the bottom of the collection trench to convey the collected groundwater to a non-perforated connector pipe and subsequently to the reactive media treatment vessel. The treatment vessel would be filled with the reactive media and sized to ensure the requisite residence time for the contaminants to be treated. The treatment vessel would discharge to a buried drain field, allowing the treated groundwater to drain into the soil down-slope of the treatment vessel. The

placement of the reactive media in a treatment vessel instead of the entire collection trench reduces the overall media cost and facilitates the replacement of the media when it is expended. The contaminants to be treated by this reactive media are trichloroethene and perchlorate. The treatment process would be anaerobic biological degradation that uses a combination of gravel and various organic media. The organic media would serve as a carbon source for the anaerobic microbes.

Maintenance of the existing cap would hydraulically isolate the landfill, and LUCs would be continued to protect the existing remedy (landfill cap) and to prevent human exposure to the landfill waste and residual groundwater contamination that may present an unacceptable risk to human health. Because the landfill source term would remain in place and groundwater upgradient of the in situ permeable reactive barrier would remain contaminated, land use would be restricted to industrial use for as long as the residual contamination remains a threat.

Estimated Capital Present Worth Cost: $2,540,000

Estimated O&M Present Worth Cost: $2,020,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost: $4,560,000

Alternative 5a – Landfill Hot Spot Removal, Passive Groundwater Treatment, Off-Site Disposal and Land Use Controls.

Alternative 5b – Complete Landfill Removal, Passive Groundwater Treatment, Off-Site Disposal and Land Use Controls.

The goals of Alternative 5a are to protect the industrial worker by preventing exposure to the remaining landfill waste and contaminated groundwater, and meet cleanup levels in Harrison Bayou through source removal and in situ groundwater treatment. This alternative includes removal of the landfill hot spots, repairing the cap, discontinued use of the existing groundwater extraction system, and installing an in situ permeable reactive barrier across the portion of the shallow groundwater plume with the highest contaminant concentrations, reducing the contaminant mass discharging to Harrison Bayou. This permeable reactive barrier would operate identically to the barrier proposed in Alternative 4.

Hot spot locations would be confirmed by excavating trenches at various locations across the landfill biased by the results of the soil gas survey conducted during the RI (Jacobs, 2000). The excavated waste would be field screened and the results used to define the location and nature of hot spot material to focus the excavation efforts and detail the waste handling and treatment process.

Alternative 5a also includes maintenance of the existing cap to hydraulically isolate the landfill, and LUCs to protect the existing remedy (landfill cap) and to prevent human exposure to the remainder of the landfill waste and residual groundwater contamination that may present an unacceptable risk to human health.

Alternative 5b is identical to 5a in all respects except that all of the landfill wastes would be removed. Because this alternative does not leave any waste in place, there are no long-term cap maintenance and landfill LUC requirements. However, groundwater

LUCs would remain in effect until groundwater cleanup levels are met.

Estimated Capital Present Worth Cost:
(a) $3,080,000
(b) $106,110,000

Estimated O&M Present Worth Cost:
(a) $9,990,000
(b) $9,490,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost:
(a) $13,070,000
(b) $115,610,000

Alternative 6 – Landfill Source In Situ Treatment, Monitored Natural Attenuation and Land Use Controls.

The goals of this alternative are to protect the industrial worker by protecting the existing remedy (landfill cap), preventing exposure to landfill waste and contaminated groundwater and to prevent further degradation of Harrison Bayou water quality through landfill source treatment and natural attenuation of contaminated groundwater. This alternative includes in situ treatment of the landfill hot spots, repairing the landfill cap, discontinuing use of the existing groundwater extraction system, and monitoring for natural attenuation. Alternative 6 also includes maintenance of the existing cap to hydraulically isolate the landfill, and LUCs to protect the existing remedy (landfill cap). In situ treatment of landfill hot spots by soil vapor extraction would reduce contaminant concentrations in target areas. The target areas have the highest concentrations and in situ treatment would rapidly reduce these highest concentrations. The contaminants in the groundwater beneath and downgradient of the landfill would decrease over time from natural degradation and chemical processes. The combination of source term treatment and the natural degradation of groundwater contaminants would ensure that Harrison Bayou is not further degraded. LUCs would also be maintained to prevent human exposure to landfill waste and contaminated groundwater.

Estimated Capital Present Worth Cost: $2,750,000

Estimated O&M Present Worth Cost: $3,650,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost: $6,400,000

Alternative 7 – Cap, Land Use Controls, In Situ Enhanced Bioremediation, Passive Biobarriers, and Monitored Natural Attenuation.

The goals of this alternative are to protect human health by implementation of LUCs prohibiting unauthorized use of the cap and groundwater, reduce contaminant concentrations in the groundwater plume and prevent discharge of contamination to Harrison Bayou. To achieve these goals, this alternative utilizes continued maintenance of the existing cap, groundwater use restrictions, installation of a biobarrier in the shallow groundwater zone adjacent to the landfill, in situ enhanced bioremediation in the shallow and intermediate groundwater zones, installation of a second biobarrier in the shallow groundwater zone near Harrison Bayou, and MNA of the shallow and intermediate groundwater zones.

In situ bioremediation would be implemented in the most contaminated portion of the shallow and intermediate groundwater zones in conjunction with phased shut down of the existing groundwater extraction system. Bioremediation would involve the

injection of a carbon substrate and a bioaugmentation culture. Because contaminant concentrations in wells near the landfill consistently exceed groundwater cleanup levels, this alternative would include installation of a passive biobarrier near the fence line of the landfill to degrade contaminants in groundwater. Because concentrations in wells near Harrison Bayou also currently exceed groundwater cleanup levels this alternative would include installation of a second passive biobarrier near Harrison Bayou to further degrade contaminants. A row of injection points perpendicular to groundwater flow direction would be installed close to Harrison Bayou. The biobarrier would consist of emulsified oil that will enable ambient microorganisms to create favorable conditions and a bioaugmentation culture (e.g., SDC-9) to ensure that a microbial species is present that is able to completely degrade TCE to ethene. The emulsified oil is a slow-release carbon source with an enhanced subsurface longevity; it would be injected to provide a long-lasting source of fermentable carbon to stimulate the biological reduction of perchlorate and TCE and its daughter products. Following the reductions in contaminant concentrations caused by the in situ bioremediation and the passive biobarriers, natural attenuation would further reduce the concentrations of contaminants in the groundwater so that surface water in Harrison Bayou does not exceed cleanup levels. A monitoring program would be implemented within this alternative to confirm the effectiveness of the various technologies. LUCs would be maintained to protect the existing remedy (landfill cap) and to prevent human exposure to landfill waste and residual groundwater contamination.

Estimated Capital Present Cost: $390,000

Estimated O&M Present Worth Cost: $1,590,000

Estimated Duration: 30 years

Estimated Total Present Worth Cost: $1,980,000

EVALUATION OF ALTERNATIVES

Nine criteria identified in the NCP, §300.430(e)(9)(iii), are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS for the site (Jacobs, 2002) and the Addendum to the FS (Shaw, 2010).

1. Overall Protection of Human Health and the Environment

Alternative 1, the No Further Action alternative, does not protect human health or the environment because no remedial activities would be conducted and no LUCs (except for cap maintenance) would be maintained. Therefore, LHAAP-16 contamination would present unacceptable risks to human health and the environment through ingestion of groundwater. The other six alternatives, collectively referred to as the action alternatives, would provide engineering controls, treatment, containment, or removal and disposal of the waste material to levels protective of human health and Harrison Bayou.

The six action alternatives would provide access and use restrictions, capping of buried wastes (the entire landfill excavation option of Alternative 5 excepted), and long-term media

monitoring. The landfill cap and LUCs would prevent exposure to landfill wastes and contaminated groundwater.

Alternatives 2, 3, 4, 6, and 7 would maintain Harrison Bayou water quality through a variety of means. Alternative 2 maintains the current actions of capping and groundwater extraction to contain the plume and prevent it further impacting Harrison Bayou. Alternatives 3, 4, and 7 are similar to Alternative 2 in that they all maintain the cap, but they all discontinue the groundwater extraction system (Alternative 3b after an estimated 5 years). Alternative 4 uses an in situ permeable reactive barrier installed parallel to Harrison Bayou, and Alternatives 3, 6, and 7 use MNA to assure protection of Harrison Bayou. Alternative 6 couples vapor extraction of the landfill hot spots with groundwater natural attenuation. Alternative 7 utilizes in situ bioremediation of target areas and passive biobarriers in conjunction with groundwater natural attenuation.

Alternative 5a is the second most aggressive of all the alternatives in that it removes the landfill hot spots (conventional excavation, off-site disposal) and installs a permeable reactive barrier to treat groundwater before it discharges to Harrison Bayou. Alternative 5b, the most aggressive alternative, removes all of the landfill waste and uses the same reactive barrier as in Alternative 5a. All alternatives are protective, though Alternative 5b is most reliable in the long term because it has less reliance on long-term LUCs.

2. Compliance with ARARs

Except for Alternative 1, which does not comply with the chemical-specific ARARs, all of the action alternatives meet the required chemical-, location-, and action-specific ARARs. None of the alternatives require a waiver.

3. Long-Term Effectiveness and Permanence

The no further action alternative would not be effective in the long term, because the baseline risk assessment indicates that the current groundwater conditions are not protective of human health and the environment, and no remedial activities would be conducted to address groundwater under this alternative.

All alternatives except Alternative 5b rely on LUCs and source isolation (i.e., capping) to isolate the residual waste from potential receptors. With the exception of the complete landfill excavation option for Alternative 5b, all action alternatives would leave waste on site. Because Alternative 5b removes the entire landfill source term, it is the most reliable in long-term protection of future human receptors. Alternatives 5a and 6 are the next most reliable in the long term because of their removal and in situ treatment, respectively, of the hot spot wastes. The long-term cap maintenance and LUCs offered by Alternatives 2, 3, 4, 5a, 6, and 7 restricting access to the contaminated media would adequately maintain residual risks below acceptable levels. If cap maintenance and monitoring programs are maintained and the owner of LHAAP-16 maintains the LUCs, the cap and LUC programs can reliably maintain residual risks at acceptable levels.

The permeable reactive barriers used in Alternatives 5a and 5b to meet drinking water standards in Harrison Bayou may be effective and relatively reliable with long-term maintenance and monitoring. To control discharges to Harrison Bayou, Alternatives 2 and 3b extract and treat contaminants in groundwater.

Alternative 2 requires long-term groundwater extraction, which has proven to be moderately effective. The extraction system has had reliability problems as with any mechanical system that must operate over the long term. Alternative 3b extracts groundwater for a shorter amount of time.

The other action alternatives rely on passive treatment options (i.e., in situ permeable reactive barrier, in situ bioremediation, passive biobarriers, MNA) to protect Harrison Bayou. The in situ permeable reactive barriers used in Alternatives 4, 5a, and 5b and in situ bioremediation and passive biobarriers used in Alternative 7, require regular monitoring and replacement of the reactive media to ensure long-term effectiveness. Long-term maintenance of these barriers could prove to be problematic because of potential fouling of the treatment media and changing geochemistry that could reduce their effectiveness. Collection trenches at LHAAP-16 would be difficult to design to effectively intercept the contaminated groundwater and drain passively. Permeable barriers and biobarriers were selected to be the representative process option because of their flexibility in being used to address VOC and perchlorate removal.

If operating effectively, the in situ groundwater treatment process of Alternatives 4 and 5 and in situ enhanced bioremediation and passive biobarriers of Alternative 7 more reliably meet the surface water objective of preventing discharge of contaminants into Harrison Bayou than the natural attenuation option in Alternatives 3 and 6. Results of the MNA evaluation for LHAAP-16 indicated that natural attenuation is a feasible remedy for certain portions of the site but not as a sole remedy due to migration concerns for the shallow groundwater zone. Alternatives 3 and 6 have a planned contingent action of using the enhanced extraction and treatment system of Alternative 2 if natural attenuation is not occurring at a sufficient level to control future discharges to Harrison Bayou.

Alternative 7 utilizes in situ bioremediation and passive biobarriers to further degrade the contaminants in groundwater in conjunction with MNA. Based on the results of the ESTCP semi-passive biobarrier technology demonstration (ESTCP, 2005; ESTCP, 2007) and the preliminary MNA evaluation, the groundwater contaminants at LHAAP-16 have been shown to be amenable to degradation by biological processes prior to discharge to Harrison Bayou.

In summary, all of the action alternatives, including their contingent actions, would effectively meet the RAOs. The reliability of the permeable treatment barrier of Alternatives 4 and 5 is less certain than that of the extraction system of Alternative 2 and 3b, but it may be more effective than the natural attenuation component of Alternatives 3a, 6, and 7. The biological processes utilized in Alternative 7 have been shown to be effective and reliable at LHAAP-16. The current source action, a cap, is limiting releases from the landfill material to the groundwater. However, the removal of the hot spots in Alternative 5a (if they can be found), or treatment of those same hot spots as in Alternative 6, can enhance the reliability of the cap. LUCs to prevent access to the landfill material are considered effective. There is no information to suggest that the hot spots identified as the probable source of migration of contaminants to groundwater would also have the greatest risk if accessed, so these alternatives are not considered more reliable. However, full

removal of the waste, Alternative 5b, would be the most reliable.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

The no further action alternative does not include treatment and would not result in a reduction of toxicity, mobility, or volume of contaminants.

Alternatives 2, 3, 4, and 7 would not address the landfill source other than providing containment through capping. Alternative 3a, through its complete reliance on groundwater natural attenuation, provides the least reduction in contaminant volume and toxicity. The natural biological and chemical processes, over time, would gradually reduce the toxicity of VOCs in groundwater and the overall volume of contaminated groundwater. Alternative 4, with its permeable reactive barrier, would reduce the toxicity and volume of the shallow groundwater that passes through it. Although the groundwater upgradient of the reactive barrier is unaffected by the reactive media (until it passes through it), the reactive barrier provides a greater reduction in toxicity and volume than Alternative 3a. Alternatives 2 and 3b actively remove contaminated groundwater from the heart of the plume and treat it ex situ in the LHAAP treatment plant. The processes in the treatment plant would reduce the toxicity and volume of the extracted groundwater. Much of the contamination in the groundwater plume would be reduced over time, offering greater reductions in toxicity and volume than that in Alternative 3a.

Alternative 7 includes in situ bioremediation in the vicinity of shallow wells and upgradient of the wells with the highest levels of chlorinated ethenes. The process would reduce the toxicity and volume. The passive biobarriers provide further reduction of toxicity, mobility, and volume of the groundwater that passes through them. MNA in conjunction with in situ bioremediation would enhance reduction of toxicity and volume. Alternative 7 includes treatment of groundwater within the plume itself. Alternatives 3a/3b, 6, and 7 include a natural attenuation component together with dilution, dispersion, and other natural processes that have the capability of ultimately reducing the contaminants to satisfy the chemical-specific ARARs.

Alternative 6 includes the in situ treatment of the landfill. The extracted VOCs, the majority of the source term at LHAAP-16, would be destroyed in a thermal oxidation unit. Although the contaminants in groundwater would be treated only through natural degradation processes, the overall reduction in toxicity and volume is greater than other alternatives.

Alternative 5 removes source material from the site, but the base action does not include treatment of that material. The permeable barrier does provide some reduction of toxicity of contaminants through treatment. If the excavated material is RCRA-characteristic, treatment of that material to meet LDRs would satisfy the NCP preference for treatment.

5. Short-Term Effectiveness

The no further action alternative would not involve any action; therefore, there would be no increase in short-term risks and no short-term environmental effects.

Through LUCs and engineered controls (e.g., physical barriers, administrative controls, and dust suppression), the six action alternatives would be protective of the community during implementation. Alternative 3a would be the most protective in the short term because there

is no construction or off-site transportation. Alternative 5b and, to a lesser extent, Alternative 5a would pose the greatest potential exposure and transportation risks to the public due to the extensive waste excavation and transportation activities. Local and site traffic would be similar for all other alternatives.

The cap maintenance activities at the landfill would require the same health and safety measures for all alternatives except for Alternative 5b. Alternative 5b and to a lesser extent Alternative 5a require extensive handling of the landfill waste and thus pose the greatest risk to remediation workers. Alternative 6 presents lower risks to remediation workers than Alternative 5a because of the less intrusive waste operations of the vapor extraction operations. Appropriate mitigative measures would be applied during construction and transportation to attain appropriate worker and public health exposure requirements in all action alternatives. By planning the construction, excavation, and transportation activities in accordance with industry and OSHA codes and requirements, risks from contaminant exposure and construction operations would be controlled to acceptable levels. All of the remaining alternatives pose similar risks to the remediation worker with Alternative 3a being the safest alternative to implement.

The short-term disturbance of on-property vegetation and wildlife habitat would be greatest under Alternatives 5a and 5b, primarily because of the waste excavation activities and the installation of the long groundwater collection trench. There would be short-term impacts on the vegetation and wildlife habitats in the vicinity of the permeable reactive barrier under alternative 4 and in situ bioremediation injection points and passive biobarriers under alternative 7, though less than that for the longer barriers in Alternatives 5a and 5b. The vapor extraction operations in Alternative 6 would lightly impact vegetation on the landfill. The remaining alternatives would have little to no short-term impacts above those related to minor maintenance activities. For earthwork and construction activities, sediment deposition into Harrison Bayou would be controlled. Erosion control measures would include surface grading; placement of rip rap and silt fences; covering surfaces with straw, mulch, riprap, or geotextile fabrics; and/or using riprap in areas with high water velocity. Following completion of all construction and excavation, disturbed areas would be regraded with clean backfill and revegetated with native grasses.

The approximate construction time for the action alternatives ranges from 6 months in Alternative 2 to 36 months in Alternative 7. Because the source term is effectively controlled in all of the alternatives (with appropriate cap maintenance), the length of time required before groundwater containment systems are no longer needed are comparable, outside the 30-year present worth period. Additional source actions (Alternatives 5 and 6) are likely to lessen the time required to control the groundwater.

The MNA evaluation for LHAAP-16 demonstrated that natural attenuation is occurring in some areas at the site. The attenuation of contaminants was observed at the source and side-downgradient of the plume. However, the shallow groundwater zone plume is still migrating along the groundwater flow direction toward Harrison Bayou. The intermediate groundwater zone plume is more stable with less migration along the flow direction. Thus, natural attenuation is a feasible remedy for certain portions of the

site but not as a sole remedy due to migration concerns for the shallow zone. MNA is proposed for Alternative 7 in conjunction with in situ bioremediation to enhance reductive dechlorination within the plume and a passive biobarrier to prevent the discharge of contaminants into surface water. Natural attenuation would be evaluated after two years of quarterly monitoring and a re-application of bio-amendments (i.e., additional in situ bioremediation) would be implemented if deemed necessary.

Detailed evaluation of natural attenuation processes would be required to determine whether the Harrison Bayou remediation levels can be met in the near future or whether a contingent action is needed under Alternatives 3 and 6.

6. Implementability

Under the no further action alternative, no new remedial action would be taken. Therefore, there would be no difficulties or uncertainties with implementation.

Overall, all of the action alternatives are technically feasible to implement. Although Alternatives 5a, 5b, and 6 would require more time, equipment, and activity than the other alternatives, the components of most alternatives use technologies that have been straightforward to implement at other sites with contaminants and conditions similar to those found at LHAAP-16. These technologies would be implemented using conventional equipment and construction methods. The excavation of the landfill wastes under Alternatives 5a and 5b would be moderately difficult because of the inherent difficulties associated with excavating debris from a landfill with an uncertain disposal history. Given the uncertain nature of the wastes in the landfill, the potential for delays in excavation exist should anomalous items or debris be encountered. Likewise, coordination issues between excavation, waste characterization sampling, and disposal could slow the process. Although the media in the reactive barrier in Alternatives 4, 5a, and 5b is expected to treat VOCs and perchlorate, the specific conditions at LHAAP-16 (low gradient, high VOCs, low perchlorate levels) have not been tested. There are negative interactions with other site contaminants that could reduce the media's performance. Based on the ESTCP semi-passive biobarriers technology demonstrations, groundwater contaminants at LHAAP-16 are amenable to degradation by biological processes under Alternative 7. All components of Alternative 7 are readily implementable. Alternative 5b, and to a lesser extent Alternative 5a, would be the most technically difficult to implement.

Alternative 6 would be more technically implementable than Alternatives 5a and 5b, though there may be some challenges associated with the installation of the vapor extraction 'system in the landfill wastes. Also, the uncertainties associated with the flow of soil gas through the variable and heterogeneous buried waste would also contribute to difficulties in implementability and performance. The robustness of the process, however, would ensure that adequate volumes of soil vapor would be removed. Alternative 6 also has uncertainty associated with the implementation and operation of a permeable barrier.

There are few technical challenges to the implementation of Alternative 4 other than those associated with the installation of the permeable reactive barrier. Although Alternative 3a does not require the installation of any engineered components, the uncertainty in the long-term effectiveness of natural attenuation with

the source term still in place may cause future delays should a contingent action need to be implemented. The groundwater extraction system and water treatment plant used in Alternatives 2 and 3b are currently operating and proven in their operation and effectiveness and make these alternatives the most technically implementable.

Administratively, all alternatives are implementable. Virtually all services and materials required for the implementation of the action alternatives would be standard for the construction industry and would be readily available. However, considerable testing and development may be needed to produce an effective design for in situ treatment of VOCs and perchlorate in groundwater. Alternative 5 is the least administratively implementable because of the off-site waste transportation and disposal activities. Various Department of Transportation regulations (e.g., 49 CFR 172, 173, and 177) apply to the transportation of wastes such as those expected from the landfill, and the waste acceptance criteria of the off-site disposal facility must be complied with. In the event that a portion of the wastes must be treated before disposal (Alternative 5 contingent action), the waste acceptance criteria of the treatment facility must also be met. Alternatives 4 and 5 would also require personnel with specialized experience in reactive barrier treatability testing, installation, and operation. The vapor extraction activities in Alternative 6 would require personnel with specialized experience in vapor extraction installation and operation. Alternative 7 would require expertise in engineering design and implementation of the in situ bioremediation and the passive biobarrier component of the alternative. Alternative 2 and Alternative 3 are the most administratively implementable.

7. Cost

Cost estimates are used in the CERCLA FS process to eliminate those remedial alternatives that are significantly more expensive than competing alternatives without offering commensurate increases in performance or overall protection of human health or the environment. The cost estimates developed are preliminary estimates with an intended accuracy range of +50 to –30 percent. Final costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final scope, final schedule, final engineering design, and other variables.

The cost estimates include capital costs (including fixed-price remedial construction) and long-term O&M costs (post-remediation). Present worth costs were developed for each alternative assuming a discount rate of 2.7 percent. The estimates for all alternatives utilize a 30-year project life for costing purposes, although the timeframe to achieve RAOs is expected to be longer. The costs of Alternatives 1 through 6 have been updated from the costs presented in the Final FS (Jacobs, 2002) to January 2008 using the Engineering News Record construction cost index, and the costs of 5-year reviews have been added to all alternatives. Also, the cost of Alternative 1 has been updated to reflect the ongoing cap maintenance/inspection activities and the implementation of LUCs under the Interim ROD for LHAAP-16.

The progression of present worth costs from the least expensive alternative to the most expensive alternative is as follows: Alternative 1, Alternative 7, Alternative 3a, Alternative 3b, Alternative 4, Alternative 6, Alternative 2, Alternative 5a, and Alternative 5b. Lowest costs are associated with Alternative 1

because no further remedial activities would be conducted. Alternative 7 has the lowest present worth and capital costs of the action alternatives. Alternatives 3a, 3b, and 4 are next in costs (all $5,000,000 or below). While Alternatives 3a and 3b rely heavily on a passive treatment component (MNA), Alternative 7 utilizes active technologies (in situ bioremediation and biobarriers) prior to MNA; those active technologies lead to much lower monitoring costs in the future, thus giving Alternative 7 a lower total present value cost. The large O&M cost for groundwater treatment (Alternative 2) and the higher capital and O&M cost of in situ vapor extraction (Alternative 6) make these alternatives roughly twice as expensive as Alternatives 3a, 3b, and 4. However, if other sites require use of the LHAAP groundwater treatment plant, the cost of Alternative 2 will be comparable to Alternative 3.

Alternatives 5a (present worth of $13 million) and 5b (present worth of $116 million) are considerably more expensive because of the combination of high capital costs and high O&M costs. The contingent action costs do not change the order of costs.

8. State/Support Agency Acceptance

The USEPA and TCEQ have reviewed the Proposed Plan. Comments received from the USEPA and TCEQ have been incorporated. Both agencies concur with the preferred alternative.

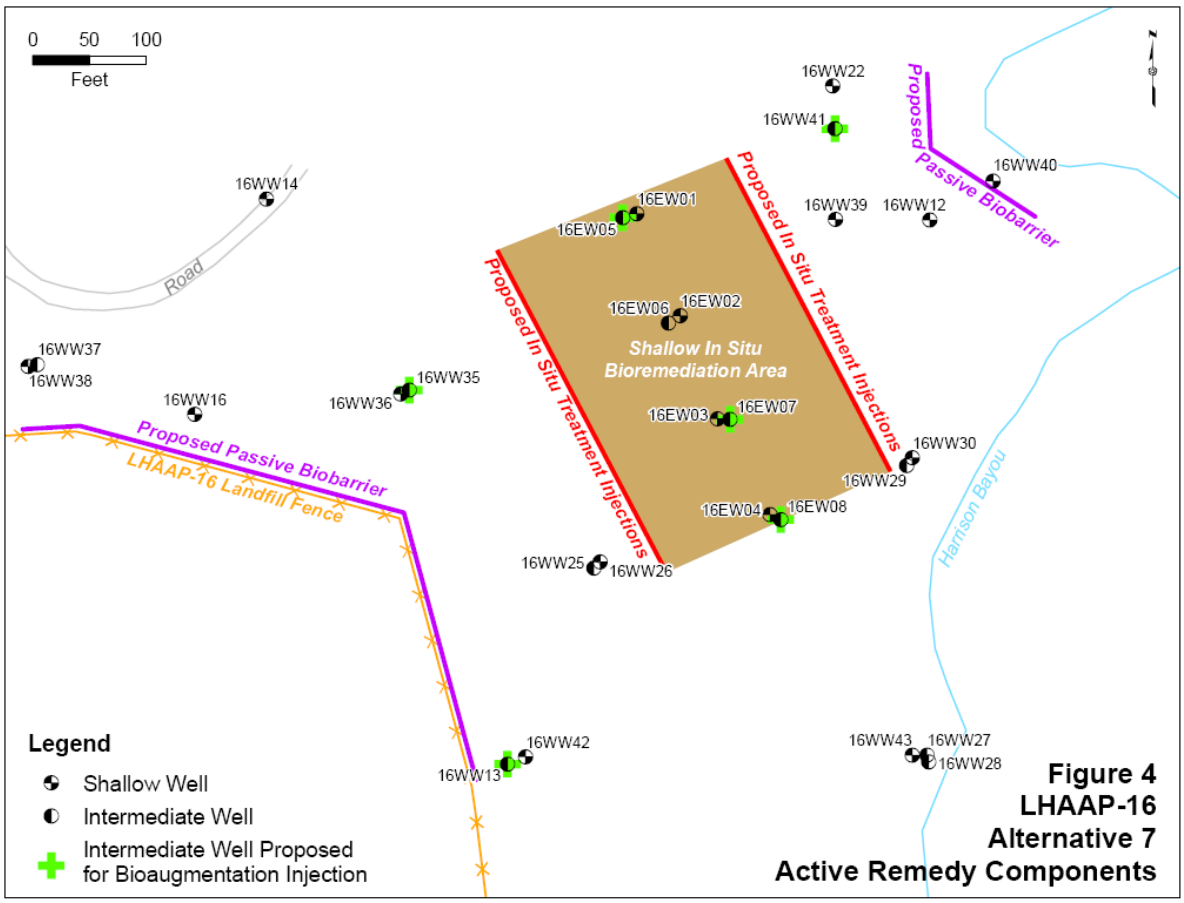
9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends. Public comments will be described and addressed in the ROD for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

Alternative 7, capping, LUCs, in situ enhanced bioremediation in a target area, passive biobarriers, and MNA, is the preferred alternative for LHAAP-16 and is consistent with the intended future use of the site as a national wildlife refuge. The approximate locations of the active components of the remedy are presented on **Figure 4**; MNA will be implemented for areas outside the influence of the active remedies. This alternative is recommended because it will be protective of human health due to the implementation of LUCs prohibiting unauthorized use of the cap and groundwater, thereby eliminating the potential contaminant exposure pathway for human receptors. Further, this alternative will satisfy the RAOs for LHAAP-16 and will reduce the COC concentrations in groundwater and control discharge of contamination to Harrison Bayou. Groundwater and surface water monitoring will be conducted to confirm that COC concentrations in the groundwater plume are declining through natural processes and that Harrison Bayou is protected from exceedances of the cleanup levels. The passive biobarriers component of this alternative will provide additional protection of Harrison Bayou. Monitoring will continue until it is demonstrated that there is no further threat of releases of contaminated groundwater into the surface water and the groundwater can be used without restriction.

Based on a preliminary natural attenuation evaluation, groundwater cleanup levels are expected to be met through natural attenuation in approximately 280 years or longer (Shaw 2010). The time frame will be reevaluated after additional sampling is conducted following shut down of the extraction system and implementation of in situ bioremediation and the passive



biobarriers. Natural attenuation will be evaluated after two years of quarterly monitoring. If proper conditions of natural attenuation are established, monitoring will continue at a reduced frequency. Otherwise, re-application of bio-amendments (i.e., additional in situ bioremediation) will be implemented.

Maintenance of the LUCs and continued environmental monitoring will be required while the landfill waste materials remain on site and the groundwater COC concentrations exceed their respective cleanup levels. The effectiveness of LUCs, cap maintenance, and long-term monitoring will be evaluated during five-year CERCLA reviews and inspections of any physical mechanisms in place at LHAAP-16. The Five-Year Reviews may indicate the need for components of this alternative to be modified based on existing and expected future surface water and groundwater conditions.

Alternative 7 is readily implementable and no significant short-term risks to worker health and safety or to the community would be expected. The present worth cost of Alternative 7 is lower than the other remedial alternatives except for Alternative 1, the No Further Action alternative.

Based on the information currently available, the U.S. Army believes that the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the CERCLA §121(b) criteria used to evaluate remedial alternatives. The preferred alternative will 1) be protective

of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solution; and 5) utilizes treatment as a principal element.

The Army intends to present details of the groundwater and surface water monitoring plan, and the MNA remedy implementation in a remedial design for LHAAP-16.

The remedy selected in the ROD may change from the preferred alternative presented here, based on public comment.

Notification of nonresidential use will accompany all transfer documents and will be recorded in the County Courthouse. Five-Year Reviews will be performed to document that the remedy remains protective of human health and the environment.

COMMUNITY PARTICIPATION

The U.S. Army, USEPA, and TCEQ provide information regarding LHAAP-16 through public meetings, the Administrative Record file for the facility, and announcements published in the Shreveport Times and Marshall News Messenger newspapers.

The dates for the public comment period, the date, location, and time of the public meeting, and the locations of the Administrative Record files are provided on the front page of this Proposed Plan.

Any significant changes to the Proposed Plan, as presented in this document, will be identified and explained in the ROD.

Primary Reference Documents for LHAAP-16

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U.S. Environmental Protection Agency (USEPA), 1993, *Presumptive Remedy for CERCLA Municipal Landfill Sites, EPA/540/F-93/035.*

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GLOSSARY OF TERMS

Administrative Record — The body of reports, official correspondence, and other documents that establish the official record of the analysis, cleanup, and final closure of a CERCLA site.

ARARs — Applicable or relevant and appropriate requirements. Refers to the federal and state requirements that a selected remedy will attain.

Attenuation — The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution, and/or transformation.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) — This law authorizes the Federal Government to respond directly to releases (or threatened releases) of hazardous substances that may be a danger to public health, welfare, or the environment. The U.S. Army currently has the lead responsibility for these activities at LHAAP.

Environmental Media — Major environmental categories of substances that surround or contact humans, animals, plants, and other organisms (e.g. surface water, ground water, soil or air) and through which chemicals or pollutants move.

Exposure — Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lung, digestive tract, etc.) and available for absorption.

Groundwater — Underground water that fills pores in soil or openings in rocks to the point of saturation.

Hazard Index — The hazard index is the sum of the hazard quotients for all chemicals to which an individual is exposed. A hazard index value of 1.0 or less indicates that no adverse non-cancer human health effects are expected to occur. Each hazard quotient is a comparison of an estimated chemical intake (dose) with a reference dose level below which adverse health effects are unlikely. Each hazard quotient is expressed as the ratio of the estimated intake (numerator) to the reference dose (denominator). The value is used to evaluate the potential for non-cancer health effects, such as organ damage, from chemical exposures.

Maximum Contaminant Level (MCL) — The maximum contaminant level is the maximum permissible level of a contaminant in a public water system. MCLs are defined in the Code of Federal Regulation (40 CFR 141, National Primary Drinking Water Regulations, which implement portions of the Safe Drinking Water Act). The TCEQ has adopted MCLs as the regulatory cleanup levels for both industrial and residential uses. Any detected compound in the groundwater samples with a MCL was evaluated by comparing it to its associated MCL.

Proposed Plan — A report for public comment highlighting the key factors that form the basis for the selection of the preferred remediation alternative.

Remedial Action — The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

Risk Assessment — An analysis of the potential adverse health effects (current and future) caused by hazardous substances at a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action). The assessment contributes to decisions regarding appropriate response alternatives.

Superfund — The common name used for CERCLA; also referred to as the Trust Fund. The Superfund Program was established to help fund cleanup of hazardous waste sites. It also allows legal action to force those responsible for sites to clean them up.

ACRONYMS

µg/L	micrograms per liter
ARARs	applicable or relevant and appropriate requirements
BERA	Baseline Ecological Risk Assessment
BHHRA	baseline human health risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
DCE	dichloroethene
DNT	dinitrotoluene
ECOP	environmental condition of property
FFA	Federal Facility Agreement
FS	feasibility study
HI	hazard index
IRA	interim remedial action
LHAAP	Longhorn Army Ammunition Plant
LUC	land use control
MCL	maximum contaminant level
MNA	monitored natural attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	operation and maintenance
RAO	remedial action objective
RI	remedial investigation
ROD	record of decision
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for LHAAP-16 is important to the U.S. Army. Comments provided by the public are valuable in helping the U.S. Army select a final remedy for these sites.

You may use the space below to write your comments, then fold and mail to Dr. Rose M. Zeiler, P.O. Box 220, Ratcliff, Arkansas 72951. Comments must be postmarked by November 8, 2010. If you have questions about the comment period, please contact Dr. Rose M. Zeiler at (479) 635-0110. Those with electronic communications capabilities may submit their comments to the U.S. Army via Internet at the following e-mail address: rose.zeiler@us.army.mil

Shaw® Shaw Environmental, Inc.

Date: September 23, 2010

Project No.:117591

TRANSMITTAL LETTER:

To: Mr. Aaron Williams

Address: US Army Corps of Engineers - Tulsa
CESWT-PP-M
1645 South 101st East Ave
Tulsa, Oklahoma 74128

Re: *Final* Record of Decision, LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant
Contract No. W912QR-04-D-0027/DS02

For: Review ____ As Requested ____ Approval ____ Corrections ____ Submittal ____ Other X ____

Item No:	***No. of Copies***	***Date:***	***Document Title***
1	2	August 2010	**Final Record of Decision, LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron,
Enclosed are two copies of the above-named document. Copies have been distributed as indicated at the end of this message. Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert – USACE, Tulsa (sent to A. Williams for distribution)
Mr. A. Maly – USAEC (electronic only)
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

1401 Enclave Parkway, Suite 250, Houston, Texas 77077 ***Phone: (281) 531-3100/Fax: (281) 531-3136***

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

September 23, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Record of Decision, LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas, August 2010

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
A. Maley, USAEC, TX
P. Srivastav, Shaw – Houston, TX (for project files)

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

September 23, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Record of Decision, LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas, August 2010
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
S. Tzhone, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
A. Maly, USAEC, TX
P. Srivastav, Shaw, Houston, TX (for project files)

FINAL

RECORD OF DECISION
LHAAP-49, FORMER ACID STORAGE AREA
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared for

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by

Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract Number W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591

August 2010

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Appendix A Public Announcements

Acronyms and Abbreviations

BERA	baseline ecological risk assessment
bgs	below ground surface
BHHRA	baseline human health risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
COPC	chemical of potential concern
DPT	direct push technology
FFA	Federal Facility Agreement
HI	hazard index
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
MCL	maximum contaminant level
MOA	Memorandum of Agreement
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	national priorities list
PCB	polychlorinated biphenyl
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	remedial investigation
ROD	record of decision
SARA	Superfund Amendments and Reauthorization Act
Shaw	Shaw Environmental, Inc.
SVOC	semivolatile organic compound
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
USACE	U.S. Army Corps of Engineers
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
U.S.C.	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

1.0 Declaration

1.1 Site Name and Location

LHAAP-49, Former Acid Storage Area.

Longhorn Army Ammunition Plant
Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System, U.S. Environmental Protection Agency (USEPA) Identification Number: TX6213820529.

1.2 Statement of Basis and Purpose

This document presents the no action decision for Site LHAAP-49 located at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The decision was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300.

The decision was based on the Administrative Record file for this site, including the remedial investigation and baseline risk assessment reports (Jacobs Engineering Group, Inc. [Jacobs] 2002a, 2002b), the Final Site Evaluation Report (Shaw Environmental, Inc. [Shaw], 2009), the installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007), the Proposed Plan (U.S. Army, 2009), and other related documents contained in the Administrative Record for site LHAAP-49.

This document is issued by the U.S. Army who is the lead agency for this installation. USEPA (Region 6) and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected No Action decision.

1.3 Description of the Selected Remedy

The lead agency has determined that no CERCLA action is necessary at LHAAP-49 to protect public health or welfare or the environment. The recommendation for no action is consistent with the criteria required under CERCLA.

The risk evaluation conducted for LHAAP-49 determined that the site is suitable for nonresidential use.

1.4 Statutory Determinations

CERCLA §121 statutory determinations are not necessary to this decision since no remedy is being selected. No remedial action is necessary to ensure protection of human health and the environment.

The LHAAP-49 risk evaluation, which was based on the reasonably anticipated future use as a national wildlife refuge, does not address unrestricted use. A notification will be recorded in Harrison County records stating that the site is suitable for nonresidential use in accordance with Texas Administrative Code (TAC) Title 30 §335.566. Because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review will be conducted every five years to ensure protection of human health and the environment under CERCLA §121(c), U.S. Code (U.S.C.) Title 42 §9621(c). Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity, per the FFA and CERCLA §121.

1.5 Authorizing Signatures

As the lead agency, the United States Army issues this no action Record of Decision (ROD) for LHAAP-49. This ROD documents that no remedy is being selected and that no action is necessary at LHAAP-49. The undersigned is the appropriate approval authority for this decision.

Thomas C Lederle 23 Aug 2010
(Name) *(Date)*
Thomas E. Lederle
Industrial Branch Chief
Base Realignment and Closure Division
United States Army

The United States Environmental Protection Agency approves the selected remedy as provided in the ROD for LHAAP-49.

Pamela Phillips, Acting 9/7/10
(Name) *(Date)*
Samuel Coleman, P.E.
Director
Superfund Division
United States Environmental Protection Agency,
Region 6

2.0 Decision Summary

2.1 Site Name, Location, and Description

LHAAP-49, Former Acid Storage Area

Longhorn Army Ammunition Plant, Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System USEPA Identification Number: TX6213820529

Lead Agency: U.S. Army, Department of Defense

Source of Cleanup Money: U.S. Army, Department of Defense

The former LHAAP is an inactive, government-owned, formerly contractor-operated and -maintained Department of Defense facility located in central east Texas in the northeast corner of Harrison County. As shown on **Figure 2-1,** LHAAP is approximately 14 miles northeast of Marshall, Texas. The facility is approximately 40 miles west of Shreveport, Louisiana. The former U.S. Army installation occupied 8,416 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake and is accessed by State Highways 43 and 134.

LHAAP was placed on the Superfund National Priorities List (NPL) on August 9, 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 Federal Facility Agreement (FFA) for remedial activities at LHAAP. The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

The site addressed in this ROD is LHAAP-49, which is shown in **Figure 2-2** and discussed below.

LHAAP-49 covers approximately 30 acres in the west-central portion of LHAAP. LHAAP-49 is the former Acid Storage Area, which was used from 1942 to 1945 for storage and formulation of acids and acid mixtures in support of trinitrotoluene (TNT) production during World War II. Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area.

The site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the U.S. Fish and Wildlife Service (USFWS) for management as the

Caddo Lake National Wildlife Refuge. The U.S. Army, the lead agency for environmental response actions at LHAAP, is acting in partnership with USEPA Region 6 and TCEQ in planning and implementing remedial action at LHAAP-49.

2.2 Site History and Enforcement Activities

2.2.1 Site History

LHAAP was established in December 1941 with the primary mission of manufacturing TNT. Production of TNT began at Plant 1 in October 1942 and continued through World War II until August 1945, when the facility was placed on standby status until February 1952. In 1952, the facility was reactivated and production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 mm ammunition continued at Plant 2 through 1956.

In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. Rocket motor production at Plant 3 continued to be the primary operation at LHAAP until 1965 when Plant 2 was reactivated for the production of pyrotechnic and illuminating ammunition. In the years following the Vietnam conflict, LHAAP continued to produce flares and other basic pyrotechnic or illuminating items for the U.S. Department of Defense inventory. From September 1988 to May 1991, LHAAP was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Forces Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

LHAAP-49 was used from 1942 to 1945 for formulation and storage of acids and acid mixtures in support of TNT production during World War II. Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area. There are no known process releases that took place at LHAAP-49; however, spills could have occurred around the tanks, lines, or buildings.

Due to the release of hazardous substances, pollutants, and contaminants from operations at the facility, the USEPA placed LHAAP on the Superfund NPL on August 9, 1990. Activities to remediate contamination associated with the listing of LHAAP as a Superfund site began in 1990. After the listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991.

2.3 Community Participation

The U.S. Army, USEPA, TCEQ and the LHAAP Restoration Advisory Board (RAB) have provided public outreach to the surrounding community concerning LHAAP-49 and other environmental sites at LHAAP. The outreach program has included fact sheets, media

interviews, site visits, invitations to attend quarterly RAB and regulatory review meetings, and public meetings consistent with its public participation responsibilities under Sections 113 (k)(2)(b), 117(a), and 121(f)(1)(g) of CERCLA.

The Proposed Plan (U.S. Army, 2010) for the decision of No Action for LHAAP-49 was released to the Administrative Record file and made available to the public for review and comment on January 25, 2010. The initial 30-day public comment period for the Proposed Plan also began on January 25, 2010. An open house was held on January 26, 2010, and the formal public meeting was held on March 9, 2010. A notice of availability of the Proposed Plan and other related documents in the Administrative Record file was published in both *The Shreveport Times* and the *Marshall News Messenger* on both January 17 and 24, 2010. A notice of the March 9, 2010, public meeting and extension of the public comment period was published in *The Shreveport Times* on February 22 and 28, 2010, and in the *Marshall News Messenger* on February 21 and 28, 2010. Written comments are addressed in the Responsiveness Summary, which is included in this ROD as **Section 3.0**.

Copies of Administrative Record documents were made available to the public at several information repository locations, including USEPA Region 6 Library, TCEQ, and Marshall Public Library. Currently, the public repository of the Administrative Record may be found at the following location:

Public Library

Location:	Marshall Public Library 300 S. Alamo Marshall, Texas 75670
Business Hours:	Monday – Thursday 10:00 a.m. – 8:00 p.m. Friday – Saturday 10:00 a.m. – 5:00 p.m.

2.4 Scope and Role of Operable Unit or Response Action

The land on which this site is located is excess to the Army's needs and is intended for transfer to the USFWS for incorporation into the Caddo Lake National Wildlife Refuge. Future anticipated use is consistent with an industrial/recreational level of exposure. This site can be addressed independent of response actions at other environmental sites at LHAAP.

2.5 Site Characteristics

This section of the ROD presents an overview of LHAAP-49 site characteristics with respect to physical site features, known or suspected sources of contamination, types of contamination, and affected media. Known or potential routes of contaminant migration are also discussed.

2.5.1 Physical Characteristics at LHAAP-49

The former Acid Storage Area is a 30-acre site situated in the west-central portion of LHAAP (**Figure 2-2**). The topography is relatively flat with approximately 3 to 5 feet of elevation increase from west to east. The surface features include numerous building foundations and several concrete saddles and platforms previously used for the support of aboveground storage tanks. Runoff from the site eventually enters Caddo Lake via Goose Prairie Creek. Runoff from the northwestern and north-central portions of the site is generally toward the north. The runoff is collected by three ditches that merge near the northern site boundary into a single ditch that conveys the runoff northward into Goose Prairie Creek. In the eastern and southeastern portions of the site, runoff is overland and is captured by small tributaries of Goose Prairie Creek to the east of the site. Runoff from the south-central and southwestern portions of the site is generally to the south or southeast. The runoff is collected by a ditch along the south boundary of the site and carried to Goose Prairie Creek. The total distance from the site to Caddo Lake is approximately 2.3 miles (Jacobs, 2002a).

The current boundaries of LHAAP-49 were established in a U.S. Army report (U.S. Army, 2005) that examined the results of metals sample analyses in and around LHAAP-49. It specifically established the boundaries to include a 2.5 acre parcel north of 4th Street that had exhibited elevated mercury concentrations in soil. The remaining areas outside LHAAP-49 were deemed to be suitable for transfer to USFWS, and the USEPA concurred (USEPA, 2005).

At LHAAP, groundwater occurs within thin silty and clayey sands that are interbedded with clayey silt and silty and sandy clays. To approximately 100 feet below ground surface (bgs), three water-bearing zones are typically encountered and described as shallow, intermediate and deep.

Soil at the site consists of interbedded silty and clayey sands, sandy silts, and clays of the Wilcox Group.

2.5.2 Nature and Extent of Contamination

As part of the Installation Restoration Program, the U.S. Army began an environmental investigation in 1976 at LHAAP followed by installation wide assessments/investigations that included the following:

- Record Search – In 1980, U.S. Army Toxic and Hazardous Material (USATHAMA, 1980) conducted a record search to assess the impact of the LHAAP installation activities including usage, storage, treatment, and disposal of toxic and hazardous materials on the environment, and define conditions that may have adversely affected human health and the environment.

- Contamination Survey – In 1982 as part of the LHAAP contamination survey, Environmental Protection Systems collected six groundwater samples for laboratory analyses. Subsequently in 1987, as part of the Resource Conservation and Recovery Act (RCRA) permit application process, and as a continuation of the contamination survey, U.S. Army Environmental Hygiene Agency (USAEHA) identified, described, and evaluated all solid waste management units at LHAAP (USAEHA, 1987). Units requiring further sampling, investigation and corrective action were delineated.

- RCRA Facility Assessment (RFA) – In 1988, a preliminary RFA was conducted by the U.S. Army (Maley, 1988). Waste at the various sites was characterized but no samples were collected.

In addition to the installation-wide investigations, site-specific investigations were conducted in a phased approach between 1998 and 2009, to identify potential site contamination at LHAAP-49. Media investigated included soil, sediment, surface water, and groundwater.

The initial investigations included a Phase III Remedial Investigation (RI) in 1998 and a field investigation in 2000. The results of these investigations are summarized in the Final Remedial Investigation Report Addendum – Group 2 Sites (Jacobs, 2002a).

During these 1998 and 2000 investigations, dioxins, explosives, metals/anions, polychlorinated biphenyls (PCBs), pesticides, perchlorate, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs) were analyzed in soil and sediment samples collected at LHAAP-49. Explosives, perchlorate and SVOCs were not detected in any of the soil samples collected. There were low scattered detections of pesticides/PCBs, dioxins, and one VOC (methylene chloride-a common laboratory contaminant) within the soil at LHAAP-49. Elevated levels of metals were detected in soil, including lead and mercury.

In groundwater, PCBs, pesticides, perchlorate, explosives, and SVOCs were not detected in the samples. Detected results in groundwater included inorganics, dioxins, and VOCs. Specifically, antimony, arsenic, chromium, selenium, and nitrate/nitrite were detected above their maximum contaminant levels (MCLs) in one or more samples.

The baseline human health risk assessment (BHHRA) (Jacobs, 2002b) was performed using the data presented in the Group 2 RI (Jacobs, 2002a). The BHHRA identified metals as chemicals of potential concern (COPCs) for soil and groundwater at LHAAP-49.

Additional investigations were conducted after the BHHRA was completed. These investigations include sampling by the USFWS (2 surface soil samples) in 2002, sampling by the U.S. Army Corps of Engineers (USACE) (13 surface soil samples) in 2004, and sampling by Shaw (22 soils samples, 4 sediment samples, and 1 surface water sample) in 2004. The soil

investigations after the BHHRA focused on two metals with elevated concentrations – lead and mercury.

Additional groundwater sampling was conducted in May 2005, October 2007, October and December 2008, and February, April, and May 2009 to address concerns about metals and nitrate/nitrite concentrations in groundwater that sometimes exceed MCLs. The sampling effort included four direct push technology (DPT) borings, installing five monitoring wells, and collecting 14 groundwater samples. Elevated nitrate/nitrite concentrations were associated with a shallow well that was typically dry. Groundwater samples collected from a properly screened replacement well did not exceed the nitrate/nitrite MCL. Chromium was associated with corrosion of a well; the well was replaced with different construction material and the chromium did not recur. Other parameters (e.g., arsenic, manganese, antimony) were found to be naturally occurring and/or associated with solid particulates that were drawn into the samples. Evaluation of these results, together with the 1998 and 2000 groundwater results, demonstrated that the occurrences of metals and nitrate/nitrite above their MCLs are not issues that require further action at the site (Shaw, 2009), and no chemicals of concern (COCs) were identified for the groundwater at LHAAP-49.

2.6 Current and Potential Future Site and Resource Uses

2.6.1 Current and Future Land Uses

LHAAP is located near the unincorporated community of Karnack, Texas. Karnack is a rural community with a population of 775 people. The incorporated community of Uncertain, Texas, population 205, is located to the northeast of LHAAP on the edge of Caddo Lake and is a resort area and an access point to Caddo Lake. The industries in the surrounding area consist of agriculture, timber, oil and natural gas production, and recreation.

LHAAP has been an industrial facility since 1942. Production activities and associated waste management activities continued until the facility was determined to be in excess of the Army's needs in 1997. The plant area has been relatively dormant since that time. The former LHAAP's perimeter fence remains in place around the refuge and represents the refuge boundary. The boundary along Caddo Lake is unfenced; however, current conditions discourage public access to areas within LHAAP.

The reasonably anticipated future use of LHAAP-49 is as a national wildlife refuge. This anticipated future use is based on a Memorandum of Agreement (MOA) (U.S. Army, 2004) between the USFWS and the U.S. Army. That MOA documents the transfer process of the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge. Presently the Caddo Lake National Wildlife Refuge occupies approximately 7,000 acres of the 8,416-acre former installation. In accordance with the National Wildlife Refuge System Administration Act

of 1966 and its amendments (16 USC 668dd), the land will remain as a national wildlife refuge unless there is a change brought about by an act of Congress, or the land is part of an exchange authorized by the Secretary of the Interior.

2.6.2 Current and Future Surface Water Uses

Streams on LHAAP currently support wildlife and aquatic life. While humans may have limited access to some streams during annual hunts, there is no routine human use of streams on LHAAP. The streams do not carry adequate numbers and size of fish to support either sport or subsistence fishing. During the summer months, the streams cease flowing or dry up. When flowing, the streams discharge into Caddo Lake. Caddo Lake is a large recreational area that covers 51 square miles and has a mean depth of 6 feet. The watershed of the lake encompasses approximately 2,700 square miles. It is used extensively for fishing and boating. Caddo Lake is a drinking water supply for multiple cities in Louisiana including Vivian, Oil City, Mooringsport, South Shore, Blanchard, Shreveport, and Bossier City.

The anticipated future uses of the streams and lake are the same as the current uses.

2.6.3 Current and Future Groundwater Uses

Groundwater in the deep aquifer (250-430 feet bgs) near LHAAP is currently used as a drinking water source. There are five active water supply wells near LHAAP. One well is located in and owned by Caddo Lake State Park. The well is completed to a depth of 315 feet and has been in use since 1935. A second well is owned by the Karnack Water Supply Corporation and services the town of Karnack. It is located approximately 2 miles southeast of town. This well is approximately 430 feet deep and has been in use since 1942. The Caddo Lake Water Supply Corporation has three wells located both north and northwest of LHAAP. These wells are identified as Caddo Lake Water Supply Corporation Wells 1, 2, and 3, and all are hydraulically upgradient of LHAAP. These wells are completed deeper in the Wilcox than the deepest zone of contamination at LHAAP. Because of this and the large distance between these wells and LHAAP, water removal from these wells is not expected to affect groundwater flow at the site. In addition, there are several livestock and domestic wells located in the vicinity of LHAAP with depths averaging approximately 250 feet.

Three water supply wells are located within the boundary of LHAAP itself. One well is located at the Fire Station; the second well is located approximately 0.35 miles southwest of the Fire Station. The third well is located north of the USFWS administration building for the Caddo Lake National Wildlife Refuge administration building, near the main entrance to LHAAP. All three water supply wells were completed within a deeper groundwater zone that is not the same zone as the environmental monitoring wells installed and described as deep wells at LHAAP. Water from these three wells is used only for non-potable purposes. Two additional wells previously supplied water to the installation, but these have been plugged and abandoned.

Although the anticipated future use of the facility as a wildlife refuge may not include the use of groundwater at LHAAP-49 as a drinking water source, the State of Texas designates all groundwater as potential drinking water, unless otherwise classified, consistent with 30 TAC §335.563(h)(1). To be conservative, a hypothetical industrial use scenario was evaluated for risk. The future industrial scenario for LHAAP assumes limited use of groundwater as a potential drinking water source.

2.7 Summary of Site Risks

This section summarizes the results of the baseline human health and ecological risk assessments conducted for LHAAP-49 (Jacobs, 2002b; Shaw, 2007). The risk assessments consist of a BHHRA and a screening ecological risk assessment performed by (Jacobs, 2002b) as well as an installation-wide BERA performed by Shaw (Shaw, 2007).

2.7.1 Human Health Risks

The baseline risk assessment estimates the risk the site poses if no action is taken. It provides the basis for taking an action and identifies the contaminants and exposure pathways that need to be addressed by a remedial action. The applicable receptor scenario for future use as a wildlife refuge is a hypothetical future maintenance worker. For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen and are expressed in scientific notation (e.g. 1×10^{-6}). The NCP, 40 Code of Federal Regulations Part 300, established a range of acceptable levels of cancer risk for Superfund sites. The acceptable risk range for site-related exposures is 1×10^{-4} to 1×10^{-6}. The potential for non-cancer effects is expressed by a ratio of the exposure to the toxicity. An individual chemical ratio less than 1 indicates that toxic non-cancer effects from that chemical are unlikely. A non-cancer hazard index (HI) is calculated when all the ratios for the individual chemicals are summed. An HI greater than 1 indicates that site-related exposures may present a risk to human health. Thus, an HI of less than 1 is acceptable since toxic non-cancer effects are unlikely.

Using the data presented in the RI, the cancer risk and the non-cancer HI were calculated based on a hypothetical future maintenance worker's exposure to the site environmental media (e.g., soil and groundwater) under an industrial scenario in the BHHRA.

The risks and hazards corresponding to contaminant levels in soil were determined to be within acceptable limits for a hypothetical future maintenance worker under the industrial scenario (Jacobs, 2002b). Shaw combined the 2002 data set from the BHHRA with data subsequently collected by USFWS, USACE, and Shaw, and found that the new data did not cause the exposure concentrations to increase (Shaw, 2007).

During the 2004 sampling, two soil sample locations at LHAAP-49 were found to have mercury concentrations that were markedly higher than soil samples elsewhere within LHAAP-49. In 2008, to address TCEQ hotspot concerns, Shaw removed soil in the vicinity of these two sample locations to a depth of 1.0 feet bgs and backfilled the area with clean soil. Shaw completed these activities in October 2008 (Shaw, 2009).

The groundwater was determined to have an acceptable cancer risk that equaled the upper value of the acceptable range. The dioxins through the dermal pathway were responsible for elevating the cancer risk for groundwater to the upper limit of the acceptable range, though the risk is still acceptable.

The non-cancer HI for groundwater was 2, which exceeded the acceptable level of 1, though no individual COPC had a hazard quotient greater than 1. The groundwater results were compared to MCLs, which are specified as cleanup goals for groundwater (TCEQ, 1998; TCEQ 2006), because the HI indicated the need for additional consideration of the groundwater. Several chemicals, including some that contribute to the HI, had occasional MCL exceedances. These are antimony, arsenic, chromium, nitrate/nitrite, and selenium. These COPCs were evaluated in the Site Evaluation Report (Shaw, 2009) with the following findings:

- Antimony was not detected above its MCL in recent sampling events, which used low-flow sampling techniques.
- Arsenic and selenium are naturally occurring under local groundwater conditions.
- Although chromium was detected above its MCL in two wells, evaluation of data suggests that the chromium contamination is associated with corrosion of the well screens. The impact to groundwater quality caused by well corrosion is unlikely to be widespread because the well casing and screen contain a limited amount of chromium. This was documented by the installation and testing of 49WW06, a monitoring well constructed of polyvinyl chloride
- Nitrate/nitrite, which exceeded its MCL at one well, was no longer found at elevated levels when the well was replaced with one properly screened across the shallow groundwater zone.

As a result of these considerations, no COCs were identified for the groundwater at LHAAP-49.

The potential for contamination to migrate from soil to groundwater was also evaluated (Shaw, 2009). The COPCs identified in soil were lead, mercury, and vanadium. Since former facilities at LHAAP-49 were operational in World War II, soil contaminants have had more than 60 years to potentially migrate from the surface soil to the groundwater; however, there are no lead, mercury, or vanadium concerns in the groundwater. Vertical migration of the chemicals with the

most elevated concentrations in soil (lead and mercury) was also examined using a computer model. The results demonstrated that these chemicals would not adversely impact groundwater.

The State of Texas requires that a notification be filed in the county disclosing that the site has been evaluated for nonresidential use in accordance with 30 TAC §335.566 because the risk evaluation was based on the reasonably anticipated future use as a national wildlife refuge. Because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review will be conducted every five years to ensure protection of human health and the environment under CERCLA §121(c), 42 U.S.C. §9621(c). Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity, per the FFA and CERCLA §121.

2.7.2 Ecological Risks

The ecological risk for LHAAP-49 was addressed in the BERA (Shaw, 2007). For the BERA, the entire installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. Each of the individual sites at LHAAP was grouped into one of these sub-areas, which were delineated based on commonalities of historic use, habitat type, and spatial proximity to each other. Conclusions for individual sites and the potential for detected chemicals to adversely affect the environment are made in the context of the overall conclusions of the sub-area in which the site falls.

Site LHAAP-49 lies within the Industrial Sub-Area, and the BERA concluded that no chemicals exceeded ecological thresholds of concern in the Industrial Sub-Area (Shaw, 2007). Thus, there are no chemicals of ecological concern at LHAAP-49. Therefore, no action is needed at LHAAP-49 for the protection of ecological receptors.

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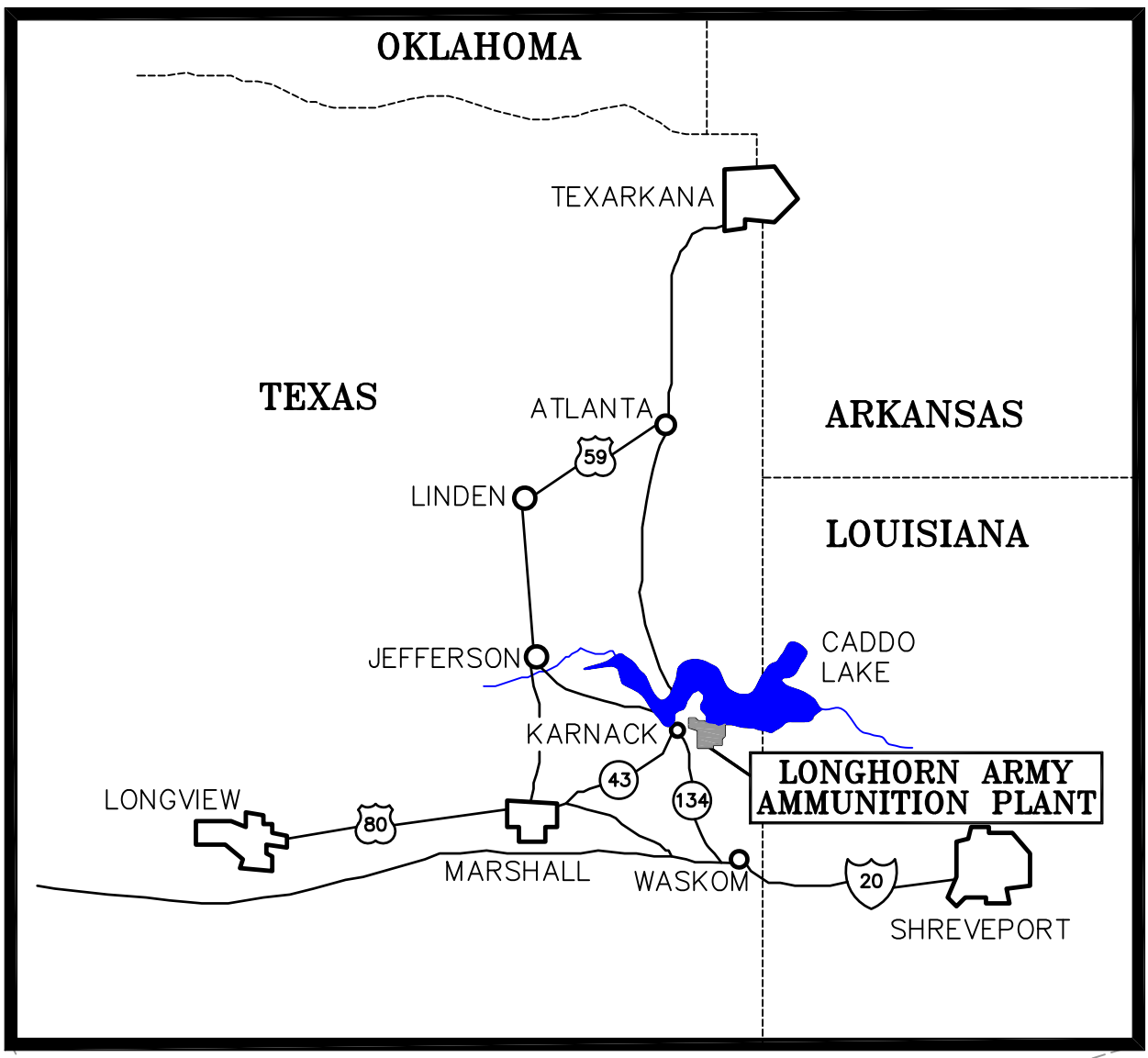

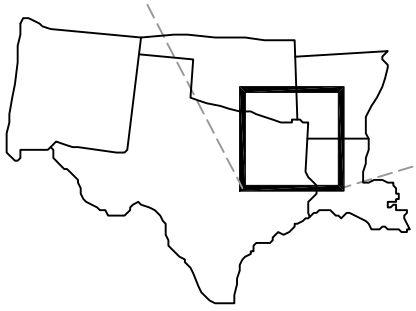

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IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	Houston, Texas	L. JONES	12/17/03	G. JONES	10/07/09	P. SRIVASTAV	10/07/09	117591-A55

PLOT DATE: 10/07/09
FORMAT REVISION 3/25/99

Shaw

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-1

LHAAP LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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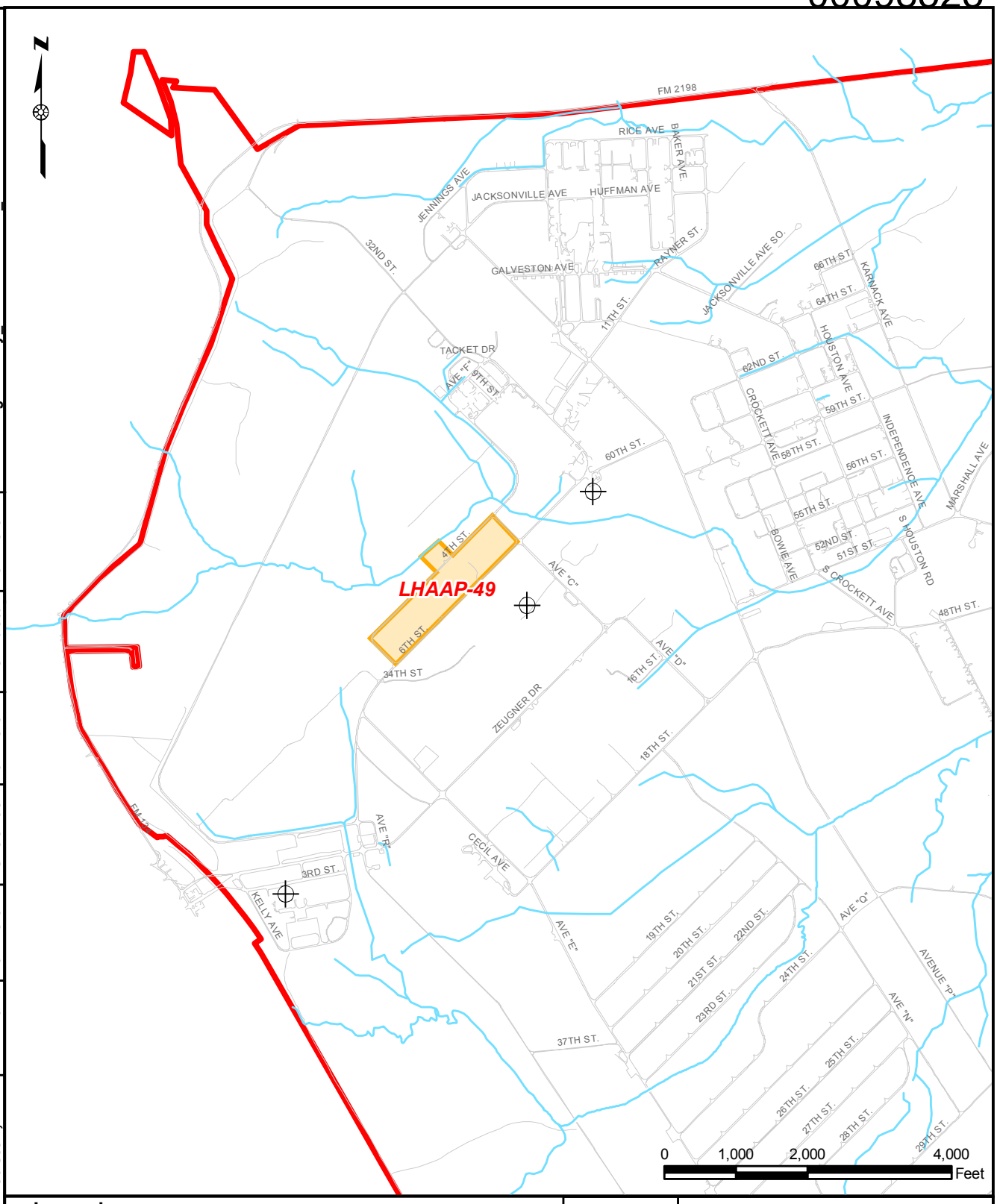

Legend

- Stream
- Road
- Site
- Lake/Pond
- LHAAP Boundary
- LHAAP Water Supply Well

OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		FILE PATH
Houston, TX	B. Lu	04/13/07	G. Jones	04/13/07	P. Srivastav	04/13/07	T:\GIS\Longhorn\My_WKSMXD\St49_Evaluation\FIG2-1.mxd

Plot Date: 06/07

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U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-2

SITE LHAAP-49 LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

3.0 Responsiveness Summary

The Proposed Plan for LHAAP-49 was released for public comments on January 25, 2010. The public asked several questions regarding LHAAP-49 at the Public Meeting on March 9, 2010, and submitted some written comments about the site via email. The public questions/comments are summarized in **Section 3.1** below, and a response is provided. The full text of the public comments in the form of a transcript is provided in the Administrative Record, available at the Marshall Public Library. No written or verbal comments about LHAAP-49 were received from the regulatory agencies during the public comment period or the Public Meeting. **Appendix A** contains the public announcement for the public comment period as well as its extension to March 25, 2010. These announcements also provide notification of the Open House on January 26, 2010, and the Public Meeting on March 9, 2010.

3.1 Stakeholder Issues and Lead Agencies Responses

Summary of Questions/Comments: The one issue on LHAAP-49 that received questions/comments was in regard to the removal of a small quantity of mercury-contaminated soil in 2008. Soil samples were not collected as part of that effort, and some members of the community indicated that USFWS is unwilling to accept transfer of the property until sampling is done. The question can be summarized as: Why has the Army not collected a soil confirmation sample below the excavation and analyzed it for mercury content?

Response: The Army, USEPA and TCEQ are satisfied that there is no unacceptable risk to the industrial user at Site 49 and so there is no need for confirmation sampling The elevated concentrations of mercury and lead that were known to exist at the site were subject to a risk analysis and found to be acceptable given the future land use. USEPA concurred with this conclusion. However, TCEQ expressed concerns that the location of the elevated mercury concentration could be a hot spot that may pose potential unacceptable risk if a person(s) were to be exposed to this area repeatedly over a long period of time. Although the Army considered this scenario highly unlikely, in an effort to expedite closure of the site, the Army's contractor performed soil removal at and around the two sample locations with the highest mercury concentrations. This soil removal was not required based on risk calculations and was not done at the direction of the Army. Prior to off-site disposal, the excavated soil was subject to waste characterization using the toxicity characteristic leaching procedure. The soil was determined to be non-hazardous. Lead and mercury results for the leachate were below detection limits. The excavated area was backfilled with clean soil from an off-site source. The backfill soil was tested for lead and mercury as well as six other metals, and the results were below background concentrations. Thus, a site with acceptable risk was made even more acceptable. Although USEPA and TCEQ find no unacceptable risk for the use of the site as a national wildlife refuge,

USFWS has stated that the land will not be accepted without a confirmation sample. Therefore, this is not a CERCLA issue, but a transfer one between USFWS and Army.

While the cost for an additional soil sample seems minor, the Army cannot readily sample without a clear technical basis for doing so. Since the risk has already been evaluated and was found to be acceptable, even while including the two high mercury results, additional samples do not appear to be warranted. The USEPA and TCEQ have reviewed the documents that describe the investigation and risk evaluation for LHAAP-49 and they have accepted the proposed plan for no action at LHAAP-49 as they indicated at the public meeting on March 9, 2010.

3.2 Technical and Legal Issues

There are no technical and legal issues beyond the issue described in **Section 3.1**.

4.0 References

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Maley, Don, 1988, *Potential Hazardous Waste Site Preliminary Assessment*, EPA Form 2070-12, April.

Shaw Environmental, Inc. (Shaw), 2007, *Installation-Wide Baseline Ecological Risk Assessment, Longhorn Army Ammunition Plant, Karnack, Texas, Volume I: Step 3 Report*, Houston, Texas, November.

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Texas Commission on Environmental Quality (TCEQ), 1998, Interoffice Memorandum from Ronald R. Pedde to Remediation Division Staff regarding implementation of the existing risk reduction rules (a.k.a. TNRCC Consistency Memorandum), July as updated through March 2006.

TCEQ, 2006, Texas Risk Reduction Rules (30 TAC §335) as updated through March 2006.

U.S. Army, 2004, *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas*, Signed by the Department of the Interior on April 27, 2004 and the Army on April 29, 2004.

U.S. Army, 2005, *Evaluations of Select Metals Detections in the West Further Investigation Area, Longhorn Army Ammunition Plant, Texas, Revision 1*, February.

U.S. Army, 2010, *Final Proposed Plan for LHAAP-49, Former Acid Storage Area, Longhorn Army Ammunition Plant, Karnack, Texas*, January.

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89/002, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

USEPA, 1994, *National Oil and Hazardous Substances Pollution Contingency Plan,* 40 *Code of Federal Regulations* Part 300, 59 *Federal Register* 47384, October 10.

USEPA, 2005, Letter from C. Villarreal to R. Zeiler, Re: Longhorn Army Ammunition Plant (LHAAP), Evaluation of the West Further Investigation Area, April 18.

Glossary of Terms

Administrative Record File – The body of reports, official correspondence, and other documents that establishes the official record of the analysis, clean up, and final closure of a site.

Background Levels – Naturally-occurring concentrations of inorganic elements (metals) that are present in the environment and have not been altered by human activity.

Characterization – The compilation of available data about the waste unit to determine the rate and extent of contaminant migration resulting from the waste site, and the concentration of any contaminants that may be present.

Chemicals of Concern (COC) – Those chemicals that significantly contribute to a pathway in an exposure model of a hypothetical receptor (e.g., a child that resides on a site). They exceed either the calculated numerical limit for cumulative site cancer risk (1 in 10,000 exposed individuals) or the calculated numerical limit of 1 for non-cancer effects, a value proposed by the USEPA.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – CERCLA was enacted by Congress in 1980 and was amended by the Superfund Amendments and Reauthorization Act in 1986. CERCLA provides federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites and established the Superfund Trust Fund.

Exposure – Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

Federal Facility Agreement – A legal binding agreement among USEPA, TCEQ, and U.S. Army that sets the standards and schedules for the comprehensive remediation of Longhorn Army Ammunition Plant.

Groundwater – Underground water that fills pores in soil or openings in rocks to the point of saturation.

Human Health Risk Assessment – A study conducted as part of a remedial investigation to determine the risk posed to human health by site-related chemicals.

National Priorities List (NPL) – The USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under

Superfund. USEPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

Record of Decision – A legal document presenting the remedial action selected for a site or operable unit. It is based on information and technical analyses generated during the remedial investigation/feasibility study and consideration of public comments on the statement of basis/proposed plan and community concerns.

Remedial Investigation – A study designed to gather data needed to determine the nature and extent of contamination at a Superfund site.

Resource Conservation and Recovery Act (RCRA) – Gives USEPA the authority to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA focuses only on active and future facilities and does not address abandoned or historical sites.

Responsiveness Summary – A summary of oral and/or written comments received during the proposed plan comment period and includes responses to these comments. The responsiveness summary is a key part of a ROD highlighting community concerns.

Proposed Plan – A plan for a site cleanup that proposes a recommended or preferred remedial alternative. The Proposed Plan is available to the public for review and comment and the preferred alternative may change based on public and other stakeholder input.

Superfund Amendments and Reauthorization Act (SARA) – Amended CERCLA in 1986. SARA resulted in more emphasis on permanent remedies for cleaning up hazardous waste sites, increased the focus on human health problems posed by hazardous waste sites, and encouraged greater citizen participation in making decisions on how sites should be cleaned up.

Superfund – The common name used for CERCLA; also referred to as the Trust Fund. The Superfund Program was established to help fund cleanup of hazardous waste sites. It also allows legal action to force those responsible for sites to clean them up.

Appendix A

Public Announcements

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLANS FOR ENVIRONMENTAL SITES LHAAP-46, -49, -50, -35A(58), AND THE PISTOL RANGE, LONGHORN ARMY AMMUNITION PLANT, TEXAS

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed Proposed Plans for the following NPL sites: LHAAP-46, LHAAP-49, LHAAP-50, LHAAP-35A(58), and the Pistol Range. Although the Proposed Plans identify preferred remedies for each of the sites, the U.S. Army welcomes the public's review and comments. The public comment period begins January 25, 2010, and concludes February 23, 2010. **On Tuesday, January 26, 2010, from 6:00 to 8:00 p.m., the U.S. Army is inviting all interested parties to attend an open house forum to view the Proposed Plans and ask questions. The open house forum will be held at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas.** Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. Summaries of each of the sites, including discussion of various alternatives that were evaluated, are provided below.

LHAAP-46, the former Plant 2 production area, is located in the north-central portion of LHAAP and covers an area of approximately 190 acres. Plant 2 was used to produce pyrotechnic devices from February 1952 to 1956 and was reactivated to produce pyrotechnic and illumination devices from 1964 until approximately 1997. Three alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) monitored natural attenuation (MNA) and land use controls (LUCs); and 3) in situ bioremediation, short-term LUCs, and long-term monitoring (LTM). Based on available information, the preferred remedy is MNA and LUCs. The preferred remedy would utilize groundwater use restriction LUCs to protect human health by preventing human exposure to contaminated groundwater and MNA to return the contaminated water to its potential beneficial use as drinking water, wherever practicable.

LHAAP-49, a former Acid Storage Area, is located in the west-central portion of LHAAP and covers an area of approximately 30 acres. The site was used from 1942 to 1945 for formulation and storage of acids and acid mixtures in support of trinitrotoluene production. Based on available information, the preferred remedy at this time is no action. The recommendation is based on the existing data and determination of no unacceptable risk to human health or to ecological receptors at LHAAP-49.

LHAAP-50, a former sump water tank, is located in the north-central portion of LHAAP and covers an area of approximately 1 acre. Historically, LHAAP-50 contained a 47,000-gallon capacity aboveground storage tank which received wastewater from various industrial waste sumps from 1955 to 1988. Three alternatives were evaluated for addressing the contaminated groundwater and soil at the site: 1) no action; 2) soil - excavation, groundwater - MNA and LUCs; and 3) soil - excavation, groundwater - in situ bioremediation, MNA, and LUCs. Based on available information, the preferred remedy at this time is the second alternative: excavation and off-site disposal of perchlorate-contaminated soils, and MNA and LUCs for groundwater. The preferred remedy would ensure protection of human health by eliminating the soil-to-groundwater and soil-to-surface water pathways, implementing groundwater use restriction LUCs to prevent exposure to contaminated groundwater, and implementing MNA until groundwater cleanup levels are achieved.

LHAAP-35A(58), known as the Shops Area, is located in the north-central portion of LHAAP and covers approximately 11 acres. 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 and became inactive in 1996 and 1997. Four alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) MNA with LUCs; 3) in situ bioremediation with short-term LUCs and LTM; and 4) in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. Based on available information, the preferred remedy at this time is the fourth alternative: in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. The preferred remedy would ensure protection of human health by 1) implementing groundwater use restriction LUCs which prevent human exposure to contaminated groundwater and 2) returning the contaminated water to its potential beneficial use as a drinking water, wherever practicable, through MNA and in situ bioremediation.

The former **Pistol Range** is located in the southeastern portion of LHAAP and covers an area of approximately 0.4 acres. The area was used by base security personnel as early as the 1950s and intermittently through 2004 as a small arms firing range. The target area was a natural, wooded slope at the eastern side of the site. Soil with contamination above industrial cleanup levels was excavated and disposed off site during a 2009 removal action. Based on available information, the preferred remedy at this time is no action. The recommendation is based on existing data and determination of no unacceptable risk to human health or to ecological receptors.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLANS FOR ENVIRONMENTAL SITES LHAAP-46, -49, -50, -35A(58), AND THE PISTOL RANGE, LONGHORN ARMY AMMUNITION PLANT, TEXAS
PUBLIC MEETING AT KARNACK COMMUNITY CENTER MARCH 9, 2010

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed Proposed Plans for the following NPL sites: LHAAP-46, LHAAP-49, LHAAP-50, LHAAP-35A(58), and the Pistol Range. Although the Proposed Plans identify preferred remedies for each of the sites, the U.S. Army welcomes the public's review and comments. The public comment period began January 25, 2010, and has been extended to March 25, 2010. **On Tuesday, March 9, 2010, from 7:00 to 9:00 p.m., the U.S. Army is inviting all interested parties to attend a public presentation of the proposed remedies for these sites and to ask questions and provide comments on the Proposed Plans. Questions, comments, and responses on the Proposed Plans will be recorded by a court reporter. This public meeting will be held at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas.** Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. Summaries of each of the sites, including discussion of various alternatives that were evaluated, are provided below.

LHAAP-46, the former Plant 2 production area, is located in the north-central portion of LHAAP and covers an area of approximately 190 acres. Plant 2 was used to produce pyrotechnic devices from February 1952 to 1956 and was reactivated to produce pyrotechnic and illumination devices from 1964 until approximately 1997. Three alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) monitored natural attenuation (MNA) and land use controls (LUCs); and 3) in situ bioremediation, short-term LUCs, and long-term monitoring (LTM). Based on available information, the preferred remedy is MNA and LUCs. The preferred remedy would utilize groundwater use restriction LUCs to protect human health by preventing human exposure to contaminated groundwater and MNA to return the contaminated water to its potential beneficial use as drinking water, wherever practicable.

LHAAP-49, a former Acid Storage Area, is located in the west-central portion of LHAAP and covers an area of approximately 30 acres. The site was used from 1942 to 1945 for formulation and storage of acids and acid mixtures in support of trinitrotoluene production. Based on available information, the preferred remedy at this time is no action. The recommendation is based on the existing data and determination of no unacceptable risk to human health or to ecological receptors at LHAAP-49.

LHAAP-50, a former sump water tank, is located in the north-central portion of LHAAP and covers an area of approximately 1 acre. Historically, LHAAP-50 contained a 47,000-gallon capacity aboveground storage tank which received wastewater from various industrial waste sumps from 1955 to 1988. Three alternatives were evaluated for addressing the contaminated groundwater and soil at the site: 1) no action; 2) soil - excavation, groundwater - MNA and LUCs; and 3) soil - excavation, groundwater - in situ bioremediation, MNA, and LUCs. Based on available information, the preferred remedy at this time is the second alternative: excavation and off-site disposal of perchlorate-contaminated soils, and MNA and LUCs for groundwater. The preferred remedy would ensure protection of human health by eliminating the soil-to-groundwater and soil-to-surface water pathways, implementing groundwater use restriction LUCs to prevent exposure to contaminated groundwater, and implementing MNA until groundwater cleanup levels are achieved.

LHAAP-35A(58), known as the Shops Area, is located in the north-central portion of LHAAP and covers approximately 11 acres. 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 and became inactive in 1996 and 1997. Four alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) MNA with LUCs; 3) in situ bioremediation with short-term LUCs and LTM; and 4) in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. Based on available information, the preferred remedy at this time is the fourth alternative: in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. The preferred remedy would ensure protection of human health by 1) implementing groundwater use restriction LUCs which prevent human exposure to contaminated groundwater and 2) returning the contaminated water to its potential beneficial use as a drinking water, wherever practicable, through MNA and in situ bioremediation.

The former **Pistol Range** is located in the southeastern portion of LHAAP and covers an area of approximately 0.4 acres. The area was used by base security personnel as early as the 1950s and intermittently through 2004 as a small arms firing range. The target area was a natural, wooded slope at the eastern side of the site. Soil with contamination above industrial cleanup levels was excavated and disposed off site during a 2009 removal action. Based on available information, the preferred remedy at this time is no action. The recommendation is based on existing data and determination of no unacceptable risk to human health or to ecological receptors.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

MEDIA RELEASE

The United States Army has prepared Proposed Plans for five environmental sites at the Longhorn Army Ammunition Plant: LHAAP-46, -49, -50, -35A(58) and the former Pistol Range. The Proposed Plans are documents that describe the sites and their proposed remedies. The Proposed Plans were developed to facilitate public involvement in the remedy selection process.

Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670 beginning January 25, 2010. The public comment period has been extended to March 25, 2010.

An informal open forum was held on January 26, 2010. A second public meeting, with a formal question and answer session, will be held on March 9, 2010, from 7:00 to 9:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661.

All written public comments on the Proposed Plans must be postmarked on or before March 25, 2010. Written comments may be provided to Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas 72951 or e-mailed to rose.zeiler@us.army.mil. E-mailed comments must be submitted by close of business on March 25, 2010.

Shaw® Shaw Environmental, Inc.

Date: ***September 23, 2010***

Project No.:117591

TRANSMITTAL LETTER:

To: Mr. Aaron Williams

Address: US Army Corps of Engineers - Tulsa
CESWT-PP-M
1645 South 101st East Ave
Tulsa, Oklahoma 74128

Re: *Final* Record of Decision, Former Pistol Range, Longhorn Army Ammunition Plant
Contract No. W912QR-04-D-0027/DS02

For: Review ____ As Requested ____ Approval ____ Corrections ____ Submittal ____ Other X ____

Item No:	*No. of Copies*	*Date:*	*Document Title*
1	2	August 2010	**Final Record of Decision, Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron,
Enclosed are two copies of the above-named document. Copies have been distributed as indicated at the end of this message. Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert – USACE, Tulsa (sent to A. Williams for distribution)
Mr. A. Maly – USAEC (electronic only)
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

1401 Enclave Parkway, Suite 250, Houston, Texas 77077 ***Phone: (281) 531-3100/Fax: (281) 531-3136***

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

September 23, 2010

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Record of Decision, Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas, August 2010

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
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A. Williams, USACE, Tulsa District, OK
A. Maly, USAEC, TX
P. Srivastav, Shaw – Houston, TX (for project files)

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

September 23, 2010

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Record of Decision, Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas, August 2010
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your records. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw'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.zeiler@us.army.mil.

Sincerely,

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

Copies furnished:
S. Tzhone, USEPA Region 6, Dallas, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
A. Maly, USAEC, TX
P. Srivastav, Shaw, Houston, TX (for project files)

FINAL

RECORD OF DECISION
FORMER PISTOL RANGE
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared for

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by

Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract Number W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591

August 2010

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Appendix A Public Notice and Media Release

Acronyms and Abbreviations

µg/L	micrograms per liter
BERA	baseline ecological risk assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DNT	dinitrotoluene
EE/CA	Engineering Evaluation/Cost Analysis
FFA	Federal Facility Agreement
GW-Ind	Groundwater Medium-Specific Concentration for Industrial Use
GWP-Ind	Soil Medium-Specific Concentration for Industrial use Based on Groundwater Protection
LHAAP	Longhorn Army Ammunition Plant
mg/kg	milligrams per kilograms
MOA	Memorandum of Agreement
MSC	medium-specific concentration
msl	mean sea level
NFA	No Further Action
NPL	national priorities list
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
ROD	Record of Decision
SAI-Ind	Texas Soil Medium-Specific Concentration for Industrial Use Based on Inhalation, Ingestion, and Direct Contact; also referred to as the Soil/Air and Ingestion Standard for Industrial Use
SARA	Superfund Amendments and Reauthorization Act
Shaw	Shaw Environmental, Inc.
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCLP	toxicity characteristic leaching procedure
TNT	trinitrotoluene
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
U.S.C.	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

1.0 Declaration

1.1 Site Name and Location

Former Pistol Range
Longhorn Army Ammunition Plant
Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System, U.S. Environmental Protection Agency (USEPA) Identification Number: TX6213820529.

1.2 Statement of Basis and Purpose

This document presents the No Further Action (NFA) decision for the former Pistol Range located at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The decision was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.

The decision was based on the Administrative Record for this site, including the Final Engineering Evaluation/Cost Analysis (EE/CA) (Shaw Environmental, Inc. [Shaw], 2009), Final Action Memorandum (U.S. Army, 2009), Final Completion Report (Shaw, 2010), Installation-wide Baseline Ecological Risk Assessment (BERA) (Shaw, 2007), and Final Proposed Plan (U.S. Army, 2010).

This document is issued by the U.S. Army who is the lead agency for this installation. USEPA (Region 6) and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the U.S. Army cleanup program. The USEPA and TCEQ concur with the selected NFA decision.

1.3 Description of the Selected Remedy

The lead agency has determined that no further CERCLA action is necessary at the former Pistol Range to protect public health or welfare or the environment. The recommendation for NFA is consistent with the criteria required under CERCLA.

Site investigation results identified areas where the surface and near surface soil was contaminated with lead at concentrations that exceeded the TCEQ soil medium-specific concentration (MSC) for industrial use based on inhalation, ingestion, and direct contact, also referred to as the Soil/Air and Ingestion Standard for Industrial Use (SAI-Ind). The investigations showed that there had been no impact to groundwater. The lead concentrations were sufficiently high to constitute a threat to public health, and a non-time-critical removal

action was determined to be appropriate. The removal action was implemented to minimize the potential for human contact with soil containing lead at concentrations that could adversely affect future maintenance workers. The removal action made the site fully compatible with the anticipated land use as a national wildlife refuge.

1.4 Statutory Determinations

No remedial action is necessary to ensure protection of human health and the environment at the former Pistol Range. The earlier removal action at the site eliminated the need to conduct further remedial action. CERCLA §121 statutory determinations are not necessary to this decision since no remedy is being selected. A notification will be recorded in Harrison County records stating that the site is suitable for nonresidential use in accordance with Texas Administrative Code (TAC) Title 30 §335.566. Because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review will be conducted every five years to ensure protection of human health and the environment under CERCLA §121(c), U.S. Code (U.S.C.) Title 42 §9621(c). Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity, per the FFA and CERCLA §121.

1.5 Authorizing Signatures

As the lead agency, the United States Army issues this no further action Record of Decision (ROD) for the former Pistol Range. This ROD documents that no remedy is being selected and that no further action is necessary at the former Pistol Range. The undersigned is the appropriate approval authority for this decision.

Thomas E Lederle 18 Aug 2010
(Name) *(Date)*
Thomas E. Lederle
Industrial Branch Chief
Base Realignment and Closure Division
United States Army

The United States Environmental Protection Agency approves the selected remedy as provided in the ROD for the former Pistol Range.

Pamela Phillips, Acting 9/7/10
(Name) *(Date)*
Samuel Coleman, P.E.
Director
Superfund Division
United States Environmental Protection Agency
Region 6

2.0 Decision Summary

2.1 Site Name, Location, and Description

Former Pistol Range

Longhorn Army Ammunition Plant, Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System USEPA Identification Number: TX6213820529

Lead Agency: U.S. Army, Department of Defense

Source of Cleanup Money: U.S. Army, Department of Defense

The former LHAAP is an inactive, government-owned, formerly contractor operated and maintained Department of Defense facility located in central east Texas in the northeast corner of Harrison County. As shown on **Figure 2-1,** LHAAP is approximately 14 miles northeast of Marshall, Texas. The facility is approximately 40 miles west of Shreveport, Louisiana. The former U.S. Army installation occupied 8,416 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake and is accessed by State Highways 43 and 134.

LHAAP was placed on the Superfund National Priorities List (NPL) on August 9, 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 Federal Facility Agreement (FFA) for remedial activities at LHAAP. The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

The site addressed in this ROD is the former Pistol Range, which is shown on **Figure 2-2** and is discussed below.

The former Pistol Range is located in the southeastern portion of LHAAP, approximately 280 feet south of Avenue Q at the end of Robert Avenue. The site is the eastern portion of a rectangular field and is approximately 110 feet north to south by 150 feet east to west (approximately 0.4 acres). The former Pistol Range was known to have been used by LHAAP security personnel for small arms target qualification and recertification. The former Pistol Range was established in the 1950s and was used intermittently through 2004.

The site is surrounded by an area (approximately 7,000 acres) that was transferred by the U.S. Department of the Army to the U.S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge. The U.S. Army, the lead agency for environmental response actions at LHAAP, is acting in partnership with USEPA Region 6 and TCEQ in planning and implementing remedial action at the former Pistol Range.

2.2 Site History and Enforcement Activities

2.2.1 History of Site Activities

LHAAP was established in December 1941 with the primary mission of manufacturing trinitrotoluene (TNT). Production of TNT began at Plant 1 in October 1942 and continued through World War II until August 1945, when the facility was placed on standby status until February 1952. Plant 2 was reactivated in 1952 where production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 millimeter ammunition continued through 1956. In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. Rocket motor production at Plant 3 continued to be the primary operation at LHAAP until 1965 when Plant 2 was again reactivated for the production of pyrotechnic and illuminating ammunition. In the years following the Vietnam conflict, LHAAP continued to produce flares and other basic pyrotechnic or illuminating items for the U.S. Department of Defense inventory. From September 1988 to May 1991, LHAAP was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Forces Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

The Pistol Range was used by LHAAP security personnel for small arms target practice and qualifying tests. The Pistol Range was established in the 1950s and was used through 2004. The target area was a natural wooded slope at the eastern side of the site.

2.2.2 History of Investigations and Previous Actions

As part of the Installation Restoration Program, the U.S. Army began an environmental investigation in 1976 at LHAAP followed by installation-wide assessments/investigations that included the following:

- Record Search – In 1980, U.S. Army Toxic and Hazardous Materials Agency (USATHAMA, 1980) conducted a record search to assess the environmental impact of the LHAAP installation activities (including usage, storage, treatment, and disposal of toxic and hazardous materials) and define conditions that may have adversely affected human health and the environment.
- Contamination Survey – In 1982, as part of the LHAAP contamination survey, Environmental Protection Systems collected six groundwater samples for laboratory analyses. Subsequently, in 1987, as part of the Resource Conservation and Recovery

Act (RCRA) permit application process, and as a continuation of the contamination survey, U.S. Army Environmental Hygiene Agency (USAEHA) identified, described, and evaluated all solid waste management units at LHAAP (USAEHA, 1987). Units requiring further sampling, investigation, and corrective action were delineated.

- RCRA Facility Assessment (RFA) – In 1988, a preliminary RFA was conducted by the U.S. Army (Maley, 1988). Waste at the various sites was characterized, but no samples were collected.

The Pistol Range itself was first investigated in 1995, when a few soil samples were collected. A comprehensive investigation of the site was conducted in 2006 and 2007. Evaluation of the data collected in those investigations showed that lead contamination in surface and near surface soil was the only environmental concern at the site. A non-time critical removal action was implemented at the former Pistol Range in 2009 to address a potential threat to public health through exposure to high levels of lead in soil. The potential threat was eliminated through soil removal. Soil with lead concentrations exceeding 1,000 milligrams per kilograms (mg/kg) was excavated and disposed of off site.

2.2.3 History of Enforcement Activities

Due to the release of hazardous substances, pollutants, and contaminants from operations at the facility, the USEPA placed LHAAP on the Superfund NPL on August 9, 1990. Activities to remediate contamination associated with the listing of LHAAP as a Superfund site began in 1990. After the listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991. Though it is not specifically listed in the FFA, the Pistol Range is an NPL site covered by the FFA because of the presence of lead-contaminated soil at the site.

2.3 Community Participation

The U.S. Army, USEPA, TCEQ, and the LHAAP Restoration Advisory Board (RAB) have provided public outreach to the surrounding community concerning the former Pistol Range and other environmental sites at LHAAP. The outreach program has included fact sheets, media interviews, site visits, invitations to attend quarterly RAB and regulatory review meetings, and public meetings consistent with its public participation responsibilities under Sections 113 (k)(2)(b), 117(a), and 121(f)(1)(g) of CERCLA.

The Proposed Plan (U.S. Army, 2010) for the decision of NFA for the former Pistol Range was released to the Administrative Record and made available to the public for review and comment on January 25, 2010. A media release was sent to radio stations KTBS, KSLA and KETK on January 18, 2010. The initial notice of availability of the Proposed Plan and other related documents in the Administrative Record file was published in *The Shreveport Times* and the

Marshall News Messenger on both January 17 and 24, 2010. An extension to the public review period was requested. A notice for the 30-day extension and a second public meeting was published in *The Shreveport Times* on February 22 and 28, 2010, and in the *Marshall News Messenger* on February 21 and 28, 2010. The newspaper and media notices for the meetings are provided in **Appendix A**. The public comment period for the Proposed Plan began on January 25, 2010, and ended March 25, 2010. Public meetings were held on January 26, 2010, in an open forum style with informal comments, questions, and discussions, and on March 9, 2010, with a more formal format and a court reporter. The transcript for the meeting on March 9, 2010, is part of the Administrative Record. The significant comments (oral or written) are addressed in the Responsiveness Summary, which is included in this ROD as **Section 3.0**.

The Administrative Record may be found locally at the information repository maintained at the following location:

Location:	Marshall Public Library 300 S. Alamo Marshall, Texas 75670
Business Hours:	Monday – Thursday 10:00 a.m. – 8:00 p.m. Friday – Saturday 10:00 a.m. – 5:00 p.m.

2.4 Scope and Role of Operable Unit or Response Action

The land on which this site is located is excess to the Army's needs and is intended for transfer to the USFWS for incorporation into the Caddo Lake National Wildlife Refuge. A removal action was formulated based on future use of the site as part of a national wildlife refuge and was implemented in 2009. The removal action addressed the only identified potential risk to human health or the environment under that land use scenario – inhalation, ingestion, and dermal contact associated with contaminated soil during industrial use. The removal action was proposed and implemented as a final action; no further remedial activities are envisioned at the former Pistol Range.

Future anticipated use is consistent with an industrial/recreational level of exposure. This site can be addressed independent of response actions at other environmental sites at LHAAP.

2.5 Site Characteristics

This section of the ROD presents an overview of the former Pistol Range site characteristics with respect to physical site features, known or suspected sources of contamination, types of contamination, and affected media. Known or potential routes of contaminant migration are also discussed.

2.5.1 Physical Characteristics at the Former Pistol Range

The former Pistol Range is located in the southeastern portion of LHAAP, approximately 280 feet south of Avenue Q at the end of Robert Avenue (**Figure 2-2**). Based on U.S. Geological Survey topographic maps, the western end of the site is approximately 175 feet above mean sea level (msl). The site slopes gently upward to the east until reaching approximately 180 feet msl. However, the elevation increases by approximately 10 feet at the very eastern end. This slope constituted the target portion of the Pistol Range. The flat portion of the former Pistol Range is covered by grass while the eastern slope (the target embankment) is forested. The former Pistol Range is located within the flood plain of Harrison Bayou. Surface drainage at the former Pistol Range generally drains west toward Harrison Bayou, either directly as sheet flow or via the drainage swale along the southwestern portion of the site.

At LHAAP, groundwater occurs within thin silty and clayey sands that are interbedded with clayey silt and silty and sandy clays. To approximately 100 feet below ground surface (bgs), three water-bearing zones are typically encountered and described as shallow, intermediate, and deep.

One monitoring well was drilled in the shallow groundwater zone in the eastern portion of the former Pistol Range near the toe of the target slope. During boring installation, clay was encountered to a depth 24 feet bgs, with the exception of a clayey sand zone from 5 to 7 feet. Beyond 24 feet, alternating layers of sand and clay, varying from 2 to 4 feet thick, were encountered until the total boring depth of 34 feet was reached. Groundwater at the site was encountered at approximately 14.5 feet bgs.

2.5.2 Nature and Extent of Contamination

Preliminary site-specific field investigations were conducted at the former Pistol Range in 1995. During the initial investigation, soil samples were collected from the target embankment and were subjected to the toxicity characteristic leaching procedure (TCLP). The leachate was analyzed for lead. Results of the analysis indicated that lead contamination was limited to the surface where lead bullets were located. In addition, results indicated that soil, if excavated from the target embankment, would likely be hazardous if the soil contained lead fragments (Thiokol, 1995 and CES, 2004).

In 2006, 88 soil samples from 52 locations were collected and field screened. Samples were collected from locations that were established in a grid pattern across the site. The grid extended outside the site to ensure that the extent of contamination was fully delineated. Three of the soil samples were collected within the ditch that runs south of the site. Samples were screened with x-ray fluorescence for lead, copper, arsenic, nickel and zinc; the metals expected at a small arms range. Except for lead, all the other metals were detected in the soil at concentrations that were below their respective SAI-Ind (TCEQ, 2006). Lead was detected at a maximum concentration

of 5,240 mg/kg. Lead concentrations exceeding the SAI-Ind value of 1,000 mg/kg were found at three locations at and near the target embankment at the eastern end of the former Pistol Range. Nine of the samples were submitted to the laboratory for analysis. Three of the laboratory soil samples that exhibited the highest lead concentration were subjected to leaching procedures. Leachate exceeded the TCLP limit for lead in all three samples that were analyzed.

Because of the high concentrations of lead encountered in some parts of the former Pistol Range, and it's potential to leach and migrate from soil to groundwater, additional investigation activities were performed in 2007. The activities included the collection of vertical delineation soil samples in the vicinity of the highest surface soil lead concentrations and the installation of a monitoring well. The well had a screen interval of 23 feet bgs to 33 feet bgs, which is in the shallow groundwater zone. Results of the vertical delineation indicated that lead concentrations decreased rapidly with depth. Lead contamination did not exceed the SAI-Ind value in any sample deeper than 12 inches. Groundwater samples were collected twice from the newly installed monitoring well. Total lead was detected in the first sample at a concentration of 17.2 micrograms per liter (µg/L), exceeding the Groundwater MSC for Industrial Use (GW-Ind) value of 15 µg/L. The elevated lead concentration was associated with high sample turbidity. Dissolved lead was well below the GW-Ind. Results of the subsequent groundwater sampling under stabilized turbidity conditions indicated that total and dissolved lead were at much lower concentrations of 5.41 and 0.5 µg/L, respectively, and were well below the GW-Ind value. All site sample locations are shown on **Figure 2-3**.

The investigations showed that there had been no impact to groundwater, but identified areas where the soil was contaminated with lead at levels that exceeded the SAI-Ind under 30 TAC §335.558(d).

In 2009, an EE/CA was conducted for the former Pistol Range site. The EE/CA activities included identifying the removal action objective, comparing contaminant levels in the soil and groundwater to promulgated regulatory levels for protection of human health, performing modeling to evaluate vertical contaminant migration, and formulating and evaluating removal alternatives. The EE/CA investigation results and modeling (using VLEACH Version 2.2) led to the following conclusions about the nature of the threat posed by the site:

- Surface and near-surface soil at and near portions of the target embankment were contaminated with lead at levels exceeding the SAI-Ind.
- Sediment, surface water, and groundwater had not been adversely impacted.
- Vertical migration of lead would not cause the groundwater to exceed the GW-Ind (i.e., the maximum contaminant level) for lead in the future.
- If excavated, soil exceeding the SAI-Ind would likely be a RCRA hazardous waste due to lead contamination.

The EE/CA identified the removal action objective as minimizing the potential for human contact with soil containing lead at concentrations that could adversely affect future maintenance workers. This objective was used as the basis for formulating and evaluating removal alternatives and selecting a removal action for the site. The EE/CA recommended excavation of surface and near surface soil contaminated with lead exceeding industrial use levels and proper disposal of that soil off site at a permitted landfill.

Between August 4 and August 19, 2009, non-time critical removal action activities were conducted at the former Pistol Range site including excavation of contaminated soil, confirmation sampling, and site restoration. Soil with lead contamination above the cleanup level (SAI-Ind) was excavated. Excavation activities were terminated where confirmation sampling results indicated that the cleanup level had been achieved. The removal action objective of protection of human health from lead at unacceptable concentrations had been achieved as demonstrated by the confirmation soil analytical results. The boundary of the excavation area is shown on **Figure 2-3**. **Figure 2-4** shows the confirmation sampling locations within the excavation area. The site was restored by backfilling with clean soil, covering the sloped area of the excavation with erosion control fabric, seeding, and mulching. Transport of excavated soil and proper disposal activities were completed on October 6, 2009.

2.6 Current and Potential Future Site and Resource Uses

2.6.1 Current and Future Land Uses

LHAAP is located near the unincorporated community of Karnack, Texas. Karnack is a rural community with a population of 775 people. The incorporated community of Uncertain, Texas, population 205, is located to the northeast of LHAAP on the edge of Caddo Lake and is a resort area and an access point to Caddo Lake. The industries in the surrounding area consist of agriculture, timber, oil and natural gas production, and recreation.

LHAAP has been an industrial facility since 1942. Production activities and associated waste management activities continued until the facility was determined to be in excess of the Army's needs in 1997. The plant area has been relatively dormant since that time. The former LHAAP's perimeter fence remains in place around the refuge and represents the refuge boundary. The boundary along Caddo Lake is unfenced; however, current conditions discourage public access to areas within LHAAP.

The reasonably anticipated future use of the former Pistol Range is as a national wildlife refuge. This anticipated future use is based on a Memorandum of Agreement (MOA) (U.S. Army, 2004) between the USFWS and the U.S. Army. That MOA documents the transfer process of the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge. Presently the Caddo Lake National Wildlife Refuge occupies approximately 7,000 acres of the 8,416-acre

former installation. In accordance with the National Wildlife Refuge System Administration Act of 1966 and its amendments (16 USC 668dd), the land will remain as a national wildlife refuge unless there is a change brought about by an act of Congress, or the land is part of an exchange authorized by the Secretary of the Interior.

2.6.2 Current and Future Surface Water Uses

Streams on LHAAP currently support wildlife and aquatic life. While humans may have limited access to some streams during annual hunts, there is no routine human use of streams on LHAAP. The streams do not carry adequate numbers and size of fish to support either sport or subsistence fishing. During the summer months, the streams cease flowing and/or dry up. The streams discharge into Caddo Lake. Caddo Lake is a large recreational area that covers 51 square miles and has a mean depth of 6 feet. The watershed of the lake encompasses approximately 2,700 square miles. It is used extensively for fishing and boating. Caddo Lake is a drinking water supply for multiple cities in Louisiana including Vivian, Oil City, Mooringsport, South Shore, Blanchard, Shreveport, and Bossier City.

The anticipated future uses of the streams and lake are the same as the current uses.

2.6.3 Current and Future Groundwater Uses

Groundwater in the deep aquifer (250-430 feet bgs) near LHAAP is currently used as a drinking water source. There are five active water supply wells near LHAAP. One well is located in and owned by Caddo Lake State Park. The well is completed to a depth of 315 feet and has been in use since 1935. A second well is owned by the Karnack Water Supply Corporation and services the town of Karnack. It is located approximately 2 miles southeast of town. This well is approximately 430 feet deep and has been in use since 1942. The Caddo Lake Water Supply Corporation has three wells located both north and northwest of LHAAP. These wells are identified as Caddo Lake Water Supply Corporation Wells 1, 2, and 3, and all are hydraulically upgradient of LHAAP. These wells are completed deeper than the deepest zone of contamination at LHAAP. Because of this and the large distance between these wells and LHAAP, water removal from these wells is not expected to affect groundwater flow at the site. In addition, there are several livestock and domestic wells located in the vicinity of LHAAP with depths averaging approximately 250 feet.

Three water supply wells are located within the boundary of LHAAP itself. One well is located at the Fire Station, approximately 2.1 miles north-northwest of the former Pistol Range. The second well is located approximately 0.35 miles southwest of the Fire Station and 2.1 miles northwest of the former Pistol Range. The third well is located north of the USFWS administration building for the Caddo Lake National Wildlife Refuge, near the main entrance to LHAAP, approximately 2.45 miles west of the former Pistol Range. All three water supply wells were completed within a deeper groundwater zone that is not the same zone as the environmental

monitoring wells installed and described as deep wells at LHAAP. Water from these three wells is used only for non-potable purposes. Two additional wells previously supplied water to the installation, but these have been plugged and abandoned. None of the water supply wells are associated with the former Pistol Range.

Although the anticipated future use of the facility as a national wildlife refuge may not include the use of groundwater at the former Pistol Range as a drinking water source, the State of Texas designates all groundwater as potential drinking water unless otherwise classified, consistent with 30 TAC §335.563(h)(1). Because some soil analytical results for lead exceeded the Soil MSC for Industrial Use Based on Groundwater Protection (GWP-Ind) value, the potential for lead contamination to leach to groundwater was investigated. In addition to lead detections in groundwater being below the GW-Ind value, vertical transport modeling demonstrated that lead would not adversely impact groundwater at the site in the future. Implementation of the 2009 soil removal action eliminated lead contamination in surface soil and near surface soil that exceeded the SAI-Ind and made the site fully compatible with the anticipated land use.

2.7 Summary of Site Risks

This section summarizes the results of the risk evaluation for the former Pistol Range site. Based on the future land use as a national wildlife refuge, contaminant levels in the soil and groundwater were compared to promulgated regulatory levels for protection of human health as part of the EE/CA (Shaw, 2009). Ecological risks were evaluated in the BERA (Shaw, 2007), and application of the BERA findings to the former Pistol Range was also presented in the EE/CA (Shaw, 2009).

2.7.1 Human Health Risks

To evaluate potential human health issues at the former Pistol Range, the soil analytical results for arsenic, copper, lead, nickel, and zinc were compared to their respective SAI-Ind and GWP-Ind values. For arsenic, copper, nickel, and zinc, no result exceeded the SAI-Ind. However, at three of the sampling locations at or near the target embankment at the eastern end of the former Pistol Range, soil was found to contain lead concentrations that exceeded the SAI-Ind for total lead (1,000 mg/kg).

A non-time critical removal action was conducted for the site in 2009 to minimize the potential for human contact with soil containing lead at concentrations that could adversely affect future maintenance workers. The soil containing lead at concentrations that exceeded the SAI-Ind was excavated and disposed of off site (soil removal was verified via confirmation sampling). While industrial cleanup levels are applicable to a depth of 2 feet bgs (TCEQ, 1998), lead contamination did not exceed the SAI-Ind in any sample deeper than 12 inches. Excavation was conducted until concentrations of lead in the sidewalls and floors of the excavation were below cleanup levels. Confirmation sample results varied from 6.53 to 607 mg/kg lead - levels that

were less than the cleanup levels and suitable for nonresidential use. The excavation was backfilled with clean soil (Shaw, 2010).

Because some soil results in the 2006 and 2007 investigations exceeded GWP-Ind values, the potential for contamination to leach to groundwater was also evaluated. The limited extent of vertical migration of lead through the soil, and the lack of lead contamination in the groundwater further supported by vertical transport modeling, demonstrated that contamination of the groundwater was not a current or potential future problem (Shaw, 2009).

The results of the 2006 and 2007 investigations also demonstrated that sediment and surface water are not impacted by the site (Shaw, 2009).

Because the risk evaluation was based on the reasonably anticipated future use as a wildlife refuge, the State of Texas requires that a notification be filed in the county disclosing that the site has been evaluated for nonresidential use in accordance with 30 TAC §335.566. In addition, because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review will be conducted every five years to ensure protection of human health and the environment under CERCLA §121(c), 42 U.S.C. §9621(c). Although the U.S. Army may later pass these procedural responsibilities to the transferee by property transfer agreement, the U.S. Army shall retain ultimate responsibility for remedy integrity, per the FFA and CERCLA §121.

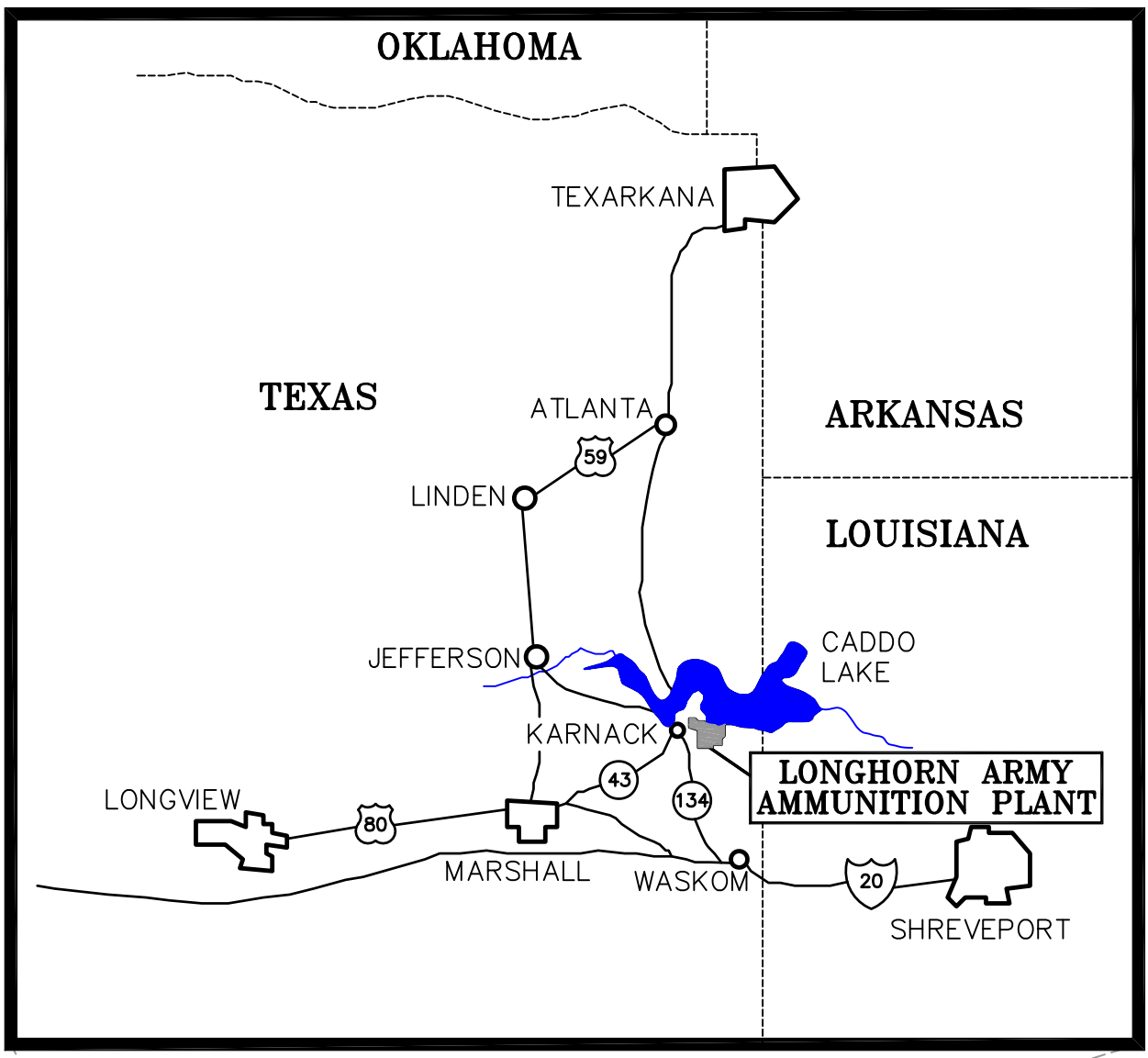
2.7.2 Ecological Risks

The ecological risk for the former Pistol Range was addressed in the installation-wide BERA (Shaw, 2007). For the BERA, the entire installation was divided into three large sub-areas (i.e., the Industrial Sub-Area, Waste Sub-Area, and Low Impact Sub-Area) for the terrestrial evaluation. The individual sites at LHAAP were grouped into one of these sub-areas, which were delineated based on commonalities of historic use, habitat type, and spatial proximity to each other. Conclusions for individual sites and the potential for detected chemicals to adversely affect the environment were made in the context of the overall conclusions of the sub-area in which the site falls. The former Pistol Range lies within the Waste Sub-Area.

The BERA evaluated potential ecological risk to a number of endpoint receptors, as well as terrestrial plant and invertebrate communities. Endpoint receptors were evaluated using a food chain model that estimated a daily dose intake, which was subsequently compared with toxicity reference values to generate a hazard quotient. Terrestrial communities were evaluated through comparisons of detected concentrations to conservative benchmarks. Multiple lines of evidence (e.g., spatial distribution of concentrations, etc.) were also considered. After evaluating all lines of evidence, the BERA concluded that there were potential ecological concerns in the Waste Sub-Area associated with barium, 2,4-dinitrotoluene (DNT), 2,6-DNT, 2,4,6-TNT, and dioxin

(Shaw, 2007). However, the BERA did not find lead or the other parameters detected in the soil at the former Pistol Range to be of ecological concern within the Waste Sub-Area. Therefore, no action is needed at the former Pistol Range for the protection of ecological receptors.

00098557



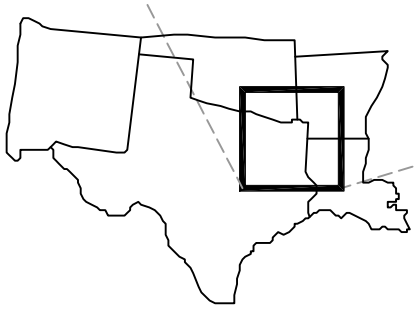


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IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	Houston, Texas	L. JONES	12/17/03	G. JONES	10/07/09	P. SRIVASTAV	10/07/09	117591-A55

PLOT DATE: 10/07/09
FORMAT REVISION 3/25/99

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TULSA DISTRICT
TULSA, OKLAHOMA

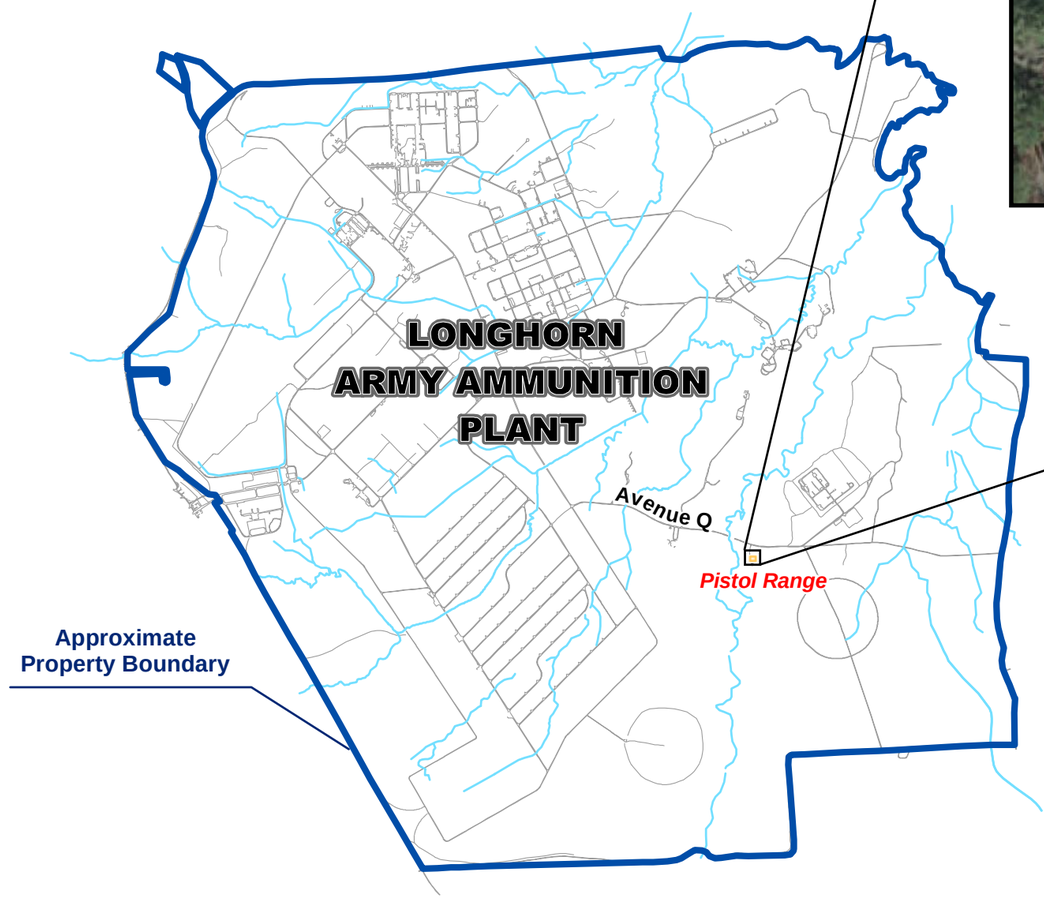
FIGURE 2-1

LHAAP LOCATION MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098558

OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		FILE PATH
Houston, TX	B. Grod	01/20/10	A. Mayila	01/20/10	G. Jones	01/20/10	T:\GIS\1117591_LHAAP\Doc\Mxd\PistolRange\RodFig2-2SiteLocation.mxd



LEGEND

- Approximate Firing Line Location
- Stream
- Road
- Target Embankment
- Pistol Range

N

0 37.5 75 150 Feet

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TULSA, OKLAHOMA

FIGURE 2-2

SITE LOCATION MAP
FORMER PISTOL RANGE

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098559

OFFICE	DRAWN BY		CHECKED BY		APPROVED BY	
Houston, TX	B. Grod	01/20/10	A. Mayila	01/20/10	G. Jones	01/20/10

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LEGEND

- Shallow Monitoring Well
- XRF Sediment Sample Location
- XRF Sample Location
- Approximate Firing Line Location
- Stream
- Road
- Excavation Area
- 25-foot Grid
- Target Embankment
- Pistol Range

N

0 30 60 120 Feet

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TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-3

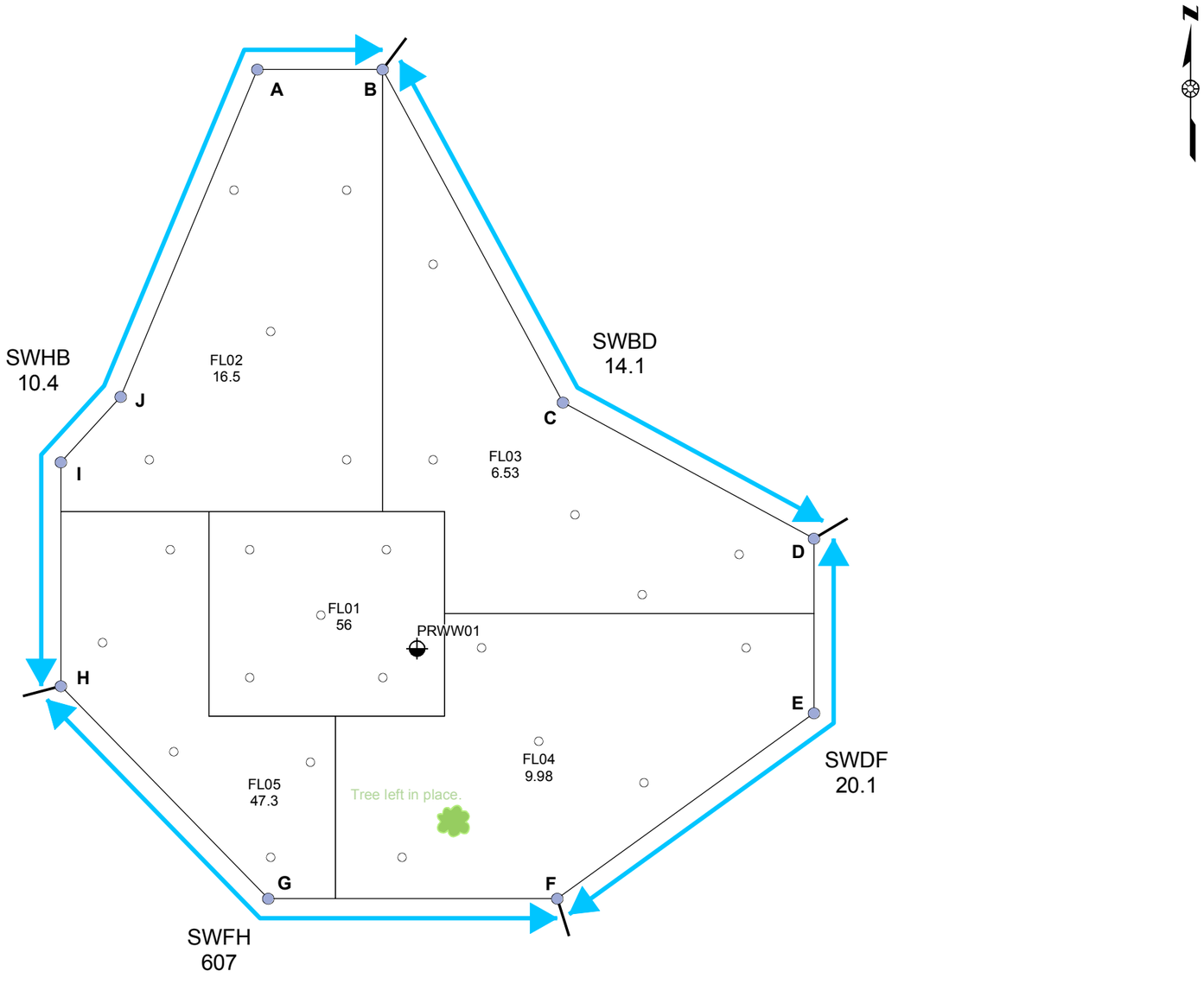
SAMPLE LOCATION AND EXCAVATION AREA MAP FORMER PISTOL RANGE

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00098560

LOCATION	EAST	NORTH	EXCAVATION DEPTH (ft.)
A	3314847.9	6951929.7	1.00
B	3314857.5	6951929.7	1.33
C	3314871.2	6951904.3	1.33
D	3314890.4	6951893.8	1.50
E	3314890.4	6951880.5	1.33
F	3314870.8	6951866.3	1.25
G	3314848.7	6951866.3	1.33
H	3314832.9	6951882.6	1.33
I	3314832.9	6951899.7	1.33
J	3314837.5	6951904.7	2.00

Area (sq ft)	2,356
Average Depth (ft.)	1.40



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APPROVED BY	G. Jones	01/20/10
CHECKED BY	M. Agnes	01/20/10
DRAWN BY	B. Grod	01/20/10
OFFICE	Houston, TX	

LEGEND

- Abandoned Well (PRWW01)
- Individual Grab Location for Composite Floor Sample
- Sidewall with Sample Name and Lead Result
- Floor Area with Sample Name and Lead Result

SWHB - Wall Sample ID with lead
10.4 concentration result in mg/kg

FL02 - Floor Sample ID with lead
16.5 concentration result in mg/kg.

NOTES:

1. Results are presented in milligrams per kilogram (mg/kg)
2. Locations were surveyed and corners staked prior to excavation. The excavation area stayed within these points.

0 5 10 20 Feet

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TULSA, OKLAHOMA

FIGURE 2-4
COMPLETED EXCAVATION AREA
WITH CONFIRMATION
SAMPLING LOCATIONS
FORMER PISTOL RANGE
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

3.0 Responsiveness Summary

The Responsiveness Summary serves three purposes. First, it provides the U .S. Army, USEPA, and TCEQ with information about community concerns with the preferred alternative at the former Pistol Range as presented in the Proposed Plan. Second, it shows how the public's comments were factored into the decision-making process for selection of the remedy. Third, it provides a formal mechanism for the U.S. Army to respond to public comments.

The U.S. Army, USEPA, and TCEQ provide information regarding the Pistol Range through public meetings, the Administrative Record for the facility, and announcements published in the Shreveport Times and Marshall News Messenger newspapers. **Section 2.3** discusses community participation with regard to the Pistol Range, including the dates for the public comment period, the date, location, and time of the public meetings, and the location of the Administrative Record. The following documents related to community involvement were added to the Administrative Record:

- Transcript of the public meeting on March 9, 2010
- Presentation slides from the March 9, 2010, public meeting
- Written questions and comments from the public during the public comment period, and the U.S. Army response to those comments dated June 4, 2010.

The public questions/comments and Army responses are summarized in **Section 3.1** below. No written or verbal comments were received from the regulatory agencies during the public comment period or at the Public Meeting. **Appendix A** contains the public announcement for the public comment period as well as its extension to March 25, 2010. These announcements also provide notification of the Open House on January 26, 2010, and the Public Meeting on March 9, 2010.

3.1 Stakeholder Issues and Lead Agency Responses

This section summarizes and responds to significant issues raised by stakeholders including the public and community groups. For the Pistol Range, there were no written questions or comments. The cost estimate is the only matter that the public brought up during the public comment period, and those comments were made verbally. The discussion below addresses verbal comments from the public meeting regarding the cost estimate for the 2009 removal action. That estimate addressed the 2009 excavation work and future land use controls. Land use would be non-residential and would be documented during five-year reviews as required by

CERCLA. The cost estimate is provided in the EE/CA (Shaw, 2009); the breakdown of the estimate is provided in Appendix F of the EE/CA.

A participant at the public meeting stated that in the past he had asked for the estimated cost of the selected alternative (Alternative 3: excavation and off-site disposal and land use controls), and had been told several different dollar figures – specifically, figures on the order of $100,000, $300,000, and $600,000. As explained in the meeting, it appears that the figures are not incorrect, but describe different things: the field work for the excavation, the total net present value, and the total cash flow over a 30-year period. The estimates for these are $185,000, $381,000, and $538,000, respectively (Shaw, 2009). The explanation is further broken down into the following topics: 1) understanding the cost estimate in the EE/CA; and 2) scope of work.

Understanding the cost estimate in the EE/CA: At the public meeting, misunderstanding about the cost estimate was addressed. One potential cause of misunderstanding was the differences between the cost estimate in the EE/CA, the actual cost to the Army, and the actual cost to the contractor that performed the removal action, Shaw. The EE/CA cost estimate is meant to provide an order-of-magnitude figure that can be used to compare alternatives. These estimates do not take into account economy of scale. Economy of scale refers to savings realized because several sites are being handled similarly and simultaneously, such as would be the case with the five-year reviews. While the EE/CA cost estimate is used to compare the cost effectiveness of different alternatives, it does not affect the actual cost to the Army, which is a figure that was negotiated with Shaw in 2005. The actual cost to Shaw is not publicly available.

Another cause of misunderstanding for the cost estimate in the EE/CA was level of effort involved. The EE/CA cost estimate includes CERCLA requirements and five-year reviews as detailed in the section below on scope of work.

Scope of work: As shown in the cost estimate details provided in the EE/CA, the complete scope of work for the removal action (Alternative 3) includes many activities beyond the digging and hauling of contaminated soil. It includes preparing plans, pre-mobilization activities, field activities (including sampling and analysis to classify the excavated soil and to ensure that the footprint of the excavation is adequate), a completion report, proposed plan, ROD, and five-year reviews for a 30 year period. The 30 year period is typical for making life cycle cost estimates in accordance with Army requirements.

It should be noted that the cost of the excavation work completed in 2009 does not affect the decision to move forward with NFA at the former Pistol Range. That decision is based on the current condition of the site and the risks (both current and future) to human health and the environment. Those risks are considered acceptable based on the reasonably anticipated future land use.

3.2 Technical and Legal Issues

This section is used to expand on technical and legal issues. However, there are no issues of that nature beyond the technical issues already discussed in **Section 3.1**.

4.0 References

Complete Environmental Services (CES), 2004, Correspondence from William R. Corrigan, III, addressed to Rose M. Zeiler, LHAAP Site Manager, Department of the Army, Subject: Data from samples at Pistol Firing Range, Karnack, Texas, July 6.

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Shaw, 2009, *Final Engineering Evaluation/Cost Analysis, Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas,* February.

Shaw, 2010, *Final Completion Report, Non-Time-Critical Removal Action at the Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas,* January.

Texas Commission on Environmental Quality (TCEQ), 1998, Interoffice Memorandum from Ronald R. Pedde to Remediation Division Staff, Subject: Implementation of the Existing Risk Reduction Rule, July 23.

TCEQ, 2006, Update Examples of Standard No. 2, Appendix II Medium-Specific Concentrations, March 31, 2006.

Thiokol Corporation (Thiokol), 1995, Letter from B. Singh/Thiokol to Administrative Contracting Officer, Subject: Ref. Letter dated 7 June 1995, Subject: TNRCC Area of Concern – Lead Contamination at Pistol Firing Range, 20 July.

U.S. Army, 1991, *Federal Facilities Agreement, Longhorn Army Ammunition Plant, Karnack, Texas,* December 30.

U.S. Army, 2004, *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas,* Signed by the Department of the Interior on April 27, 2004 and the Army on April 29, 2004.

U.S. Army, 2009, *Final Action Memorandum for Former Pistol Range and LHAAP-04, Former Pilot Wastewater Treatment Plant,* July.

U.S. Army, 2010, *Final Proposed Plan for the Former Pistol Range, Longhorn Army Ammunition Plant, Karnack, Texas,* January.

U.S. Army Environmental Hygiene Agency (USAEHA), 1987, *Final Groundwater Contamination Survey No. 38-26-0851-89 Evaluation of Solid Waste Management Units, Longhorn Army Ammunition Plant, Karnack, Texas*, May.

U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), 1980, *Installation Assessment of Longhorn Army Ammunition Plant, Report No. 150,* February.

Glossary of Terms

Administrative Record File – The body of reports, official correspondence, and other documents that establishes the official record of the analysis, clean up, and final closure of a site.

Characterization – The compilation of available data about the waste site to determine the rate and extent of contaminant migration resulting from the site, and the concentration of any contaminants that may be present.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – CERCLA was enacted by Congress in 1980 and was amended by the Superfund Amendments and Reauthorization Act in 1986. CERCLA provides federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites and established the Superfund Trust Fund.

Exposure – Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

Federal Facility Agreement – A binding legal agreement among USEPA, TCEQ, and U.S. Army that sets the standards and schedules for the comprehensive remediation of Longhorn Army Ammunition Plant.

Groundwater – Underground water that fills pores in soil or openings in rocks to the point of saturation.

National Priorities List (NPL) – The USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. USEPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

Record of Decision – A legal document presenting the remedial action selected for a site or operable unit. It is based on information and technical analyses generated during the remedial investigation/feasibility study process and consideration of public comments on the proposed plan and community concerns.

Resource Conservation and Recovery Act (RCRA) – Gives USEPA the authority to control the generation, transport, treatment, storage, and disposal of hazardous waste. RCRA focuses only on active and future facilities and does not address abandoned or historical sites.

Responsiveness Summary – A summary of oral and/or written comments received during the proposed plan comment period, including responses to these comments. The responsiveness summary is a key part of a ROD highlighting community concerns.

Proposed Plan – A plan for site cleanup that proposes a recommended or preferred remedial alternative. The Proposed Plan is available to the public for review and comment. The preferred alternative may change based on public and other stakeholder input.

Superfund Amendments and Reauthorization Act (SARA) – Amended CERCLA in 1986. SARA resulted in more emphasis on permanent remedies for cleaning up hazardous waste sites, increased the focus on human health problems posed by hazardous waste sites, and encouraged greater citizen participation in making decisions on how sites should be cleaned up.

Superfund – The common name used for CERCLA; also referred to as the Trust Fund. The Superfund Program was established to help fund cleanup of hazardous waste sites. It also allows legal action to force those responsible for sites to clean them up.

Appendix A

Public Notice and Media Release

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLANS FOR ENVIRONMENTAL SITES LHAAP-46, -49, -50, -35A(58), AND THE PISTOL RANGE, LONGHORN ARMY AMMUNITION PLANT, TEXAS

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed Proposed Plans for the following NPL sites: LHAAP-46, LHAAP-49, LHAAP-50, LHAAP-35A(58), and the Pistol Range. Although the Proposed Plans identify preferred remedies for each of the sites, the U.S. Army welcomes the public's review and comments. The public comment period begins January 25, 2010, and concludes February 23, 2010. **On Tuesday, January 26, 2010, from 6:00 to 8:00 p.m., the U.S. Army is inviting all interested parties to attend an open house forum to view the Proposed Plans and ask questions. The open house forum will be held at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas.** Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. Summaries of each of the sites, including discussion of various alternatives that were evaluated, are provided below.

LHAAP-46, the former Plant 2 production area, is located in the north-central portion of LHAAP and covers an area of approximately 190 acres. Plant 2 was used to produce pyrotechnic devices from February 1952 to 1956 and was reactivated to produce pyrotechnic and illumination devices from 1964 until approximately 1997. Three alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) monitored natural attenuation (MNA) and land use controls (LUCs); and 3) in situ bioremediation, short-term LUCs, and long-term monitoring (LTM). Based on available information, the preferred remedy is MNA and LUCs. The preferred remedy would utilize groundwater use restriction LUCs to protect human health by preventing human exposure to contaminated groundwater and MNA to return the contaminated water to its potential beneficial use as drinking water, wherever practicable.

LHAAP-49, a former Acid Storage Area, is located in the west-central portion of LHAAP and covers an area of approximately 30 acres. The site was used from 1942 to 1945 for formulation and storage of acids and acid mixtures in support of trinitrotoluene production. Based on available information, the preferred remedy at this time is no action. The recommendation is based on the existing data and determination of no unacceptable risk to human health or to ecological receptors at LHAAP-49.

LHAAP-50, a former sump water tank, is located in the north-central portion of LHAAP and covers an area of approximately 1 acre. Historically, LHAAP-50 contained a 47,000-gallon capacity aboveground storage tank which received wastewater from various industrial waste sumps from 1955 to 1988. Three alternatives were evaluated for addressing the contaminated groundwater and soil at the site: 1) no action; 2) soil - excavation, groundwater - MNA and LUCs; and 3) soil - excavation, groundwater - in situ bioremediation, MNA, and LUCs. Based on available information, the preferred remedy at this time is the second alternative: excavation and off-site disposal of perchlorate-contaminated soils, and MNA and LUCs for groundwater. The preferred remedy would ensure protection of human health by eliminating the soil-to-groundwater and soil-to-surface water pathways, implementing groundwater use restriction LUCs to prevent exposure to contaminated groundwater, and implementing MNA until groundwater cleanup levels are achieved.

LHAAP-35A(58), known as the Shops Area, is located in the north-central portion of LHAAP and covers approximately 11 acres. 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 and became inactive in 1996 and 1997. Four alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) MNA with LUCs; 3) in situ bioremediation with short-term LUCs and LTM; and 4) in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. Based on available information, the preferred remedy at this time is the fourth alternative: in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. The preferred remedy would ensure protection of human health by 1) implementing groundwater use restriction LUCs which prevent human exposure to contaminated groundwater and 2) returning the contaminated water to its potential beneficial use as a drinking water, wherever practicable, through MNA and in situ bioremediation.

The former **Pistol Range** is located in the southeastern portion of LHAAP and covers an area of approximately 0.4 acres. The area was used by base security personnel as early as the 1950s and intermittently through 2004 as a small arms firing range. The target area was a natural, wooded slope at the eastern side of the site. Soil with contamination above industrial cleanup levels was excavated and disposed off site during a 2009 removal action. Based on available information, the preferred remedy at this time is no action. The recommendation is based on existing data and determination of no unacceptable risk to human health or to ecological receptors.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLANS FOR ENVIRONMENTAL SITES LHAAP-46, -49, -50, -35A(58), AND THE PISTOL RANGE, LONGHORN ARMY AMMUNITION PLANT, TEXAS
PUBLIC MEETING AT KARNACK COMMUNITY CENTER MARCH 9, 2010

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency Region 6, the U.S. Army has developed Proposed Plans for the following NPL sites: LHAAP-46, LHAAP-49, LHAAP-50, LHAAP-35A(58), and the Pistol Range. Although the Proposed Plans identify preferred remedies for each of the sites, the U.S. Army welcomes the public's review and comments. The public comment period began January 25, 2010, and has been extended to March 25, 2010. **On Tuesday, March 9, 2010, from 7:00 to 9:00 p.m., the U.S. Army is inviting all interested parties to attend a public presentation of the proposed remedies for these sites and to ask questions and provide comments on the Proposed Plans. Questions, comments, and responses on the Proposed Plans will be recorded by a court reporter. This public meeting will be held at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas.** Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. Summaries of each of the sites, including discussion of various alternatives that were evaluated, are provided below.

LHAAP-46, the former Plant 2 production area, is located in the north-central portion of LHAAP and covers an area of approximately 190 acres. Plant 2 was used to produce pyrotechnic devices from February 1952 to 1956 and was reactivated to produce pyrotechnic and illumination devices from 1964 until approximately 1997. Three alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) monitored natural attenuation (MNA) and land use controls (LUCs); and 3) in situ bioremediation, short-term LUCs, and long-term monitoring (LTM). Based on available information, the preferred remedy is MNA and LUCs. The preferred remedy would utilize groundwater use restriction LUCs to protect human health by preventing human exposure to contaminated groundwater and MNA to return the contaminated water to its potential beneficial use as drinking water, wherever practicable.

LHAAP-49, a former Acid Storage Area, is located in the west-central portion of LHAAP and covers an area of approximately 30 acres. The site was used from 1942 to 1945 for formulation and storage of acids and acid mixtures in support of trinitrotoluene production. Based on available information, the preferred remedy at this time is no action. The recommendation is based on the existing data and determination of no unacceptable risk to human health or to ecological receptors at LHAAP-49.

LHAAP-50, a former sump water tank, is located in the north-central portion of LHAAP and covers an area of approximately 1 acre. Historically, LHAAP-50 contained a 47,000-gallon capacity aboveground storage tank which received wastewater from various industrial waste sumps from 1955 to 1988. Three alternatives were evaluated for addressing the contaminated groundwater and soil at the site: 1) no action; 2) soil - excavation, groundwater - MNA and LUCs; and 3) soil - excavation, groundwater - in situ bioremediation, MNA, and LUCs. Based on available information, the preferred remedy at this time is the second alternative: excavation and off-site disposal of perchlorate-contaminated soils, and MNA and LUCs for groundwater. The preferred remedy would ensure protection of human health by eliminating the soil-to-groundwater and soil-to-surface water pathways, implementing groundwater use restriction LUCs to prevent exposure to contaminated groundwater, and implementing MNA until groundwater cleanup levels are achieved.

LHAAP-35A(58), known as the Shops Area, is located in the north-central portion of LHAAP and covers approximately 11 acres. 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 and became inactive in 1996 and 1997. Four alternatives were evaluated for addressing the contaminated groundwater at the site: 1) no action; 2) MNA with LUCs; 3) in situ bioremediation with short-term LUCs and LTM; and 4) in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. Based on available information, the preferred remedy at this time is the fourth alternative: in situ bioremediation followed by MNA and LUCs for the eastern plume, and MNA and LUCs for the western plume. The preferred remedy would ensure protection of human health by 1) implementing groundwater use restriction LUCs which prevent human exposure to contaminated groundwater and 2) returning the contaminated water to its potential beneficial use as a drinking water, wherever practicable, through MNA and in situ bioremediation.

The former **Pistol Range** is located in the southeastern portion of LHAAP and covers an area of approximately 0.4 acres. The area was used by base security personnel as early as the 1950s and intermittently through 2004 as a small arms firing range. The target area was a natural, wooded slope at the eastern side of the site. Soil with contamination above industrial cleanup levels was excavated and disposed off site during a 2009 removal action. Based on available information, the preferred remedy at this time is no action. The recommendation is based on existing data and determination of no unacceptable risk to human health or to ecological receptors.

For further information or to submit written comments, contact: Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951; phone number 479-635-0110 or e-mail rose.zeiler@us.army.mil.

MEDIA RELEASE

The United States Army has prepared Proposed Plans for five environmental sites at the Longhorn Army Ammunition Plant: LHAAP-46, -49, -50, -35A(58) and the former Pistol Range. The Proposed Plans are documents that describe the sites and their proposed remedies. The Proposed Plans were developed to facilitate public involvement in the remedy selection process.

Copies of the Proposed Plans and supporting documentation are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670 beginning January 25, 2010. The public comment period has been extended to March 25, 2010.

An informal open forum was held on January 26, 2010. A second public meeting, with a formal question and answer session, will be held on March 9, 2010, from 7:00 to 9:00 p.m. at the Karnack Community Center, Highway 134 and Spur 449, Karnack, Texas 75661.

All written public comments on the Proposed Plans must be postmarked on or before March 25, 2010. Written comments may be provided to Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas 72951 or e-mailed to rose.zeiler@us.army.mil. E-mailed comments must be submitted by close of business on March 25, 2010.

Comments on Draft Record of Decision (published June 2010)
LHAAP-49, Former Acid Storage Area
Longhorn Army Ammunition Plant, Karnack, Texas

Comments Received: August 2010

Reviewer: Stephen Tzhone, U.S. Environmental Protection Agency
Respondents: Shaw Environmental, Inc.

1. Respondent Concurs (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	C, D[1], E or X	Response	A or D[2]
1	1-2	1.4 / 1	EPA recommends modification of this section under CERCLA Section 121(c), 42 U.S.C. § 9621(c). Unless this Site can support unlimited use and unrestricted exposure because hazardous substances no longer remain at the Site, then a five-year review will be required under CERCLA Section 121(c), and the FFA. As such, the following language would be appropriate, "Because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure, a five-year review will be conducted every five years to ensure protection of human health and the environment under CERCLA Section 121(c), 42 U.S.C. § 9621(c)."	C	The text recommended by EPA was incorporated.	
2	2-10	2.7.1 / 9	See comment # 1; EPA recommends insertion of the same language in this section, at the end of the last paragraph.	C	The text recommended by EPA was incorporated.	

Comments on Draft Record of Decision (published June 2010)
LHAAP-49, Former Acid Storage Area
Longhorn Army Ammunition Plant, Karnack, Texas

Comments Received: July 2010

Reviewer: Fay Duke, Texas Commission on Environmental Quality
Respondents: Shaw Environmental, Inc.

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

Comment #	Page	Section/ Paragraph	Comment	C, D[1], E or X	Response	A or D[2]
1	3-1	3.1 / 2	Our recommended changes to the response to comment on site LHAAP-49 are: "The elevated concentrations of mercury and lead that were known to exist at the site were subject to a risk analysis and found to be acceptable given the future land use. EPA concurred with this conclusion. However, TCEQ expressed concerns that the location of the elevated mercury concentration could be a hot spot that may pose potential unacceptable risk if a person(s) were to be exposed to this area repeatedly over a long period of time. Although the Army considered this scenario highly unlikely, in an effort to expedite closure of the site, the Army's contractor performed soil removal at and around the two sample locations with the highest mercury concentrations. This soil removal was not required based on risk calculations and was not done at the direction of the Army. Prior to off-site disposal, the excavated soil was subject to waste characterization using the toxicity characteristic leaching procedure."	C	Text revised as suggested.	

MEDIA RELEASE

The United States Army has prepared a Proposed Plan for the environmental site LHAAP-16 at the Longhorn Army Ammunition Plant. The Proposed Plan is the document that describes LHAAP-16 and its proposed remedies. The Proposed Plan was developed to facilitate public involvement in the remedy selection process.

Copies of the Proposed Plan and other supporting documentation for LHAAP-16 are available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. The public comment period is October 10, 2010 through November 9, 2010.

A public meeting will be held on October 19, 2010, from 7:00 to 9:00 p.m. at the Caddo Lake State Park Group Recreation Hall located at 245 Park Road 2 off FM 2198, between SH 43 and Old Farm to Market Road 134 near Karnack, Texas, approximately 1 mile north from the front gate of the former Longhorn Army Ammunition Plant. The park entrance fee will be waived for attendees of this meeting.

All written public comments on the Proposed Plan must be postmarked on or before November 9, 2010. Written comments may be provided to Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant, P.O. Box 220, Ratcliff, Arkansas, 72951 or e-mailed to rose.zeiler@us.army.mil. E-mailed comments must be submitted by close of business on November 9, 2010.

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Thursday, September 23, 2010 2:32 PM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(1)

This message was sent via FAXCOM, a product from Biscom Inc. http://www.biscom.com/

-------Fax Transmission Report-------

To:	KTBS3 at 9033340288
Subject:	Media Release
Result:	The transmission was successful.
Explanation:	All Pages Ok
Pages Sent:	3
Connect Time:	0 minutes, 56 seconds
Transmit Time:	09/23/2010 14:31
Transfer Rate:	14400
Status Code:	0000
Retry Count:	0
Job Id:	9002
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1009231930500523
Fax Line:	8
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Thursday, September 23, 2010 2:33 PM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(2)

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-------Fax Transmission Report-------

To:	KMSS at 3186314194
Subject:	Media Release
Result:	The transmission was successful.
Explanation:	All Pages Ok
Pages Sent:	3
Connect Time:	1 minutes, 12 seconds
Transmit Time:	09/23/2010 14:31
Transfer Rate:	14400
Status Code:	0000
Retry Count:	0
Job Id:	9003
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1009231931230524
Fax Line:	4
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Thursday, September 23, 2010 2:33 PM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(3)

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To:	KSLA at 3186776705
Subject:	Media Release
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Pages Sent:	3
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Transmit Time:	09/23/2010 14:32
Transfer Rate:	14400
Status Code:	0000
Retry Count:	0
Job Id:	9004
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1009231931570525
Fax Line:	6
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Thursday, September 23, 2010 2:34 PM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

4

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Transfer Rate:	14400
Status Code:	0000
Retry Count:	0
Job Id:	9005
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1009231932270526
Fax Line:	8
Fax Server:	127.0.0.1

Norris, Mary

From: faxadmin [faxadmin@shawgrp.com]
Sent: Thursday, September 23, 2010 2:35 PM
To: Norris, Mary
Subject: Fax: Tx 'ok' Report

(5)

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To:	KETK at 9035612459
Subject:	Media Release
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Explanation:	All Pages Ok
Pages Sent:	3
Connect Time:	0 minutes, 55 seconds
Transmit Time:	09/23/2010 14:33
Transfer Rate:	14400
Status Code:	0000
Retry Count:	0
Job Id:	9006
Unique Id:	ENTBTRFAX01_SMTPFaxQ_1009231933000527
Fax Line:	4
Fax Server:	127.0.0.1

LONGHORN ARMY AMMUNITION PLANT,

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE: Tuesday, 21 September 2010
TIME: 1:00 p.m.
PLACE:
Teleconference, Call-in-Number Courtesy of Shaw: 866-797-9304/4155734

Welcome **RMZ**

Action Items

Army

- Provide update on sampling of sumps at LHAAP-65

Shaw

- Provide weekly updates on the field work at LHAAP-47

Defense Environmental Restoration Program (DERP) PBC Update **PS/GJ**

- Document Status/Environmental Sites (Table)
- LHAAP-47 field update
- Proposed Plans - Status
- Records of Decision - Status
- INF Pond liner repair - Status
- Groundwater Treatment Plant
- Marshall Public Library Administrative Record Switch to Electronic Status

DERP Total Environmental Restoration Contract Update **RMZ**

- LHAAP-37/67 – Status of RD
- Remaining TERC Recordations

BRAC-Funded Environmental Restoration

- LHAAP-19 – Demolition Landfill Progress **JRL/AW**

MMRP Update

- Address EPA-TCEQ Responses to Perchlorate Memo **RMZ**

USFWS Update **RMZ/PB**

- Receipt of Documents for Review
- OPS and Proposed Remedies

Other Issues **RMZ**

- Sitewide Schedule Review – Critical Documents
- RAB

Adjourn

Shaw® Shaw Environmental, Inc.

Subject: **Final Minutes, Monthly Managers Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: **Teleconference**
Date of Meeting: **September 23, 2010; 1:00 PM – 2:30 PM**

Meeting Participants:

USACE-Tulsa:	Aaron Williams, John Lambert
Shaw:	Praveen Srivastav, Susan Watson, Kay Everett
USEPA Region 6:	Steve Tzhone, Terry Burton
TCEQ:	Fay Duke, Dale Vodak

Welcome **John Lambert**

Action Item Status:

Army

- Provide update on the sampling of two sumps at LHAAP-65. Aaron indicated that the results were back from the samples collected at the two sumps. One of the four samples collected indicated mercury was present. LHAAP-65 is not a NPL site. LHAAP-65 was not part of the original LHAAP-35/36 Sump and Waste Sump survey conducted as it had apparently slipped through the cracks. The soil sample for mercury was 0.62 mg/kg with the SAI of 0.15 mg/kg. They will complete a data quality review and will submit a draft report shortly. There was no sediment or residue in the bottom of the sumps to sample. The water samples collected were below the Risk Reduction Standard 2 MSC.
- Provide FY11 schedule to EPA. The Master Site Schedule will be distributed shortly. Steve said that he would forward it to Fay.

Shaw

- Provide information on the high reporting limits for TCE at 47DPT03 and 47DPT05. The samples were reanalyzed using lower detection limits. The new results were below the detection limit of 0.25 µg/L and is still non-detect but below the screening level.
- Installed intermediate DPTs east of 47WW34. No contaminants were detected.
- Provide weekly updates on the field work at LHAAP-47. Updates are conducted weekly and a status on the field work will be presented later in this meeting.

Defense Environmental Restoration Program (DERP) PBC Update **Praveen Srivastav**

Document Status/Environmental Sites
Praveen Srivastav went over the document status/environmental sites table.

- LHAAP-02: TCEQ concurrence letter was received and the Final Decision Document was submitted.
- LHAAP-03: The Army comments were received and RTC is in preparation.
- LHAAP-04: The Draft Final Completion Report is in regulatory review. Awaiting groundwater sample results.
- LHAAP-16: The Final Proposed Plan document for LHAAP-16 was submitted earlier this week. The public meeting is scheduled for October 19, 2010, and the newspaper notices will be published in this Sunday's papers.
- LHAAP-17: The preliminary draft ROD is in Army's review.
- LHAAP-18/24: Responses on the Draft (Final) Feasibility Study are being resolved and expect they will be submitted to Army by the end of the week or early next week.
- LHAAP-29: The Draft Proposed Plan is in comment resolution with the Army. A draft to the regulators is under preparation.
- LHAAP-46: The Final Record of Decision is currently undergoing final comment resolution between the Army and EPA.
- LHAAP-47: The Draft Final Feasibility Study for LHAAP-47 is in progress. Currently field investigations are being conducted as required by the regulators including installation of new wells, DPT soil sampling, and groundwater sampling.
- LHAAP-49/PR: The Final RODs for LHAAP-49 and the Pistol Range is in the signature phase.
- LHAAP-50: The draft final ROD is currently undergoing final comment resolution between the Army and EPA.
- LHAAP-58: The draft final ROD is currently undergoing final comment resolution between the Army and EPA.
- LHAAP-35/36: The Final Decision Document is in review with TCEQ for final proposed change to document.

LHAAP-47 Field Update
Sections of the FS for LHAAP-47 are being revised as data is being received. Early results from some of the groundwater samples collected at LHAAP-47 have started coming in from the field work. The direct push drilling unit has been demobed. The well at 47WW25 that had a historic high concentration of TCE was still dry. A shallow DPT temporary well was installed near 47WW25 at a deeper level in order to collect a water sample since the existing well has been dry. First water was encountered about 3 feet below the well, and TCE was detected. Also, an intermediate well (47WW37) was installed near 47WW25, and results from the 47WW37 intermediate well indicated that perchlorate was detected (concentration was below the cleanup level). The nearby shallow DPT temporary well indicated perchlorate was not detected. Fay asked where the perchlorate was coming from if not from the top down. A discussion followed. Fay asked what operation was upgradient to this location. The site to the west of LHAAP-47 is known as LHAAP-05 and was the "powerhouse boiler pond". There are no wells at this site since there were no environmental concerns. So no known source exists upgradient of this well.

Sampling results have been consistent with historical data. Previously reported samples from 47DPT03 and 47DPT05 showed initial results of 12.5 U µg/L for TCE and were reanalyzed with

results below the lower detection limit of 0.25 µg/L Soil sampling around Building 25-C at LHAAP-47 had also been completed with no detections for perchlorate above the clean up goal.

Proposed Plans – Status
Various proposed plans are in different stages. Currently, LHAAP-16 is almost complete and will be finalized this week.

Records of Decision – Status
This was addressed above.

INF Pond Liner Repair – Status
Shaw is looking for a borrow area for the soil needed to repair the soil cover at the INF pond. Shaw sampled the soil from two off-site borrow areas but arsenic concentrations from these samples exceeded background. There are small trees at the top of the slope where the water doesn't encroach but there is concern that the trees may have penetrated the plastic. Shaw plans to cut these trees. Fay asked when the repairs may be done as she or someone from TCEQ should take a look at it. Praveen said it would probably occur in 2 to 3 weeks. Dale said that he would be available to take a look at the liner before the repairs are done.

Groundwater Treatment Plant
The plant is running normally and treating water 4 days a week. Shaw is doing some maintenance work and the pumps are being repainted, etc. The amount of water processed is reduced during the weekend and then increased during the week. All pumps are working at full capacity, and there have been no major outages.

Marshall Public Library Administrative Record Switch to Electronic Status
The Marshall Public Library has submitted a request to prohibit sending them the paper copies of the Administration Record due to size and space constraints. The Fish and Wildlife Service expressed an interest in taking the library copies of the Administrative Record for Longhorn. John indicated the hard copies should go to the Army Trailer unless the Army Trailer already has a copy.

DERP Total Environmental Restoration Contract Update

LHAAP-37/67 –Status of RD
The RD is close to completion and should be available to regulators within the next couple of weeks.

Remaining TERC Recordations
Army received approval on the deed recordations and will need to file the documents at the courthouse.

BRAC-Funded Environmental Restoration

LHAAP-19 – Demolition Landfill Progress
The closure report has been completed and the copies will be submitted to Fay soon, then the deed recordation documentation needs to be performed.

MMRP Update

Address EPA- TCEQ Responses to Perchlorate Memo

The discussion is ongoing on how to handle the monitoring requirement from pre-ROD and post-ROD. They are currently awaiting direction.

USFWS Update

Receipt of Documents for Review
Paul Bruckwicki had said at last month's meeting that he was not having any problems receiving the environmental documents for the installation. This item was left on the agenda from last meeting and will be removed.

OPS and Proposed Remedies
This was not discussed.

Other Issues

Site-wide Schedule Review – Critical Documents
This document is routinely updated and presented to the RAB each time. Steve would like to have the submittal dates or end dates. John suggested that another column be added to the table to enable this data to be incorporated easily.

Language in the FFA indicates that a 30-day dispute resolution is in place after regulators review documents assuming there is no change between the draft final and the final. Otherwise, the changes should be presented for concurrence or approval. Steve indicated that there should not be that much time between the draft final and final versions of a document. Praveen asked him what that would be in weeks. Steve said that maybe 2 weeks would suffice. A discussion followed on draft, draft final, and final document review process.

It was noted that 5 RODs have been slated for signature. Steve hadn't seen LHAAP-50 or 58 yet; but he said the ROD for LHAAP-46 has already been past legal. John said that he thought we were on track for the rest of the RODs.

RAB
Aaron tracked changes to the RAB charter and presented those proposed changes to the RAB for discussion last month. Nine new RAB members were seated at the RAB meeting in August. There are two new members that will be seated at October's meeting. Notices have gone out regarding the next RAB meeting which will be held at Caddo Lake State Park. The Public Meeting for LHAAP-16 will be held that evening following the RAB.

Meeting Adjourned

Next meeting is set for October 19, 2010 at Longhorn AAP with a RAB meeting to follow that evening.

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
September 21, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
1	Final Decision Document, signedLHAAP-02	8/03/10	x	x	Final (signed and with Appendix A-concurrence letter)	9/30/10	x	x		TCEQ concurrence received. Final document in preparation for distribution	
2	Draft Soil Removal Work Plan, LHAAP-03	7/15/10	x		Draft Final	09/30/10	x	x		Army comments received. RTC in preparation	
3	Draft Final Completion Report, LHAAP-04	05/24/10	x	x	Final	10/15/10	x	x		In regulatory review.	
4	Draft Proposed Plan, LHAAP-16	4/30/10	x		Final	9/24/10	x	x		Final proposed plan in preparation.	Public meeting scheduled for 10/19/10
5	Final Proposed Plan, LHAAP-17	5/21/10	x	x						Final submitted May 21, 2010	
6	Preliminary Draft Record of Decision, LHAAP-17	9/17/10	x							In Army's review	
7	Draft (Final) Feasibility Study, LHAAP-18/24	5/13/09	x	x	Draft Final	10/30/10	x	x		Received EPA and TCEQ comments on 8/5/10	
8	(Preliminary) Draft Proposed Plan, LHAAP-29	5/21/10	x		Draft Proposed Plan	9/30/10	x	x	In progress	Received Army comments; DRAFT to regulators under preparation	

Shaw® Shaw Environmental, Inc.

Status of Sites and Technical Documents
Longhorn Army Ammunition Plant – PBC Contract
September 21, 2010

No.	Document in Progress	Submittal Date	Army	Regulator	Next Submittal	Expected Date	Army	Regulator	Comment Resolution	Status	**Remarks**
9	(Preliminary) Draft Record of Decision, LHAAP-46	04/30/10	x		Final Record of Decision, LHAAP-46	9/30/10	x	x	In progress	Currently undergoing final comment resolution between Army and EPA	
10	Draft (Final) Focused Feasibility Study, LHAAP-47	04/15/10	x	x	Revised Draft to Army	10/15/10	x		In progress	Currently field investigations in progress as required by regulators. Installing wells, and DPT soil and groundwater sampling	
11	Draft Final Record of Decision, LHAAP-49	6/17/10	x	x	Final	9/30/10	x	x	In progress	In signature phase with the EPA	
12	(Preliminary) Draft Record of Decision, LHAAP-50	05/7/10	x		Final	9/30/10	x	x	In progress	Currently undergoing final comment resolution between Army and EPA	
13	(Preliminary) Draft Record of Decision, LHAAP-58	05/14/10	x		Final	9/30/10	x	x	In progress	Currently undergoing final comment resolution between Army and EPA	
14	Draft Final Decision Document, LHAAP-35/36	05/6/10	x	x	Final	9/30/10	x	x	In progress	Submitted proposed changes for TCEQ review	
15	Draft Final Record of Decision, Pistol Range	6/17/10	x		Final	9/30/10			In progress	In signature phase with the EPA	

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STATE OF TEXAS
COUNTY OF HARRISON

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-16 LONGHORN ARMY AMMUNITION PLANT, TEXAS PUBLIC MEETING ON OCTOBER 19, 2010, AT THE CADDO LAKE STATE PARK RECREATIONAL FACILITY

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and U.S. Environmental Protection Agency Region 6 (USEPA), the U.S. Army has developed the Proposed Plan for site LHAAP-16. Although the Proposed Plan for LHAAP-16 identifies the preferred remedy for the site, the U.S. Army welcomes the public's review and comments. Beginning on October 10, 2010, copies of the Proposed Plan and supporting documentation will be available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. The public comment period is October 10, 2010, through November 9, 2010. **The public meeting will be held on Tuesday, October 19, 2010, at the Caddo Lake State Park Group Recreation Hall from 7:00 PM to 9:00 PM.** Caddo Lake State Park is located at 245 Park Road 2 near Karnack, Texas off of FM 2198 between SH 43 and Old Farm to Market Road 134, approximately 1 mile north from the Karnack Post Office (and front gate of the former Longhorn Army Ammunition Plant). The park entrance fee will be waived for attendees of this meeting. Questions, comments, and responses on the Proposed Plan will be recorded by a court reporter during the public meeting. Written comments will be accepted throughout the public comment period.

Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor-operated and -maintained industrial facility located in central-east Texas in the northeastern corner of Harrison County. The installation occupies nearly 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. LHAAP was established in December 1941 near the beginning of World War II for the manufacture of trinitrotoluene. Other past industrial operations at the installation included the use of secondary explosives, rocket motor propellants, and various pyrotechnics, such as illuminating and signal flares and ammunition. LHAAP was found to have actual and potential releases of hazardous substances or pollutants or contaminants associated with past operations, and it was added to the National Priorities List (NPL) in 1990.

LHAAP-16 encompasses an area of approximately 20 acres in the south-central portion of LHAAP. Approximately 13 acres are a capped landfill, and the remainder is an area with associated groundwater contamination. Harrison Bayou runs along the northeastern edge of LHAAP-16. The landfill was established in the 1940s and was used for disposal of solid and industrial wastes until the 1980s when disposal activities were terminated. The Army and USEPA signed a Record of Decision in 1995 approving an interim remedial action for LHAAP-16 to mitigate potential risks posed by buried material at the landfill. The interim remedial action included the construction of a multilayer landfill cap, which was completed in 1998.

The current Proposed Plan for LHAAP-16 addresses groundwater contamination as well as the material buried in the landfill at the site. Continued maintenance of the existing landfill cap has been retained as a component of most of the remedial alternatives considered for the site. In addition, most alternatives include specific measures for groundwater remediation, and all alternatives utilize some degree of land use controls (LUCs). The full list of alternatives is: 1) No action; 2) Cap, enhanced groundwater extraction; 3a) Cap, monitored natural attenuation; 3b) Cap, hot spot extraction, monitored natural attenuation; 4) Cap, passive groundwater treatment; 5a) Landfill hotspot removal, passive groundwater treatment; 5b) Complete landfill removal, passive groundwater treatment; 6) Landfill Source Treatment (in situ), monitored natural attenuation; and 7) Cap, monitored natural attenuation, in situ enhanced bioremediation, passive bio barriers. Based on available information, the preferred remedy is Alternative 7, which addresses the groundwater contamination at LHAAP-16 in a manner that is cost-effective and consistent with the Army's intent to transfer the site to the USFWS for use as a wildlife refuge. Alternative 7 would be protective of human health due to the implementation of LUCs prohibiting unauthorized use of the cap and groundwater, thereby eliminating the potential contaminant exposure pathways for human receptors. The bioremediation and bio barriers would reduce contaminant concentrations in groundwater and prevent discharge of contamination to Harrison Bayou.

For further information or to submit written comments, contact:
Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant,
P.O. Box 220, Ratcliff, Arkansas, 72951;
phone number 479-635-0110
or e-mail rose.zeiler@us.army.mil.

On this 28th day of September, 20 10
nally appeared before me the undersigned, a Notary Public
l for said county and state.

Dianne Gray

MARSHALL NEWS MESSENGER, a daily newspaper
hed at MARSHALL, County of HARRISON, State of
S, who, being by me duly sworn, states that the attached
tisement, a true copy of which is hereto annexed, was
hed in said newspaper in its issues thereof on the following

26th day of September 20 10
____ day of ____ 20 ____
____ day of ____ 20 ____
____ day of ____ 20 ____
____ day of ____ 20 ____
____ day of ____ 20 ____

Dianne Gray
IE

Subscribed and sworn to before me this 28th
September 20 10.

Dana S Morton

Notary Public, Harrison County, Texas

mmision
3-21-13

DANA MORTON
MY COMMISSION EXPIRES
March 21, 2013

2030 LEGAL NOTICES

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-16 LONGHORN ARMY AMMUNITION PLANT, TEXAS
PUBLIC MEETING ON OCTOBER 19, 2010, AT THE CADDO LAKE STATE PARK RECREATIONAL FACILITY

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The current Proposed Plan for LHAAP-16 addresses groundwater contamination as well as the material buried in the landfill at the site. Continued maintenance of the existing landfill cap has been retained as a component of most of the remedial alternatives considered for the site. In addition, most alternatives include specific measures for groundwater remediation, and all alternatives utilize some degree of land use controls (LUCs). The full list of alternatives is: 1) No action; 2) Cap, enhanced groundwater extraction; 3a) Cap, monitored natural attenuation; 3b) Cap, hot spot extraction, monitored natural attenuation; 4) Cap, passive groundwater treatment; 5a) Landfill hotspot removal, passive groundwater treatment; 5b) Complete landfill removal, passive groundwater treatment; 6) Landfill Source Treatment (in situ), monitored natural attenuation; and 7) Cap, monitored natural attenuation, in situ enhanced bioremediation, passive bio barriers. Based on available information, the preferred remedy is Alternative 7, which addresses the groundwater contamination at LHAAP-16 in a manner that is cost-effective and consistent with the Army's intent to transfer the site to the USFWS for use as a wildlife refuge. Alternative 7 would be protective of human health due to the implementation of LUCs prohibiting unauthorized use of the cap and groundwater, thereby eliminating the potential contaminant exposure pathways for human receptors. The bioremediation and bio barriers would reduce contaminant concentrations in groundwater and prevent discharge of contamination to Harrison Bayou.

For further information or to submit written comments, contact:
Dr. Rose M. Zeiler, Longhorn Army Ammunition Plant,
P.O. Box 220, Ratcliff, Arkansas, 72951;
phone number 479-635-0110
or e-mail rose.zeiler@us.army.mil.

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

DISTRICT 06 Rule 37 Case No. 0267451
DATE OF ISSUANCE: Sep 15, 2010
Status/Permit No. 702057
NOTICE OF PROTEST DEADLINE: 5:00 PM, Oct 27, 2010
Address: Railroad Commission of Texas
ATTN: Drilling Permit Unit
P. O. Box 12967
Austin, Texas 78711-2967
Fax: (512) 463-7324
Email: SWR37@RRC.STATE.TX.US

NOTICE OF APPLICATION

NOTICE IS HEREBY GIVEN that the SAMSON LONE STAR, LLC, [RRC Operator No. 744737] has made

3018 EDUCATION/ TRAINING

Secondary Science Teacher: Bachelor's degree in Education/Science (or similar) and its equivalency accepted. Licence to Teach in area. Dr. Sharon Ross, Superintendent 1600 MLK Dr., Jefferson, TX 75657. **MAIL RESUMES ONLY.**

3023 GENERAL

MLI, TX, Provider of Services for People with Mental Retardation seeks self motivated individual for the position of Home Supervisor. Applicants must have high school diploma or equivalent and experience in the field. Send Resume to: Robert Harms, Administrator, P.O. Box 8316, Marshall, TX 75671.

3024 HEALTH CARE

★★★★★
SOCIAL WORKER needed for Hospice/ Homecare LMSW or LBSW, Pay per visit, flexible hours. Mail resume to Marshall Homecare & Hospice, 111 E. Burleson, Marshall, Tx. 75670 or fax 903-923-8624

TEXAS STATE OPTICAL Receptionist & Doctor's Assistant, 8:15-5:30 M-F. Drug test & ref. req. Apply @ 2306 End Blvd. South. Previous applicants need not apply.

✔✔✔✔✔
Thompson Home Health has the following positions available: a FT Marketer, a PT, and an OT. Please fax resume: 903-938-6309

Superior Hiring Event
Come meet us in Longview this Thursday!

Cement Operators & Supervisors
Slickline Assistants & Operators
Oilfield Experience & More

Thursday, September 30th
11:00 am to 2:00 pm
4:00 pm to 7:00pm
Holiday Inn Express in Longview

RSVP online now!
http://budurl.com/SREL

Also hiring in Shreveport on 10/1
Sign up at http://budurl.com/SRES

Superior Opportunities.
Superior Stability.
Superior Careers.
866-771-4490

SUPERIOR ENERGY SERVICES

3024 HEALTH CARE

3024 HEALTH CARE

LIFECARE HEALTH SERVICES
Has An Opening For
RN for Home Health Visits
Fax resume to 903-297-7020 Attn: David
or apply at: 1809 Gilmer Rd, Longview

If you are an RDA Dental Assistant and want to teach, we need instructors for day and evening

Heritage House of Marshall
COME GROW WITH US!
Now hiring:
Full-Time LVNs
Night Shift 10-6
Competitive wage, Good benefits

3037 MAINTENANCE

HANDY/ MAINTENANCE MAN
Small Non-Profit organization seeking a Handy/Maintenance Man who will be responsible for overall facility maintenance and upkeep, working 30 hrs a week. Must have the ability to lift items up to 50lbs without assistance, be proficient in correcting minor electrical, plumbing and construction problems and will be responsible for obtaining bids and hiring contractors. Also experence in operation and repairs of maintenance equpment preferred. High School Diploma or equivalent required. Salary is $13.00 per hour. Criminal History background check and drug test required. No phone calls, please. Come to **410 West Grand Avenue to fill out an application Monday-Friday 8:30 a.m. to 4:30 p.m.**

3042 MANUFACTURING/ OPERATIONS

MANPOWER *Will Put* YOU *to Work* TODAY!
Manpower is looking for experienced
AIRLESS SPRAY PAINTERS
Please call our office today for us to set you up with an interview. You must have at least 3 years of verifiable work experience in this field. Must have experience in mixing paints and sand blasting as well as be able to use industrial airless spray paint equipment. Pay is $12.90 per hour and must be open to 1st or 2nd shift.
903-759-4458
Manpower

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3049 OILFIE

Class A CDL D field Service now hiring Cla drivers w/ tan endorsement. 1 yr. verifiabl exp. Local wo daily. Company P l e a s e 903-327-2634.

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Energy Services, Inc
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The Times

PROOF OF PUBLICATION

STATE OF LOUISIANA

PARISH OF CADDO

Before me, the undersigned authority, personally came and appeared

Altheas Critton personally known to me,

Who being duly sworn, deposes and says that she is the Assistant to the Classified Advertising Manager of The Times, and that the attached Advertisement entitled:

PUBLIC NOTICE THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR ENVIRONMENTAL SITE LHAAP-16 LONGHORN ARMY AMMUNITION PLANT, TEXAS PUBLIC MEETING ON OCTOBER 19, 2010, AT THE CADDO LAKE STATE PARK RECREATIONAL FACILITY

The Times on the following dates to wit:

September 26, 2010

(Signed) Altheas Critton

Sworn to and subscribed before me this 27th day of September, 2010

Diana W. Barber

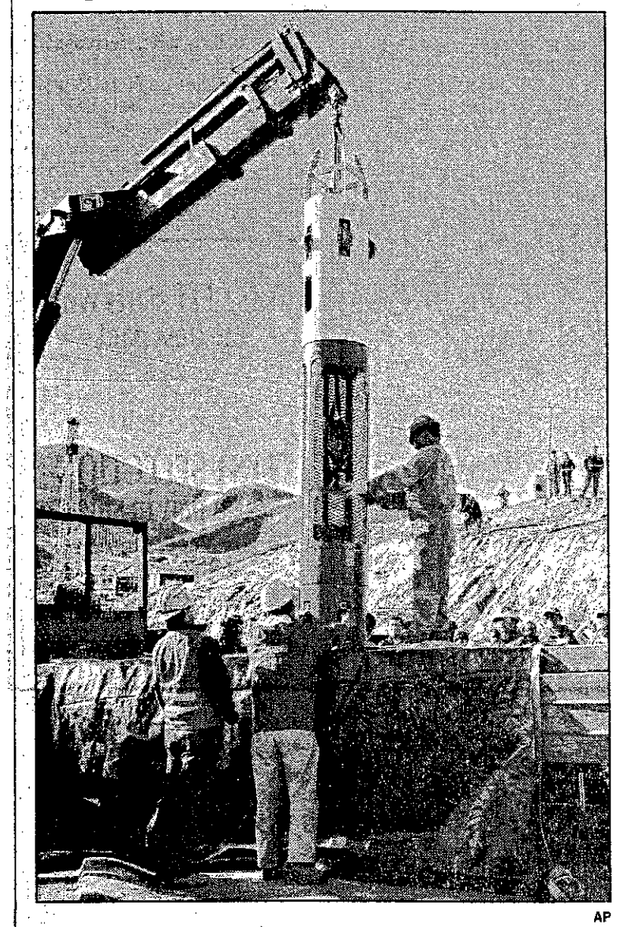
DIANA W. BARBER, NOTARY PUBLIC # 60491
CADDO PARISH, LOUISIANA
MY COMMISSION IS FOR LIFE

(Notary)

GANNETT

00098590

Capsule to help rescue miners



AP

Workers move a capsule that will be used to rescue trapped miners from the collapsed San Jose mine in Copiapo, Chile, on Saturday. Thirty-three miners have been trapped deep underground in the copper and gold mine since it collapsed Aug. 5. The man-size capsule will be used to pull the miners out one by one once one of the three rescue holes being drilled reach the men. The government says that should happen by early November or earlier if all goes well.

Lawyer questions Calif. execution set before key election seat battle

By Paul Elias
The Associated Press

SAN FRANCISCO — San Quentin Prison's warden walked to the death row cell of Albert Greenwood Brown on Aug. 31 and read a war-

Political play

During his campaign for attorney general — and now for governor — Jerry Brown promised to "enforce the

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN
FOR ENVIRONMENTAL SITE LHAAP-16
LONGHORN ARMY AMMUNITION PLANT, TEXAS
PUBLIC MEETING ON OCTOBER 19, 2010, AT THE CADDO LAKE STATE PARK RECREATIONAL FACILITY

The U.S. Army is the lead agency for environmental response actions at Longhorn Army Ammunition Plant (LHAAP). In partnership with Texas Commission on Environmental Quality and U.S. Environmental Protection Agency Region 6 (USEPA), the U.S. Army has developed the Proposed Plan for site LHAAP-16. Although the Proposed Plan for LHAAP-16 identifies the preferred remedy for the site, the U.S. Army welcomes the public's review and comments. Beginning on October 10, 2010, copies of the Proposed Plan and supporting documentation will be available for public review at the Marshall Public Library, 300 S. Alamo, Marshall, Texas, 75670. The public comment period is October 10, 2010, through November 9, 2010. **The public meeting will be held on Tuesday, October 19, 2010, at the Caddo Lake State Park Group Recreation Hall from 7:00 PM to 9:00 PM.** Caddo Lake State Park is located at 245 Park Road 2 near Karnack, Texas off of FM 2198 between SH 43 and Old Farm to Market Road 134, approximately 1 mile north from the Karnack Post Office (and front gate of the former Longhorn Army Ammunition Plant). The park entrance fee will be waived for attendees of this meeting. Questions, comments, and responses on the Proposed Plan will be recorded by a court reporter during the public meeting. Written comments will be accepted throughout the public comment period.
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