REGULATORY DRAFT
SUMMARY TECHNICAL MEMORANDUM
COMPOSITE SURFACE SOIL SAMPLING EVENT
SHERMAN HEIGHTS SMALL ARMS RANGE (SHSAR) IMPACT SLOPE

FORT RILEY, KANSAS

Prepared for:

U.S. Army Corps of Engineers, Omaha District
1616 Capitol Avenue
Omaha, Nebraska 68102-4901

Contract No. W9128F-16-D-0044

Task Order No: 0002

Prepared by:

TEHAMA, LLC
1600 Genessee Street, Suite 754
Kansas City, MO 64102

August 2020

TABLE OF CONTENTS

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Global Laboratories
Bay West	Bay West, LLC
bgs	below ground surface
COPC	chemicals of potential concern
DoD	Department of Defense
DGM	digital geophysical mapping
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ft	feet
GPS	global positioning system
KDHE	Kansas Department of Health and Environment
LOD	limit of detection
LTM	long-term monitoring
LUC	Land Use Controls
MC	munitions constituents
MD	munitions debris
MEC	munitions explosives concern
mg/kg	milligrams per kilogram
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
PP	Proposed Plan
ppm	parts per million
QCSR	Quality Control Summary Report
RCRA	Resource Conservation and Recovery Act
RDP	Remedial Design Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RIP	Remedy in Place
RLS	Registered Land Surveyor
ROD	Record of Decision
RSL	Regional Screening Level

RTK	real time kinematic
SHSAR	Sherman Heights Small Arms Range
SI	Site Investigation
TCLP	toxicity characteristic leaching procedure
Tehama	Tehama, LLC
Tukuh	Tukuh Technologies, LLC
TRW	Technical Review Workgroup for Lead
USACE	U.S. Army Corps of Engineers
XRF	X-ray fluorescence

1.0 INTRODUCTION

This Summary Technical Memorandum discusses the 2020 composite surface soil sampling event conducted by Tehama, LLC (Tehama) at the Sherman Heights Small Arms Range (SHSAR) located at Ft. Riley, Kansas. In November 2017, following the establishment of Land Use Controls (LUCs), Tehama performed routine long-term monitoring (LTM) at the SHSAR in accordance with the approved Record of Decision (ROD) and collected 48 surface soil samples (40 parent samples, 4 duplicate, 2 matrix spikes and 2 matrix spike duplicates (Tehama, 2020). LTM surface soil sampling was performed around the perimeter of the fence line to confirm that lead was not migrating downslope beyond the remedy fence line. Due to lead concentrations at three discrete sample locations (SP17, SP38, and SP39) along the perimeter of the fence exceeding the remediation goal of 400 milligrams per kilogram (mg/kg) listed in the ROD, additional composite sampling to further characterize lead concentrations in the area of these samples was performed April 27th, 2020 in compliance with US Environmental Protection Agency (EPA) and Kansas Department of Health and Environment (KDHE) letters dated 11 September 2018 and 28 June 2018, respectively. EPA and KDHE letters are included in Appendix F.

1.1 Sampling Objectives

Composite surface soil sampling was conducted to further characterize lead concentrations at three discrete surface soil sample locations (SP17, SP38 and SP39) which exceeded the remediation goal of 400 mg/kg during the November 2017 routine LTM surface soil sampling event. Composite samples were collected near the base of the slope along the southern fence line at discrete sample location SP17 and side slope along the western fence line at discrete sample locations SP38 and SP39.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

Fort Riley is located in portions of Clay, Geary and Riley counties between the cities of Salina and Topeka in north central Kansas. The Installation covers more than 100,000 acres, which are divided into six cantonment areas (Main Post, Camp Forsyth, Camp Funston, Camp Whitside, Marshall Army Airfield and Custer Hill), maneuver areas, firing ranges and an Impact Area. Portions of Fort Riley are bounded by the cities of Riley, Junction City and Ogden, Kansas (Bay West, 2014a).

The SHSAR Impact Slope is a Munitions Response Site (MRS) that falls under the Military Munitions Response Program (MMRP) and is located near the southern Post boundary. The SHSAR extends approximately 150 to 400 feet (ft) wide by 8,000 ft in length (52.00 acres) and is located between the Colyer Manor military family housing complex and the Sherman Heights highlands (Bay West, 2014a). A Site Location Map, Figure 1 in Appendix A, details the site and surrounding features.

2.2 Summary of Contamination

In November 2010, Bay West, LLC (Bay West), completed the field phase of the Remedial Investigation (RI), including characterization for subsurface anomalies using digital geophysical mapping (DGM) and

intrusive assessment across 16 acres, and real-time analog survey (mag and dig) across 36 acres (Bay West, 2014b). More than 2,000 subsurface anomalies were evaluated and three munitions explosives concern (MEC) items were identified during the intrusive assessment. Approximately 700 pounds of munitions debris (MD) and 5,700 pounds of non-MD were removed from the MRS.

An additional evaluation for munitions constituents (MC) in soil and groundwater was conducted based on the results of the RI. Incremental soil samples were collected from 0 to 0.5 ft bgs with the top surface soil removed to ensure the aliquot sample was not collected from surface slough. The 15 samples were analyzed by Bay West for Resource Conservation and Recovery Act (RCRA) metals (excluding mercury) by method 6010C and explosives by method 8330B. Lead was the only chemical of potential concern detected above the KDHE Tier 2 Risk-Based Residential Standard of 400 mg/kg. Lead concentrations for incremental soil sampling ranged from 14 mg/kg to 1,300 mg/kg.

Although groundwater sample collection was attempted at nine locations within three areas of the MRS, water was only encountered in the central portion of the MRS. One groundwater sample was collected from an interval between 54-56 feet below ground surface (bgs) and analyzed for RCRA metals (excluding mercury) by method 6010C and explosives by method 8330B (Bay West, 2014a). Explosives were not reported above the laboratory limit of detection (LOD) and metals were below the KDHE Tier 2 Risk-Based Residential Standards or the laboratory LOD.

To further delineate the horizontal and vertical extent of previously detected lead-impacted soil, supplemental X-ray fluorescence (XRF) analysis was completed. A total of 163 soil samples were collected from 0 to 0.5 ft bgs and an additional seven discrete samples were collected from 0.5 to 1.0 ft bgs and were analyzed with an XRF. Lead concentrations ranged from less than the LOD to 1,315 mg/kg, with 44 samples exceeding the field screening criteria of 300 mg/kg. Additional samples were collected from each location exceeding the field screening level by stepping out 100 ft laterally until XRF readings were below 300 mg/kg for two consecutive grids. All samples collected from 0.5-1.0 ft bgs were below screening criteria (Bay West, 2014a).

2.3 Site History and Previous Investigations

The SHSAR was reported to be operational from the late 1800s until the late 1980s. The site was used for a variety of munitions training activities: anti-aircraft and anti-tank ranges were used until 1946 while the small arms range remained in use until the late 1980s. The direction of fire was to the north, where elevations rise approximately 100 ft. Most of the area has been redeveloped into the Colyer Manor military family housing complex.

In 1994, soil sampling, followed by lead removal, occurred in a section of the Colyer Manor residential complex. Approximately 1,500 cubic yards of lead contaminated soil were removed to remediate to levels below the EPA Regional Screening Level (RSL) of 400 mg/kg for lead. In addition, a full surface and subsurface MEC survey was completed.

A Site Investigation (SI) was completed during 2005 that evaluated the firing points and the Impact Slope separately. No MEC or MD was found during the survey of the firing points and no further action was recommended for this site. The SI recommended further investigation of the Impact Slope due to the presence of potential MEC items and metals contamination in soils.

In 2014, Bay West conducted a Remedial Investigation/Feasibility Study (RI/FS) to evaluate remedial options for additional lead-contaminated soils. The RI/FS recommended LUCs based on an analysis of site contaminants, current and future use, protection of human health and the environment, and ability to implement and cost (Bay West, 2014a). Sampling locations and results from the RI are displayed on Figure 2-4. A Proposed Plan (PP) was made available to the public, and it identified the preferred alternative as LUCs for lead-impacted soils at the MRS. Following stakeholder review and a public comment period, a final PP was completed in November 2014.

The Final ROD presented the selected remedy as Alternative 2: (LUCs; Land Use Requirements). The major components of the selected remedy are public education, legal restrictions on future land use, physical access restrictions, and LTM and maintenance consisting of soil sampling to be performed every two years, groundwater sampling to be performed every five years, inspection/maintenance of the physical barrier annually, and five year reviews. The ROD also identified the location where the perimeter fence was to be located to limit access to the area containing lead in excess of the RSL (USACE, 2016). Table 1 displays the LTM sampling requirements up until 2030.

Table 1: LTM Sampling Requirements until 2030

LTM Sampling Requirement	Year to be Performed
Groundwater Sampling	2021
Soil Sampling	2022
Soil Sampling	2024
Groundwater/Soil Sampling	2026
Soil Sampling	2028
Soil Sampling	2030

2.4 Contaminates of Potential Concern

The soil and groundwater data used in the risk assessment were collected in 2010 and 2011 as part of the SHSAR Impact Slope MRS Remedial Investigation (RI). Inorganic contaminant concentrations that were less than or equal to background levels were excluded as chemicals of potential concern (COPCs). Arsenic, chromium and lead concentrations exceeded RSLs, however, chromium did not exceed background. The maximum arsenic concentration (5 mg/kg) was slightly above background (4.6 mg/kg) but did not exceed the KDHE Tier 2 level for residential soil (11.3 mg/kg), so arsenic was excluded as a COPC. Only lead is considered a human health chemical of concern in soil for the site (USACE, 2016).

3.0 SAMPLING PROGRAM

3.1 Surveying

On April 27, 2020 Tukuh Technologies, LLC (Tukuh) surveyed and staked the 5-point composite sampling points in the area of SP17, SP38, and SP39 in accordance with the approved Remedial Design Plan (RDP) Addendum (Tehama, 2020). The survey was completed by a Registered Land Surveyor (RLS) in the State of Kansas using a real-time kinematic (RTK)-global positioning system (GPS). Survey coordinates for the sample points are included in Appendix B. The projection used to collect the surface soil sample locations was in Kansas State Plane – North, the datum used was NAD83 and the point data layout is described as Point, Northing, Easting, Elevation, and Description.

3.2 Surface Soil Sampling

Tehama mobilized to the site on April 27, 2020 and began sample collection activities in the area of SP17, SP38, and SP39. Tehama personnel collected 3 parent samples and one duplicate sample from 0-0.5 ft bgs, each comprised of a 5-point composite sample which was combined to make one composite sample. All sample locations are depicted on Figure 2 (Appendix A) and were collected as close as possible to the surveyed sampling points. Photographs of the site and sample locations are provided in Appendix G.

The 5-point surface soil samples were collected using stainless steel trowels from the upper 6 inches of soil. Samples were sieved twice, first with a No. 4 sieve in the field to remove bulk debris, then jarred, labeled and shipped for laboratory sieving with a No. 60 sieve to obtain the fine fraction; followed by laboratory analysis of the fine fraction material as recommended in the TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges (EPA, 2003b).

Each sample was placed in a laboratory-supplied 2 oz. glass jar, labeled with pertinent identifying information (e.g., sample ID, sample collection date and time, analysis to be performed, sampler's initials), placed in a cooler with ice and maintained at 4 °C during transportation to ALS Global Laboratories (ALS) under standard chain-of-custody protocol. ALS is a Department of Defense (DoD), Environmental Laboratory Accreditation Program (ELAP) accredited laboratory based in Houston, Texas.

Soil sampling expendables such as trowels and nitrile gloves were contained in plastic bags and disposed of as municipal trash. New trowels were utilized for each sampling location; therefore, decontamination of sampling equipment was not necessary and the potential for cross-contamination between sampling points was eliminated.

3.3 Analytical Results

Analytical results indicated detections of lead in all three parent samples and one duplicate sample. Analytical results indicated two exceedances above the RSL of 400 mg/kg for lead. Soil samples SHSAR/SP38/SS02/0-0.5' and SHSAR/SP39/SS02/0-0.5' contained lead at concentrations of 2,530 mg/kg, 415 mg/kg respectively.

Soil sample SHSAR/SP38/SS02/0-0.5' was collected near the middle of the slope, along the western fence line with SHSAR/SP39/SS02/0-0.5' collected approximately 100 feet north. Figure 2 identifies the sample

locations and corresponding detections for samples above the RSL. Table 1 in Appendix C provides a summary of analytical data. The complete laboratory analytical report prepared by ALS can be found in Appendix D.

3.4 Quality Control Summary Report

Data validation of the surface soil sample data set was completed and the results are presented in a Quality Control Summary Report (QCSR). All data was found to be acceptable and no data were qualified during the review. All project completeness goals were met, and all data are usable as reported by the laboratory. The QCSR and ADR.net generated summary reports are provided in Appendix E.

3.5 Recommendations

Based on the 2020 composite sampling event exceedances above the remediation goal of 400 mg/kg at sampling locations SP38 and SP39, Tehama recommends further characterization and delineation of the extent of lead contamination along the outer fence line of the western slope at the SHSAR where SP38 and SP39 are located using surface soil sample collection submitted for laboratory analysis.

Further characterization would include delineation through surface soil sample collection for laboratory analysis in five-ft increments extending 20 ft to the west of sample locations SP38 and SP39 to a depth of 0 to 0.5 ft. Previous investigation of soil to the north and south of SP38 and SP39 show lead levels below the RSL. Therefore, additional delineation in these directions would not be necessary.

Upon completion of the delineation, Tehama proposes extending the current LUC fencing to encapsulate all lead contamination. A small portion of the fence line, starting five ft to the north and south of the two sample locations, would be removed. A new fence would then be installed to surround the newly delineated area. New fencing would follow the current in-place fencing design.

This option achieves remedy in place (RIP) in accordance with the ROD by restricting access to areas of contamination through LUCs.

4.0 REFERENCES

Bay West, 2014a. *Remedial Investigation/Feasibility Study, Sherman Heights Small Arms Range Impact Slope Munitions Response Site, Fort Riley, Junction City, Kansas.* Prepared for the U.S. Army Corps of Engineers, Omaha District. February.

Bay West, 2014b. *Proposed Plan*. Prepared for the U.S. Army Corps of Engineers, Omaha District. August.

EPA, 2003a. *Superfund Lead-Contaminated Residential Sites Handbook*, EPA, Lead Sites Workgroup. August.

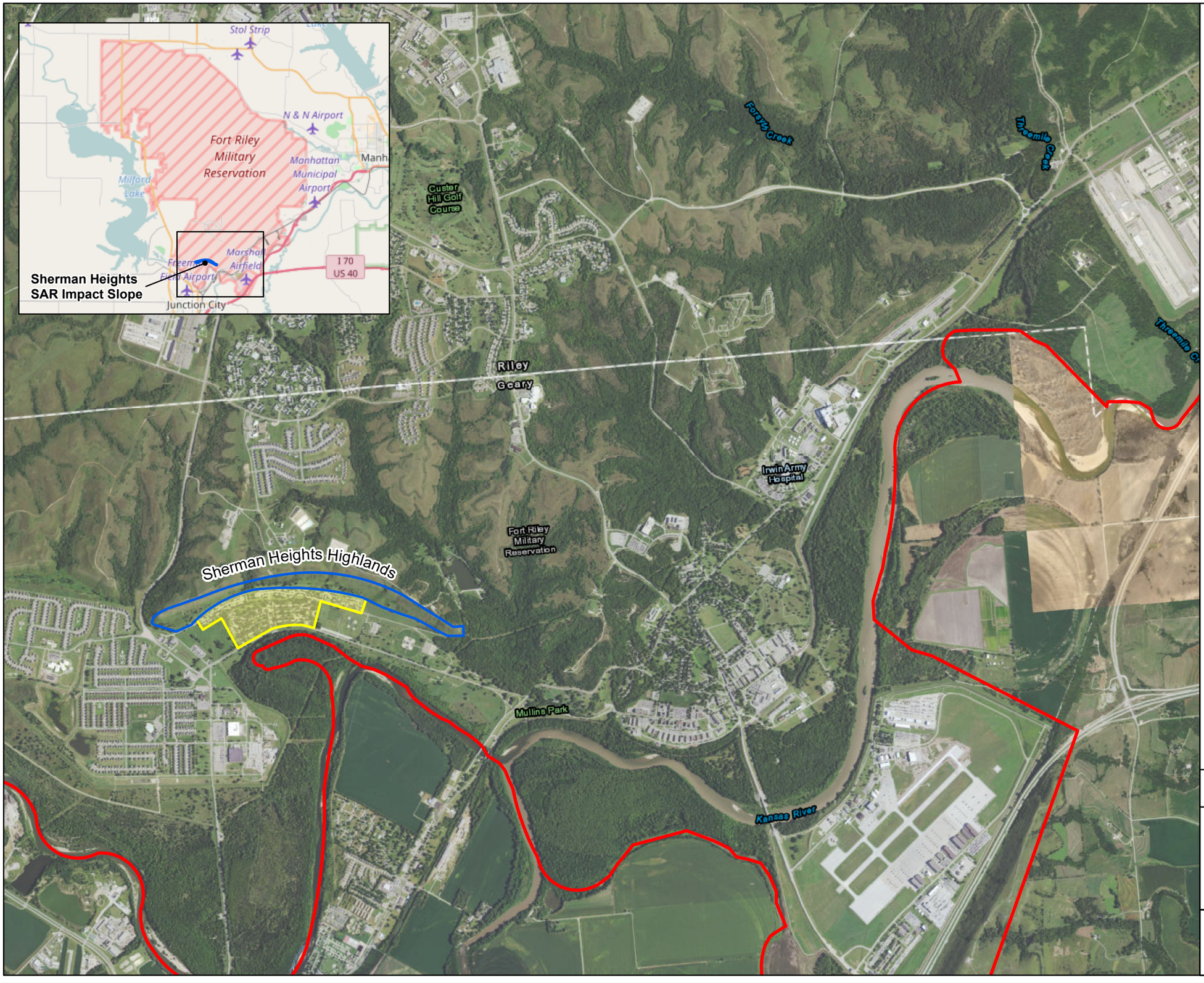
EPA, 2003b. *TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges,* EPA TRW. March

Tehama, 2020, *Remedial Design Plan Addendum, Sherman Heights Small Arms Range, Impact Slope, Fort Riley, Kansas*. Prepared for the U.S. Army Corps of Engineers, Omaha District. February.

U.S. Army Corps of Engineers, Omaha District, *Record of Decision*, Revision 03, Fort Riley, Sherman Heights Small Arms Range, Impact Slope, Junction City, Kansas, January.

Appendix A

FIGURES



Legend

- SHSAR Impact Slope MRS
- Fort Riley Boundary
- Colyer Manor Military Family Housing

N

0 1,750 3,500 7,000

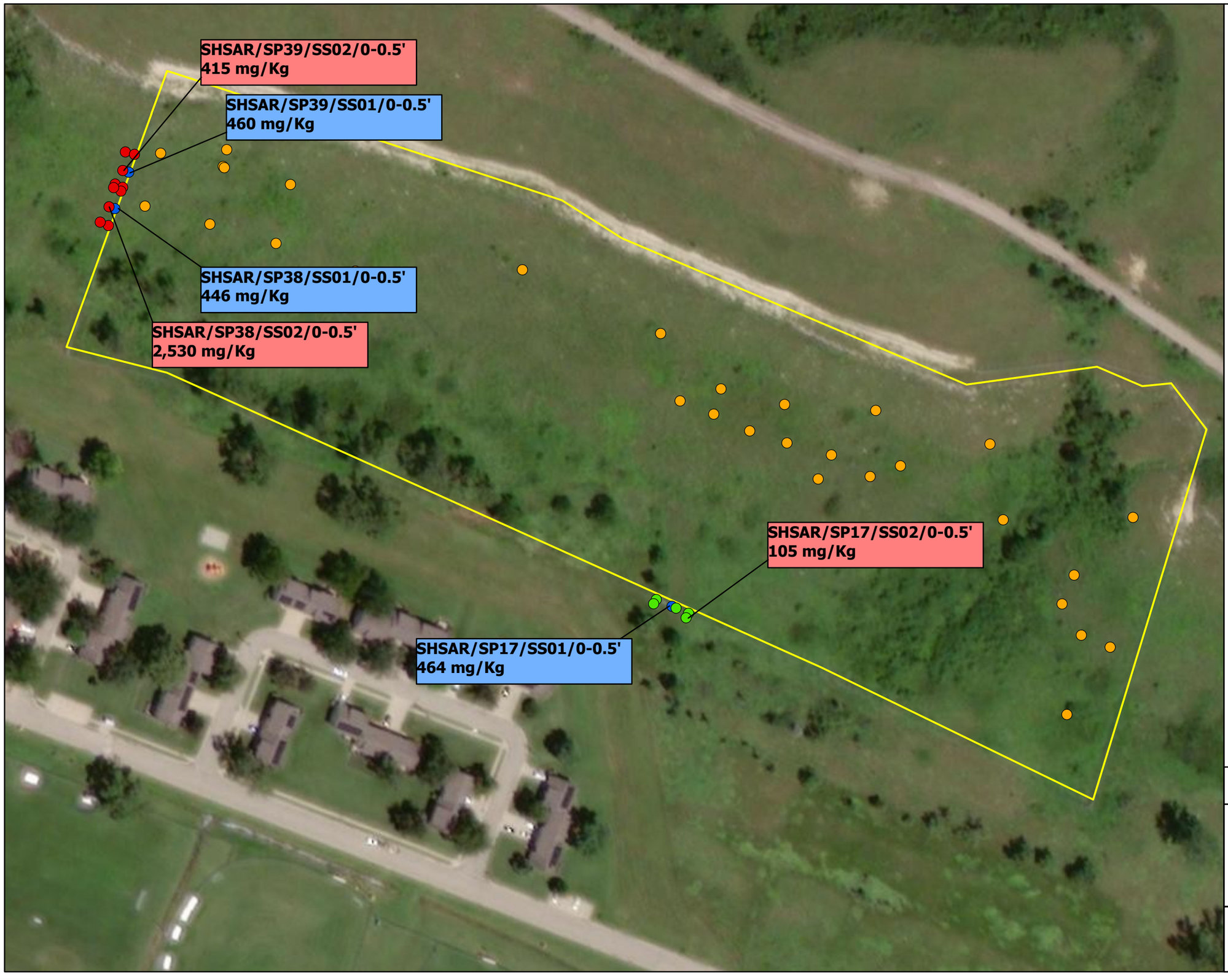
Feet

United States Army
Fort Riley, Kansas

Site Location Map

SHSAR Summary Technical Memorandum

Tehama, LLC	DATE	FIGURE
	04/03/2017	1



Legend

- RI/FS Lead Concentrations > 400 mg/Kg
- 2017 Soil Sample > 400 mg/Kg
- 2020 Composite Sample > 400 mg/Kg
- 2020 Composite Sample < 400 mg/Kg
- Fence Location

Note: The 2020 composite samples were collected from a five-point composite with the middle sample location being the same as the 2017 discrete surface soil sample.

N

0 100 200 400

Feet

Sherman Heights Small Arms Range
Fort Riley, Kansas

Composite Sample Location and 2020 Concentration Map

SHSAR Summary Technical Memorandum

Tehama, LLC	DATE	FIGURE
	8/5/2020	2

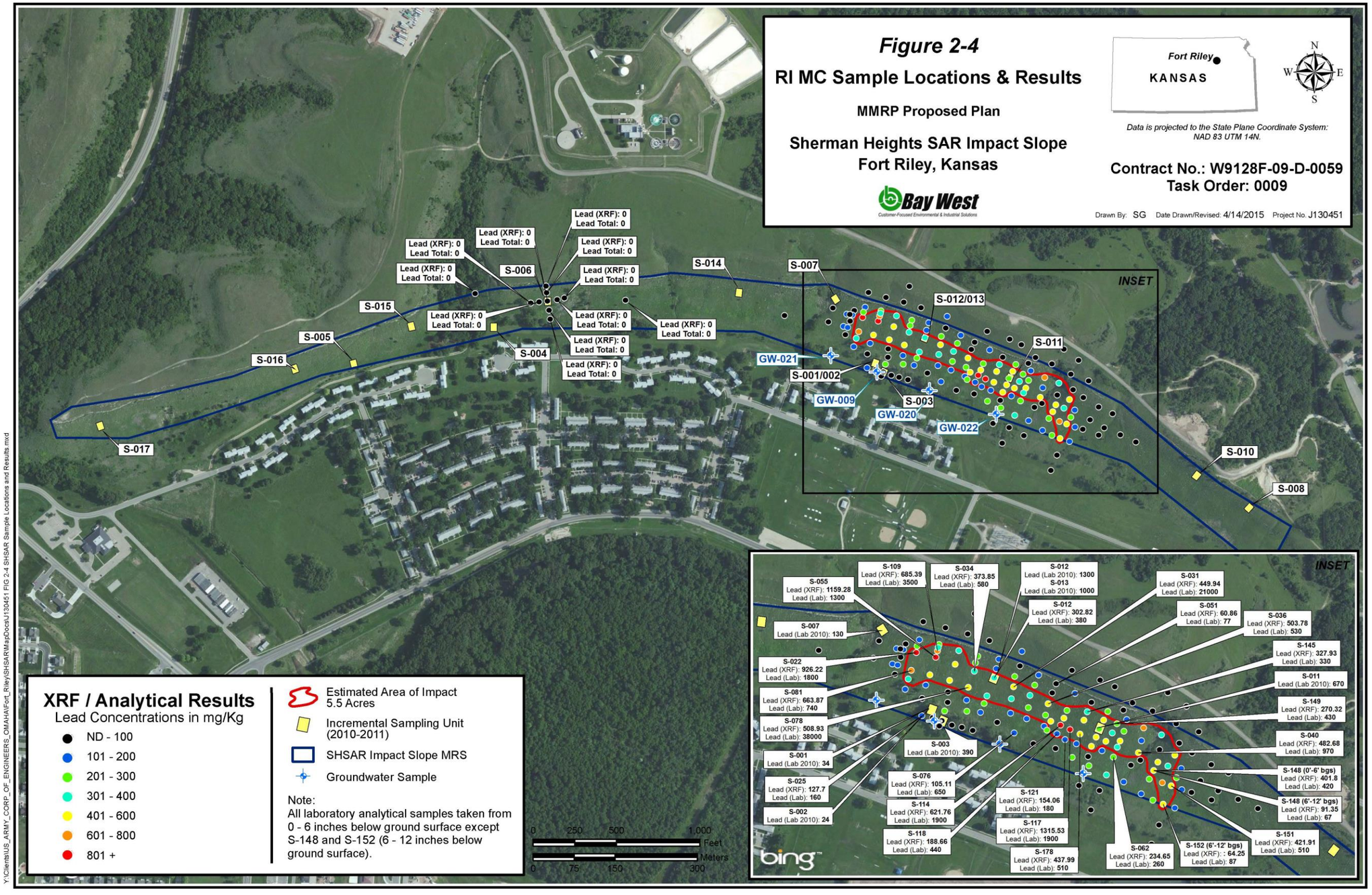


Figure 2-4
RI MC Sample Locations & Results
MMRP Proposed Plan
Sherman Heights SAR Impact Slope
Fort Riley, Kansas
Bay West
Customer-Focused Environmental & Industrial Solutions
Fort Riley
KANSAS
N
W
E
S
Data is projected to the State Plane Coordinate System: NAD 83 UTM 14N.
Contract No.: W9128F-09-D-0059
Task Order: 0009
Drawn By: SG Date Drawn/Revised: 4/14/2015 Project No. J130451
INSET
S-017
S-016
S-005
S-015
S-004
S-006
S-014
S-007
S-012/013
S-011
S-010
S-008
GW-021
S-001/002
GW-009
S-003
GW-020
GW-022
Lead (XRF): 0
Lead Total: 0
XRF / Analytical Results
Lead Concentrations in mg/Kg
ND - 100
101 - 200
201 - 300
301 - 400
401 - 600
601 - 800
801 +
Estimated Area of Impact
5.5 Acres
Incremental Sampling Unit
(2010-2011)
SHSAR Impact Slope MRS
Groundwater Sample
Note:
All laboratory analytical samples taken from 0 - 6 inches below ground surface except S-148 and S-152 (6 - 12 inches below ground surface).
0 250 500 1,000 Feet
0 75 150 300 Meters
S-109 Lead (XRF): 685.39 Lead (Lab): 3500
S-034 Lead (XRF): 373.85 Lead (Lab): 580
S-012 Lead (Lab 2010): 1300
S-013 Lead (Lab 2010): 1000
S-031 Lead (XRF): 449.94 Lead (Lab): 21000
S-055 Lead (XRF): 1159.28 Lead (Lab): 1300
S-012 Lead (XRF): 302.82 Lead (Lab): 380
S-051 Lead (XRF): 60.86 Lead (Lab): 77
S-036 Lead (XRF): 503.78 Lead (Lab): 530
S-007 Lead (Lab 2010): 130
S-145 Lead (XRF): 327.93 Lead (Lab): 330
S-022 Lead (XRF): 926.22 Lead (Lab): 1800
S-011 Lead (Lab 2010): 670
S-081 Lead (XRF): 663.87 Lead (Lab): 740
S-149 Lead (XRF): 270.32 Lead (Lab): 430
S-078 Lead (XRF): 508.93 Lead (Lab): 38000
S-040 Lead (XRF): 482.68 Lead (Lab): 970
S-003 Lead (Lab 2010): 390
S-001 Lead (Lab 2010): 34
S-148 (0'-6' bgs) Lead (XRF): 401.8 Lead (Lab): 420
S-076 Lead (XRF): 105.11 Lead (Lab): 650
S-025 Lead (XRF): 127.7 Lead (Lab): 160
S-121 Lead (XRF): 154.06 Lead (Lab): 180
S-148 (6'-12' bgs) Lead (XRF): 91.35 Lead (Lab): 67
S-114 Lead (XRF): 621.76 Lead (Lab): 1900
S-002 Lead (Lab 2010): 24
S-117 Lead (XRF): 1315.53 Lead (Lab): 1900
S-151 Lead (XRF): 421.91 Lead (Lab): 510
S-118 Lead (XRF): 188.66 Lead (Lab): 440
S-178 Lead (XRF): 437.99 Lead (Lab): 510
S-062 Lead (XRF): 234.65 Lead (Lab): 260
S-152 (6'-12' bgs) Lead (XRF): : 64.25 Lead (Lab): 87
bing
Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Fort_Riley\SHSAR\MapDocs\J130451 FIG 2-4 SHSAR Sample Locations and Results.mxd

Appendix B

SURVEY DATA

Appendix B — Survey Data
Composite Surface Soil Sampling Event
Sherman Heights Small Arms Range Impact Slope, Fort Riley, Kansas

Sample Name	Point	Northing	Easting	Elevation	Description
SHSAR/SP17/SS02/0-0.5'	5000	271554.630	1649405.694	1078.664	Center Soil Sample
SHSAR/SP17/SS02/0-0.5'	5001	271556.522	1649401.139	1077.663	Northwest Soil Sample
SHSAR/SP17/SS02/0-0.5'	5002	271554.013	1649400.125	1077.240	Southwest Soil Sample
SHSAR/SP17/SS02/0-0.5'	5003	271550.160	1649408.899	1079.239	Southeast Soil Sample
SHSAR/SP17/SS02/0-0.5'	5004	271552.337	1649410.182	1079.757	Northeast Soil Sample
SHSAR/SP38/SS02/0-0.5'	5005	272055.465	1648686.435	1123.531	Center Soil Sample
SHSAR/SP38/SS02/0-0.5'	5006	272050.950	1648684.113	1121.563	Southeast Soil Sample
SHSAR/SP38/SS02/0-0.5'	5007	272060.211	1648687.287	1125.221	Northeast Soil Sample
SHSAR/SP38/SS02/0-0.5'	5008	272060.211	1648684.494	1125.452	Northwest Soil Sample
SHSAR/SP38/SS02/0-0.5'	5009	272051.930	1648680.871	1121.510	Southwest Soil Sample
SHSAR/SP39/SS02/0-0.5'	5010	272102.626	1648702.684	1141.453	Center Soil Sample
SHSAR/SP39/SS02/0-0.5'	5011	272107.665	1648704.722	1143.942	Northeast Soil Sample
SHSAR/SP39/SS02/0-0.5'	5012	272108.538	1648701.715	1143.899	Northwest Soil Sample
SHSAR/SP39/SS02/0-0.5'	5013	272097.572	1648701.011	1139.257	Southeast Soil Sample
SHSAR/SP39/SS02/0-0.5'	5014	272098.716	1648698.036	1139.373	Southwest Soil Sample

Appendix C

LABORATORY DATA SUMMARY TABLE

Appendix C — Laboratory Data Summary Table
Composite Surface Soil Sampling Event
Sherman Heights Small Arms Range Impact Slope, Fort Riley, Kansas

Analyte	RSL	Units	SHSAR/SP17/ SS02/0-0.5'	SHSAR/SP38/ SS02/0-0.5'	SHSAR/SP39/ SS02/0-0.5'	SHSAR/SP17/ SS02/0-0.5' (SS02 DUP)
Lead by Method SW6020A						
Lead mg/kg	400	mg/Kg	105	2,530	415	106

Notes:

mg/kg = milligrams per kilogram

Shaded = Exceeds RSL

Appendix D

LABORATORY ANALYTICAL REPORT

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 13, 2020

Megan Perez-Utter
Tehama, LLC.
1600 Genessee
Kansas City, MO 64102

Work Order: **HS20041225**

Laboratory Results for: **Sherman Heights Small Arms Range**

Dear Megan,

ALS Environmental received 4 sample(s) on Apr 30, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Work Order: HS20041225

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20041225-01	SHSAR/SP17/SS02/0-0.5'	Soil		27-Apr-2020 13:00	30-Apr-2020 08:45	☐
HS20041225-02	SHSAR/SP38/SS02/0-0.5'	Soil		27-Apr-2020 14:00	30-Apr-2020 08:45	☐
HS20041225-03	SHSAR/SP39/SS02/0-0.5'	Soil		27-Apr-2020 13:30	30-Apr-2020 08:45	☐
HS20041225-04	SHSAR/SP17/SS02DUP/0-0.5'	Soil		27-Apr-2020 13:00	30-Apr-2020 08:45	☐

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Work Order: HS20041225

CASE NARRATIVE

Work Order Comments

- Samples were air dried at the laboratory from May 1, 2020 through May 4, 2020. The samples were sieved on May 4, 2020 with the mass passing through a No. 60 sieve used for SW6020 analysis.

Metals by Method SW6020

Batch ID: 153336

Sample ID: SHSAR/SP38/SS02/0-0.5' (HS20041225-02MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Lead

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Sample ID: SHSAR/SP17/SS02/0-0.5'
Collection Date: 27-Apr-2020 13:00

ANALYTICAL REPORT
WorkOrder:HS20041225
Lab ID:HS20041225-01
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**					Prep:SW3050A / 07-May-2020		Analyst: JC
Lead	**105**		**0.0124**	**0.0953**	**0.477**	**mg/Kg**	1	11-May-2020 16:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Sample ID: SHSAR/SP38/SS02/0-0.5'
Collection Date: 27-Apr-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20041225
Lab ID:HS20041225-02
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**					Prep:SW3050A / 07-May-2020		Analyst: JC
Lead	**2,530**		**1.22**	**9.36**	**46.8**	**mg/Kg**	100	11-May-2020 17:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Sample ID: SHSAR/SP39/SS02/0-0.5'
Collection Date: 27-Apr-2020 13:30

ANALYTICAL REPORT
WorkOrder:HS20041225
Lab ID:HS20041225-03
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**					Prep:SW3050A / 07-May-2020		Analyst: JC
Lead	**415**		**0.238**	**1.83**	**9.14**	**mg/Kg**	20	11-May-2020 17:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
Sample ID: SHSAR/SP17/SS02DUP/0-0.5'
Collection Date: 27-Apr-2020 13:00

ANALYTICAL REPORT
WorkOrder:HS20041225
Lab ID:HS20041225-04
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020**					Prep:SW3050A / 07-May-2020		Analyst: JC
Lead	**106**		**0.0121**	**0.0930**	**0.465**	**mg/Kg**	1	11-May-2020 17:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
WorkOrder: HS20041225

Batch ID: 153336 **Start Date:** 08 May 2020 08:01 **End Date:** 08 May 2020 14:00
Method: METALS PREP - SOLIDS - SW3050B **Prep Code:** 3050_I_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20041225-01		0.5244 (g)	50 (mL)	95.35
HS20041225-02		0.5343 (g)	50 (mL)	93.58
HS20041225-03		0.5469 (g)	50 (mL)	91.42
HS20041225-04		0.5375 (g)	50 (mL)	93.02

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
WorkOrder: HS20041225

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 153336 (0)	**Test Name :** METALS BY SW6020A				**Matrix:** Soil	
HS20041225-01	SHSAR/SP17/SS02/0-0.5'	27 Apr 2020 13:00		07 May 2020 14:00	11 May 2020 16:37	1
HS20041225-02	SHSAR/SP38/SS02/0-0.5'	27 Apr 2020 14:00		07 May 2020 14:00	11 May 2020 17:34	100
HS20041225-03	SHSAR/SP39/SS02/0-0.5'	27 Apr 2020 13:30		07 May 2020 14:00	11 May 2020 17:49	20
HS20041225-04	SHSAR/SP17/SS02DUP/0-0.5'	27 Apr 2020 13:00		07 May 2020 14:00	11 May 2020 17:04	1

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
WorkOrder: HS20041225

QC BATCH REPORT

Batch ID: 153336 (0) **Instrument: ICPMS05** **Method: METALS BY SW6020A**

MBLK Sample ID: **MBLK-153336** Units: **mg/Kg** Analysis Date: **11-May-2020 16:32**
Client ID: Run ID: **ICPMS05_361351** SeqNo: **5580233** PrepDate: **07-May-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.01426	0.479								J

LCS Sample ID: **LCS-153336** Units: **mg/Kg** Analysis Date: **11-May-2020 16:34**
Client ID: Run ID: **ICPMS05_361351** SeqNo: **5580247** PrepDate: **07-May-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	9.402	0.489	9.789	0	96.0	80 - 120				

MS Sample ID: **HS20041225-02MS** Units: **mg/Kg** Analysis Date: **11-May-2020 16:44**
Client ID: **SHSAR/SP38/SS02/0-0.5'** Run ID: **ICPMS05_361351** SeqNo: **5580238** PrepDate: **07-May-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	977.7	0.464	9.273	2398	-15300	75 - 125				SEO

MSD Sample ID: **HS20041225-02MSD** Units: **mg/Kg** Analysis Date: **11-May-2020 16:46**
Client ID: **SHSAR/SP38/SS02/0-0.5'** Run ID: **ICPMS05_361351** SeqNo: **5580239** PrepDate: **07-May-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	857.8	0.473	9.464	2398	-16300	75 - 125	977.7	13.1	20	SEO

PDS Sample ID: **HS20041225-02PDS** Units: **mg/Kg** Analysis Date: **11-May-2020 17:39**
Client ID: **SHSAR/SP38/SS02/0-0.5'** Run ID: **ICPMS05_361351** SeqNo: **5580306** PrepDate: **07-May-2020** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	3473	46.8	935.8	2531	101	75 - 125				

SD Sample ID: **HS20041225-02SD** Units: **mg/Kg** Analysis Date: **11-May-2020 17:36**
Client ID: **SHSAR/SP38/SS02/0-0.5'** Run ID: **ICPMS05_361351** SeqNo: **5580305** PrepDate: **07-May-2020** DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	2453	234					2531	3.11	10	

The following samples were analyzed in this batch: HS20041225-01 HS20041225-02 HS20041225-03 HS20041225-04

Client: Tehama, LLC.
Project: Sherman Heights Small Arms Range
WorkOrder: **HS20041225**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

Sample Receipt Checklist

Work Order ID: HS20041225 **Date/Time Received:** **30-Apr-2020 08:45**

Client Name: Tehama **Received by:** **Jared R. Makan**

Completed By:	/S/ Nilesh D. Ranchod	30-Apr-2020 17:46	**Reviewed by:**	/S/ Dane J. Wacasey	05-May-2020 17:40
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Soil** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:222156
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.1°C UC/C		IR # 25
Cooler(s)/Kit(s):	46004		
Date/Time sample(s) sent to storage:	04/30/2020 18:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 222156

HS20041225

Tehama, LLC.
Sherman Heights Small Arms Range

IV

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	Sherman Heights Arms Range	A	ICP_S_Low (6020 Lead Only)
Work Order		Project Number		B	MOIST, ASTM (Moisture %)
Company Name	Tehama, LLC.	Bill To Company	Tehama, LLC.	C	air dry then sieve with No. 60 sieve
Send Report To	Dillon Moran	Invoice Attn	Dillon Moran	D	
Address	1600 Genessee St. Suite 700	Address	1600 Genessee	E	
				F	
City/State/Zip	Kansas City, MO 64102	City/State/Zip	Kansas City MO 64102	G	
Phone	(816) 533-2246	Phone	(816) 533-2246	H	
Fax		Fax		I	
e-Mail Address	Dillon.Moran@TehamaLLC.com	e-Mail Address	Dillon.Moran@TehamaLLC.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SHSAR/SP17/SS02/0-0.5'	4/27/20	1300	soil	none	1	X	X	X								
2	SHSAR/SP38/SS02/0-0.5'	4/27/20	1400	soil	none	1	X	X	X								
3	SHSAR/SP38/SS02MS/0-0.5'	4/27/20	1400	soil	none	1	X	X	X								
4	SHSAR/SP38/SS02 MSD/0-0.5'	4/27/20	1400	soil	none	1	X	X	X								
5	SHSAR/SP39/SS02/0-0.5'	4/27/20	1330	soil	none	1	X	X	X								
6	SHSAR/SP17/SS02Dup/0-0.5'	4/27/20	1300	soil	none	1	X	X	X								
7																	
8																	
9																	
10																	

4-29-20

Sampler(s) Please Print & Sign: Dillon Moran [signature]

Shipment Method: FedEx

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other ______

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
[signature]	4/29/20	1345	
Relinquished by:	Date: 4/30/20	Time: 08:45	Received by (Laboratory): J. [signature]
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Sherman Heights Small Arms Range

Cooler ID	Cooler Temp.
46004	1.1 / 1.1
	IR25
	CF0.0

QC Package: (Check One Box Below)
[ ] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[X] DOD II
[ ] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887 46004	CUSTODY SEAL Date: 4/29/20 Time: 1300 Name: Dillon Moran Company: Tehama LLC	Seal Broken By: SM Date: 04/30/20

46004 APR 30 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

46004

ORIGIN ID:SGRA (816) 832-1876
DILLON MORAN
TEHAMA LLC
8347 WALMER STREET

OVERLAND PARK, KS 66212
UNITED STATES US

SHIP DATE: 28APR20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: SHERMAN-BTC-CG
RMA:

FedEx Express E

FedEx TRK# 0221 1251 0296 6630

THU - 30 APR 10:30A
PRIORITY OVERNIGHT

NH SGRA

77099
TX-US IAH

#2639692 04/29 56BJ4/7B3A/FE4A

Appendix E

QCSR AND ADR REPORTS

BURNS McDONNELL

May 28, 2020

Mr. Jim Bouvier
United States Army Corps of Engineers
CENWO-PM-H – Omaha District
1616 Capital Avenue
Omaha, Nebraska 68102-4901

Re: Quality Control Summary Report – April 2020 Sampling Event
Sherman Heights Small Arms Range (Site)
Fort Riley, Kansas
Contract No. W9128F-16-D-0044, T.O. 002

Dear Mr. Bouvier:

This Quality Control Summary Report (QCSR) presents the data validation summary for the follow-up sampling event to evaluate lead concentrations on the downslope side of the installed fence line. The initial sampling event was conducted in November 2017 in order to evaluate that lead-contaminated soil was not migrating downslope, beyond the remedy fence line at the Site. The data validation was conducted in accordance with the corresponding *Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) Sherman Heights Small Arms Range, Fort Riley, Kansas* (April 2017) (UFP-QAPP). The data were validated utilizing Automated Data Review (ADR) software from Laboratory Data Consultants.

Soil samples were collected April 27, 2020 at the Site and sent off-site for analysis of lead by SW-846 6020. ALS of Houston, Texas (ALS) was the selected laboratory for these sample analyses. All samples were analyzed and reported under one sample delivery group (SDG): HS20041225. This QCSR summarizes the data review for the noted SDG. The following items were reviewed during the course of this data review. Any data qualifiers added based on this review are presented in the Data Qualifier Summary.

- Chain of Custody (COC) Review: The COC was completed and the appropriate signatures noted. A copy of the COC is provided in the noted SDG. Samples arrived at ALS within the sample preservation temperature range of less than 6 degrees Celsius.

- Sample Holding Times: Holding Time for the samples analyzed during this review was as follows:

    - Lead by method 6020: 180 days

  All samples were analyzed within the noted holding time.

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

- Method Blanks: Method blanks were reviewed to assess possible cross-contamination or carry over in sample preparation or analysis. General qualification was as follows: any detection noted in the blank was reviewed in the associated sample(s). If the sample exhibited a detection of said analyte less than five times this blank detection (or ten times for common laboratory contaminants), the sample was disregarded as false positive and qualified as undetected (U).

  One method blank detection was noted during this review. However, all associated samples were greater than five times this blank detection. Therefore, no qualifiers were necessary. A Method Blank Outlier Report is included summarizing this detection.

- Laboratory Control Samples: A Laboratory Control Sample (LCS) was analyzed for the reported QC batch. LCS percent recoveries (RECs) outside control limits can indicate potential problems with analytical accuracy. The reported LCS REC for this data review was within control limits. The LCS Outlier Report was generated and included herein.

- Matrix Spikes (MS)/Matrix Spike Duplicates (MSDs): One site-specific MS/MSD was reported for this sampling event. MS/MSD RECs outside control limits can indicate potential problems with analytical accuracy, while the MS/MSD relative percent difference (RPD) may indicate problems with analytical precision.

  The MS/MSD Outlier Report was generated and is included herein. Note: although the report notes the MS/MSD RECs as outside control limits, further review was performed and found that the MS/MSD spike amounts were less than one-fourth the parent sample concentration. In other words, the spike amount was too low to allow accurate recovery due to the high lead concentration. No data qualifiers were added based on this project-specific MS/MSD.

- Miscellaneous QC Samples: Due to the high lead concentration in the parent sample used for the MS/MSD yielding inconclusive results, the laboratory reported a post digestion spike (PDS) and serial dilution sample. Both of these QC samples yielded acceptable results, and no further actions were necessary. Review of these items were made utilizing the analytical hardcopy as these QC data were not included in the ADR deliverable.

- Field Duplicates: One field duplicate pair was collected and analyzed for this sampling event. A Field Duplicate Relative Percent Difference (RPD) Report was generated and is included herein. The following field duplicate pair was collected:

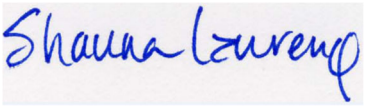
    - SHSAR/SP17/SS02/0-0.5' and SHSAR/SP17/SS02DUP/0-0.5'

    The lead results for this field duplicate pair were adequately replicated, and no further review was necessary. The Field Duplicate RPD Report was generated and included herein.

In conclusion, no data were qualified during the course of this review. All project completeness goals were met, and all data are usable as reported by the laboratory. ADR.net generated summary reports are included for the aforementioned QC items and included within this QCSR.

If you have any questions regarding this QCSR or the data contained within the ADR.net validation packages, please call me at (816) 822-3940.

Sincerely,



Shauna Lawrence

cc: Dillon Moran, Tehama, LLC

Data Review Sample Summary Report by Analysis Method

Reviewed By: **Approved By:** **Laboratory: ALSHS**

Client Sample ID	Lab Sample ID	Matrix	Sample Type	Preparation Method	Collection Date	Validation Code
Lab Reporting Batch: HS20041225						
Method: 6020						
SHSAR/SP38/SS02/0-0.5	HS20041225-02	Soil	Field_Sample	SW3050	4/27/2020 2:00:00 PM	S2AVE
SHSAR/SP38/SS02/0-0.5MS	HS20041225-02MS	Soil	Matrix_Spike	SW3050	4/27/2020 2:00:00 PM	S2AVE
SHSAR/SP17/SS02DUP/0-0.5	HS20041225-04	Soil	Field_Duplicate	SW3050	4/27/2020 1:00:00 PM	S2AVE
SHSAR/SP38/SS02/0-0.5MSD	HS20041225-02MSD	Soil	Matrix_Spike_Duplicate	SW3050	4/27/2020 2:00:00 PM	S2AVE
SHSAR/SP39/SS02/0-0.5	HS20041225-03	Soil	Field_Sample	SW3050	4/27/2020 1:30:00 PM	S2AVE
SHSAR/SP17/SS02/0-0.5	HS20041225-01	Soil	Field_Sample	SW3050	4/27/2020 1:00:00 PM	S2AVE

Data Review Sample Summary Report by Analysis Method

Reviewed By: **Approved By:** **Laboratory: ALSHS**

Client Sample ID	Lab Sample ID	Matrix	Sample Type	Preparation Method	Collection Date	Validation Code

Validation Label Legend

Label Code	Label Decription	EPA Level
S1VE	Stage_1_Validation_Electronic	N/A
S1VM	Stage_1_Validation_Manual	N/A
S1VEM	Stage_1_Validation_Electronic_and_Manual	N/A
S2AVE	Stage_2A_Validation_Electronic	Level 3 w/o calibration
S2AVM	Stage_2A_Validation_Manual	Level 3 w/o calibration
S2AVEM	Stage_2A_Validation_Electronic_and_Manual	Level 3 w/o calibration
S2BVE	Stage_2B_Validation_Electronic	Level 3 with calibration
S2BVM	Stage_2B_Validation_Manual	Level 3 with calibration
S2BVEM	Stage_2B_Validation_Electronic_and_Manual	Level 3 with calibration
S3VE	Stage_3_Validation_Electronic	Level 4
S3VM	Stage_3_Validation_Manual	Level 4
S3VEM	Stage_3_Validation_Electronic_and_Manual	Level 4
S4VE	Stage_4_Validation_Electronic	Level 4
S4VM	Stage_4_Validation_Manual	Level 4
S4VEM	Stage_4_Validation_Electronic_and_Manual	Level 4
NV	Not_Validated	N/A

Data Review Summary

Lab Reporting Batch ID: HS20041225
EDD Filename: HS20041225__SEDD

Laboratory: ALSHS
eQAPP Name: ShermanHeights

Validation Area	*Note*
Technical Holding Times	A
Temperature	A
Initial Calibration	N
Continuing Calibration/Initial Calibration Verification	N
Method Blanks	SR
Surrogate/Tracer Spikes	N
Matrix Spike/Matrix Spike Duplicates	SR
Laboratory Duplicates	N
Laboratory Replicates	N
Laboratory Control Samples	A
Compound Quantitation	A
Field Duplicates	N
Field Triplicates	N
Field Blanks	N

A = Acceptable, N = Not provided/applicable, SR = See report

The contents of this report reflect findings made by ADR during Automated Data Review, manual applied qualifiers are not considered. Please refer to the Overall Qualifier Summary report for manual qualifiers.

Temperature Outliers

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

No Data Review Qualifiers Applied.

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

No Data Review Qualifiers Applied.

Method Blank Outlier Report

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

Method: **6020**
Matrix: **Soil**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
MBLK-153336	5/11/2020 4:32:00 PM	LEAD	0.01426 MG/KG	SHSAR/SP17/SS02/0-0.5 SHSAR/SP17/SS02DUP/0-0.5 SHSAR/SP38/SS02/0-0.5 SHSAR/SP39/SS02/0-0.5

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

No Data Review Qualifiers Applied.

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

Method: **6020**

Matrix: **Soil**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
SHSAR/SP38/SS02/0-0.5MS (Wet) SHSAR/SP38/SS02/0-0.5MSD (Wet) (SHSAR/SP38/SS02/0-0.5)	LEAD	-15300	-16300	84.00-118.00	-	LEAD	See Note Below J- (all detects) R (all non-detects)

The spike amount for the MS/MSD was less than one-fourth the concentration of the noted parent sample. As such, no conclusion could be made regarding the accuracy of the spike. The associated QC was acceptable, and no data qualifiers were necessary.

Field Duplicate RPD Report

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

Method: 6020
Matrix: Soil

Analyte	Concentration (MG/KG)		Sample RPD	eQAPP RPD	Flag
	SHSAR/SP17/ SS02/0-0.5 (Wet)	SHSAR/SP17/ SS02DUP/0-0.5 (Wet)			
LEAD	105	106	1	20.00	No Qualifiers Applied

Project Name and Number: - Sherman Heights Small Arms Range

Reporting Limit Outliers

Lab Reporting Batch ID: HS20041225 **Laboratory: ALSHS**

EDD Filename: HS20041225__SEDD **eQAPP Name: ShermanHeights**

No Data Review Qualifiers Applied.

Field QC Assignments and Associated Samples

EDD File Name: HS20041225
eQapp Name: ShermanHeights

	Associated Samples	Sample Collection Date
Field QC SHSAR/SP17/SS02DUP/0-0.5 **QC Type:** Field_Duplicate		
	SHSAR/SP17/SS02/0-0.5	4/27/2020 1:00:00 PM

Data Qualifier Summary

Lab Reporting Batch ID: HS20041225

Laboratory: ALSHS

EDD Filename: HS20041225__SEDD

eQAPP Name: ShermanHeights

No Data Review Qualifiers Applied.

Appendix F

REGULATORY CORRESPONDENCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

SEP 1 1 2018

Mr. Alan Hynek
Restoration Program Manager
Environmental Division, DPW
407 Pershing Court
IMNW-RLY-PWE
Fort Riley, Kansas 66442

Dear Mr. Hynek:

The U. S. Environmental Protection Agency has completed its review of the Draft Summary Memorandum 2017 Long-Term Monitoring Surface Soil Sampling Event for Operable Unit 8. The EPA's comments are enclosed. This letter and enclosed comments are also being emailed. The date of the email serves as the receipt date for Fort Riley, closing the comment period.

Please update the Federal Facility Agreement schedule for the completion of the EPA review period for the draft report. If you have any questions or concerns, please contact me via email at oconnor.daniel@epa.gov or at (913) 551-7868.

Sincerely,

Danny O'Connor
Remedial Project Manager
Federal Facilities and Post Construction Section
Superfund Division

Enclosure

cc: Ms. Laura Percifield, USACE Omaha District (email only)
Ms. Margaret Townsend, KDHE (email only)

OU8 Draft 2017 Long-Term Monitoring Surface Soil Sampling Event Report
EPA Comments
September 2018

General Comment – The EPA agrees with the Kansas Department of Health and Environment's comment made for the Interim Remedial Action Completion Report regarding the elevated lead concentrations detected outside the fenced area. The Army needs to address what action will be taken to either address or further investigate the elevated lead concentrations.

Lead concentrations at three discrete sample locations (SP17, SP38, and SP39) exceeded the remediation goal of 400 milligrams per kilogram (mg/kg) listed in the Record of Decision for Operable Unit 8. The EPA recommends that the Army further characterize lead concentrations surrounding these areas following protocols outlined in the 2003 Superfund Lead-Contaminated Residential Handbook. In general, this would include:

- designating a decision unit, no larger than 100 feet by 100 feet, including and surrounding each of the three sample locations with elevated lead concentrations.
- Collecting a five-point (or aliquot) composite sample from each decision unit. Aliquots should be evenly spaced within each decision unit.
- Submittal of these composite samples for laboratory analysis of lead.

The EPA also recommends that all soil samples be prepared and sieved twice as recommended in the TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges. The TRW document provides rationale regarding the necessity for sieving samples and provides recommendations regarding the size of screen to be used.

STATE OF KANSAS

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GOVERNOR JEFF COLYER, M.D.
JEFF ANDERSEN, SECRETARY

June 28, 2018

Mr. Alan Hynek
Directorate of Public Works
Environmental Division
407 Pershing Court
Ft. Riley, Kansas 66442

RE: Draft Summary Memorandum 2017 LTM Surface Soil Sampling Event
Sherman Heights Small Arms Range Site – (SHSAR) Impact Slope, Fort Riley, Kansas

Dear Mr. Hynek:

The Kansas Department of Health and Environment/Bureau of Environmental Remediation (KDHE/BER) reviewed the above referenced document, received on May 23, 2018, and approves the document. Please provide a change page for the title page and an updated electronic copy (CD). Should you have any questions, please contact me by phone at 785-296-1936 or email at margaret.townsend@ks.gov.

Sincerely,

Margaret Townsend

Margaret Townsend, P.G.
Unit Chief, Federal Facilities
Remedial Section/BER

C: Randy Carlson → Margaret Townsend → File, Fort Riley, SHSAR (C5-031-03037-1)
Amer Safadi, EPA- Region 7, electronic
Amanda Chirpich, USACE- KC District, electronic

Appendix G

PHOTOGRAPHS

Figure 1: Survey laths indicating soil sampling locations are observed along the south perimeter of the SHSAR. Image taken facing East.

Figure 2: Composite soil sampling location observed with a garden trowel for scale. To avoid cross contamination, a different trowel was used for each composite sample, and discarded after.

Figure 3: Composite soil samples were collected to depths of 0-0.5'.
The samples were collected as close to the surveyed stakes as possible.