WORK PLAN AND SAMPLING AND ANALYSIS PLAN ADDENDUM

AREA OF CONCERN 45

Prepared for:

Camp Stanley Storage Activity
Boerne, Texas

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May 2011

ADDENDUM TO WORK PLAN AND SAMPLING AND ANALYSIS PLAN
SITE CLOSURE INVESTIGATION FOR AREA OF CONCERN 45

Parsons is currently under contract to provide an investigation at Area of Concern 45 (AOC-45), Camp Stanley Storage Activity (CSSA), Boerne, Texas. This document serves as both an addendum to the existing CSSA *Work Plan*, February, 1996 (see CSSA Environmental Encyclopedia (www.stanley.army.mil), Volume 1-1) and work plan addenda contained therein, and an addendum to the existing CSSA *Field Sampling Plan*, February, 1996 (see CSSA Environmental Encyclopedia, Volume 1-4) and sampling and analysis plan addenda contained therein.

The goal of the investigation is the removal of all soils that exceed identified Texas Risk Reduction Program (TRRP) protective concentration limits (PCLs) (see Section 2.3). It is expected that, upon completion of this investigation, a Release Investigation Report (RIR) will be prepared. Both the identified PCLs and the type of closure report may be modified based on the investigation findings.

This Addendum describes additional activities to be conducted as part of this investigation, and addresses specific SAP items related to those activities. Work will be performed in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA) 3008(h) Order in effect for CSSA and in accordance with 30 Texas Administrative Code (TAC) §350, the TRRP administered by the Texas Commission on Environmental Quality (TCEQ).

Additional specific activities associated with this investigation are described in the *Storm Water Pollution Prevention Plan for AOC-45*, May, 2011 and the *RCRA Facility Investigation Interim Measures Waste Management Plan (RFI/IM WMP) Addendum for AOC-45*, May, 2011.

SITE DESCRIPTION AND BACKGROUND

1.1 Description

AOC-45 is located in the southwestern portion of the Inner Cantonment Area (Figure 1), approximately 650 yards north of the southern CSSA boundary. The site consists of a flat area that contains spent and unspent bullets, presumably from the Building 90 test fire room. Prior uses of the site are unknown. The site appears as a disturbed area in a 1946 aerial photo and progressively less disturbed in photos from 1957 and later. Additional background information on AOC-45 can be found in CSSA Environmental Encyclopedia, Volume 3-2.

1.2 Previous Investigations

Previous investigations at AOC-45 are limited to an X-Ray Fluorescence (XRF) survey conducted in December of 2010 followed by a soil sampling event conducted in

April 2011 to confirm the XRF data. The XRF survey included the measuring of 69 in-situ surface soil locations for metals levels within the AOC. Of the detectable metals, the results for zinc and lead have been shown to have a strong statistical correlation with laboratory-verified samples, so these metals were used as indicators of potential areas of metals contamination at the site. Of these two metals, only lead was detected above Tier 1 levels (84.5 miligrams per kilogram (mg/kg)). Contour lines of these results are depicted show on Figure 2.

On April 7, 2011, two surface samples were collected from within the site (AOC45-SS13 and AOC45-SS14) to confirm the elevated XRF values and an additional twelve surface samples (AOC45-SS01 through AOC45-SS12) were collected along the perimeter to confirm the revised site boundary. The samples were analyzed for CSSA 9 metals and explosives. No explosives were detected, however the lead results for AOC45-SS01, AOC45-SS09, AOC45-SS13 and AOC45-SS14 exceeded the Tier 1 PCL (Figure 2). Three additional samples (AOC45-SS15, AOC45-SS16, and AOC45-SS17) were collected for lead analysis on April 20, 2011 to confirm the horizontal extent of contamination at the southern and northwestern boundary of the site. The results showed no lead above the Tier 1 PCL at these locations.

2.0 INVESTIGATION PROCEDURES

This investigation will include the excavation of contaminated soils, and the collection of confirmation samples for laboratory analysis to verify the successful removal of all contaminated soils from the site. All removal work will be performed in Level D personal protective equipment and under the health and safety protocol outlined in the *Health and Safety Plan,* December, 2010.

2.1 Excavation Effort

Soils identified as contaminated (criteria described in Section 2.3) through the field screening effort and confirmation sampling will be excavated and managed accordingly. The proposed excavation area, which is approximately 0.5 acres in size, is depicted on Figure 3. The excavation will be coordinated with CSSA to avoid the disturbance of all utility and communication lines.

The area will be excavated initially to a depth of approximately one foot, resulting in approximately 1000 cubic yards (CY) of soil media. The excavated soil media may be either stockpiled along and adjacent to the excavation to allow for inspection, or moved directly to the respective staging area (Figure 3) and placed into 500 CY piles.

Due to the history of the AOC, munitions debris and unexploded ordnance (UXO) are not expected. If these items are encountered during the effort, work will stop immediately and a UXO technician will be called in to provide UXO support as necessary. Passenger vehicles and equipment trailers will not enter the excavated area. Excavating equipment will be parked on a trailer prior to leaving CSSA.

2.2 Waste Management

Contaminated soils will be managed in accordance with CSSA's *RFI Interim Measures Waste Management Plan,* Parsons, 2006 and the *RFI/IM Addendum for AOC-45,* May, 2011.

For excavated soils, waste characterization sampling will occur at a frequency of 1 sample per 500 CY. Waste characterization samples will be analyzed by the toxicity characteristic leaching procedure (TCLP) for RCRA 8 metals. All impacted soils that meet non-hazardous criteria and CSSA standards for berm reuse will be transported to the East Pasture berm. Impacted soil media which is believed to contain potential contaminants of concern (COCs) greater than 20 times the regulated TCLP criteria (*i.e.*, 20 times rule) will undergo waste characterization sampling at a frequency of 1 sample per 200 CY.

Any soil media identified above characteristic hazardous criteria (40 Code of Federal Regulations [CFR] 261.24) will be treated on-site in accordance with the *RFI/Interim Measures Waste Management Plan* (i.e. with use of PIMS, etc.) to non-hazardous levels and managed at the East Pasture berm or off-post as appropriate. All impacted soil media that meet non-hazardous criteria and CSSA standards for berm reuse (e.g. no pieces of metal greater than six inches, no materials identified as MEC items, etc.) will be transported to the East Pasture berm for reuse. Parsons will coordinate the transportation of soils to the East Pasture berm with CSSA personnel.

Stockpiles of soil identified containing concentrations of contaminants greater than hazardous toxicity criteria within the excavated area will be covered with plastic until the removal process begins. Excavated non-hazardous soils will remain uncovered.

2.3 Soil Sampling

The TRRP Tier 1 PCL identified for this investigation is defined as the lowest value among the following: 1) the TRRP Tier 1 Residential 30-acre PCL for total soil combined ($^{Tot}Soil_{Comb}$); and 2) the TRRP Tier 1 Residential 30-acre PCL for groundwater protection ($^{GW}Soil_{Ing}$). If the lowest value is less than the CSSA soil background value, the soil background value becomes the Tier 1 PCL. Table 1 outlines these values and identifies the PCLs for the CSSA 9 metal analytes. The identified PCLs may be modified based on investigation findings, if necessary.

Soil samples for laboratory analysis will be collected during and post-excavation, as necessary, to confirm the successful removal of contaminated soils. Soil samples with results lower than the identified PCLs will be used to confirm contamination removal at a rate of approximately 1 sample per 50 feet along the horizontal excavation boundary, and 1 sample per 10,000 square feet to confirm the vertical excavation boundary. If any results indicate contamination above the identified PCLs, the excavation of soils will be expanded in that direction until confirmation samples show no indication of metal

contamination above PCLs. The number and location of confirmation samples will be dependent on the extent of excavation.

Confirmation soil samples will be collected and analyzed for CSSA 9 metals. Soil samples will be discrete grab samples and will be collected as described in the *CSSA SAP*, February, 1996. The collection and analysis of quality assurance/quality control (QA/QC) samples is described in the *CSSA Base-wide Quality Assurance Project Plan, Version 1.0*, January, 2003 (see CSSA Environmental Encyclopedia, Volume 1-4). The QA/QC samples and their collection frequency are as follows:

- One Field Duplicate (FD) per 10 samples
- One Matrix Spike (MS) and one Matrix Spike Duplicate (MSD) per 20 samples
- One Equipment Blank (EB) per site.

Full QA/QC will be performed on these samples and 100% of the results will be validated/verified by a chemist.

The necessary turnaround time (TAT) for the samples will be based on the current timeframe of the excavation and may range from expedited (3-day) to the standard TAT (21-day).

2.4 Erosion Control Measures and Site Rehabilitation

Erosion control and site rehabilitation will follow the *Storm Water Pollution Prevention Plan for AOC-45*, May 2011.

3.0 SCHEDULE

This investigation may take place at any time and is anticipated to take approximately one week. All excavation work will be coordinated and scheduled in advance with CSSA.

Upon completion of the field effort an RIR will be completed for AOC-45. As discussed previously, if the investigation results warrant, another type of closure report may be completed instead.

Table 1. Assessment Levels for Chemicals of Potential Concern
CSSA 9 Metals
Area of Concern 45

Chemical of Potential Concern	**Residential Tier 1 $^{Tot}Soil_{Comb}$ (mg/kg)[1]**	**Residential Tier 1 $^{GW}Soil_{Ing}$ (mg/kg)[2]**	**CSSA Soil Background (mg/kg)[3]**	**EcoBenchmark (mg/kg)[4]**
Arsenic	24.2	2.5	**19.6**	NA
Barium	7,840.5	**221.9**	186	NA
Cadmium	52.0	0.75	**3.0**	NA
Chromium	23,053	**1200**	40.2	NA
Copper	547.6	**521.2**	23.2	NA
Lead	500	1.5	**84.5**	NA
Mercury	2.1	0.0039	**0.77**	NA
Nickel	832	**78.7**	35.5	NA
Zinc	9,921.5	**1,180.2**	73.2	NA

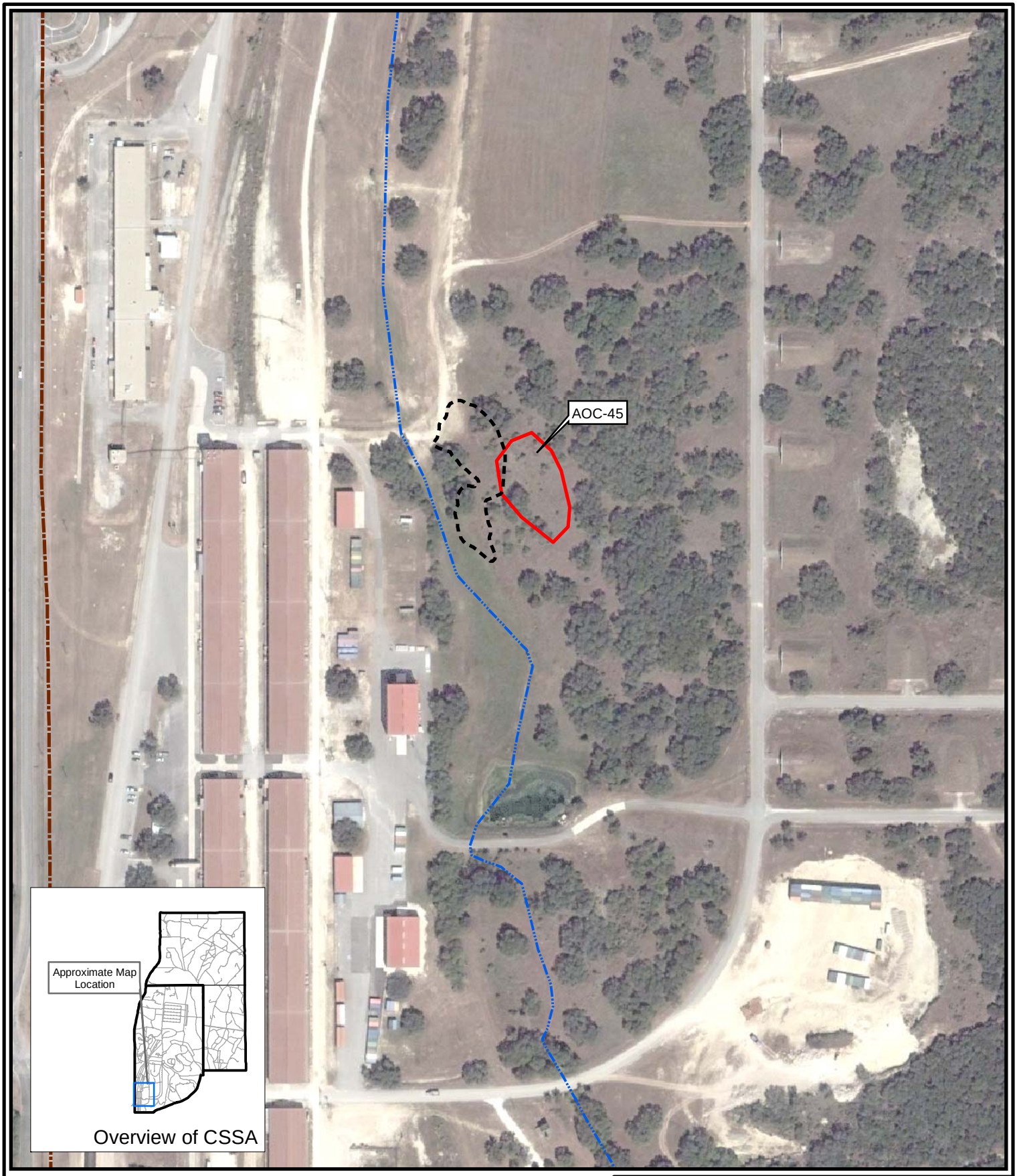
1) Texas Risk Reduction Program Rule Tier 1 Protective Concentration Levels (PCLs) $^{Tot}Soil_{Comb}$, for 30 acre source area, March 31, 2010 (http://www.tceq.state.tx.us/remediation/trrp/trrppcls.html).

2) Texas Risk Reduction Program Rule Tier 1 Protective Concentration Levels (PCLs) $^{GW}Soil_{Ing}$, for 30 acre source area, March 31, 2010 (http://www.tceq.state.tx.us/remediation/trrp/trrppcls.html).

3) Second Revision to Evaluation of Background Metals Concentrations in Soils and Bedrock, February, 2002.

4) Figure 30 TAC `350.77 (b) Tier 1 Exclusion Criteria Checklist, Subpart D, De Minimus Land Area- AOC 72 is less than one acre, therefore ecological evaluation is not necessary.

Identified PCLs are shown in **bold**.



Aerial Photo Date: 2008

N
W E
S

Intermittent Stream
CSSA Boundary
Proposed AOC-45 Excavation based on XRF Results
Original AOC-45 Boundary

0 160 320 480
Feet

Figure 1

AOC-45
Site Location Map
Camp Stanley Storage Activity

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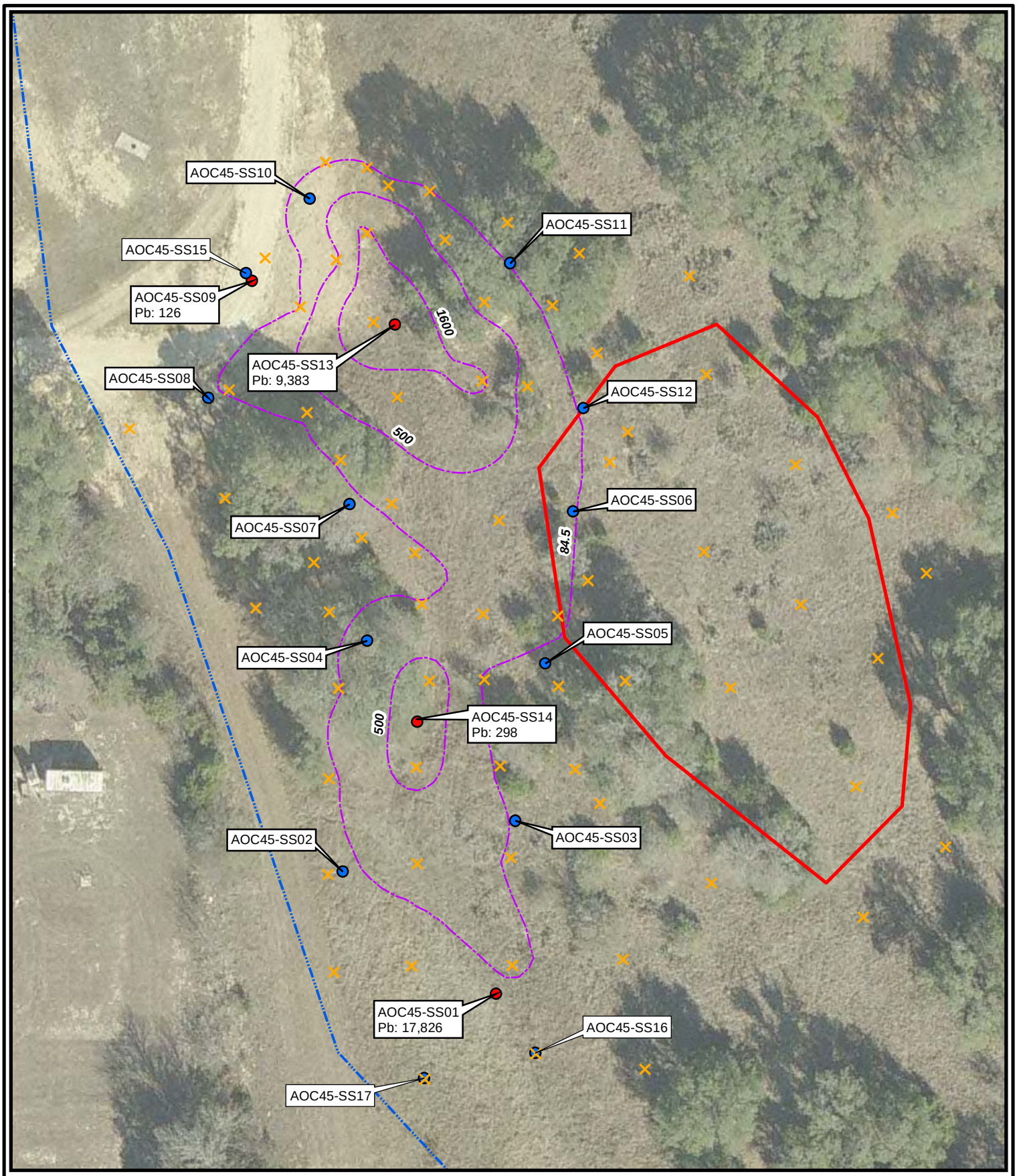

Aerial Photo Date: 2009

N
W E
S

0 25 50 100 Feet

- Soil sample location with COC concentrations detected above Tier 1 PCLs in mg/kg
- Soil sample location with COC concentrations detected below Tier 1 PCLs in mg/kg
- XRF Sample Locations
- Lead Contours (XRF Results in mg/kg)
- Intermittent Stream
- Original AOC-45 Boundary

Figure 2

AOC-45
Sampling Results
Camp Stanley Storage Activity

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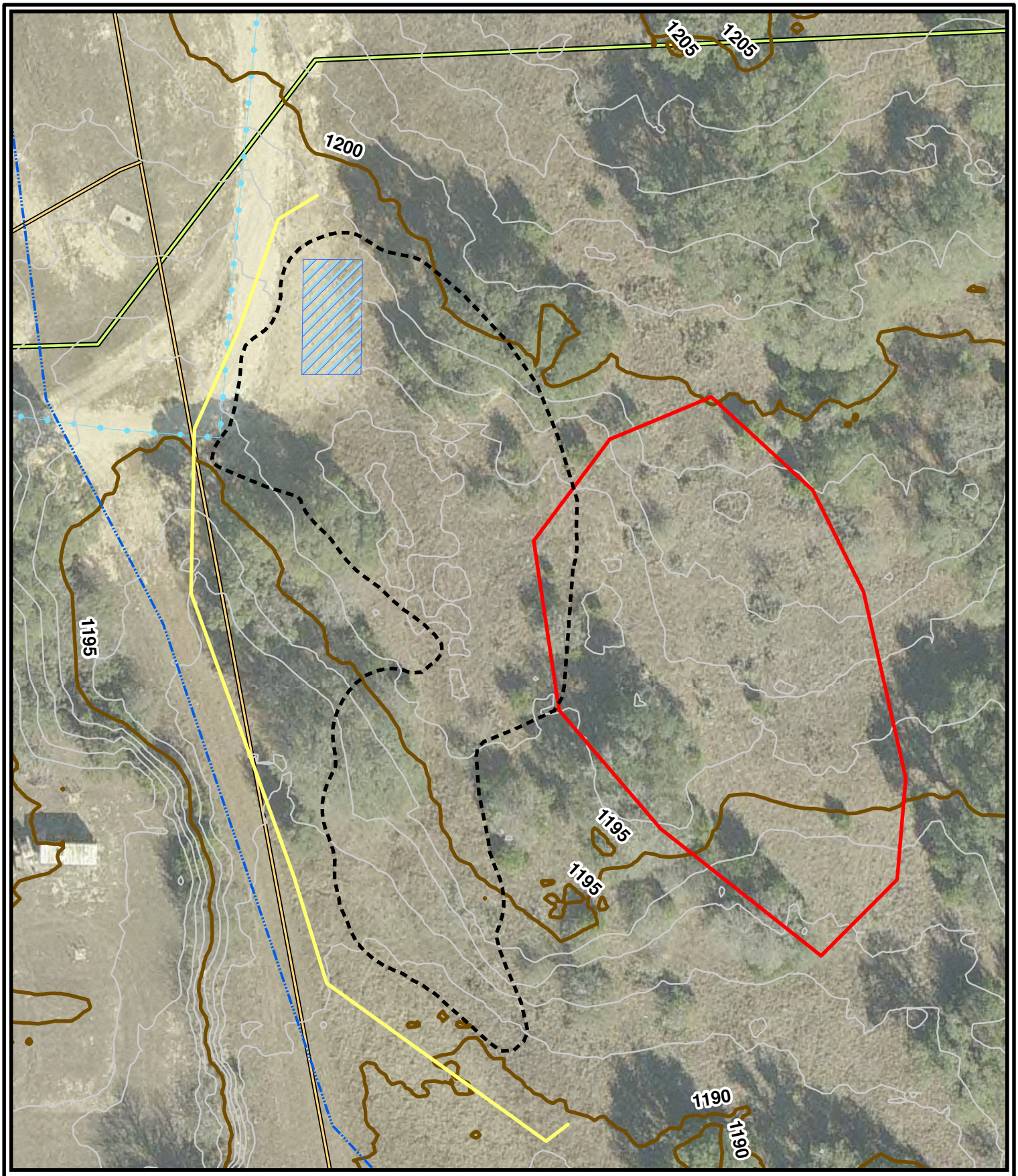

Aerial Photo Date: 2009

N
W E
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0 20 40 80 Feet

- Waste Water
- Water
- Communications
- 5 Foot Contours
- 1 Foot Contours
- Silt Fence
- Intermittent Stream
- Proposed Staging Area
- Proposed AOC-45 Excavation based on XRF Results
- Original AOC-45 Boundary

Figure 3

AOC-45
Proposed Excavation Effort
Camp Stanley Storage Activity

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