

RELEASE INVESTIGATION REPORT
AREA OF CONCERN 74
CAMP STANLEY STORAGE ACTIVITY



Prepared for:

Camp Stanley Storage Activity
Boerne, Texas

Prepared by:

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EXECUTIVE SUMMARY

Area of Concern (AOC) 74 is an approximately 2.5-acre site located in the western portion of Camp Stanley Storage Activity's (CSSA) Inner Cantonment Area. AOC-74 was identified as a potential AOC based on visual evidence of surficial construction debris. Work performed at the site included x-ray fluorescence (XRF) analysis of soil samples, environmental sampling, unexploded ordnance (UXO) inspection, the removal and proper disposal of soil containing contaminants above Tier 1 protective concentration levels (PCLs), and proper documentation of all activities, including preparation of this Release Investigation Report (RIR). This RIR requests No Further Action (NFA) at AOC-74.

In summary, activities at AOC-74 as described in this RIR showed the following results:

- Excavation, removal, and confirmation sampling were performed at AOC-74.
- The contaminants of concern (COCs) identified above soil background concentrations at AOC-74 were arsenic, cadmium, chromium, lead, nickel, and zinc. Areas of contamination exceeding Tier 1 PCLs have been either excavated and removed from the site, or were used to calculate a 95% upper confidence limit (UCL) per Texas Administrative Code (TAC) §350.79(2)(A) which does not exceed the Tier 1 PCL.

From information presented in this report, the results of the investigation at AOC-74 meet the three criteria as described in the Texas Commission on Environmental Quality (TCEQ) (2003) guidance *Determining Which Releases are Subject to Texas Risk Reduction Program (TRRP)*. Thus, the following three criteria were met:

- Soil found to have a COC concentrations above the Tier 1 PCLs were either excavated from the site or used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-74. Soil that was found to have concentrations above Tier 1 PCLs was excavated and removed, so there will be no future impact to groundwater, surface water, or sediment from AOC-74.
- AOC-74 passes the Tier 1 Ecological Exclusion Criteria Checklist (**Appendix B**).

Because these three criteria are met, AOC-74 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and to request an NFA decision from TCEQ.

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
APPL	Agriculture & Priority Pollutants Laboratory, Inc.
BS	Bexar Shale
BTOC	below top of casing
CC	Cow Creek
COC	contaminant of concern
CSSA	Camp Stanley Storage Activity
CY	cubic yard
DQO	Data Quality Objective
EE	Environmental Encyclopedia
FSP	Field Sampling Plan
ft	feet
^{GW} Soil _{Ing}	soil to groundwater ingestion pathway (PCL)
IM	Interim Measures
LGR	Lower Glen Rose
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MQL	method quantification limit
NFA	No Further Action
PCL	protective concentration level
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RIR	Release Investigation Report
RL	reporting limit
RMU	Range Management Unit
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCLP	toxicity characteristic leaching procedure
^{Tot} Soil _{Comb}	total soil combined pathway (PCL)
TRRP	Texas Risk Reduction Program
UCL	upper confidence limit

ACRONYMS AND ABBREVIATIONS (*continued*)

UGR	Upper Glen Rose
USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance
VOC	volatile organic compound
WMP	Waste Management Plan
XRF	x-ray fluorescence

1.0 INTRODUCTION

Parsons is under contract to provide investigations and environmental services for waste sites located at Camp Stanley Storage Activity (CSSA) in Boerne, Texas (**Figure 1**). This contract includes characterization of selected waste disposal sites and preparation of appropriate documentation, including a Release Investigation Report (RIR) for Area of Concern (AOC) 74 (**Figure 2**). AOC-74 is located in the western portion of the Inner Cantonment Area, approximately 430 yards east of the western CSSA boundary. This site covers approximately 2.5 acres. This work was performed in accordance with 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 Texas Risk Reduction Program (TRRP) of the Texas Commission on Environmental Quality (TCEQ). This RIR was prepared following TCEQ reporting and documentation requirements for releases that do not trigger applicability to the TRRP rule.

This report describes environmental investigation activities at AOC-74. Work included x-ray fluorescence (XRF) analysis of soils; environmental sampling; unexploded ordnance (UXO) inspection; excavation and removal of impacted soil; waste characterization and confirmatory sampling and analysis; and proper documentation of all activities, including preparation of this closure report. All work was performed according to applicable federal, state, and local rules and regulations.

For this report, Section 1 provides the introduction and the documentation to support this RIR. Section 2 provides historical background information for CSSA and for AOC-74. Section 3 describes the objectives and rationale for preparing an RIR for AOC-74 and the findings from environmental investigations for the site. The groundwater and surface water for CSSA and the area near AOC-74 are also described in Section 3. Section 4 summarizes the findings from completing the Tier 1 Ecological Exclusion Criteria Checklist, which is included as an appendix to this RIR. Section 5 summarizes the overall findings and recommendations for the site. All figures and tables are provided at the end of this RIR (pages 9 through 17). References cited in this report can be found in the CSSA Environmental Encyclopedia (EE) ([Volume 1-1, Bibliography](#)) at www.stanley.army.mil.

2.0 HISTORICAL BACKGROUND

2.1 CAMP STANLEY STORAGE ACTIVITY

Camp Stanley Storage Activity is located in northwestern Bexar County, about 19 miles northwest of downtown San Antonio. The installation consists of approximately 4,004 acres immediately east of Ralph Fair Road, and approximately 0.5 mile east of Interstate Highway 10 (Figure 1). Camp Bullis borders CSSA on the north, east, and south.

The land where CSSA is located was used for ranching and agriculture until the 1900s. During 1906 and 1907, six tracts of land were purchased by the U.S. Government and designated the Leon Springs Military Reservation. The land included campgrounds and cavalry shelters.

In October 1917, the installation was re-designated Camp Stanley. Extensive construction was started during World War I to provide housing for temporary cantonments and support facilities. In 1931, the installation was selected as an ammunition depot, and construction of standard magazines and igloo magazines began in 1938. Land was also used to test, fire and overhaul ammunition components. As a result of these historic activities, CSSA has several historical waste sites, including Solid Waste Management Units (SWMUs), AOCs, and Range Management Units (RMUs).

The present mission of CSSA is the receipt, storage, issue, and maintenance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. Because of its mission, CSSA has been designated a restricted access facility. No changes to the CSSA mission and/or military activities are expected in the future.

2.2 AOC-74

2.2.1 Overview

AOC-74 was identified as a potential AOC in 2010 based on visual evidence of surficial construction debris. Prior uses are unknown. The analytical results for contaminants of concern (COCs) detected at the site are discussed in Section 3.1. A series of historical aerial photos of the site are shown on **Figure 3** and photographs showing investigation and excavation activities at the site are provided in **Appendix A**.

2.2.2 Setting, Size, and Description

AOC-74 is located in the western portion of the Inner Cantonment Area, approximately 430 yards east of the western CSSA boundary (Figure 2). AOC-74 covers approximately 2.5 acres. Additional background information on AOC-74 can be found in the CSSA EE ([Volume 3-2, AOC-74](#)).

2.2.3 Potential Contaminant Sources and Chemicals of Concern

Review of historic aerial photographs did not reveal any specific disturbed areas of concern. However, CSSA found construction debris including concrete blocks, pipes, tiles, and metal debris scattered around the surface. COCs at AOC-74 include metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). In addition, due to the age of the surficial construction debris found at the site, asbestos is also included as a potential COC.

3.0 OBJECTIVES OF RIR FOR AOC-74

In accordance with TCEQ (2003) guidance, *Determining Which Releases are Subject to TRRP* (www.tceq.state.tx.us/assets/public/remediation/trrp/releasesTRRPrev.pdf), an RIR can be prepared for a site when results of an investigation lead to the following conclusions:

- Concentrations of chemicals detected at the site do not exceed Tier 1 residential soil action levels;
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at the site; and
- The site passes the Tier 1 Ecological Exclusion Criteria Checklist (the completed checklist is provided in **Appendix B**).

When these three criteria are met for a site, the release is not subject to TRRP. For such a site, an RIR can be submitted to the TCEQ and a No Further Action (NFA) decision can be requested.

As referred to in the criteria listed above, the Tier 1 residential soil action levels are provided by TCEQ (2010) and were selected following TCEQ guidance (TCEQ, 2007). These action levels are referred to as protective concentration levels (PCLs) and are selected for each chemical detected at the site (*i.e.*, COCs). The PCLs are based on the general size of the site, which is also referred to as the “source area” size. The source area is either assumed to be 0.5 acre if the site is less than 0.5 acre in size, or assumed to be 30 acres if the site is larger than 0.5 acre. Thus, the soil action levels for AOC-74 are based on a 30-acre source area, since the size of the site is approximately 2.5 acre. The PCL is then selected based on the lower of the two PCLs listed for either (1) the total soil combined pathway ($^{Tot}Soil_{Comb}$) (*i.e.*, exposure to a COC from incidental ingestion, dermal contact, inhalation of volatiles and particulates, and vegetable consumption); or (2) the soil to groundwater pathway ($^{GW}Soil_{Ing}$) (*i.e.*, soil-to-groundwater leaching of a COC to groundwater, where the PCL is the highest concentration of COC allowed in soil to be protective of Class 1 or Class 2 groundwater).

Also based on the TCEQ guidance, if the background level or the method quantification limit (MQL) is a higher concentration than the PCL, then the higher of the background or MQL is used as the action level. Based on the metals that are most common to past activities at CSSA, TCEQ has approved background concentrations for nine CSSA metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc) (Parsons, 2002). The statistically calculated and TCEQ-approved background metal concentrations are shown in the analytical summary table (**Table 1**) and are also available in the CSSA EE ([Volume 2, Background Metals Levels](#)). It is noted that the action levels/PCLs for five of the nine metals are based on the CSSA background concentrations (these five metals are arsenic, barium, cadmium, lead, and mercury).

3.1 AOC-74 FIELD ACTIVITIES AND INVESTIGATIONS

CSSA identified AOC-74 in 2011 when scattered construction debris was found during parking lot construction adjacent to Building 605. In June 2011, Parsons conducted XRF field screening to identify potential areas of contamination. This sampling identified an area with lead and zinc concentrations above Tier 1 PCLs. In November 2011, Parsons conducted soil sampling at several locations across the site and performed a UXO investigation to assess the presence of subsurface anomalies on site. Subsequently, impacted soil was excavated and transported to the East Pasture berm.

A summary of the cleanup confirmation results at the site are shown in Table 1 (detected compounds only) and **Appendix C** (all analytes), and the confirmation soil sampling locations are shown on **Figure 5**. Waste characterization results for samples collected from stockpiled soil excavated as part of this effort are shown in **Appendix F**. The data verification summary report for the sampling and analytical results is provided in **Appendix D**. Sample locations for soils remaining at the site are shown on Figure 5. The clearance areas where soils were excavated and removed are also shown on Figure 5. Waste characterization sampling is described in Section 3.1.4. Additional information about past activities and investigations at the sites can be found in the CSSA EE ([Volume 3-2, AOC-74](#)).

3.1.1 Sampling and Analytical Procedures

For all sampling and analytical activities at CSSA, Parsons follows TCEQ-approved Quality Assurance (QA) and Quality Control (QC) procedures as described in the post-wide CSSA Quality Assurance Project Plan (QAPP) which can be found in the CSSA EE ([Volume 1-4, Sampling and Analysis Plan](#)). The detailed CSSA QAPP presents specific policies, organization, functions, and QA/QC requirements for environmental programs at CSSA, including TCEQ-approved analytical methods, reporting limits (RL), and QA/QC procedures.

The CSSA QAPP: (1) was prepared for use by contractors that perform environmental services at CSSA to ensure that the data are scientifically valid and defensible; (2) establishes the analytical protocols and documentation requirements to ensure that the samples are collected and analyzed, and that the data are reviewed and validated in a specified manner; and (3) provides detailed guidance for using the Data Quality Objective (DQO) process for specific investigations. The CSSA QAPP and delivery/task order specific Field Sampling Plans (FSP) constitute the CSSA Sampling and Analysis Plan (SAP). The SAP defines data quality for a specific project. Information regarding post-wide and site-specific plans and TCEQ correspondence can be found in the CSSA EE ([Volume 1-1, Correspondence](#)).

Following the CSSA-specific plans, the investigative soil analyses for AOC-74 were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 8260B (VOCs); Method 8270C (SVOCs); Method 8081 (pesticides); Method 8151A (herbicides); and Method 6010 (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc). Prior to soil/waste disposal, waste

characterization samples were collected from the excavated material and analyzed for toxicity characteristic leaching procedure (TCLP) metals (Methods SW1311/6010B and SW1311/7470A). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analyses.

3.1.2 XRF Survey

An XRF survey for lead and zinc was conducted in June 2011. Lead and zinc XRF results have shown a strong statistical correlation with laboratory-verified samples. As such, these metals were used as indicators of potential areas of metals contamination at the site. Sample locations and results for the XRF survey are shown on **Figure 4**. The purpose of the XRF survey was to gather field screening data regarding the presence of metals above Tier 1 PCLs in surface soils. XRF analytical results showed that both lead and zinc were detected above Tier 1 PCLs.

3.1.3 Excavation, Removal, and Confirmation Sampling at AOC-74

In November 2011, ten surface soil samples were collected from within the site to confirm the elevated XRF values, and an additional five surface samples were collected along the perimeter to confirm the proposed excavation boundary (Figure 5). The samples were analyzed for metals, VOCs, and SVOCs. Results showed concentrations of arsenic, chromium, cadmium, lead, nickel, and zinc above Tier 1 PCLs. Low levels of SVOCs were detected below Tier 1 PCLs. The sample containing elevated levels of arsenic was additionally analyzed for herbicides and pesticides; however, none were detected.

On November 7 and 8, 2011, a UXO investigation was conducted at the site. The investigation involved a Schonstedt-aided visual inspection of the site by UXO technicians. No indications of unidentifiable subsurface anomalies, buried debris, or waste disposal trenches were found within the site boundary.

Excavation activities to remove soils with metal concentrations above their Tier 1 PCLs were conducted between November 22 and December 8, 2011. During this period, approximately 2,200 cubic yards (CY) of soil media and construction debris were removed from the site. All excavation activities were conducted by USA Environment, under the supervision of a Parsons Construction Manager. The excavated area was 0.8 acre in size, approximately 360 feet (ft) long (northeast to southwest), and ranged from about 50 ft wide near the center to about 200 ft wide towards the north end, as shown on Figure 5. The southern end of the site was excavated to a depth of approximately 1 ft while the northern and western side of the site was excavated to a depth of approximately 2 ft. Following completion of the excavation, confirmation samples from the bottoms and sidewalls of the excavated areas were sampled and the results are shown in Table 1. Confirmation soil samples showed four locations that still contained metal concentrations above their Tier 1 PCLs. Two soil samples slightly exceeded the Tier 1 PCL for chromium of 40.2 milligrams per kilogram (mg/kg): SS04 (42 mg/kg) and BOT01 (49 mg/kg) at a depth of 2-2.5 ft. Two soil samples slightly exceeded the Tier 1 PCL for zinc of 120 mg/kg: SS09 (136 mg/kg) and SS12 (130 mg/kg).

Per TAC §350.79(2)(A), a 95% upper confidence limit (UCL) may be calculated to determine if there is a statistical basis for no further action on a particular COC. A 95% UCL of 32.07 mg/kg was calculated for the chromium concentrations remaining in site soils, which does not exceed the Tier 1 PCL of 40.2 mg/kg (**Appendix G**). A 95% UCL of 77.59 mg/kg was calculated for the zinc concentrations remaining in site soils, which does not exceed the Tier 1 PCL of 120 mg/kg (**Appendix G**).

Low levels of several VOCs and polycyclic aromatic hydrocarbons were detected at three locations, but concentrations were well below Tier 1 PCLs. No evidence of asbestos tiling was encountered during the field effort, so no samples were collected for asbestos analysis.

3.1.4 Waste Characterization and Off-Post Disposal Activities

Waste characterization efforts were performed in accordance with requirements of CSSA's *RCRA Facility Investigation (RFI) and Interim Measures (IM) Waste Management Plan (WMP) – Revised*, dated May 2006 (approved by TCEQ in August 2006) and the RFI/IM WMP Addendum for AOC-74, dated November 2011.

Excavated material was stockpiled along and adjacent to the excavation site during the excavation for waste characterization and then moved to the assigned staging area for waste characterization. TCLP results from the stockpiled soils indicated the material met non-hazardous Class 2 criteria, so approximately 2,200 CY of soils were transported to the East Pasture Berm for reuse, as per TCEQ approval December 20, 2010 (**Appendix E**).

3.2 GEOLOGY/HYDROGEOLOGY

Based on the sampling results and the geological and hydrogeological characteristics of the site, surface water and groundwater have not been affected by historical activities at AOC-74. A description of the geology and hydrogeology of the area is provided below. Additional information on geology, hydrology and physiography at CSSA are also available in the CSSA EE ([Volume 1-1, Background Information Report](#)).

3.2.1 CSSA Geology/Hydrogeology

The Lower Glen Rose (LGR) is the uppermost geologic stratum in the CSSA area. The LGR is a massive, fossiliferous, vuggy limestone that grades upward into thin beds of limestone, marl, and shale. The LGR is approximately 300-330 ft thick in the CSSA area and is underlain by the Bexar Shale (BS) facies of the Hensell Sand, which is estimated to be from 60 to 150 ft thick under the CSSA area. The BS consists of silty dolomite, marl, calcareous shale, and shaley limestone. The geologic strata dip approximately 1 to 2 degrees to the south-southeast at CSSA.

The uppermost hydrogeologic layer at CSSA is the unconfined Upper Trinity aquifer, which consists of the Upper Glen Rose (UGR) Limestone. Locally at CSSA, very low-yielding perched zones of groundwater can exist in the UGR; however, it is very sporadic and seasonal. Transmissivity values are not available for the UGR. Regionally, groundwater flow is thought to

be enhanced along the bedding contacts between marl and limestone; however, the hydraulic conductivity between beds is thought to be poor. This interpretation is based on the observation of discordant static water levels in adjacent wells completed in different beds. Principal development of solution channels is limited to evaporite layers in the UGR Limestone.

The Middle Trinity aquifer functions as the primary source of groundwater at CSSA. It consists of the LGR Limestone, the BS, and the Cow Creek (CC) Limestone. The LGR Limestone outcrops north of CSSA, along Cibolo Creek, and within the central and southwestern portions of CSSA. As such, principal recharge into the Middle Trinity aquifer is via precipitation infiltration at outcrops and along creek beds during flood events. At CSSA, the BS is interpreted as a confining layer, except where it is fractured and faulted, allowing vertical flow from the up-dip CC Limestone into the overlying, down-dip LGR. Fractures and faults within the BS may allow hydraulic communication between the LGR and CC Limestones. Regional groundwater flow within the Middle Trinity aquifer is toward the south and southeast and the average transmissivity coefficient is 1,700 gallons per day per ft (CSSA EE, [Volume 5, Hydrogeologic Report](#)). In general, groundwater at CSSA flows in a northeast to southwest direction. However, local flow gradient may vary depending on rainfall, recharge, and possibly well pumping.

3.2.2 AOC-74 Groundwater and Surface Water

No site-specific information regarding groundwater is available for AOC-74. However, between October 1992 and June 2011, measured water levels at Well CS-10, which is located approximately 270 ft east of the site, have ranged from 132.8 ft below top of casing (BTOC) (December 1998) to 470.0 ft BTOC (December 2006). Low concentrations of VOCs and metals detected in CS-10 (below their respective maximum contaminant levels [MCLs]) are attributed to contaminated groundwater from the SWMU B-3 bioreactor plume.

The closest surface water body to AOC-74 is an unnamed intermittent tributary or drainage approximately 1,200 ft north of the site (**Figure 6**). The tributary, which only contains water immediately after significant rain events, drains to Salado Creek, located approximately 4,000 ft east of AOC-74. The north-south trending creek exits the CSSA boundary approximately 6,550 ft south-southeast of the site. No significant degradation of high quality receiving waters is anticipated from AOC-74.

4.0 TIER 1 ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

In accordance with TCEQ (2003) guidance, an RIR is submitted when the results of an investigation lead to a conclusion that COCs do not exceed Tier 1 residential soil action levels and there is no evidence of other affected media. The site must also pass the Tier 1 Ecological Exclusion Criteria Checklist. The checklist must be completed as part of the RIR for a site. The completed checklist is provided in Appendix B. Results show that the site passes the checklist and that there are no ecological exposure pathways of concern at AOC-74. Thus, based on the absence of any complete or significant ecological exposure pathways, AOC-74 may be excluded from further ecological assessment.

5.0 SUMMARY AND RECOMMENDATIONS

AOC-74 is located in the western portion of the Inner Cantonment Area, approximately 430 yards east of the western CSSA boundary (Figure 2). AOC-74 covers approximately 2.5 acres. AOC-74 was identified as a potential AOC based on visual evidence of surficial construction debris. Prior uses are unknown.

In summary, activities at AOC-74 as described in this RIR showed the following results:

- Excavation, removal, and confirmation sampling were performed at AOC-74.
- Soils found to have COC concentrations above the Tier 1 PCLs were either excavated from the site or were used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL.
- Approximately 2,200 CY of contaminated soil were excavated and properly disposed of at the East Pasture Berm.
- Confirmation samples were collected from trench bottoms and sidewalls to confirm all waste had been removed.

From information presented in this report, the results of the investigation at AOC-74 meet the three criteria as described in TCEQ's (2003) guidance *Determining Which Releases are Subject to TRRP*. Thus, the following three criteria were met:

- Soils found to have COC concentrations above Tier 1 PCLs were either excavated from the site or were used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL;
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-74; and
- AOC-74 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, AOC-74 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and to request an NFA decision from the TCEQ.

TABLES AND FIGURES

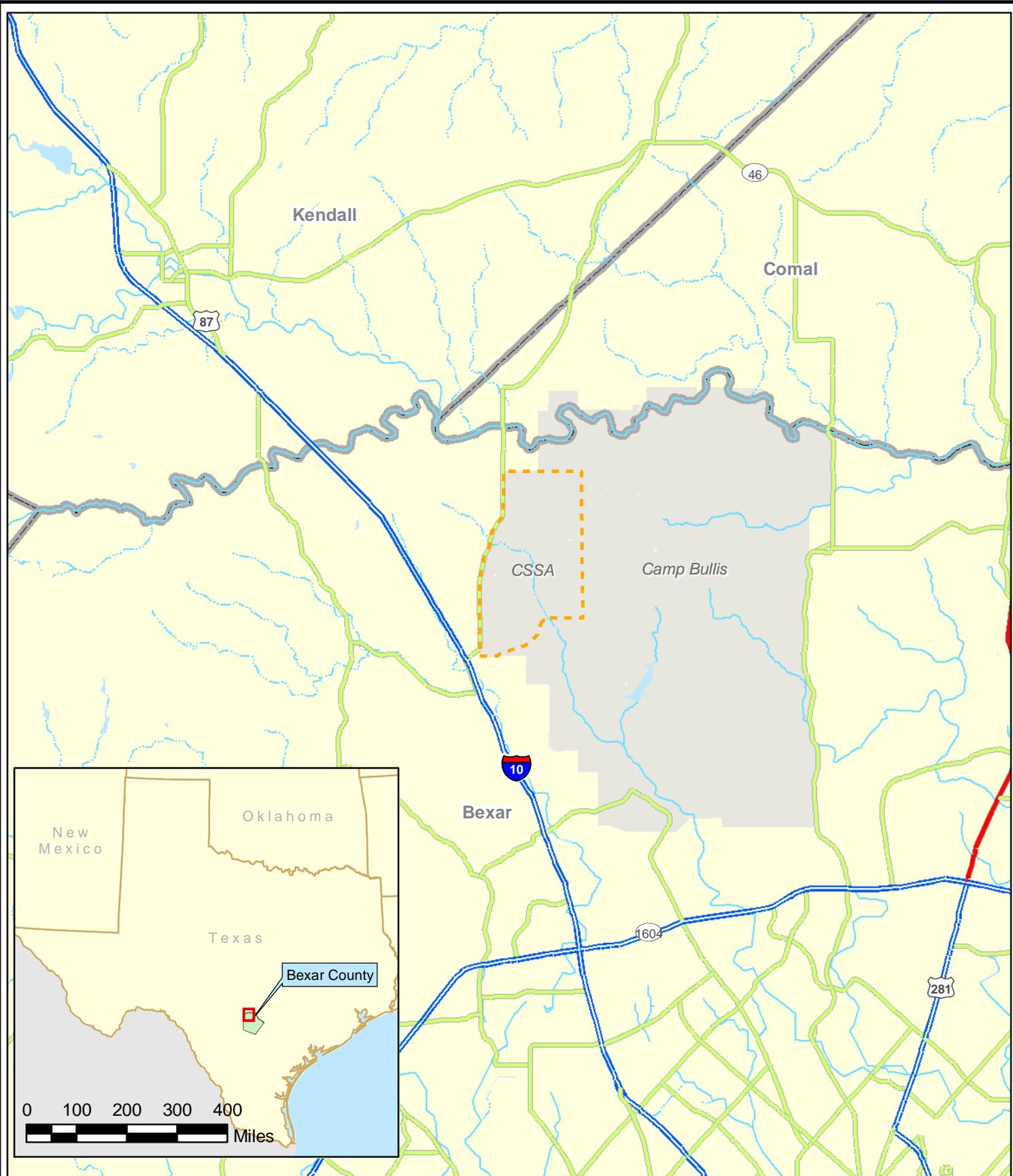
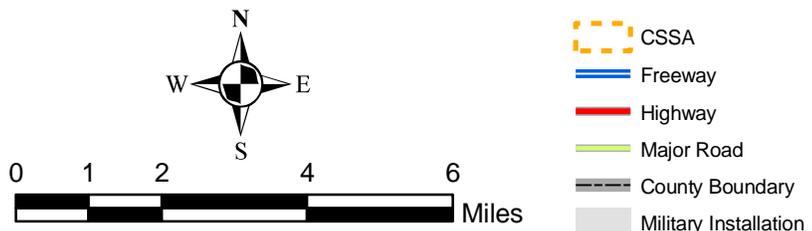
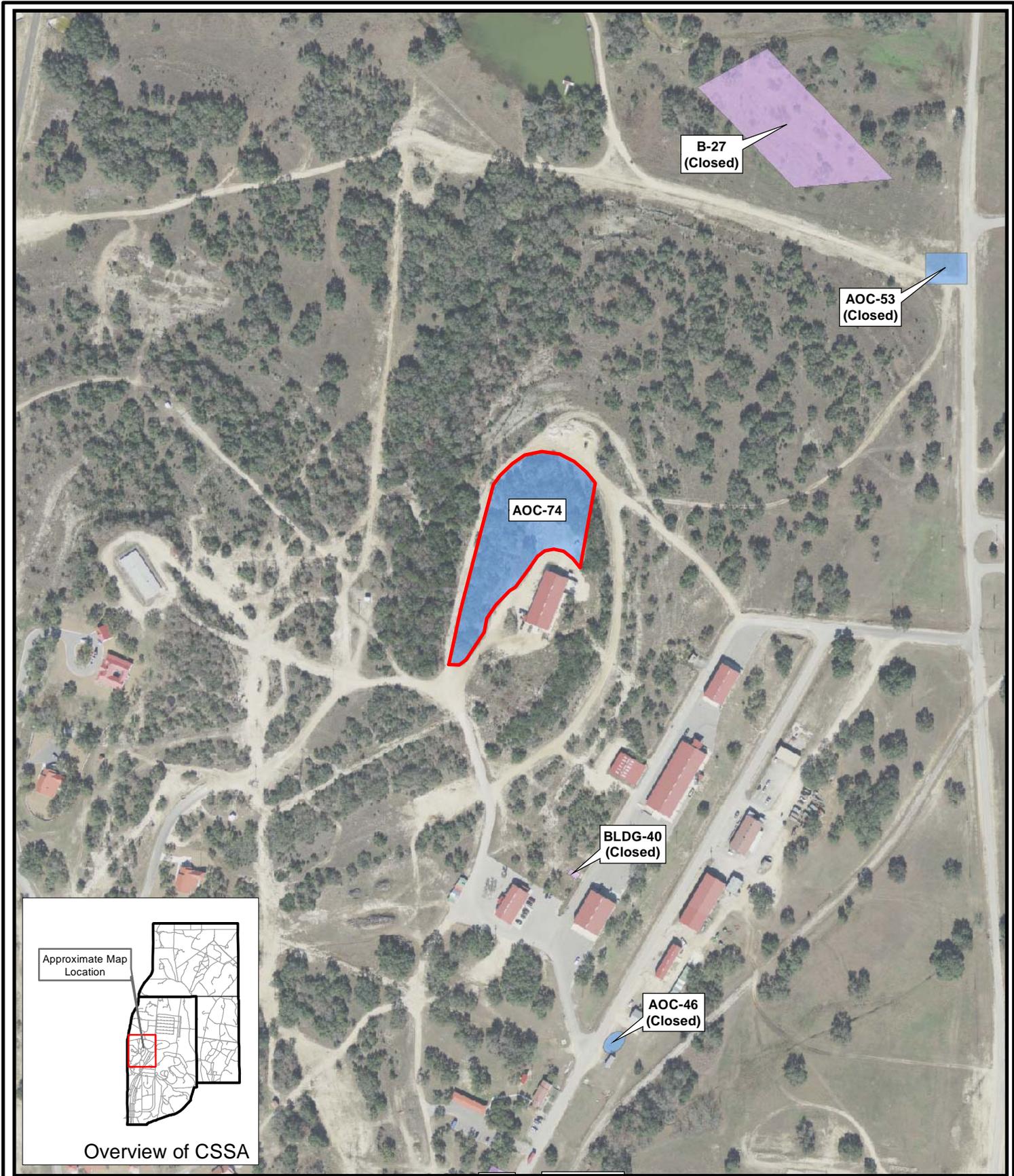


Figure 1

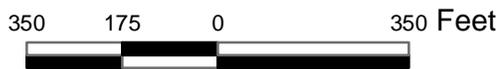
**CSSA Location Map
Camp Stanley Storage Activity**

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Aerial Photo Date: 2010

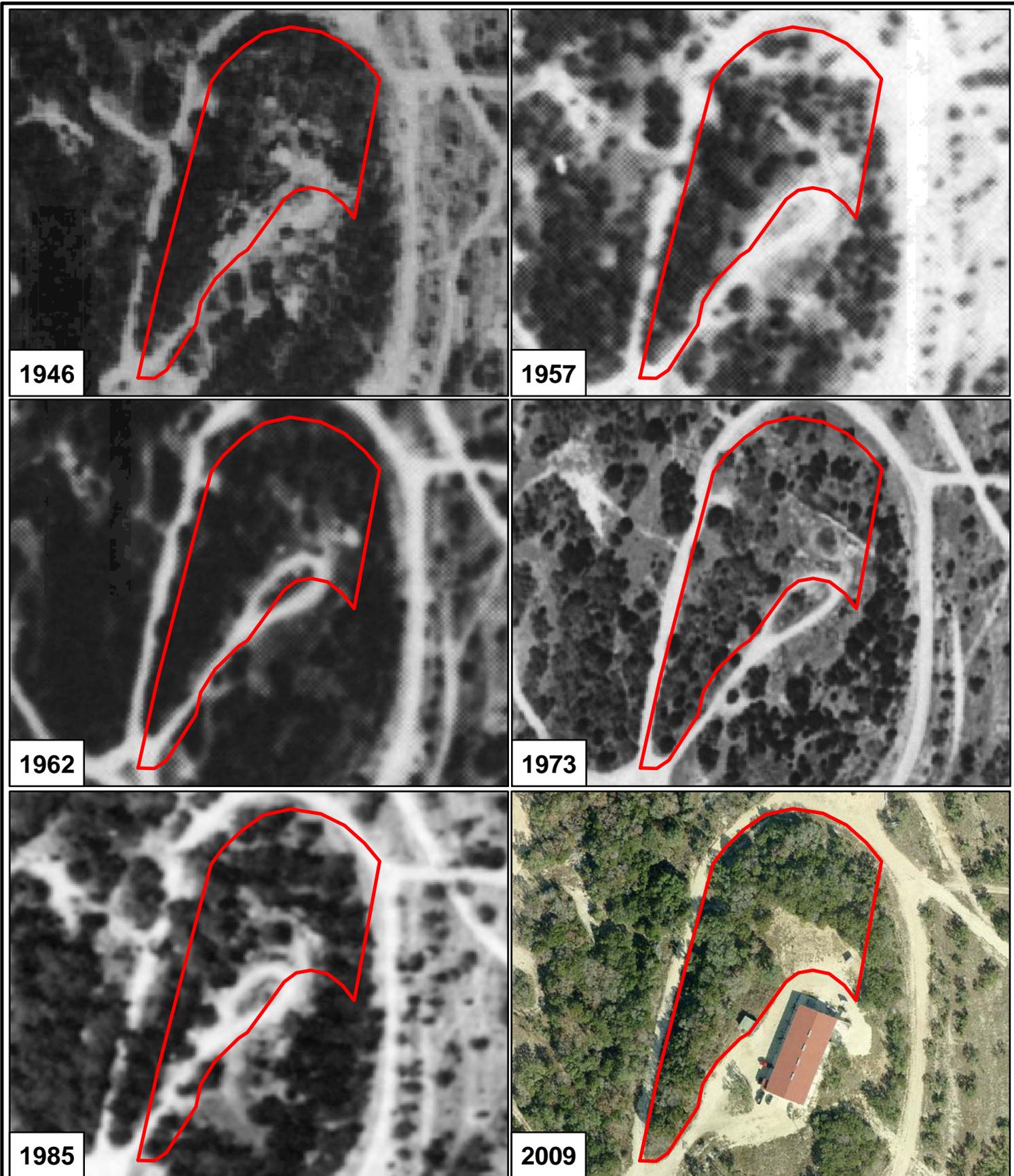


- AOC-74 Boundary
- AOC Boundary
- SWMU Boundary

Figure 2

AOC-74
Site Location Map
Camp Stanley Storage Activity

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1946

1957

1962

1973

1985

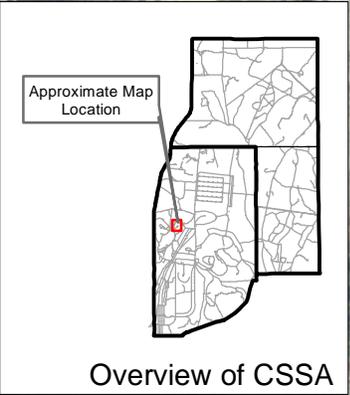
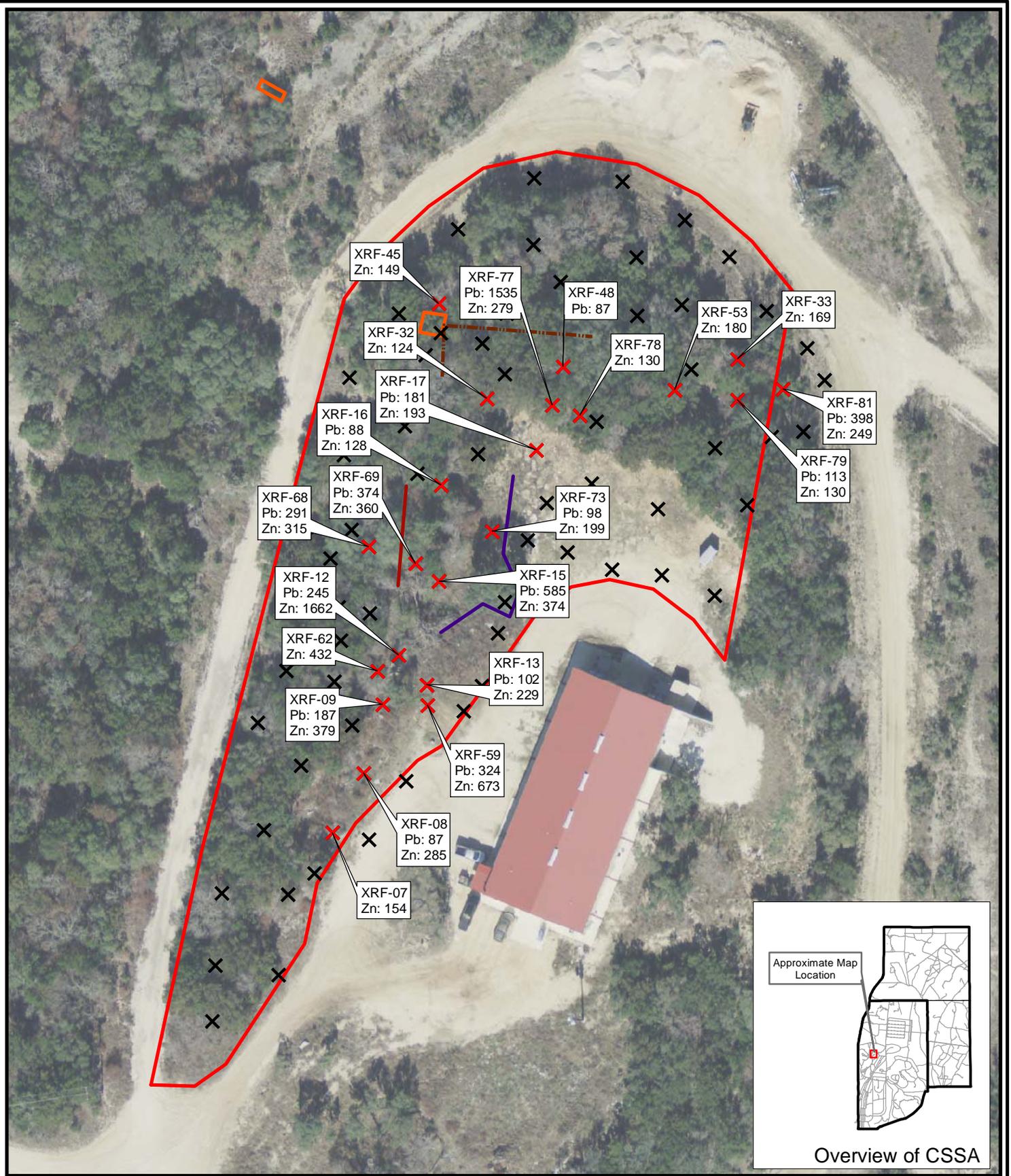
2009



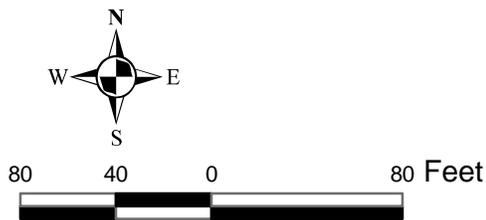
 AOC-74



Figure 3
 AOC-74
 Aerial Photographs
 Camp Stanley Storage Activity
PARSONS



Aerial Photo Date: 2010

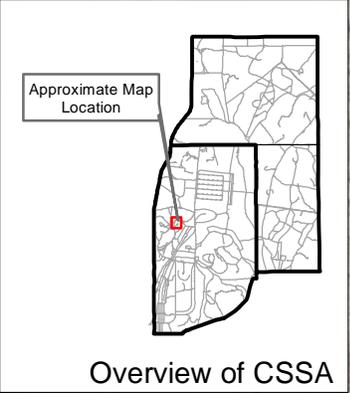
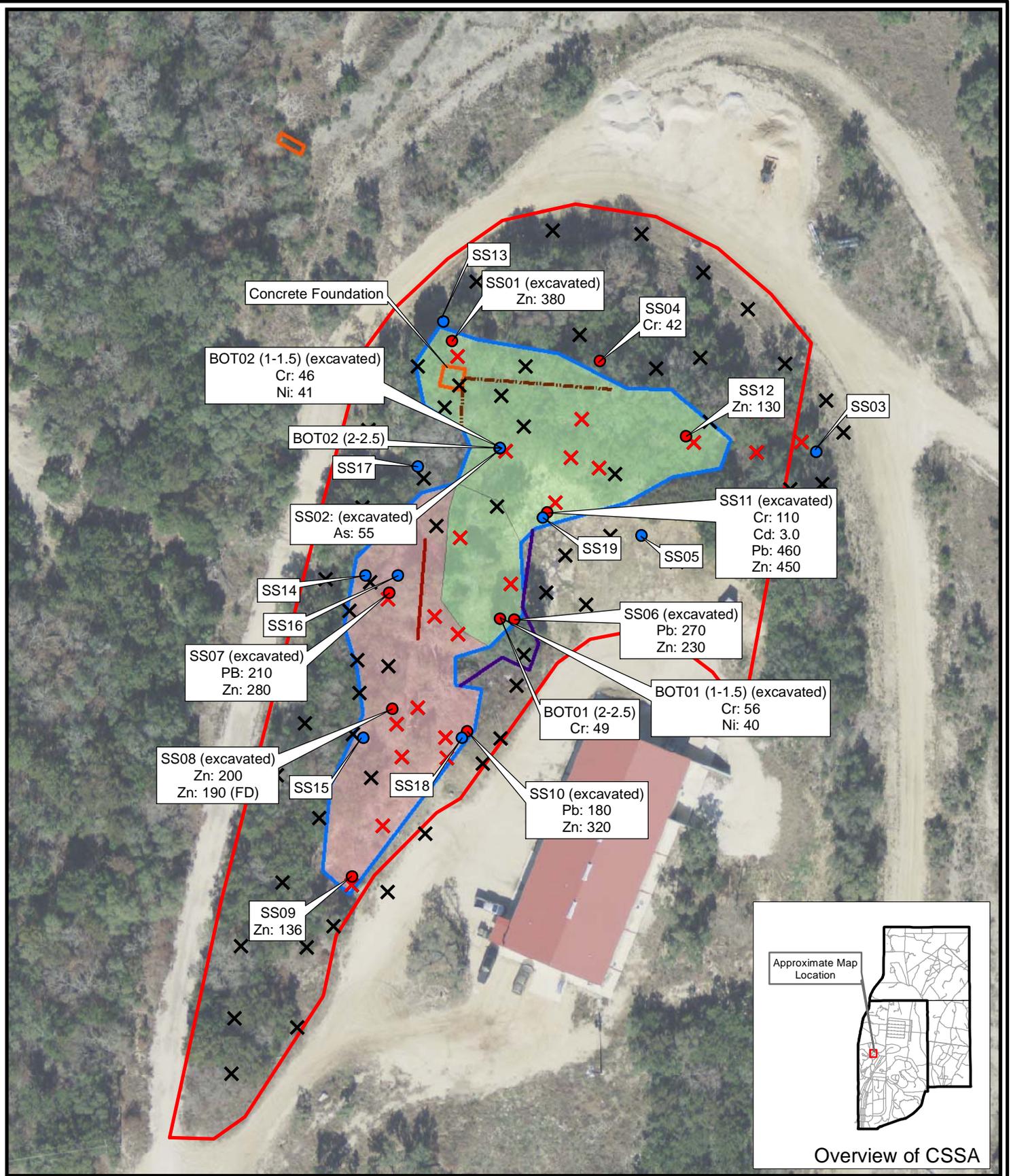


- ✕ XRF Sample Location
- ✕ XRF Results above Tier 1 PCL
- ▭ AOC-74 Boundary
- New Rock Wall
- Old Retaining Wall
- ▭ Concrete Foundation
- Fence

Figure 4

AOC-74
XRF Sampling Results
Camp Stanley Storage Activity

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Aerial Photo Date: 2010



80 40 0 80 Feet

- Soil Sample
- Soil Sample Location with result above PCL in (mg/kg)
- ✕ XRF Sample Location
- ✕ XRF Results above Tier 1 PCL
- Excavation Extent**
- 1 ft deep
- 2 ft deep, or to Bedrock
- Total Excavation Area
- New Rock Wall
- Old Retaining Wall
- Concrete Foundation
- Fence

Figure 5

AOC-74
Sample and Excavation Locations
Camp Stanley Storage Activity

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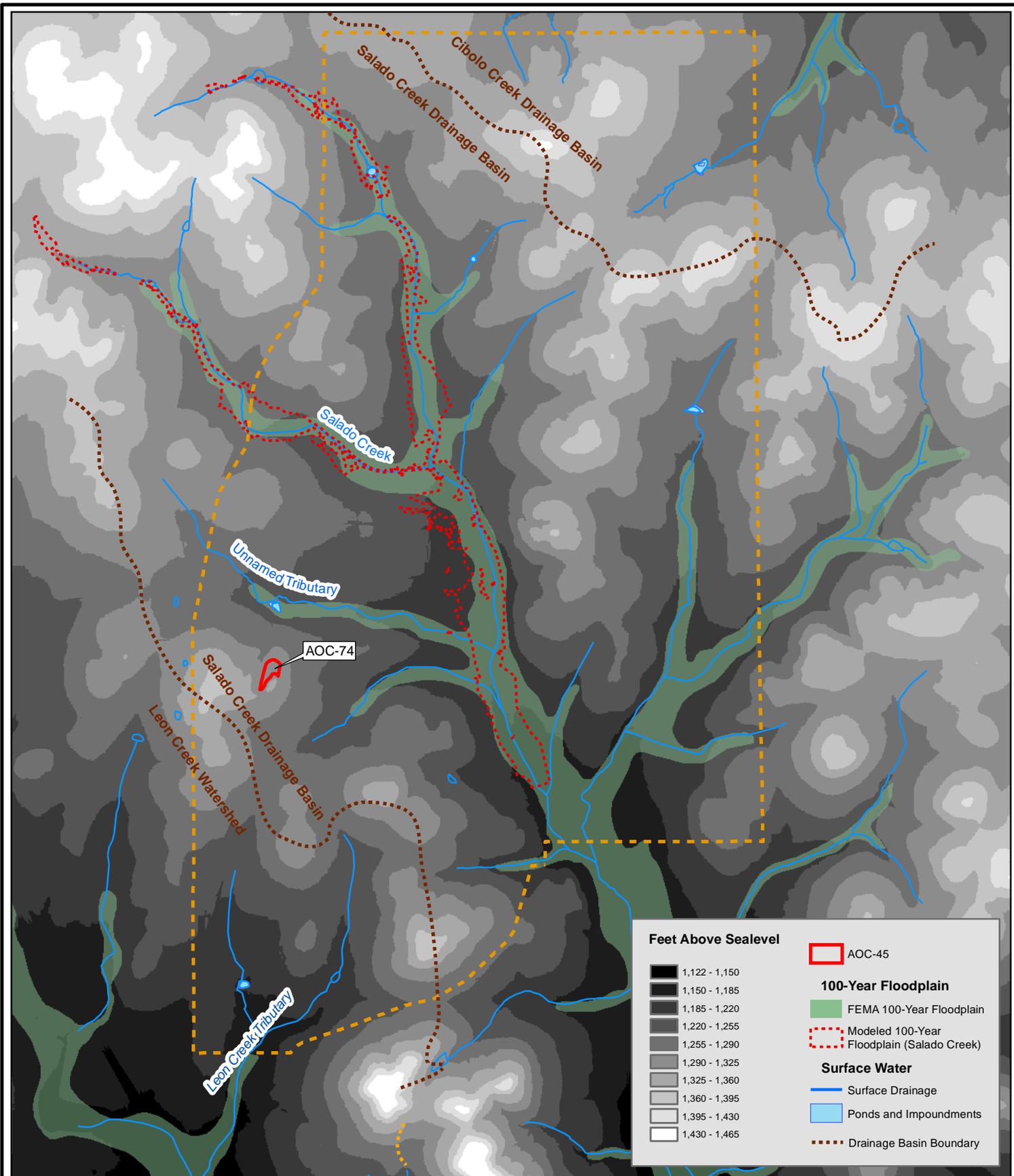


Figure 6

AOC-74 Topography,
Surface Water, and Floodplains
Camp Stanley Storage Activity

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APPENDIX A
Site Photographs



Photo 1. AOC-74 looking southeast (November 2011).



Photo 2. Excavation of AOC-74, looking northwest (November 2011).



Photo 3. Excavation of AOC-74, looking northwest (November 2011).



Photo 4. Excavation of AOC-74, looking south (November 2011).



Photo 5. Debris removed from AOC-74, looking north (November 2011).

APPENDIX B

Tier 1 Ecological Exclusion Criteria Checklist

Figure: 30 TAC §350.77(b)

TIER 1: Exclusion Criteria Checklist

This exclusion criteria checklist is intended to aid the person and the TNRCC in determining whether or not further ecological evaluation is necessary at an affected property where a response action is being pursued under the Texas Risk Reduction Program (TRRP). Exclusion criteria refer to those conditions at an affected property which preclude the need for a formal ecological risk assessment (ERA) because there are **incomplete or insignificant ecological exposure pathways** due to the nature of the affected property setting and/or the condition of the affected property media. This checklist (and/or a Tier 2 or 3 ERA or the equivalent) must be completed by the person for all affected property subject to the TRRP. The person should be familiar with the affected property but need not be a professional scientist in order to respond, although some questions will likely require contacting a wildlife management agency (i.e., Texas Parks and Wildlife Department or U.S. Fish and Wildlife Service). The checklist is designed for general applicability to all affected property; however, there may be unusual circumstances which require professional judgement in order to determine the need for further ecological evaluation (e.g., cave-dwelling receptors). In these cases, the person is strongly encouraged to contact TNRCC before proceeding.

Besides some preliminary information, the checklist consists of three major parts, **each of which must be completed unless otherwise instructed**. PART I requests affected property identification and background information. PART II contains the actual exclusion criteria and supportive information. PART III is a qualitative summary statement and a certification of the information provided by the person. **Answers should reflect existing conditions and should not consider future remedial actions at the affected property**. Completion of the checklist should lead to a logical conclusion as to whether further evaluation is warranted. Definitions of terms used in the checklist have been provided and users are strongly encouraged to familiarize themselves with these definitions before beginning the checklist.

Name of Facility:

Camp Stanley Storage Activity (CSSA), Boerne, Texas.

Affected Property Location:

Area of Concern (AOC) 74 (AOC-74) is located in the western portion of the Inner Cantonment Area at CSSA, approximately 430 yards east of the western CSSA boundary (see Figure 2 of the RIR). The site covers approximately 2.5 acres.

Mailing Address:

**Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, TX 78015**

TNRCC Case Tracking #s:

**Water Customer No.: CN602728206.
Air Customer No.: CN600126262.**

Solid Waste Registration #s:

Texas Solid Waste Registration No.: 69026.

Voluntary Cleanup Program #: **Not applicable.**

EPA I.D. #s:

USEPA Identification No.: TX2210020739.

Figure: 30 TAC §350.77(b)

Definitions¹

Affected property - The entire area (i.e., on-site and off-site; including all environmental media) which contains releases of chemicals of concern at concentrations equal to or greater than the assessment level applicable for residential land use and groundwater classification.

Assessment level - A critical protective concentration level for a chemical of concern used for affected property assessments where the human health protective concentration level is established under a Tier 1 evaluation as described in §350.75(b) of this title (relating to Tiered Human Health Protective Concentration Level Evaluation), except for the protective concentration level for the soil-to-groundwater exposure pathway which may be established under Tier 1, 2, or 3 as described in §350.75(i)(7) of this title, and ecological protective concentration levels which are developed, when necessary, under Tier 2 and/or 3 in accordance with §350.77(c) and/or (d), respectively, of this title (relating to Ecological Risk Assessment and Development of Ecological Protective Concentration Levels).

Bedrock - The solid rock (i.e., consolidated, coherent, and relatively hard naturally formed material that cannot normally be excavated by manual methods alone) that underlies gravel, soil or other surficial material.

Chemical of concern - Any chemical that has the potential to adversely affect ecological or human receptors due to its concentration, distribution, and mode of toxicity. Depending on the program area, chemicals of concern may include the following: solid waste, industrial solid waste, municipal solid waste, and hazardous waste as defined in Texas Health and Safety Code, §361.003, as amended; hazardous constituents as listed in 40 Code of Federal Regulations Part 261, Appendix VIII, as amended; constituents on the groundwater monitoring list in 40 Code of Federal Regulations Part 264, Appendix IX, as amended; constituents as listed in 40 CFR Part 258 Appendices I and II, as amended; pollutant as defined in Texas Water Code, §26.001, as amended; hazardous substance as defined in Texas Health and Safety Code, §361.003, as amended, and the Texas Water Code §26.263, as amended; regulated substance as defined in Texas Water Code §26.342, as amended and §334.2 of this title (relating to Definitions), as amended; petroleum product as defined in Texas Water Code §26.342, as amended and §334.122(b)(12) of this title (relating to Definitions for ASTs), as amended; other substances as defined in Texas Water Code §26.039(a), as amended; and daughter products of the aforementioned constituents.

Community - An assemblage of plant and animal populations occupying the same habitat in which the various species interact via spatial and trophic relationships (e.g., a desert community or a pond community).

Complete exposure pathway - An exposure pathway where a human or ecological receptor is exposed to a chemical of concern via an exposure route (e.g., incidental soil ingestion, inhalation of volatiles and particulates, consumption of prey, etc).

De minimus - The description of an area of affected property comprised of one acre or less where the ecological risk is considered to be insignificant because of the small extent of contamination, the absence of protected species, the availability of similar unimpacted habitat nearby, and the lack of adjacent sensitive environmental areas.

Ecological protective concentration level - The concentration of a chemical of concern at the point of exposure within an exposure medium (e.g., soil, sediment, groundwater, or surface water) which is determined in accordance with §350.77(c) or (d) of this title (relating to Ecological Risk Assessment and Development of Ecological Protective Concentration Levels) to be protective for ecological receptors. These concentration levels are primarily intended to be protective for more mobile or wide-ranging ecological receptors and, where appropriate, benthic invertebrate communities within the waters in the state. These concentration levels are not intended to be directly protective of receptors with limited mobility or range (e.g., plants, soil invertebrates, and small rodents), particularly those residing within active areas of a facility, unless these receptors are threatened/endangered species or unless

¹These definitions were taken from 30 TAC §350.4 and may have both ecological and human health applications. For the purposes of this checklist, it is understood that only the ecological applications are of concern.

impacts to these receptors result in disruption of the ecosystem or other unacceptable consequences for the more mobile or wide-ranging receptors (e.g., impacts to an off-site grassland habitat eliminate rodents which causes a desirable owl population to leave the area).

Ecological risk assessment - The process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors; however, as used in this context, only chemical stressors (i.e., COCs) are evaluated.

Environmental medium - A material found in the natural environment such as soil (including non-waste fill materials), groundwater, air, surface water, and sediments, or a mixture of such materials with liquids, sludges, gases, or solids, including hazardous waste which is inseparable by simple mechanical removal processes, and is made up primarily of natural environmental material.

Exclusion criteria - Those conditions at an affected property which preclude the need to establish a protective concentration level for an ecological exposure pathway because the exposure pathway between the chemical of concern and the ecological receptors is not complete or is insignificant.

Exposure medium - The environmental medium or biologic tissue in which or by which exposure to chemicals of concern by ecological or human receptors occurs.

Facility - The installation associated with the affected property where the release of chemicals of concern occurred.

Functioning cap - A low permeability layer or other approved cover meeting its design specifications to minimize water infiltration and chemical of concern migration, and prevent ecological or human receptor exposure to chemicals of concern, and whose design requirements are routinely maintained.

Landscaped area - An area of ornamental, or introduced, or commercially installed, or manicured vegetation which is routinely maintained.

Off-site property (off-site) - All environmental media which is outside of the legal boundaries of the on-site property.

On-site property (on-site) - All environmental media within the legal boundaries of a property owned or leased by a person who has filed a self-implementation notice or a response action plan for that property or who has become subject to such action through one of the agency's program areas for that property.

Physical barrier - Any structure or system, natural or manmade, that prevents exposure or prevents migration of chemicals of concern to the points of exposure.

Point of exposure - The location within an environmental medium where a receptor will be assumed to have a reasonable potential to come into contact with chemicals of concern. The point of exposure may be a discrete point, plane, or an area within or beyond some location.

Protective concentration level - The concentration of a chemical of concern which can remain within the source medium and not result in levels which exceed the applicable human health risk-based exposure limit or ecological protective concentration level at the point of exposure for that exposure pathway.

Release - Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, with the exception of:

- (A) A release that results in an exposure to a person solely within a workplace, concerning a claim that the person may assert against the person's employer;
- (B) An emission from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine;
- (C) A release of source, by-product, or special nuclear material from a nuclear incident, as those terms are defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. §2011 et seq.), if the release is subject to requirements concerning financial protection established by the Nuclear Regulatory Commission under §170 of that Act;

(D) For the purposes of the environmental response law §104, as amended, or other response action, a release of source, by-product, or special nuclear material from a processing site designated under §102(a)(1) or §302(a) of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. §7912 and §7942), as amended; and

(E) The normal application of fertilizer.

Sediment - Non-suspended particulate material lying below surface waters such as bays, the ocean, rivers, streams, lakes, ponds, or other similar surface water body (including intermittent streams). Dredged sediments which have been removed from below surface water bodies and placed on land shall be considered soils.

Sensitive environmental areas - Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young, and overwintering. Examples include critical habitat for threatened and endangered species, wilderness areas, parks, and wildlife refuges.

Source medium - An environmental medium containing chemicals of concern which must be removed, decontaminated and/or controlled in order to protect human health and the environment. The source medium may be the exposure medium for some exposure pathways.

Stressor - Any physical, chemical, or biological entity that can induce an adverse response; however, as used in this context, only chemical entities apply.

Subsurface soil - For human health exposure pathways, the portion of the soil zone between the base of surface soil and the top of the groundwater-bearing unit(s). For ecological exposure pathways, the portion of the soil zone between 0.5 feet and 5 feet in depth.

Surface cover - A layer of artificially placed utility material (e.g., shell, gravel).

Surface soil - For human health exposure pathways, the soil zone extending from ground surface to 15 feet in depth for residential land use and from ground surface to 5 feet in depth for commercial/industrial land use; or to the top of the uppermost groundwater-bearing unit or bedrock, whichever is less in depth. For ecological exposure pathways, the soil zone extending from ground surface to 0.5 feet in depth.

Surface water - Any water meeting the definition of surface water in the state as defined in §307.3 of this title (relating to Abbreviations and Definitions), as amended.

PART I. Affected Property Identification and Background Information

1) Provide a description of the specific area of the response action and the nature of the release. Include estimated acreage of the affected property and the facility property, and a description of the type of facility and/or operation associated with the affected property. Also describe the location of the affected property with respect to the facility property boundaries and public roadways.

Camp Stanley Storage Activity: CSSA is located in northwestern Bexar County, about 19 miles northwest of downtown San Antonio. The installation consists of approximately 4,004 acres immediately east of Ralph Fair Road, and approximately 0.5 mile east of Interstate Highway 10 (see Figure 1 of the RIR). CSSA has several historical waste sites, including Solid Waste Management Units (SWMUs), AOCs, and Range Management Units (RMUs). The present mission of CSSA is the receipt, storage, issue, and maintenance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. Because of its mission, CSSA has been designated a restricted access facility. No changes to the CSSA mission and/or military activities are expected in the future.

AOC-74: AOC-74 is located in the western portion of the Inner Cantonment Area at CSSA, approximately 430 yards east of the western CSSA boundary (see Figure 2 of the RIR). The site covers approximately 2.5 acres.

Attach available USGS topographic maps and/or aerial or other affected property photographs to this form to depict the affected property and surrounding area. Indicate attachments:

Topo map Aerial photo Other

Aerial photos of the site and land adjacent to the site are shown on Figure 3 of the RIR. Figure 2 of the RIR shows the general location of AOC-74.

2) Identify environmental media known or suspected to contain chemicals of concern (COCs) at the present time. Check all that apply:

<u>Known/Suspected COC Location</u>	<u>Based on sampling data?</u>	
<input type="checkbox"/> NO – Soil ≤ 5 ft below ground surface	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Soil >5 ft below ground surface	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Groundwater	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Surface Water/Sediments	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Explain (previously submitted information may be referenced):

October 1992 and June 2011, measured water levels at Well CS-10, which is located approximately 270 ft east of the site, have ranged from 132.8 ft below top of casing (BTOC) (December 1998) to 470.0 ft BTOC (December 2006). Low concentrations of VOCs and metals detected in CS-10 (below their respective maximum contaminant levels [MCLs]) are attributed to contaminated groundwater from Plume 2.

The closest surface water body to AOC-74 is an unnamed intermittent tributary or drainage approximately 1,200 of the site (Figure 6). The tributary, which only contains water immediately after significant rain events, drains to Salado Creek, located approximately 4,000 ft east of AOC-74. The north-south trending creek exits the CSSA boundary approximately 6,550 ft south-southeast of the site. No significant degradation of high quality receiving waters is anticipated from AOC-74.

Based on soil samples collected at AOC-74, there are no VOCs, SVOCs, pesticides, herbicides, or explosives at the site that exceed their respective PCL (see Appendix C of this RIR). Metals with

concentrations exceeding Tier 1 PCLs at the site were excavated and removed or used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL. There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-74. Over the past 19 years, there have been samples collected from the closest well to AOC-74 (CS-10, located 270 ft east of the site) and analyzed for metals and VOCs. Low concentrations of VOCs and metals detected in CS-10 (below their respective maximum contaminant levels [MCLs]) are attributed to contaminated groundwater from the SWMU B-3 bioreactor plume. Additionally, since soils found to have concentrations of metals above their PCLs were excavated and removed, there will be no impact to groundwater, surface water or sediment from AOC-74.

3) Provide the information below for the nearest surface water body which has become or has the potential to become impacted from migrating COCs via surface water runoff, air deposition, groundwater seepage, etc. Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

- a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and
- b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

The nearest surface water body, **an unnamed tributary to Salado Creek**, is **approximately 1,200 feet southeast (downgradient) from** the affected property (AOC-74). The water body is best described as a:

freshwater stream: _____ perennial (has water all year)
 intermittent (dries up completely for at least 1 week a year) [only has water during and immediately after rain events.]

_____ intermittent with perennial pools

- freshwater swamp/marsh/wetland
 saltwater or brackish marsh/swamp/wetland
 reservoir, lake, or pond; approximate surface acres:
 drainage ditch
 tidal stream bay estuary
 other; specify

Is the water body listed as a State classified segment in Appendix C of the current Texas Surface Water Quality Standards; §§307.1 - 307.10?

- Yes** Segment # _____ Use Classification: **1910**
 No

If the water body is not a State classified segment, identify the first downstream classified segment.

Name:

Salado Creek Drainage Basin

Segment #:

Segment 1910 – From the confluence with the San Antonio River in Bexar County to Rocking Horse Lane west of Camp Bullis in Bexar County.

Use Classification:

Salado Creek is classified as an intermittent creek upstream (south) of CSSA to Loop 410 in San Antonio. The creek is classified as perennial downstream of Loop 410. Although water uses are not distinguished between the upstream intermittent and the downstream perennial sections, the designated uses of Segment 1910 as a whole are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-74.

As necessary, provide further description of surface waters in the vicinity of the affected property:

The nearest surface water body is an unnamed tributary to Salado Creek and is approximately 1,200 feet southeast (downgradient) from the site. This unnamed tributary is intermittent. Salado Creek is intermittent and only contains water during and immediately following rain events. Salado Creek is intermittent in the area due to limited-duration flowing springs during the winter and spring.

PART II. Exclusion Criteria and Supportive Information

Subpart A. Surface Water/Sediment Exposure

1) Regarding the affected property where a response action is being pursued under the TRRP, have COCs migrated and resulted in a release or imminent threat of release to either surface waters or to their associated sediments via surface water runoff, air deposition, groundwater seepage, etc.? Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

- a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and
- b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

Yes No

Explain:

There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-74. Since soils that were found to have concentrations of metals above their PCLs were removed or used to calculate a 95% upper confidence limit (UCL) that does not exceed the Tier 1 PCL, there will be no impact to groundwater, surface water, or sediment from AOC-74.

If the answer is Yes to Subpart A above, the affected property does not meet the exclusion criteria. However, complete the remainder of Part II to determine if there is a complete and/or significant soil exposure pathway, then complete PART III - Qualitative Summary and Certification. If the answer is No, go to Subpart B.

Subpart B. Affected Property Setting

In answering "Yes" to the following question, it is understood that the affected property is not attractive to wildlife or livestock, including threatened or endangered species (i.e., the affected property does not serve as valuable habitat, foraging area, or refuge for ecological communities). (May require consultation with wildlife management agencies.)

1) Is the affected property wholly contained within contiguous land characterized by: pavement, buildings, landscaped area, functioning cap, roadways, equipment storage area, manufacturing or process area, other surface cover or structure, or otherwise disturbed ground?

Yes No

Explain:

AOC-74 is an approximately 2.5-acre site located in the western portion of the Inner Cantonment Area at CSSA. Figure 2 of the RIR shows the location of AOC-74 and the surrounding area.

If the answer to Subpart B above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subparts C and D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart B above is No, go to Subpart C.

Subpart C. Soil Exposure Subparts C and D skipped based on answers to Subparts A and B.

1) Are COCs which are in the soil of the affected property solely below the first 5 feet beneath ground surface **or** does the affected property have a physical barrier present to prevent exposure of receptors to COCs in surface soil?

Yes No

Explain:

If the answer to Subpart C above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subpart D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart C above is No, proceed to Subpart D.

Subpart D. De Minimus Land Area Subparts C and D skipped based on answers to Subparts A and B.

In answering "Yes" to the question below, it is understood that all of the following conditions apply:

The affected property is not known to serve as habitat, foraging area, or refuge to threatened/endangered or otherwise protected species. (Will likely require consultation with wildlife management agencies.)

Similar but unimpacted habitat exists within a half-mile radius.

The affected property is not known to be located within one-quarter mile of sensitive environmental areas (e.g., rookeries, wildlife management areas, preserves). (Will likely require consultation with wildlife management agencies.)

There is no reason to suspect that the COCs associated with the affected property will migrate such that the affected property will become larger than one acre.

1) Using human health protective concentration levels as a basis to determine the extent of the COCs, does the affected property consist of one acre or less and does it meet all of the conditions above?

Yes No

Explain how conditions are met/not met:

If the answer to Subpart D above is Yes, then no further ecological evaluation is needed at this affected property, assuming the answer to Subpart A was No. Complete PART III - Qualitative Summary and Certification. If the answer to Subpart D above is No, proceed to Tier 2 or 3 or comparable ERA.

PART III. Qualitative Summary and Certification (Complete in all cases).

Attach a brief statement (not to exceed 1 page) summarizing the information you have provided in this form. This summary should include sufficient information to verify that the affected property meets or does not meet the exclusion criteria. The person should make the initial decision regarding the need for further ecological evaluation (i.e., Tier 2 or 3) based upon the results of this checklist. After review, TNRCC will make a final determination on the need for further assessment. **Note that the person has the continuing obligation to re-enter the ERA process if changing circumstances result in the affected property not meeting the Tier 1 exclusion criteria.**

Completed by: Laura Marbury, P.G. (Typed/Printed Name)

Principal Geologist (Title)

February 8, 2012 (Date)

I believe that the information submitted is true, accurate, and complete, to the best of my knowledge.

Julie Burdey, P.G. (Typed/Printed Name of Person)

Project Manager (Title of Person)


_____ (Signature of Person)

February 8, 2012 (Date Signed)

APPENDIX C

Confirmation Sample Results for All Analytes at AOC-74

Appendix C. Confirmation Sample Results for All Analytes at AOC-74

	Volatile Organics																																						
	4-Chlorotoluene CAS: 105-43-4	Qualifier	Dilution	Bromobenzene CAS: 108-86-1	Qualifier	Dilution	Bromochloromethane CAS: 74-97-5	Qualifier	Dilution	Bromodichloromethane CAS: 75-27-4	Qualifier	Dilution	Bromoform CAS: 75-25-2	Qualifier	Dilution	Bromomethane CAS: 74-83-9	Qualifier	Dilution	Carbon tetrachloride CAS: 56-23-5	Qualifier	Dilution	Chlorobenzene CAS: 108-90-7	Qualifier	Dilution	Chloroethane CAS: 75-00-3	Qualifier	Dilution	Chloroform CAS: 67-66-3	Qualifier	Dilution	Chloromethane CAS: 74-87-3	Qualifier	Dilution	cis-1,2-Dichloroethene CAS: 156-59-2	Qualifier	Dilution			
Tier 1 Soil PCLs - 30 acre[†]																																							
Residential Combined Exposure ^[1]	1.60E+03	n		2.80E+02	n		3.30E+03	n		9.80E+01	c		2.80E+02	c		2.90E+01	n		2.30E+01	c		3.20E+02	n		2.30E+04	n		8.00E+00	c		8.40E+01	c		1.20E+02	n				
Residential Groundwater Exposure ^[2]	5.40E+00	n		1.20E+00	n		1.50E+00	n		3.30E-02	c		3.20E-01	c		6.50E-02	n		3.10E-02	m		5.50E-01	m		1.50E+01	n		5.10E-01	n		2.00E-01	c		1.20E-01	m				
TCEQ-Approved Background Values																																							
CSSA 9 Metals Background Concentration ^[3]	na			na			na			na			na			na			na			na			na			na			na			na			na		
Sample Locations (Date Collected - Depth)																																							
AOC74-BOT01 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT01 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS01 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS02 (07-Nov-2011) (EXCAVATED)	0.0011	U	1	0.00090	U	1	0.00080	U	1	0.00090	U	1	0.0011	U	1	0.00070	U	1	0.0010	U	1	0.00070	U	1	0.0015	U	1	0.00070	U	1	0.0015	U	1	0.00080	U	1	0.00080	U	1
AOC74-SS03 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS04 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS05 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS06 (07-Nov-2011) (EXCAVATED)	0.0011	U	1	0.00090	U	1	0.00080	U	1	0.00090	U	1	0.0011	U	1	0.00070	U	1	0.0010	U	1	0.00070	U	1	0.0015	U	1	0.00070	U	1	0.0015	U	1	0.00080	U	1	0.00080	U	1
AOC74-SS07 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS08 (07-Nov-2011) (EXCAVATED)	0.0011	M	1	0.00090	M	1	0.00080	U	1	0.00090	U	1	0.0011	M	1	0.00070	U	1	0.0010	U	1	0.00070	M	1	0.0015	U	1	0.00070	U	1	0.0015	U	1	0.00080	U	1	0.00080	U	1
AOC74-SS08-DUP (07-Nov-2011) (EXCAVATED)	0.0011	U	1	0.00090	U	1	0.00080	U	1	0.00090	U	1	0.0011	U	1	0.00070	U	1	0.0010	U	1	0.00070	U	1	0.0015	U	1	0.00070	U	1	0.0015	U	1	0.00080	U	1	0.00080	U	1
AOC74-SS09 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS10 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS11 (16-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS12 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13-DUP (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS14 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS15 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS16 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS17 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS18 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS19 (30-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		

Appendix C. Confirmation Sample Results for All Analytes at AOC-74

	Volatile Organics																																						
	<i>o</i> -Xylene CAS: 95-47-6	Qualifier	Dilution	<i>p</i> -Cymene (<i>p</i> - Isopropyltoluene) CAS: 99-87-6	Qualifier	Dilution	<i>sec</i> -Butylbenzene CAS: 135-98-8	Qualifier	Dilution	Styrene CAS: 100-42-5	Qualifier	Dilution	<i>tert</i> -Butylbenzene CAS: 98-06-6	Qualifier	Dilution	Tetrachloroethene (PCE) CAS: 127-18-4	Qualifier	Dilution	Toluene CAS: 108-88-3	Qualifier	Dilution	<i>trans</i> -1,2-Dichloroethene CAS: 156-60-5	Qualifier	Dilution	<i>trans</i> -1,3-Dichloropropene CAS: 10061-02-6	Qualifier	Dilution	Trichloroethene (TCE) CAS: 79-01-6	Qualifier	Dilution	Trichlorofluoromethane CAS: 75-69-4	Qualifier	Dilution	Vinyl chloride CAS: 75-01-4	Qualifier	Dilution			
Tier 1 Soil PCLs - 30 acre[†]																																							
Residential Combined Exposure ^[1]	2.90E+04	n		8.20E+03	n		3.30E+03	n		4.30E+03	n		3.30E+03	n		9.40E+01	c		5.40E+03	n		3.70E+02	n		2.60E+01	c		6.80E+01	n		2.50E+04	n		3.40E+00	c				
Residential Groundwater Exposure ^[2]	3.50E+01	m		1.20E+02	n		4.20E+01	n		1.60E+00	m		5.00E+01	n		2.50E-02	m		4.10E+00	m		2.50E-01	m		1.80E-02	c		1.70E-02	m		6.40E+01	n		1.10E-02	m				
TCEQ-Approved Background Values																																							
CSSA 9 Metals Background Concentration ^[3]	na			na			na			na			na			na			na			na			na			na			na			na					
Sample Locations (Date Collected - Depth)																																							
AOC74-BOT01 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT01 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS01 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS02 (07-Nov-2011) (EXCAVATED)	0.00070	U	1	0.0012	U	1	0.0011	U	1	0.00090	U	1	0.0012	U	1	0.00080	U	1	0.0010	U	1	0.00080	U	1	0.00090	U	1	0.0012	U	1	0.0013	U	1	0.0013	U	1	0.0013	U	1
AOC74-SS03 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS04 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS05 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS06 (07-Nov-2011) (EXCAVATED)	0.00070	U	1	0.0012	U	1	0.0011	U	1	0.00090	U	1	0.0012	U	1	0.00080	U	1	0.0010	U	1	0.00080	U	1	0.00090	U	1	0.0012	U	1	0.0013	U	1	0.0013	U	1	0.0013	U	1
AOC74-SS07 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS08 (07-Nov-2011) (EXCAVATED)	0.00070	M	1	0.0012	M	1	0.0011	M	1	0.00090	M	1	0.0012	M	1	0.00080	M	1	0.0010	M	1	0.00080	U	1	0.00090	M	1	0.0012	M	1	0.0013	U	1	0.0013	U	1	0.0013	U	1
AOC74-SS08-DUP (07-Nov-2011) (EXCAVATED)	0.00070	U	1	0.0012	U	1	0.0011	U	1	0.00090	U	1	0.0012	U	1	0.00080	U	1	0.0010	U	1	0.00080	U	1	0.00090	U	1	0.0012	U	1	0.0013	U	1	0.0013	U	1	0.0013	U	1
AOC74-SS09 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS10 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS11 (16-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS12 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13-DUP (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS14 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS15 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS16 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS17 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS18 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS19 (30-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		

Appendix C. Confirmation Sample Results for All Analytes at AOC-74

	Semi-Volatile Organics																																						
	Benzyl butyl phthalate CAS: 85-68-7	Qualifier	Dilution	bis(2-Chloroethoxy)methane CAS: 111-91-1	Qualifier	Dilution	bis(2-Chloroethyl)ether CAS: 111-44-4	Qualifier	Dilution	bis(2-Chloroisopropyl)ether CAS: 108-60-1	Qualifier	Dilution	bis(2-Ethylhexyl) phthalate CAS: 117-81-7	Qualifier	Dilution	Chrysene CAS: 218-01-9	Qualifier	Dilution	Dibenzo(a,h)anthracene CAS: 53-70-3	Qualifier	Dilution	Dibenzofuran CAS: 132-64-9	Qualifier	Dilution	Diethyl phthalate CAS: 84-66-2	Qualifier	Dilution	Dimethyl phthalate CAS: 131-11-3	Qualifier	Dilution	Di-n-butyl phthalate CAS: 84-74-2	Qualifier	Dilution	Di-n-octyl phthalate CAS: 117-84-0	Qualifier	Dilution			
Tier 1 Soil PCLs - 30 acre[†]																																							
Residential Combined Exposure ^[1]	1.60E+03	c		2.50E+00	c		1.40E+00	c		4.10E+01	c		4.30E+01	c		5.60E+02	c		5.50E-01	c		2.70E+02	n		5.30E+04	n		5.30E+04	n		6.20E+03	n		2.60E+03	n				
Residential Groundwater Exposure ^[2]	1.30E+02	c		5.90E-03	c		1.10E-03	c		9.50E-02	c		8.20E+01	m		7.70E+02	c	>S	7.60E+00	c		1.70E+01	n		7.80E+01	n		3.10E+01	n		1.70E+03	n		1.00E+06	n	>S			
TCEQ-Approved Background Values																																							
CSSA 9 Metals Background Concentration ^[3]	na			na			na			na			na			na			na			na			na			na			na			na					
Sample Locations (Date Collected - Depth)																																							
AOC74-BOT01 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT01 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-BOT02 (16-Nov-2011-Depth 2-2.5 ft. bgs)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS01 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS02 (07-Nov-2011) (EXCAVATED)	0.040	U	1	0.060	U	1	0.040	U	1	0.050	U	1	0.030	U	1	0.35	F	1	0.050	F	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.030	U	1
AOC74-SS03 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS04 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS05 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS06 (07-Nov-2011) (EXCAVATED)	0.040	U	1	0.060	U	1	0.040	U	1	0.050	U	1	0.030	U	1	0.50	F	1	0.070	F	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.030	U	1
AOC74-SS07 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS08 (07-Nov-2011) (EXCAVATED)	0.040	U	1	0.060	U	1	0.040	U	1	0.050	U	1	0.030	U	1	0.22	F	1	0.040	M	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.030	U	1
AOC74-SS08-DUP (07-Nov-2011) (EXCAVATED)	0.040	U	1	0.060	U	1	0.040	U	1	0.050	U	1	0.030	U	1	0.13	F	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.040	U	1	0.030	U	1
AOC74-SS09 (07-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS10 (07-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS11 (16-Nov-2011) (EXCAVATED)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS12 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS13-DUP (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS14 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS15 (16-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS16 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS17 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS18 (28-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		
AOC74-SS19 (30-Nov-2011)	--			--			--			--			--			--			--			--			--			--			--			--			--		

Appendix C. Confirmation Sample Results for All Analytes at AOC-74

	Metals																						
	Cadmium CAS: 7440-43-9	Qualifier	Dilution	Chromium CAS: 7440-47-3	Qualifier	Dilution	Copper CAS: 7440-50-8	Qualifier	Dilution	Lead CAS: 7439-92-1	Qualifier	Dilution	Mercury CAS: 7439-97-6	Qualifier	Dilution	Nickel CAS: 7440-02-0	Qualifier	Dilution	Zinc CAS: 7440-66-6	Qualifier	Dilution		
Tier 1 Soil PCLs - 30 acre[†]																							
Residential Combined Exposure ^[1]	5.20E+01	n		2.70E+04	n		5.50E+02	n		5.00E+02	n		2.10E+00	n		8.30E+02	n		9.90E+03	n			
Residential Groundwater Exposure ^[2]	7.50E-01	m	>S	1.20E+03	m	>S	5.20E+02	a	>S	1.50E+00	a	>S	3.90E-03	m		7.90E+01	n	>S	1.20E+03	n	>S		
TCEQ-Approved Background Values																							
CSSA 9 Metals Background Concentration ^[3]	3 ^{††}			40.2 ^{††}			23.2 ^{††}			84.5 ^{††}			0.77 ^{††}			35.5 ^{††}			73.2 ^{††}				
Sample Locations (Date Collected - Depth)																							
AOC74-BOT01 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	0.22	F	1	61		1	23		1	38		1	0.090	F	1	44		1	97		1		
AOC74-BOT01 (16-Nov-2011-Depth 2-2.5 ft. bgs)	0.11	F	1	53		1	25		1	45		1	0.11		1	37		1	110		1		
AOC74-BOT02 (16-Nov-2011-Depth 1-1.5 ft. bgs) (EXCAVATED)	0.21	F	1	50		1	28		1	50		1	0.11		1	45		1	110		1		
AOC74-BOT02 (16-Nov-2011-Depth 2-2.5 ft. bgs)	0.030	U	1	42		1	32		1	31		1	0.080	F	1	36		1	100		1		
AOC74-SS01 (07-Nov-2011) (EXCAVATED)	0.42	F	1	31	J	1	14		1	60		1	0.20	J	1	21	J	1	380		20		
AOC74-SS02 (07-Nov-2011) (EXCAVATED)	0.27	F	1	34	J	1	14		1	64		1	0.16	J	1	30	J	1	77		1		
AOC74-SS03 (07-Nov-2011)	0.030	U	1	8.5	F	1	2.8		1	9.7	F	1	0.050	F	1	5.9	J	1	9.3		1		
AOC74-SS04 (07-Nov-2011)	0.090	F	1	42	J	1	10		1	37		1	0.090	F	1	33	J	1	57		1		
AOC74-SS05 (07-Nov-2011)	0.41	F	1	23	J	1	12		1	34		1	0.14	J	1	23	J	1	52		1		
AOC74-SS06 (07-Nov-2011) (EXCAVATED)	0.54		1	36	J	1	14		1	270		20	0.12	J	1	24	J	1	230		20		
AOC74-SS07 (07-Nov-2011) (EXCAVATED)	0.75		1	19	F	1	19		1	310		20	0.23	J	1	13	J	1	280		20		
AOC74-SS08 (07-Nov-2011) (EXCAVATED)	0.50		1	26	J	1	16		1	64	M	1	0.10	J	1	25	J	1	200	M	20		
AOC74-SS08-DUP (07-Nov-2011) (EXCAVATED)	0.50		1	31	J	1	16		1	65		1	0.13	J	1	28	J	1	190		20		
AOC74-SS09 (07-Nov-2011)	0.54		1	39	J	1	17		1	47		1	0.090	F	1	26	J	1	140		20		
AOC74-SS10 (07-Nov-2011) (EXCAVATED)	1.1		1	19	F	1	42		1	180		1	0.14	J	1	14	J	1	320		20		
AOC74-SS11 (16-Nov-2011) (EXCAVATED)	2.9		1	130		1	57		1	510		1	0.17		1	30		1	500		1		
AOC74-SS12 (16-Nov-2011)	0.080	F	1	34		1	25		1	53		1	0.14		1	28		1	140		1		
AOC74-SS13 (16-Nov-2011)	0.030	U	1	6.3	F	1	3.3		1	11		1	0.050	F	1	5.1		1	37		1		
AOC74-SS13-DUP (16-Nov-2011)	0.030	U	1	5.6	F	1	3.3		1	11		1	0.050	F	1	5.0		1	35		1		
AOC74-SS14 (16-Nov-2011)	0.030	U	1	10	F	1	7.7		1	41		1	0.090	F	1	9.4		1	38		1		
AOC74-SS15 (16-Nov-2011)	0.13	F	1	34		1	25		1	59		1	0.13		1	29		1	90		1		
AOC74-SS16 (28-Nov-2011)	--			--			--			3.4	F	1	--			--			0.60	U	1		
AOC74-SS17 (28-Nov-2011)	0.030	U	1	17	F	1	--			38		1	--			16		1	43		1		
AOC74-SS18 (28-Nov-2011)	--			--			--			23		1	--			--			33		1		
AOC74-SS19 (30-Nov-2011)	0.030	UJ	1	17	F	1	--			31		1	--			13		1	28		1		

NOTES:

- † TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: May 24, 2011).
- †† CSSA Soil Background Concentrations. Second Revision, Evaluation of Background Metals Concentrations in Soils and Bedrock at CSSA. February 2002. Values from Table 3.3.
- ††† Texas-Specific median background concentration.
- PCLs and CSSA background values coded in this table as [1, 2, 3].
- [1] ^{Tot}Soil_{Comb} = PCL for COPC in soil for a 30 acre source area and a potential future resident (combined exposure for ingestion, dermal contact, inhalation of volatiles and particulates, and ingestion of above-ground and below-ground vegetables).
- [2] ^{GW}Soil_{ing} = PCL for COPC in soil for a 30 acre source area and a potential future resident (soil-to-groundwater leaching of COPC to Class 1 and 2 groundwater).
- [3] CSSA Soil Background Concentrations. PCLs are shown in blue font. All values are measured in milligrams per kilogram (mg/Kg) unless otherwise noted. Depths are surface level unless otherwise noted.
- c = carcinogenic.
- n = noncarcinogenic.
- m = primary MCL-based.
- a = EPA Action Level-based.
- >S = solubility limit exceeded during calculation.
- na = not applicable.
- ft. bgs = feet below ground surface

QA NOTES AND DATA QUALIFIERS:

- (NO CODE) - Confirmed identification.
- U - Analyte was not detected above the indicated Method Detection Limit (MDL).
- F - Analyte was positively identified, but the quantitation is an estimation above the MDL and below the Reporting Limit (RL).
- J - Analyte was positively identified, but the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
- UJ - Analyte was not detected above the indicated RL; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
- M = Concentration is estimated due to a matrix effect.
- Values shown in **BOLD** indicate detections above the MDL.
- Values **HIGHLIGHTED** indicate detections above the PCL.

APPENDIX D

Data Verification Summary Report

DATA VERIFICATION SUMMARY REPORT**for AOC 74 samples collected from
CAMP STANLEY STORAGE ACTIVITY****BOERNE, TEXAS**

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples and associated field quality control (QC) samples collected from AOC 74 at Camp Stanley Storage Activity (CSSA) on November 7, 2011. The samples were assigned to the following Sample Delivery Group (SDG):

66236

The samples in this SDG were analyzed for volatile organic compounds (VOCs), semi-VOCs (SVOCs), pesticides, herbicides, and metals. Not all samples were analyzed for all parameters. QC samples included one trip blank (TB) for VOC only, one equipment blank (EB) for all parameters, one set of parent and field duplicate (FD) and one pair of matrix spike/matrix spike duplicate (MS/MSD) samples.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 3.5°C, which was within the 2-6°C range recommended by the CSSA QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

ICP-AES Metals**General**

The ICP-AES metal portion of this SDG consisted of eleven (11) soil samples and one EB. All samples were analyzed for arsenic, barium, cadmium, chromium, copper, nickel, lead, and zinc.

The metal analyses were performed using USEPA SW846 Method 6010B. The samples were analyzed following the procedures outlined in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

The samples were digested in two batches (#161160 for soil and #161191 for the EB). The samples were injected in two injection batches under two sets of initial calibration curve (ICAL). All analyses were performed undiluted except most digestate were diluted 20 fold for barium, lead, and zinc.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two laboratory control samples (LCSs), one for soil and one for EB, and MS/MSD samples.

The LCS recoveries for all target metals were within acceptance criteria for both batches.

Sample AOC74-SS08 was designated as the parent sample for the MS/MSD analyses. All non-compliant %Rs for the MS/MSD are listed below:

AOC74-SS08

Metals	MS, %R	MSD, %R	Criteria, %R
Barium	149	135	75-125
Lead	68	(79)	
Zinc	146	72	

() indicates the %R was compliant.

“M” flags were applied to the above metal results of the parent sample.

%R for the MS of nickel was 74.8% and lab applied “M” to the parent sample result. Due to the minor exceedance, Parsons data validator removed the M flag.

Precision

Precision was evaluated by the relative percent difference (%RPD) of the parent and FD sample results and MS/MSD results. Sample AOC74-SS08 was collected in duplicate.

%RPD of MS/MSD were compliant except zinc which had a %RPD of 24% (criteria is $\leq 20\%$). “M” flag has already been applied due to accuracy issue, no further flagging is needed.

AOC74-SS08

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	103.9	117.4	12	≤ 20
Cadmium	0.50	0.50	0	
Chromium	26.2	31.4	18	
Copper	15.68	15.97	1.8	
Lead	64.23	65.11	1.4	
Nickel	24.92	27.87	11	
Zinc	200.8	191.3	4.8	

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating preservation and holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

All samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. All samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- Low-level check standard met the criteria.
- All second source criteria were met. Both ICV samples were prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The dilution test (DT) was performed on sample AOC74-SS08. This test was applicable to all target metals except cadmium:

Metal	%D	Criteria
Arsenic	0.17	
Barium	12	
Chromium	12	
Copper	4.7	%D ≤ 10
Lead	9.6	
Nickel	10.5	
Zinc	12	

- The post digestion spike (PDS) was performed on the same sample as the DT. It was applicable for barium, cadmium, nickel, and zinc:

Metal	%R	Criteria
Barium	96	
Cadmium	92	
Chromium	55	75 – 125%
Nickel	58	
Zinc	98	

“J” flag was applied to the chromium and nickel results of all soil samples in this SDG.

There were two method blanks, one EB, and several calibration blanks associated with the metal analyses in this SDG. All blanks were compliant.

Barium and zinc were detected in the EB with concentrations less than half of the reporting limits.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP-AES metal results for the samples in this SDG were considered usable. Therefore, the completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERURY

General

The mercury portion of this SDG consisted of eleven (11) soil samples and one EB. All samples were collected on November 7, 2011 and were prepared and analyzed for total mercury using USEPA Method SW7470A for the EB and SW7471B for soil.

All samples were analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed within the holding time required by the method.

The sample was digested in batch #161091 for soil and batch #161183 for the EB. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtain from the two LCSs and MS/MSD.

Two LCS recoveries and MS/MSD for mercury were within acceptance criteria.

Precision

Precision was evaluated based on the %RPD of parent/FD and MS/MSD results.

AOC74-SS08

Metal	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Mercury	0.10	0.13	26	≤20

“J” flags were applied to the mercury result of both parent and FD samples.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and

- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

All samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All calibration verification criteria were met.
- DT and PDS are not applicable.

There were two method blanks, one EB, and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The mercury result for the sample in this SDG was considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

VOLATILES

General

This data package consisted of four (4) soil samples, one EB, and one TB. The samples were collected on November 7, 2011 and were analyzed for a full list of VOCs.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in four analytical batches under four sets of initial calibration (ICAL) curves. All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method. All samples were analyzed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the four LCSs, MS/MSD, and the surrogate spikes. MS/MSD were performed with sample AOC72-SS08.

All LCSs recoveries were within acceptance criteria for all four batches.

There were 36 VOCs with non-compliant MS and/or MSD %R. "M" flags were applied to the parent sample results.

All surrogates were recovered within the limits except Toluene-d4 were recovered higher than the control limit in the MS and MSD and in the LCS of batch 161538. No flags were applied.

Precision

Precision was evaluated with the %RPD of the MS/MSD and parent and field duplicate sample results. Sample AOC72-SS08 was collected in duplicate.

There were two compounds with %RPD greater than 30% of the MS/MSD analyses. "M" flags have already been applied to the parent sample results due to accuracy issues, therefore, no additional flags were needed.

None of the target compounds were detected above the RLs in both parent and FD samples, therefore, the %RPD calculation is not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining TB, EB, and laboratory blanks for cross contamination of samples during analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- All four LCS samples were prepared with a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.

There were four MBs, one TB, one EB, and few calibration blanks associated with the VOC analyses in this SDG. All blanks were non-detect for all target VOCs at RLs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All VOC results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

SEMI-VOLATILES

General

This data package consisted of three (3) soil samples, one pair of MS/MSD, one FD, and one EB. The samples were collected on November 7, 2011 and were analyzed for a full list of SVOCs.

The SVOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8270C. The samples were analyzed in two analytical batches under two sets of initial calibration (ICAL) curves. All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method. All samples were analyzed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the two LCSs, MS/MSD, and the surrogate spikes.

All LCSs and surrogate spike recoveries were within acceptance criteria.

There were ten compounds with non-compliant %Rs for the MS and/or MSD. "M" flag was applied to the parent sample results of eight SVOCs. Since the exceedances of MS or MSD for Chrysene and Indfeno(1,2,3-cd)pyrene were minor, the "M" flags applied to the results of these two compounds in the parent sample were replaced with "F" flags by Parsons data validator.

Precision

Precision was evaluated with the %RPD of the MS/MSD and parent and field duplicate sample results. Sample AOC72-SS08 was collected in duplicate.

There were five compounds with non-compliant %RPDs for the MS/MSD analyses. "M" flags have already been applied to the parent sample result due to accuracy issue. No further action is needed.

None of the target SVOCs were detected in both parent and FD at or greater than RLs.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- Both LCS samples were prepared with a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

There were two MBs, one EB, and few calibration blanks associated with the SVOC analyses in this SDG. All blanks were non-detect for all target SVOCs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All SVOC results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

PESTICIDES

General

This data package consisted of one (1) soil sample, AOC74-SS02, which was collected on November 7, 2011 and were analyzed for a full list of pesticides.

The pesticide analysis was performed using United States Environmental Protection Agency (USEPA) SW846 Method 8081A. The samples were under one set of initial calibration (ICAL) curves. This sample was analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed undiluted within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS and the surrogate spikes.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision could not be measured due to the lack of duplicate analyses.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;

- Evaluating holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

The sample in this data package was analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. This sample was prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- The initial calibration verification samples were prepared with a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.

There were one MB and few calibration blanks associated with the pesticide analyses in this SDG. All blanks were non-detect for all target pesticides at RLs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All pesticide results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

HERBICIDES

General

This data package consisted of one (1) soil sample, AOC74-SS02, which was collected on November 7, 2011 and were analyzed for a full list of herbicides.

The pesticide analysis was performed using United States Environmental Protection Agency (USEPA) SW846 Method 8151. The samples were under one set of initial calibration (ICAL) curves. This sample was analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed undiluted within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS and the surrogate spikes.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision could not be measured due to the lack of duplicate analyses.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

The sample in this data package was analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. This sample was prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- The initial calibration verification sample was prepared with a secondary source. All second source verification criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.

There were one MB and few calibration blanks associated with the pesticide analyses in this SDG. All blanks were non-detect for all target herbicides at RLs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All herbicide results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

DATA VERIFICATION SUMMARY REPORT
for AOC 74 samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers nine soil samples and one field quality control (QC) sample collected from AOC 74 at Camp Stanley Storage Activity (CSSA) under Environmental Protection Support, Investigations, and Treatability Studies on November 16, 2011. The samples were assigned to the following Sample Delivery Group (SDG):

66329

The samples in this SDG were analyzed for metals including arsenic, barium, cadmium, chromium, copper, nickel, lead, zinc, and mercury. There was one set of parent and field duplicate (FD) samples collected as field QC samples.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 2.0°C, which was within the 2-6°C range recommended by the CSSA QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

ICP-AES Metals

General

The ICP-AES metal portion of this SDG consisted of ten (10) soil samples. The samples were collected on November 16, 2011 and were analyzed for arsenic, barium, cadmium, chromium, copper, nickel, lead, and zinc.

The metal analyses were performed using USEPA SW846 Method 6010B. The samples were analyzed following the procedures outlined in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

The samples were digested in one batch (#161779). The samples were analyzed in one batch under a single ICAL. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the laboratory control sample (LCS).

The LCS recoveries for all target metals were within acceptance criteria.

Precision

Precision was evaluated based on the relative percent difference (%RPD) of the parent and FD results. Sample AOC74-SS13 was collected in duplicate. %RPD calculation is only applicable when both concentrations are greater than reporting limit.

AOC74-SS13

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	15.3	13.9	9.6	≤20
Copper	3.30	3.31	0.3	
Lead	10.91	11.10	1.7	
Nickel	5.10	5.04	1.2	
Zinc	37.4	35.1	6.3	

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating preservation and holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- All metals met criteria in the low-level check standard.
- All second source criteria were met. The ICV sample was prepared using a secondary source.
- All CCV criteria were met except the CCV which bracketed the method blank and LCS had zinc recovered at 110.8% with control limit of 110%. This is not significant to flag any associated data.
- All interference check (ICSA/ICSAB) criteria were met.

- The dilution test (DT) was performed on sample AOC74-SS12. This test was only applicable to all metals other than cadmium:

Metal	%D	Criteria
Arsenic	9.94	%D ≤ 10
Barium	12.9	
Chromium	14.0	
Copper	3.04	
Lead	10.9	
Nickel	14.2	
Zinc	13.5	

- The post digestion spike (PDS) was performed on the same sample as the DT. It was applicable for all metals other than arsenic and copper:

Metal	%R	Criteria
Barium	84	75 – 125%
Cadmium	94	
Chromium	98	
Lead	92	
Nickel	97	
Zinc	84	

There was one method blank and several calibration blanks associated with the metal analyses in this SDG. All blanks were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP-AES metal results for the samples in this SDG were considered usable. Therefore, the completeness for the metal portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERURY

General

The mercury portion of this SDG consisted of ten (10) soil samples. The samples were collected on November 16, 2011. All samples were prepared and analyzed for mercury using USEPA Method SW7471B.

All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The samples for mercury were digested in one batch (#161567). The samples were analyzed in a one batch under a single ICAL. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery for mercury was within acceptance criteria.

Precision

Precision could not be evaluated for mercury since mercury was detected less than the reporting limit for both parent and FD samples.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. The sample was prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All calibration verification criteria were met.

There was one method blank and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All mercury results for the samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

DATA VERIFICATION SUMMARY REPORT
for AOC 74 samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers four soil samples collected from AOC 74 at Camp Stanley Storage Activity (CSSA) on November 28, 2011. The samples were assigned to the following Sample Delivery Group (SDG):

66401

The samples in this SDG were analyzed for selected total or TCLP metals.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 2.0°C, which was within the 2-6°C range recommended by the CSSA QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

ICP-AES Metals

General

The ICP-AES metal portion of this SDG consisted of four (4) soil samples. One sample was analyzed for TCLP-RCRA 8 metals, two samples were analyzed for lead and zinc, and one sample was analyzed for arsenic, cadmium, chromium, copper, nickel, lead, and zinc.

The metal analyses were performed using USEPA SW846 Method 6010B. The TCLP extraction was performed using USEPA SW846 Method 1311. The samples were analyzed following the procedures outlined in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

The samples were digested in two batches (#161820 for the TCLP-metals and #161822 for the total metals). The samples were injected in one injection batch under a single set of initial calibration curve (ICAL). All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two laboratory control samples (LCSs), one for total metals and one for TCLP-metals.

The LCS recoveries for all target metals were within acceptance criteria for both batches.

Precision

Precision could not be due to the lack of duplicate analysis.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating preservation and holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- Low-level check standard met the criteria.
- All second source criteria were met. The ICV sample was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The dilution test (DT) was performed on sample AOC74-SS17. This test was applicable to chromium, lead, nickel, and zinc:

Metal	%D	Criteria
Chromium	1.72	%D ≤ 10
Lead	70.0	
Nickel	1.76	
Zinc	4.97	

- The post digestion spike (PDS) was performed on the same sample as the DT. It was applicable for arsenic, cadmium and lead:

Metal	%R	Criteria
Arsenic	94	75 – 125%
Cadmium	82	
Lead	90	

There were two method blanks and several calibration blanks associated with the metal analyses in this SDG. All blanks were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP-AES metal results for the samples in this SDG were considered usable. Therefore, the completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERURY

General

The mercury portion of this SDG consisted of one (1) soil waste characterization sample. The sample was collected on November 28, 2011. This sample was prepared and analyzed for TCLP mercury using USEPA Method SW1311/SW7470A.

The sample was analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed within the holding time required by the method.

The sample was digested in batch #161804. The analysis was performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery for mercury was within acceptance criteria.

Precision

Precision could not be evaluated for mercury since there were no duplicate analyses involved in this SDG.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. The sample was prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.

- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All calibration verification criteria were met.

There was one method blank and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The mercury result for the sample in this SDG was considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

DATA VERIFICATION SUMMARY REPORT**for AOC 74 samples collected from
CAMP STANLEY STORAGE ACTIVITY****BOERNE, TEXAS**

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers four soil samples collected from AOC 74 at Camp Stanley Storage Activity (CSSA) on November 30, 2011. The samples were assigned to the following Sample Delivery Group (SDG):

66411

The samples in this SDG were analyzed for selected total or TCLP metals.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. The samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 2.0°C, which was within the 2-6°C range recommended by the CSSA QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

ICP-AES Metals**General**

The ICP-AES metal portion of this SDG consisted of three (3) soil samples. Two samples were analyzed for TCLP-RCRA 8 metals, one samples were analyzed arsenic, cadmium, chromium, nickel, lead, and zinc.

The metal analyses were performed using USEPA SW846 Method 6010B. The TCLP extraction was performed using USEPA SW846 Method 1311. The samples were analyzed following the procedures outlined in the Work Plan. All samples were prepared and analyzed within the holding time required by the method and the Work Plan.

The samples were digested in two batches (#161927 for the TCLP-metals and #161948 for the total metals). The samples were injected in two injection batches under two sets of initial calibration curve (ICAL). All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two laboratory control samples (LCSs), one for total metals and one for TCLP-metals.

The LCS recoveries for all target metals were within acceptance criteria for both batches.

Precision

Precision could not be due to the lack of duplicate analysis.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the Work Plan;
- Comparing actual analytical procedures to those described in the Work Plan;
- Evaluating preservation and holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the Work Plan. The samples were prepared and analyzed within the holding times required by the method.

- All instrument initial calibration criteria were met.
- Low-level check standard met the criteria.
- All second source criteria were met. The ICV sample was prepared using a secondary source.
- All CCV criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The dilution test (DT) was performed on sample AOC74-SS19. This test was applicable to chromium, lead, and nickel:

Metal	%D	Criteria
Chromium	19	%D ≤ 10
Lead	25	
Nickel	25	

- The post digestion spike (PDS) was performed on the same sample as the DT. It was applicable for arsenic, cadmium and lead:

Metal	%R	Criteria
Arsenic	94	75 – 125%
Cadmium	64	
Chromium	80	
Lead	80	

Nickel	80	
Zinc	81	

“J” flag was applied to the cadmium result of the parent sample.

There were two method blanks and several calibration blanks associated with the metal analyses in this SDG. All blanks were compliant.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP-AES metal results for the samples in this SDG were considered usable. Therefore, the completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 95%.

MERURY

General

The mercury portion of this SDG consisted of two (2) soil waste characterization sample. The sample was collected on November 30, 2011. This sample was prepared and analyzed for TCLP mercury using USEPA Method SW1311/SW7470A.

The sample was analyzed following the procedures outlined in the CSSA QAPP, prepared and analyzed within the holding time required by the method.

The sample was digested in batch #161924. The analysis was performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery for mercury was within acceptance criteria.

Precision

Precision could not be evaluated for mercury since there were no duplicate analyses involved in this SDG.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. The sample was prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All calibration verification criteria were met.

There was one method blank and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The mercury result for the sample in this SDG was considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

APPENDIX E

TCEQ Approval for Non-Hazardous Soils Reuse, December 20, 2010



DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY, RRAD
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

December 3, 2010

U-029-10

Mr. Kirk Coulter, P.G., Project Manager
Texas Commission on Environmental Quality
Corrective Action Team 1, VCP-CA Section
Remediation Division
PO Box 13087 (MC-127)
Austin, TX 78711-3087

SUBJECT: Movement of Non-Hazardous Metals Impacted Soils from SWMU/AOC Closure Efforts to East Pasture Firing Range, Camp Stanley Storage Activity, Boerne, Texas
TCEQ Industrial Solid Waste Registration #69026, EPA Identification Number TX2210020739

Dear Mr. Coulter:

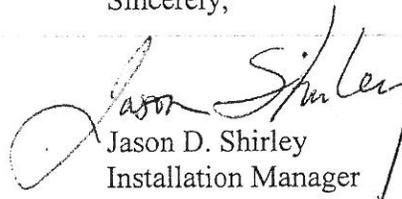
The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Material Command, U.S. Army, is providing this letter to notify the TCEQ of CSSA's plan to move and manage non-hazardous metals-impacted soils generated during remedial actions at CSSA's Solid Waste Management Units (SWMU) and Area of Concerns (AOC) to CSSA's East Pasture Firing Range Berm located in Range Management Unit 1 (RMU-1).

CSSA currently has a need for additional soils on the small arms firing range berm in the east pasture. In recent years, this berm has been modified with non-hazardous soils generated from various SWMUs and AOCs remedial actions. The non-hazardous soil movement and management within the east pasture RMU-1 was authorized by TCEQ and USEPA during a Technical Interchange Meeting held on April 19, 2006 and subsequent letter by Mr. Sonny Rayos, TCEQ Project Manager, dated May 7, 2008. This letter is provided to TCEQ to reaffirm regulatory agreement with this practice.

To verify the generated remediation soils are non-hazardous prior to movement to the east pasture, soil samples will be collected and analyzed for TCLP metals in accordance with CSSA's approved RFI/IM Waste Management Plan dated May 2006. Movement of the non-hazardous metals-impacted soils from CSSA SWMUs and AOCs to the East Pasture Firing Range Berm is expected to occur on an as needed basis as determined by CSSA.

If you have any questions regarding this notification, please contact Gabriel Moreno-Fergusson at (210) 698-5208 or Mr. Ken Rice, Parsons, at (512) 719-6050.

Sincerely,


Jason D. Shirley
Installation Manager

cc: Mr. Greg Lyssy, EPA Region 6
Mr. Jorge Salazar, TCEQ Region 13
Ms. Julie Burdey, Parsons

Schoepflin, Shannon

From: Kirk Coulter [KCoulter@tceq.state.tx.us]
Sent: Monday, December 20, 2010 2:40 PM
To: Rice, Ken R
Subject: Re: Revised workplan fo Vapor Intrusion Survey Investigation at AOC-65

Hi Ken

On the movement of non-haz waste letter. I am sending this E-Mail to you as an informal approval of the letter sent to me on December 3, 2010. I understand that this procedure was approved during Technical meeting held on April 19, 2006 between Camp Stanley, Mr. Sonny Rayos (TCEQ), Parsons Engineering and Mr. Greg Lyssy (EPA).

If you have any questions, please call me

Thanks

Kirk

>>> "Rice, Ken R" <Ken.R.Rice@parsons.com> 12/7/2010 4:48 PM >>>
Greg,

I was preparing for our upcoming meeting in January and realized I have not set you the attached revised vapor intrusion survey work plan you requested from our last meeting. This was revised to include that three additional soil gas samples within AOC-65 southwest of building 90 for

TO-15 PCE SIM analysis. We have collected soil gas samples directly west of building 90 (at CSSA's fence line) and indoor air samples within building 90. The remaining effort is to collect soil gas data similar to what may be present off-post. That is, the groundwater PCE concentrations within the LGR aquifer in the southern portion of AOC-65 are conservatively similar in off-post groundwater PCE concentrations.

Therefore soil gas samples collected in the southern portion of AOC-65 may be more representative of the off-post soil gas present above similar LGR contaminated groundwater. We intend to take the soil gas samples for TO-15 PCE SIM analysis prior to our meeting so that all results may be discussed and finalization of the Vapor Intrusion Survey Report initiated. If you have any questions or concerns please do not hesitate to call or contact me.

Regards,

Ken Rice
Parsons
512-719-6050 (Austin)
512-497-0075 (mobile)

Safety - Make it Personal !

APPENDIX F

Waste Characterization Sampling Results for AOC-74

Appendix F. Waste Characterization Sampling Results for AOC-74

SAMPLE ID:		AOC74-WC01	AOC74-WC02	AOC74-WC03	AOC74-WC04	AOC74-WC05
DATE SAMPLED:		11/28/2011	11/30/2011	11/30/2011	12/1/2011	12/1/2011
LAB SAMPLE ID:		AY51257	AY51299	AY51300	AY51332	AY51333
Metals - SW6010B/SW7470A						
Units						
Arsenic	mg/L	0.016 F	0.0040 F	0.0070 F	0.0020 U	0.0020 U
Barium	mg/L	0.38	0.59	0.52	0.35	0.34
Cadmium	mg/L	0.00030 U	0.00030 U	0.00030 U	0.00030 U	0.00030 U
Chromium	mg/L	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U
Lead	mg/L	0.0050 F	0.010 F	0.010 F	0.0032 F	0.0041 F
Mercury	mg/L	0.00010 U	0.00020 F	0.00010 U	0.00020 F	0.00020 F
Selenium	mg/L	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
Silver	mg/L	0.0088 F	0.0092 F	0.0090 F	0.0063 F	0.0066 F

QA NOTES AND DATA QUALIFIERS:

(NO CODE) - Confirmed identification.

U - Analyte was not detected above the indicated Method Detection Limit (MDL).

F - Analyte was positively identified, but the quantitation is an estimation above the MDL and below the Reporting Limit (RL).

Detections are **bolded**.

APPENDIX G

ProUCL Calculation Summaries for Chromium and Zinc in AOC-74 Soils

General UCL Statistics for Full Data Sets

User Selected Options

From File WorkSheet.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Chromium

General Statistics

Number of Valid Observations 13
Number of Distinct Observations 13

Raw Statistics

Minimum 7
Maximum 49
Mean 24.85
Median 23
SD 14.62
Std. Error of Mean 4.055
Coefficient of Variation 0.588
Skewness 0.205

Log-transformed Statistics

Minimum of Log Data 1.946
Maximum of Log Data 3.892
Mean of log Data 3.013
SD of log Data 0.699

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic 0.917
Shapiro Wilk Critical Value 0.866

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.901
Shapiro Wilk Critical Value 0.866

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 32.07

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995) 31.76
95% Modified-t UCL (Johnson-1978) 32.11

Gamma Distribution Test

k star (bias corrected) 2.093
Theta Star 11.87
MLE of Mean 24.85
MLE of Standard Deviation 17.17
nu star 54.41
Approximate Chi Square Value (.05) 38.46
Adjusted Level of Significance 0.0301
Adjusted Chi Square Value 36.56
Anderson-Darling Test Statistic 0.474
Anderson-Darling 5% Critical Value 0.741
Kolmogorov-Smirnov Test Statistic 0.185
Kolmogorov-Smirnov 5% Critical Value 0.239

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL 35.15
95% Adjusted Gamma UCL 36.98

Potential UCL to Use

Assuming Lognormal Distribution

95% H-UCL 41.9

95% Chebyshev (MVUE) UCL 47.86
97.5% Chebyshev (MVUE) UCL 57.58
99% Chebyshev (MVUE) UCL 76.67

Data Distribution

Data appear Normal at 5% Significance Level

Nonparametric Statistics

95% CLT UCL 31.52
95% Jackknife UCL 32.07
95% Standard Bootstrap UCL 31.24
95% Bootstrap-t UCL 32.65
95% Hall's Bootstrap UCL 31.31
95% Percentile Bootstrap UCL 30.92
95% BCA Bootstrap UCL 31.28
95% Chebyshev(Mean, Sd) UCL 42.52
97.5% Chebyshev(Mean, Sd) UCL 50.17
99% Chebyshev(Mean, Sd) UCL 65.19

Use 95% Student's-t UCL 32.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

