

RELEASE INVESTIGATION REPORT

AREA OF CONCERN 45 CAMP STANLEY STORAGE ACTIVITY



Prepared for:

Camp Stanley Storage Activity Boerne, Texas

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EXECUTIVE SUMMARY

Area of Concern (AOC) 45 is located in the southwestern portion of the Inner Cantonment Area, approximately 650 yards north of the southern CSSA boundary, and is approximately 0.5 acre in size. The site consisted of a flat area that contained spent and unspent bullets, presumably from the Building 90 test fire room. Prior uses of the site are unknown, but no trenches or any other signs of disposal are present at the site. In May 2011, contaminated soil above Tier 1 protective concentration levels (PCLs) from in and around AOC-45 was removed and properly disposed as described herein. This Release Investigation Report (RIR) requests No Further Action (NFA) at AOC-45.

In summary, activities at AOC-45 as described in this RIR showed the following results:

- Two rounds of excavation, removal, and confirmation sampling were performed at AOC-45.
- The contaminant of concern (COC) identified above soil background concentrations at AOC-45 was lead. Areas of metals contamination exceeding Tier 1 PCLs have been excavated and removed from the site or were used to calculate a 95% upper confidence limit (UCL) per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL.

From the information summarized above and presented in this report, the results of the investigations at AOC-45 meet the three criteria as described in Texas Commission on Environmental Quality (TCEQ) (2003) guidance *Determining Which Releases are Subject to the Texas Risk Reduction Program (TRRP)*. Thus, the following criteria were met:

- 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.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-45. Inorganic groundwater contamination has not been reported in the closest well to AOC-45 (well CS-MW7-LGR located approximately 200 feet west of the site). Since soils that were 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-45.
- AOC-45 passes the Tier 1 Ecological Exclusion Criteria Checklist (**Appendix B**).

Because these three criteria are met, AOC-45 is not subject to TRRP. Therefore, this RIR was prepared to document the results and a NFA decision is requested from the 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
LCS	laboratory control sample
LGR	Lower Glen Rose
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MQL	method quantitation 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)
TPH	total petroleum hydrocarbon
TRRP	Texas Risk Reduction Program

UCL	upper confidence limit
UGR	Upper Glen Rose
USEPA	U.S. Environmental Protection Agency
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) 45 (**Figure 2**). AOC-45 is located in the southwest portion of the Inner Cantonment area, approximately 650 yards north of the southern CSSA boundary. The site covers approximately 0.5 acre. 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-45. Work included x-ray fluorescence (XRF) analysis of soils; environmental sampling; 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-45. Section 3 describes the objectives and rationale for preparing an RIR for AOC-45 and the findings from environmental investigations for the site. The groundwater and surface water for CSSA and the area near AOC-45 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-45

2.2.1 Overview

Prior uses of AOC-45 are unknown; however, small arms ammunition found on site indicates it was likely used as an ammunition disposal area until the 1960s. A series of historical aerial photographs of the site is shown on **Figure 3**. The 1957 photograph shows some ground disturbance in the northeastern side of the site. In 1966, an area in the northern portion of the photograph is disturbed. This disturbed area is also visible in the 1973 and 1985 photographs.

The analytical results for contaminants of concern (COCs) remaining at the site are discussed in Section 3.1. Photographs showing investigation, excavation, and removal activities at the sites are provided in **Appendix A**. The history of the sites and previous investigations at the sites are discussed below.

2.2.2 Setting, Size, and Description

AOC-45 is located in the southwestern portion of the Inner Cantonment Area, approximately 650 yards north of the southern CSSA boundary. AOC-45 covers approximately 0.5 acre. The site consists of a flat area that contained spent and unspent bullets, presumably from the Building 90 test fire room. No other prior uses are known. Additional background information on AOC-45 can be found in the CSSA EE ([Volume 3-2, AOC-45](#)).

2.2.3 Potential Contaminant Sources, Chemicals of Concern, and Previous Investigations

An XRF survey for lead and zinc was conducted at AOC-45 on December 6, 7, and 21, 2010. 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 **Figure 4**. The purpose of the XRF survey was to gather field screening data regarding the presence of metals above Tier 1 protective concentration levels (PCLs) in surface soils. XRF analytical results showed that only lead was detected above Tier 1 levels (84.5 milligrams per kilogram

[mg/kg]) at 24 locations. During the XRF survey, the site was visually inspected for signs of past trenching or waste disposal activities. No such evidence was encountered.

3.0 OBJECTIVES OF RIR FOR AOC-45

In accordance with TCEQ (2003) guidance, *Determining Which Releases are Subject to TRRP* (www.tceq.state.tx.us/assets/public/remediation/trrp/releasesTRRPprev.pdf), an RIR can be performed 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 sites, an RIR can be submitted to document the results and a No Further Action (NFA) decision can be requested from the TCEQ.

As referred to in the criteria listed above, the Tier 1 residential soil action levels are provided by TCEQ and were selected following TCEQ guidance (TCEQ, 2007). The most current action levels were used (May 2011). These action levels are referred to as 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. If the source area is greater than or equal to 0.5 acre, then the source area is assumed to be 30 acres. Thus, the soil action levels for AOC-45 are based on a 30-acre source area. 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 quantitation 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 metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc). The statistically calculated and TCEQ-approved background metal concentrations are shown in **Table 1**, and are also available in the CSSA EE ([Volume 2, Background Metals Levels](#)). It is noted that the action levels/PCLs for four of the nine metals are based on the background concentrations (these four metals are arsenic, cadmium, lead, and mercury).

3.1 FIELD ACTIVITIES AND INVESTIGATIONS

A summary of the cleanup confirmation results at the sites 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 4. The clearance areas where soils were excavated and removed are also shown on Figure 4. Waste characterization sampling and off-post removal activities are described in Section 3.1.3. Additional information about past activities and investigations at the site can be found in the CSSA EE ([Volume 1-3, AOC-45](#)).

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, QAPP](#)). 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-45 were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 8260B (volatile organic compounds [VOCs]); Method 8270C (semi-volatile organic compounds [SVOCs]); Method 8330 (explosives); 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) and total petroleum hydrocarbons (TPH) (Method TX1005). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analyses.

3.1.2 Excavation, Removal, and Confirmation Sampling at AOC-45

In April 2011, two surface samples were collected from within the site to confirm the elevated XRF values, and an additional twelve surface samples were collected along the perimeter to confirm the revised site boundary (Figure 5). The samples were analyzed for metals and explosives. No explosives were detected; however the lead results for four of the samples exceeded the Tier 1 PCL. Additional samples were collected for lead analysis in May 2011 to confirm the horizontal extent of contamination at the southern and northwestern boundary of the site. The results showed lead above the Tier 1 PCL in four locations (Figure 5).

To address contaminated soils at AOC-45, excavation activities were conducted on May 11, 2011 and May 16, 2011. During this period, approximately 1,000 CY of soil media were excavated from the site. All excavation activities were conducted by USA Environment, under the supervision of a Parsons Construction Manager. The excavated area was 0.5 acre in size, approximately 320 feet (ft) long (northwest to southeast), and ranged from about 30 ft wide near the center to about 140 ft wide towards the northwest end, as shown on Figure 4. The excavation area was modified around the perimeter in an attempt to preserve the edge trees' root systems. The site was initially excavated to a depth of approximately one foot. Confirmation soil samples showed four locations that still contained lead concentrations above the Tier 1 PCL.

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 76.59 mg/kg was calculated for the lead concentrations remaining in site soils, which does not exceed the Tier 1 PCL of 84.5 mg/kg (**Appendix G**). Only one sample location remained above the UCL. This area was then excavated an additional foot and sample SS27 was collected in its place (Figure 5). Confirmation samples from the second round of excavation showed no COCs above Tier 1 PCLs (Table 1). 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. Photos 5 and 6 in Appendix A show the excavation activities for AOC-45.

3.1.3 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 RIF/IM WMP Addendum for AOC-45, dated April 2011. Waste characterization sample results for excavated soils are included in Appendix F.

Excavated material was stockpiled along and adjacent to the excavation area during the excavation 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 the soil materials were moved to the East Pasture berm. After excavation activities were complete, the site was graded so that the site surface was smooth and seeded with native grasses and wildflowers.

Results of waste characterization showed that the impacted media from AOC-45 met State of Texas Class 2 non-hazardous criteria (30 TAC §335 Subchapter R). Approximately 1,000 CY

of excavated soil materials were moved to the East Pasture berm for reuse, as per TCEQ approval April 19, 2006 (**Appendix E**).

3.2 SITE 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-45. 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-45 Groundwater and Surface Water

No site-specific information regarding groundwater is available. However, between September 2001 and March 2011, measured water levels at Well CS-MW7-LGR, which is located approximately 200 ft downgradient of the site, have ranged from 33.1 ft below top of casing (BTOC) (December 2004) to 291.1 ft BTOC (September 2006). Low concentrations of VOCs and metals detected in CS-MW7-LGR (below their respective maximum contaminant levels [MCLs]) are attributed to contaminated groundwater from Plume 2.

The closest surface water body to AOC-45 is an unnamed Leon Creek tributary approximately 140 ft downgradient of the site (**Figure 6**). The tributary drains to the W-Tank, located approximately 420 ft south of AOC-45. The W-Tank is located approximately 4,375 ft upgradient to Upper Leon Creek. The nearest classified creek downgradient from AOC-45 is Upper Leon Creek. The creek is classified as a perennial stream. Upper Leon Creek is classified under Texas Surface Water Quality Standards as Segment 1907 from a point 330 ft upstream of State Highway 16, northwest of San Antonio in Bexar County to a point 5.6 miles upstream of Scenic Loop Road, north of Helotes in Bexar County. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-45.

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-45. Thus, based on the absence of any complete or significant ecological exposure pathways, AOC-45 may be excluded from further ecological assessment.

5.0 SUMMARY AND RECOMMENDATIONS

AOC-45 is located in the southwestern portion of the Inner Cantonment Area, approximately 650 yards north of the southern CSSA boundary. AOC-45 covers approximately 0.5 acre. The site consists of a flat area that contained spent and unspent bullets, presumably from the Building 90 test fire room. No other prior uses of the site are known. In 1966, an area in the northern portion of the photograph is disturbed. This disturbed area is also visible in the 1973 and 1985 photographs.

In summary, activities at AOC-45 as described in this RIR showed the following results:

- Two rounds of excavation, removal, and confirmation sampling were performed at AOC-45.

- 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.
- Over 1,000 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 the information summarized above and presented in this report, the results of the investigations at AOC-45 meet the three criteria as described in TCEQ (2003) guidance *Determining Which Releases are Subject to the TRRP*. Thus, the following criteria were met:

- 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.
- AOC-45 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).
- COC concentrations remaining in soil at AOC-45 were all below Tier 1 residential PCLs, which are protective of groundwater; therefore, no other media (surface water, sediment, or groundwater) have been affected, nor will be affected in the future, by the site.

Because these three criteria are met, AOC-45 is not subject to TRRP. Therefore, this RIR was prepared to document the results and a NFA decision is requested from the TCEQ.

TABLES AND FIGURES

Table 1. Summary of Chemical Constituents Remaining in Soils at CSSA AOC-45

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations	Sample Locations																										
		Residential			Source Area 30 acre		AOC45-SS01 07-Apr-2011		AOC45-SS02 07-Apr-2011		AOC45-SS03 07-Apr-2011		AOC45-SS04 07-Apr-2011		AOC45-SS05 07-Apr-2011		AOC45-SS06 07-Apr-2011		AOC45-SS07 07-Apr-2011		AOC45-SS08 07-Apr-2011										
		Soil mg/kg	Soil mg/kg		mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF										
		[1]	[2]		[3]																										
Inorganic Metals																															
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6 ++	4.3	F	1	3.1	F	1	3.3	F	1	4.5	M	1	5.0	F	1	3.9	F	1	2.5	F	1	2.2	F	1
Barium	7440-39-3	7840.5	n	221.9	m	>S	300 +++	22			28			24			42	M	1	44			26			14			16		
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3 ++	0.030	U	1	0.030	U	1	0.040	F	1	0.17	M	1	0.16	F	1	0.050	F	1	0.030	U	1	0.030	U	1
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2 ++	5.2	F	1	6.8	F	1	7.1	F	1	11	M	1	12	F	1	6.8	F	1	3.1	F	1	4.0	F	1
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2 ++	13			6.6			5.3			11	M	1	11			7.1			5.6			7.2		
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5 ++	18,000	J	200	15	J	1	13	J	1	27	M	1	83	J	1	62	J	1	20	J	1	56	J	1
Mercury	7439-97-6	2.1	n	0.0	m		0.77 ++	0.020	F	1	0.010	U	1	0.030	F	1	0.080	F	1	0.030	F	1	0.020	F	1	0.050	F	1	0.010	U	1
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.5 ++	4.5			5.3			5.9			9.0	M	1	9.3			6.4			3.6			3.9		
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2 ++	22			23			15			29	M	1	29			16			15			11		

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations	Sample Locations																										
		Residential			Source Area 30 acre		AOC45-SS09 07-Apr-2011		AOC45-SS10 07-Apr-2011		AOC45-SS10-DUP 07-Apr-2011		AOC45-SS11 07-Apr-2011		AOC45-SS12 07-Apr-2011		AOC45-SS13 07-Apr-2011		AOC45-SS14 07-Apr-2011		AOC45-SS15 20-Apr-2011										
		Soil mg/kg	Soil mg/kg		mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF										
		[1]	[2]		[3]																										
Inorganic Metals																															
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6 ++	2.1	F	1	3.8	F	1	3.8	F	1	3.7	F	1	4.1	F	1	2.3	F	1	2.4	F	1	--		
Barium	7440-39-3	7840.5	n	221.9	m	>S	300 +++	14			31			27			42			28			14			22			--		
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3 ++	0.030	U	1	0.050	F	1	0.030	U	1	0.17	F	1	0.090	F	1	0.11	F	1	0.070	F	1	--		
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2 ++	3.1	F	1	9.7	F	1	8.6	F	1	8.9	F	1	8.2	F	1	4.8	F	1	5.4	F	1	--		
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2 ++	6.6			6.1			5.2			11			7.2			150			16			--		
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5 ++	130	J	1	29	J	1	61	J	1	56	J	1	48	J	1	9,400	J	100	300	J	1	24		1
Mercury	7439-97-6	2.1	n	0.0	m		0.77 ++	0.010	U	1	0.010	U	1	0.010	U	1	0.10			0.030	F	1	0.060	F	1	0.050	F	1	--		
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.5 ++	3.7			6.0			5.4			7.3			7.0			1.4	F	1	4.1			--		
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2 ++	11			18			18			29			18			50			28			--		

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations	Sample Locations																										
		Residential			Source Area 30 acre		AOC45-SS16 20-Apr-2011		AOC45-SS16-DUP 20-Apr-2011		AOC45-SS17 20-Apr-2011		AOC45-SS18 16-May-2011		AOC45-SS19 16-May-2011		AOC45-SS19-DUP 16-May-2011		AOC45-SS20 16-May-2011		AOC45-SS21 16-May-2011										
		Soil mg/kg	Soil mg/kg		mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF										
		[1]	[2]		[3]																										
Inorganic Metals																															
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6 ++	--			--			--			--			--			--			--			--		
Barium	7440-39-3	7840.5	n	221.9	m	>S	300 +++	--			--			--			--			--			--			--			--		
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3 ++	--			--			--			--			--			--			--			--		
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2 ++	--			--			--			--			--			--			--			--		
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2 ++	--			--			--			--			--			--			--			--		
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5 ++	17			15		1	15		1	230	J	1	93	M	1	55	J	1	53	J	1	43	J	1
Mercury	7439-97-6	2.1	n	0.0	m		0.77 ++	--			--			--			--			--			--			--			--		
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.5 ++	--			--			--			--			--			--			--			--		
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2 ++	--			--			--			--			--			--			--			--		

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations	Sample Locations																										
		Residential			Source Area 30 acre		AOC45-SS22 16-May-2011		AOC45-SS23 16-May-2011		AOC45-SS24 16-May-2011		AOC45-SS25 16-May-2011		AOC45-SS26 16-May-2011		AOC45-SS27 24-May-2011														
		Soil mg/kg	Soil mg/kg		mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF														
		[1]	[2]		[3]																										
Inorganic Metals																															
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6 ++	--			--			--			--			--			--			--			--		
Barium	7440-39-3	7840.5	n	221.9	m	>S	300 +++	--			--			--			--			--			--			--			--		
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3 ++	--			--			--			--			--			--			--			--		
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2 ++	--			--			--			--			--			--			--			--		
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2 ++	--			--			--			--			--			--			--			--		
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5 ++	26	J	1	110	J	1	45	J	1	17	J	1	11,000	J	100	58			1					
Mercury	7439-97-6	2.1	n	0.0	m		0.77 ++	--			--			--			--			--			--			--			--		
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.5 ++	--			--			--			--			--			--			--			--		
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2 ++	--			--			--			--			--			--			--			--		

Table 1. Summary of Chemical Constituents Remaining in Soils at CSSA AOC-45

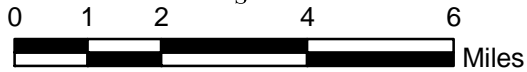
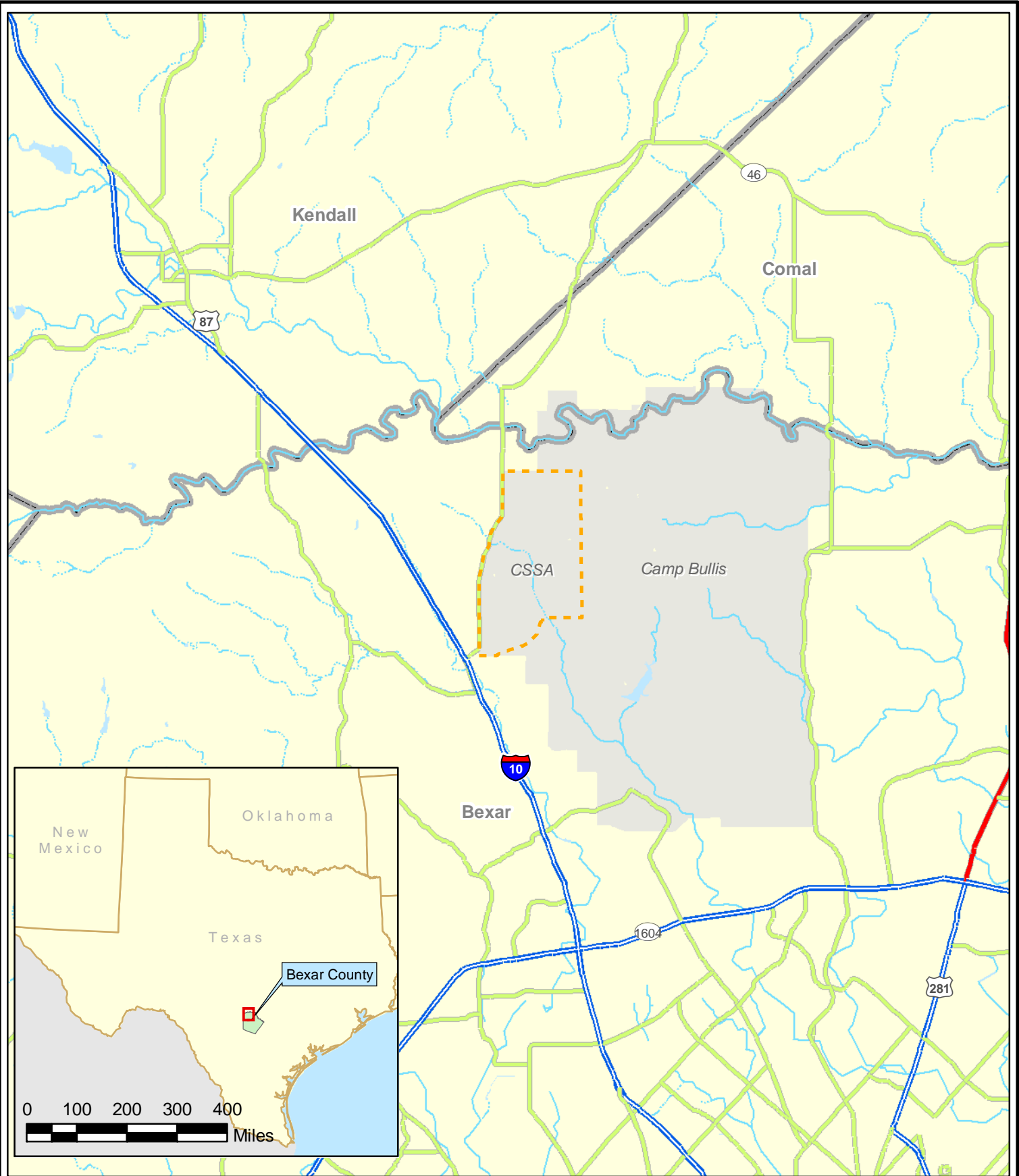
Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†] Residential		TCEQ-Approved CSSA Background Metal Concentrations	Sample Locations													
		Source Area 30 acre			AOC45-SS01	AOC45-SS02	AOC45-SS03	AOC45-SS04	AOC45-SS05	AOC45-SS06	AOC45-SS07	AOC45-SS08						
		Soil mg/kg [1]	Soil mg/kg [2]		mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF			
Explosives 2,4-Dinitrotoluene	121-14-2	6.9	c	0.0027	c	na	--	--	--	--	--	--	--	--	--			
Explosives 2,4-Dinitrotoluene	121-14-2	6.9	c	0.0027	c	na	--	--	--	--	--	0.17	F	1	0.080	U	1	--
Explosives 2,4-Dinitrotoluene	121-14-2	6.9	c	0.0027	c	na	--	--	--	--	0.080	U	1	0.080	U	1	--	--
Explosives 2,4-Dinitrotoluene	121-14-2	6.9	c	0.0027	c	na	--	--	--	--	--	--	--	--	--	--	--	--

NOTES:

- † TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: March 25, 2009).
 - †† 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.
- mg/kg = milligrams per kilogram.
 - c = carcinogenic.
 - n = noncarcinogenic.
 - m = primary MCL-based.
 - a = EPA Action Level-based.
 - >S = solubility limit exceeded during calculation.
 - na = not applicable.
 - = not sampled.

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 associated concentration is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
 - M - Analyte was positively identified but the associated concentration is an estimation due to an associated matrix effect.
- Values shown in **BOLD** indicate detections above the MDL.









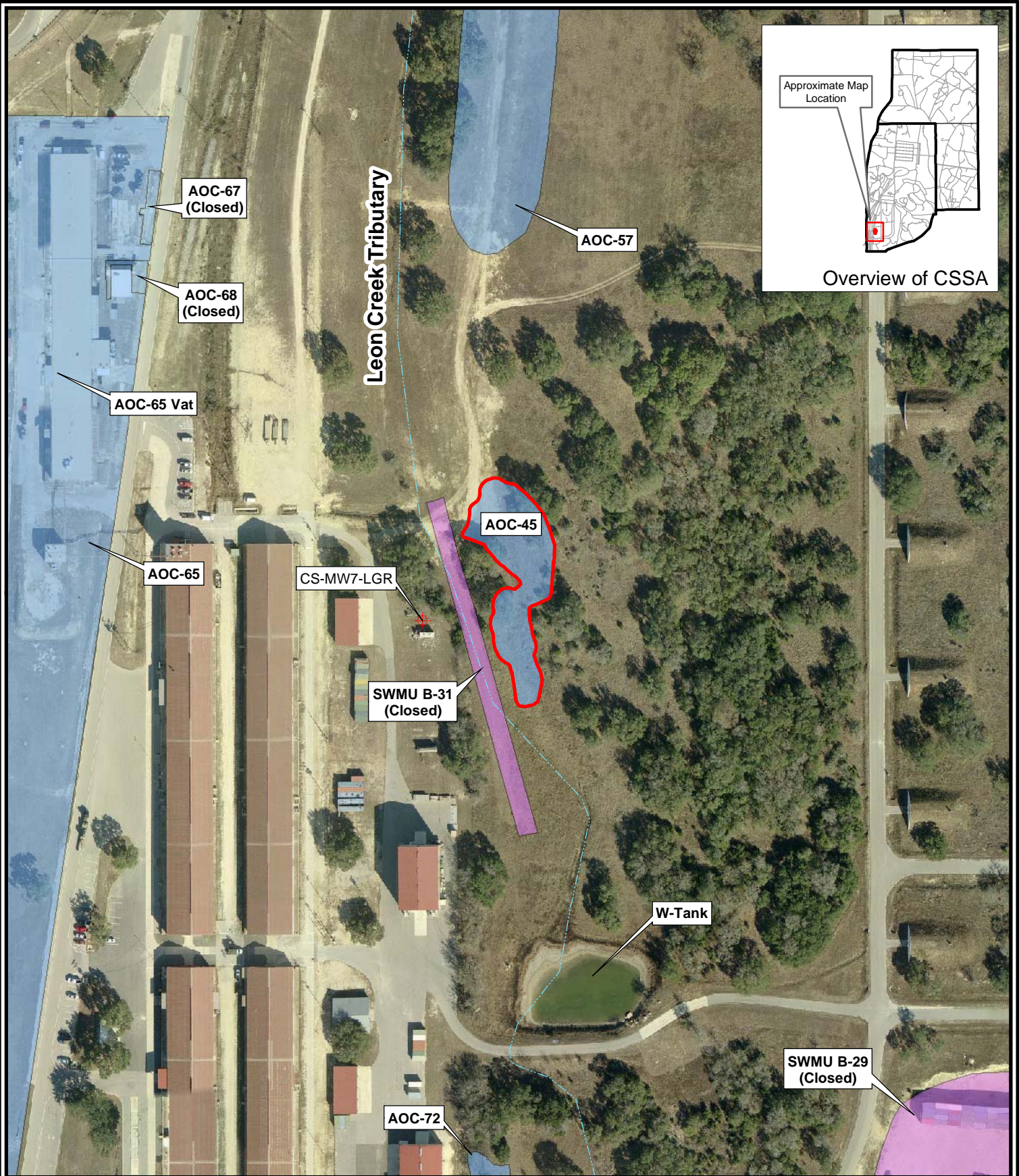
-  CSSA
-  Freeway
-  Highway
-  Major Road
-  County Boundary
-  Military Installation

Figure 1

CSSA Location Map
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009

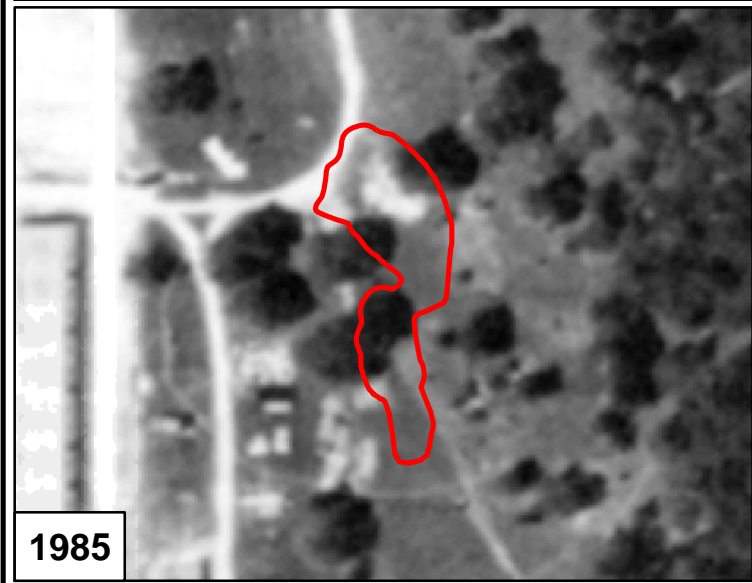
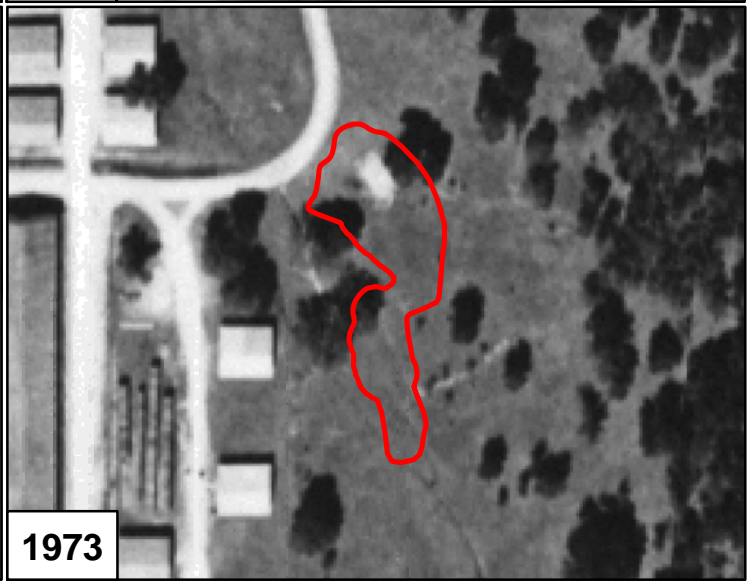
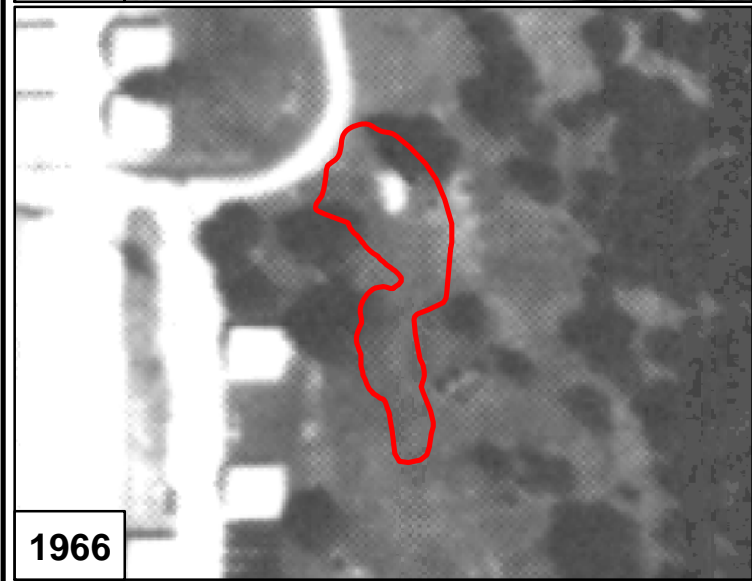
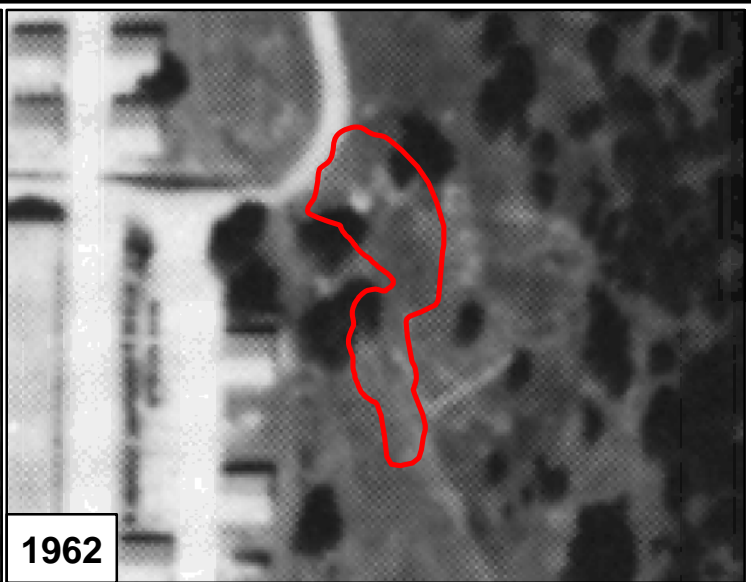
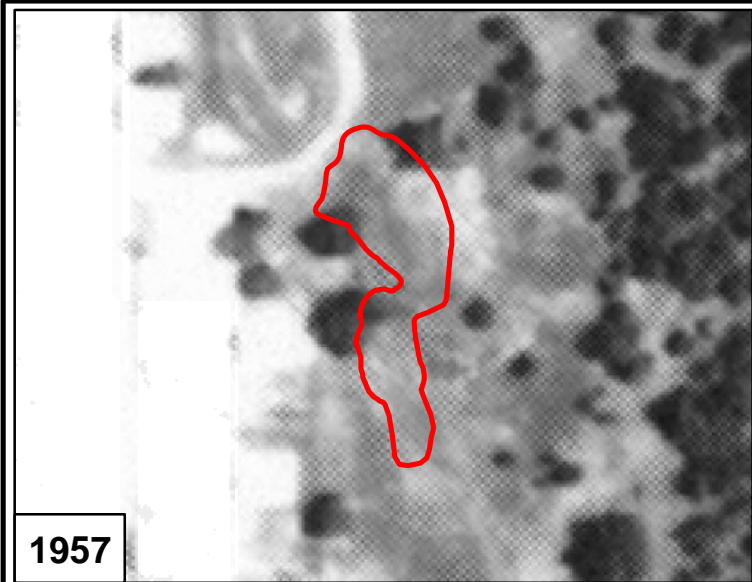


175 87.5 0 175 Feet



- CS-MW7-LGR
- AOC-45
- AOC Boundary
- SWMU Boundary
- Stream
- CSSA Outer Fence Line

Figure 2
AOC-45
Site Location Map
Camp Stanley Storage Activity
PARSONS



1957

1962

1966

1973

1985

2008



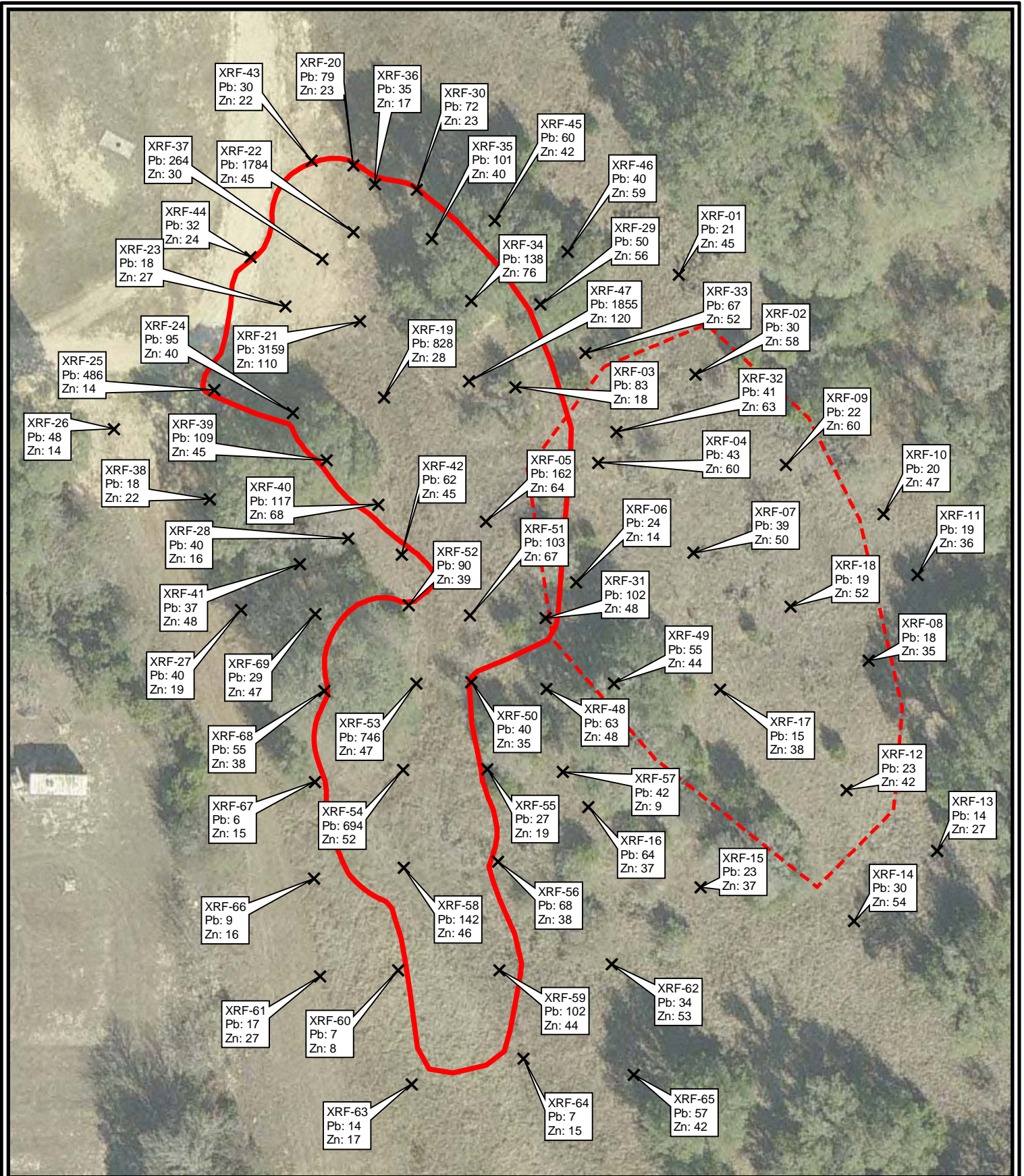
 AOC-45

0 100 200 400 Feet

Figure 3

AOC-45
Aerial Photographs
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009



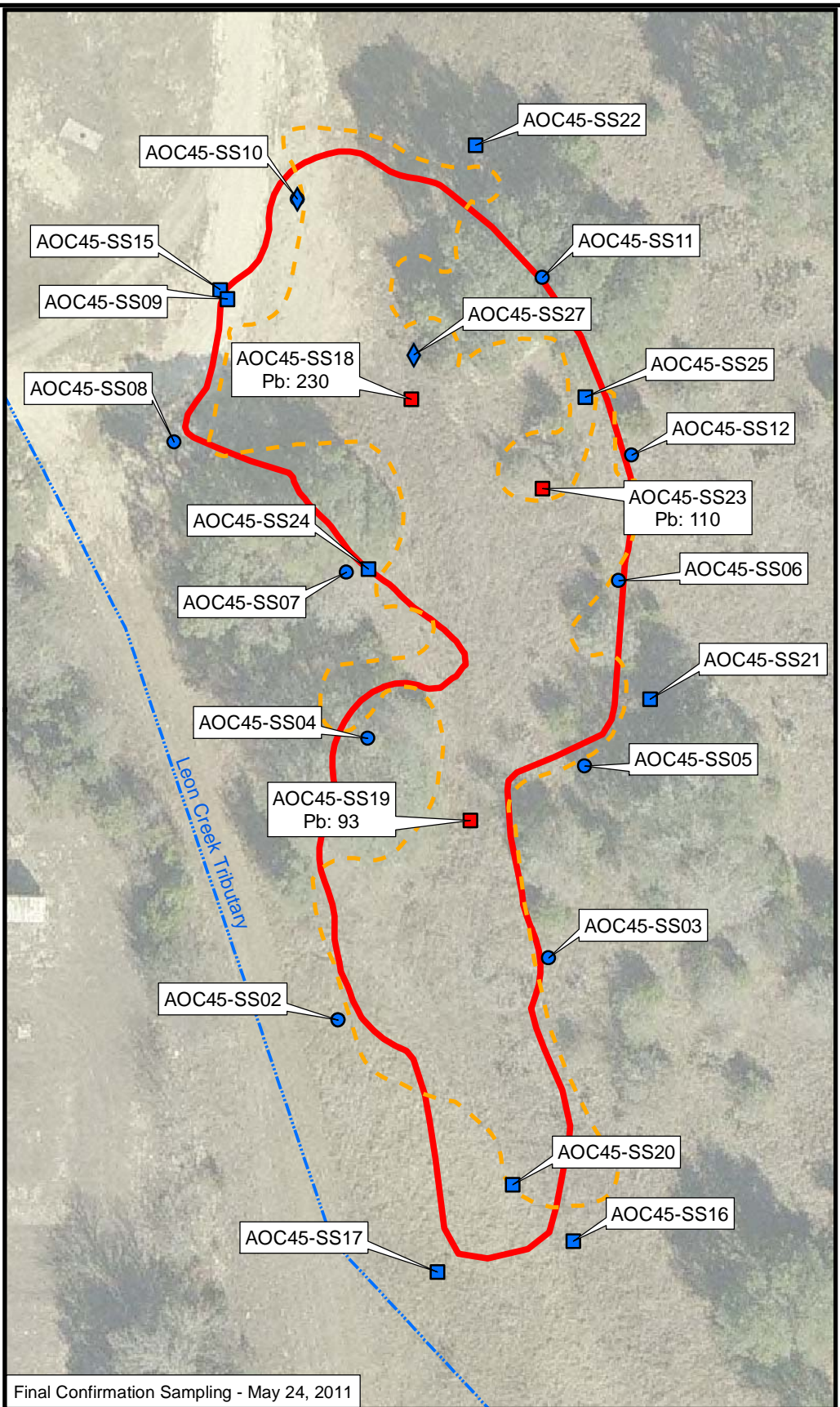
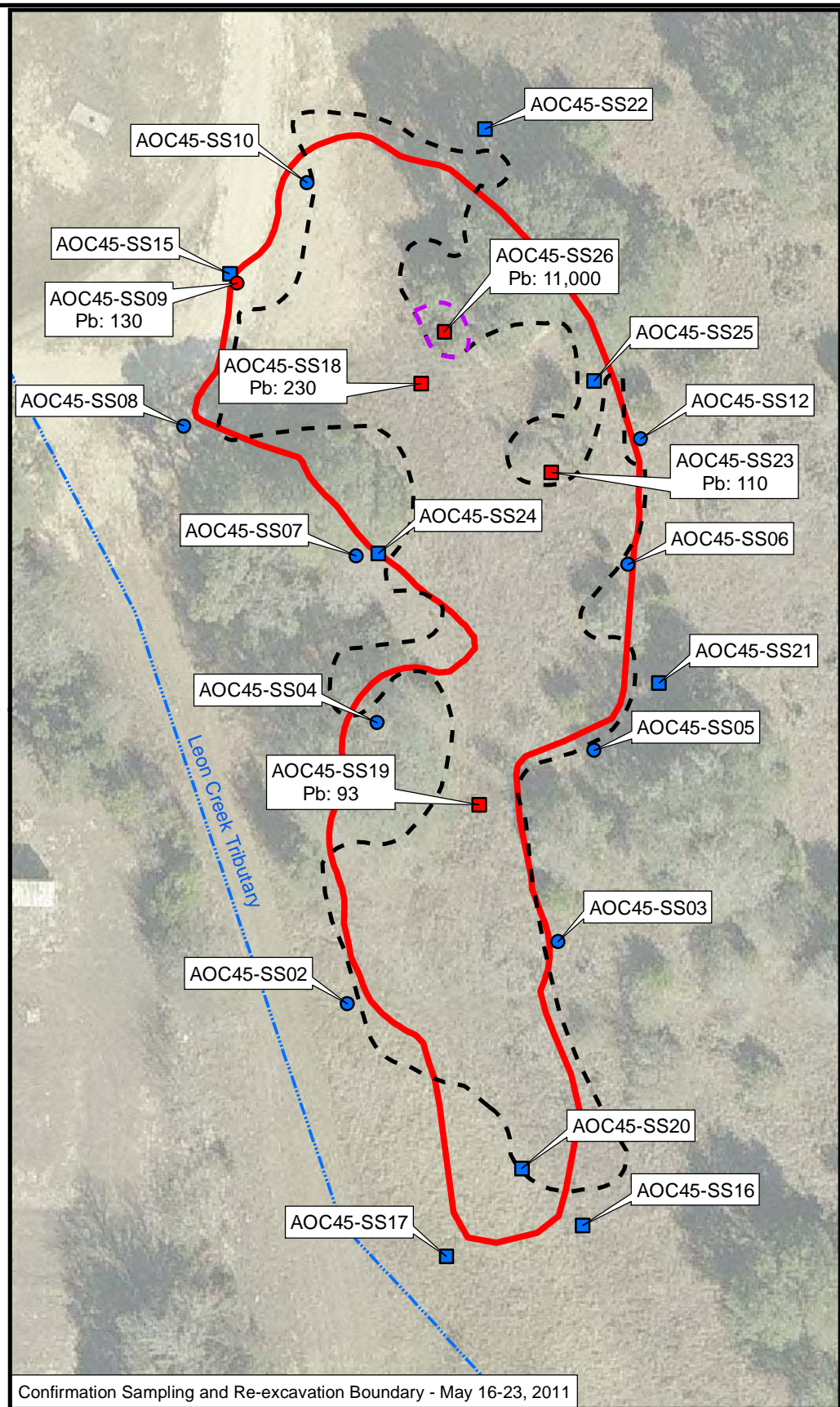
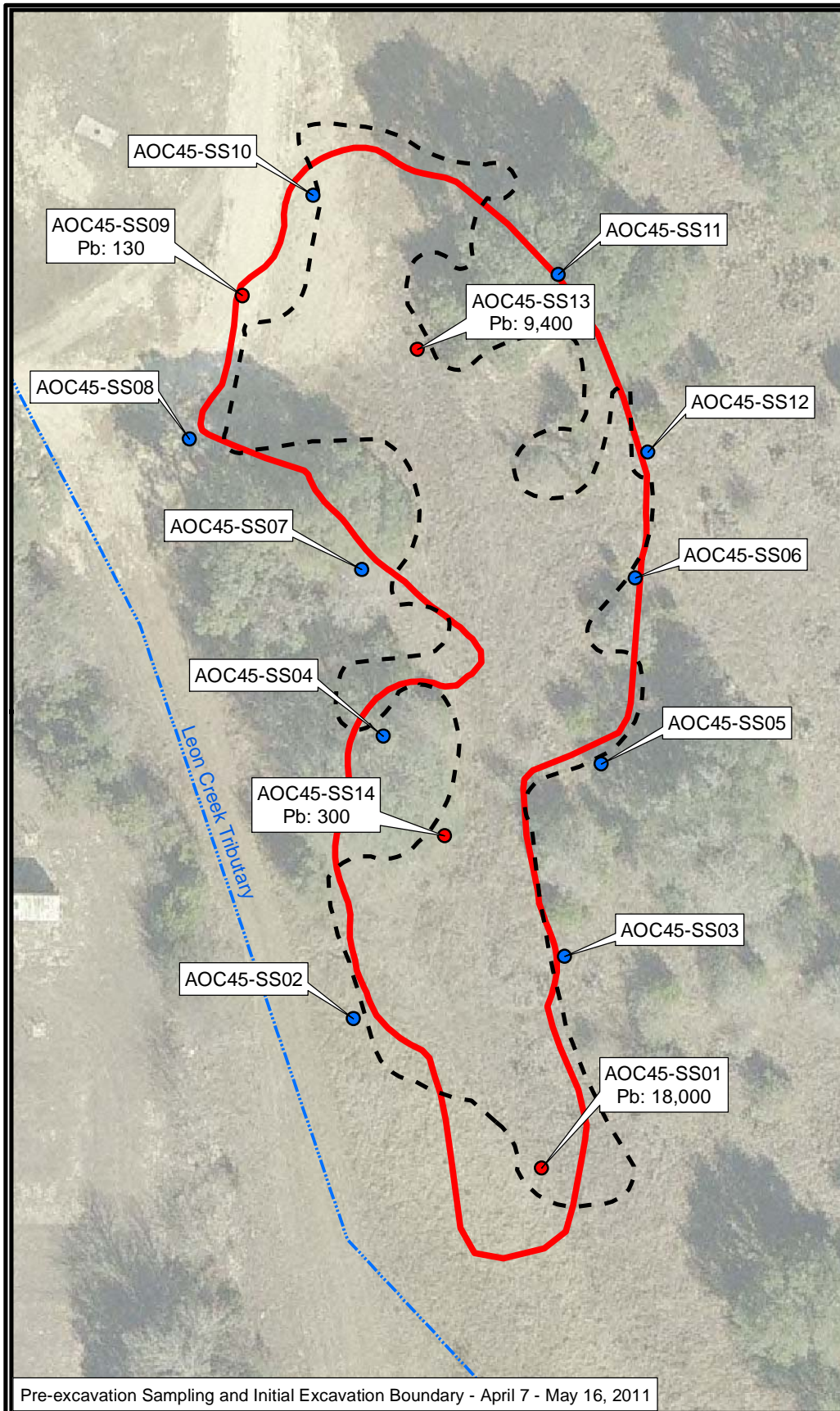
0 20 40 80 Feet

- × XRF Sample Location (Results in mg/kg)
- Revised AOC-45 Boundary based on field data results
- Original AOC-45 Boundary

Figure 4

AOC-45
XRF Sampling Results
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009



J:\C\SSA\GIS\AOC45\Maps\AOC45_RIR_sample_location_map_3view.mxd - 8/2/2011 @ 10:13:48 AM

- AOC-45 Boundary
 - Intermittent Stream
 - Initial Excavation Boundary
May 11 - May 16, 2011
 - Re-excavation Boundary
May 23, 2011
 - Total Excavated Area
 - Collected April 7, 2011
 - Collected May 16 - May 20, 2011
 - ◆ Collected May 24, 2011
- (Red indicates an exceedance of the Tier 1 PCL. Exceeding concentrations are indicated above.)*

Figure 5
AOC-45
Sample & Excavation Locations
Camp Stanley Storage Activity

PARSONS

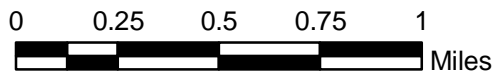
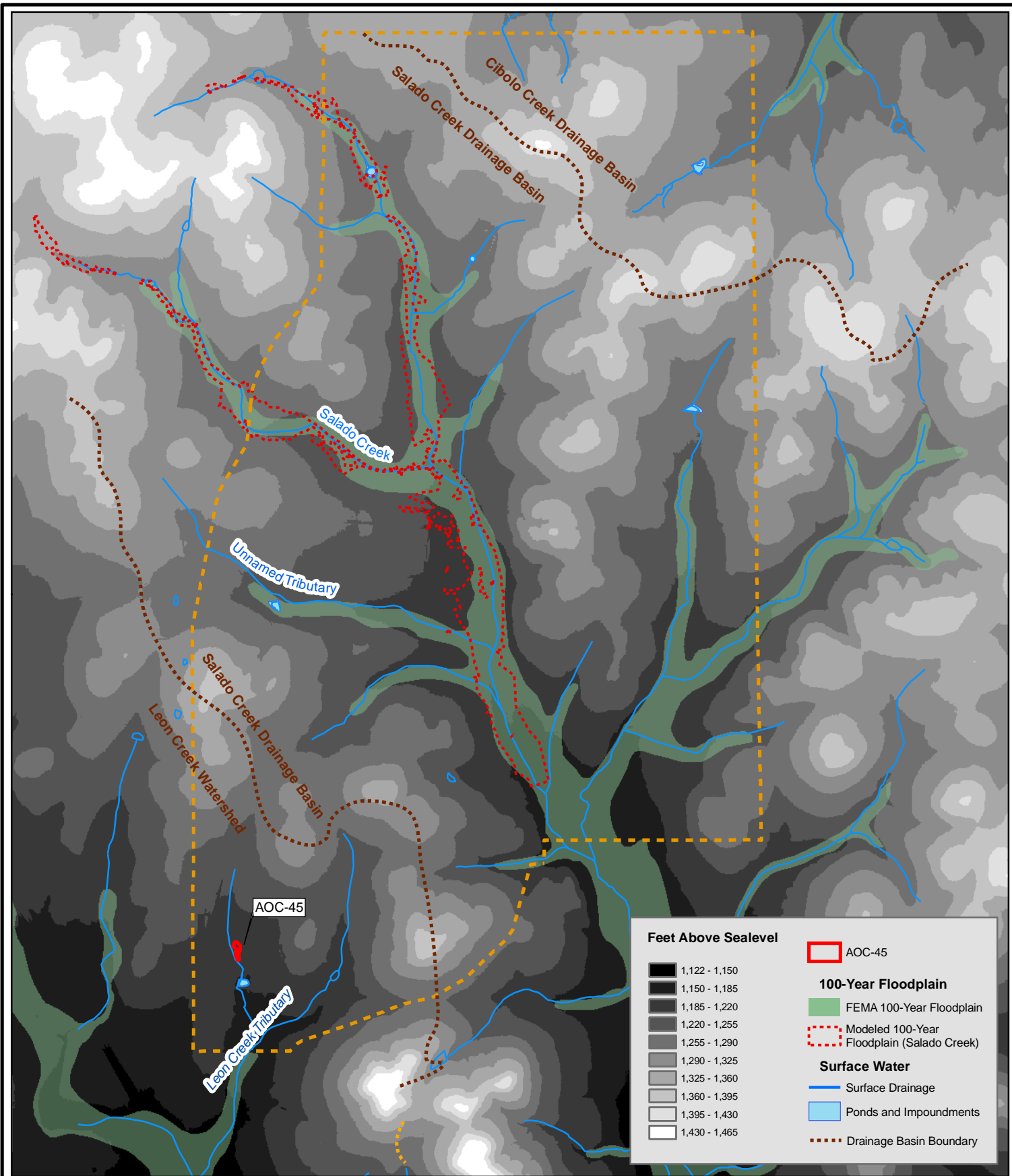


Figure 6

AOC-45 Topography,
Surface Water, and Floodplains
Camp Stanley Storage Activity

PARSONS

APPENDIX A
Site Photographs



Photo 1. AOC-45 prior to excavation, looking south (May 2001).



Photo 2. AOC-45 prior to excavation, looking north (May 2001).



Photo 3. Soil sample collection at AOC-45, looking northeast (April 2011).



Photo 4. Soil sample collection at AOC-45, looking northwest (April 2011).



Photo 5. Excavation of AOC-45, looking south (May 2011).



Photo 6. Excavation of AOC-45, looking north (May 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:

AOC-45 is located in the southwest portion of the Inner Cantonment area (see Figure 2 of this RIR). The site lies approximately 650 yards north of the southern CSSA boundary and is approximately 0.5 acre in size.

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 impacts to these receptors result in disruption of the ecosystem or other unacceptable consequences for the more

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.

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 SWMUs, AOCs, and 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-45: AOC-45 is located in the southwest portion of the Inner Cantonment area. The site lies approximately 650 yards north of the southern CSSA boundary and covers approximately 0.5 acre. Prior to the excavation activities described herein, the area was open and covered by grass. Some low brush had grown up in areas around the site. Oak trees dot the western and southeastern edges of the site.

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-45.

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):

Based on soil samples collected at AOC-45, there are no VOCs or SVOCs at the site (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-45. Over the past 10 years, there have been samples collected from the closest well to AOC-45 (well CS-MW7-LGR located approximately 200 ft downgradient of the site) and analyzed for metals and VOCs. Low concentrations of VOCs and metals detected in CS-MW7-LGR (below their respective MCLs) are attributed to contaminated groundwater from Plume 2. 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-45.

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 that drains to the W-Tank and then to Leon Creek**, is **approximately 140 feet** from the affected property (**downgradient of AOC-45**). 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: _____

No

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

Name:

Upper Leon Creek

Segment #:

Segment 1907 – from a point 100 meters (330 feet) upstream of State Highway 16 northwest of San Antonio in Bexar County to a point 9.0 kilometers (5.6 miles) upstream of Scenic Loop Road north of Helotes in Bexar County.

Use Classification:

Upper Leon Creek is classified as a perennial stream. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-45.

All creeks at CSSA are intermittent and only have water during and immediately following rain events. Refer to Section 3.2.3 of the RIR.

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

The closest surface water body to AOC-45 is an unnamed tributary approximately 140 ft downgradient of the site. The tributary drains to the W-Tank, located approximately 420 ft to the south of AOC-45. The W-Tank is located along the westernmost unnamed tributary of Upper Leon Creek. At this point along the unnamed tributary, the distance to Upper Leon Creek is 4,375 ft. The W-Tank is fed by precipitation.

The nearest classified creek that is downgradient from AOC-45 is Upper Leon Creek. The creek is classified as a perennial stream. Upper Leon Creek is classified under Texas Surface Water Quality Standards as Segment 1907 from a point 330 ft upstream of State Highway 16 northwest of San Antonio in Bexar County to a point 5.6 miles upstream of Scenic Loop Road north of Helotes in Bexar County. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-45.

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-45. Since soils that were found to have concentrations of metals above their PCLs were excavated/removed, there will be no impact to groundwater, surface water, or sediment from AOC-45.

The closest surface water body to AOC-45 is an unnamed tributary approximately 140 ft downgradient of the site. This creek, and all other creeks at CSSA, are intermittent and only contain water during and immediately following rain events.

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:

Concentrations of chemicals detected in soil samples at AOC-45 do not exceed Tier 1 residential soil action levels. Soils found to have metals concentrations above their PCLs were either excavated and removed 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-45. Since soils found to have concentrations of metals above their PCLs were excavated/removed, there will be no impact to groundwater, surface water, or sediment in the area. Inorganic groundwater contamination has not been reported in the closest well to AOC-45 (well CS-MW7-LGR located approximately 200 feet downgradient of the site).

Additionally, several surveys have been conducted at CSSA for threatened and endangered (T&E) species. The only T&E species that have been documented at CSSA are the black-capped vireo (*Vireo atricapillus*) [BCVI] and golden-cheeked warbler (*Dendroica chrysoparia*) [GCWA]. AOC-45 is not located within BCVI or GCWA habitat. The nearest potential habitats for local endangered species are approximately 2,400 ft east. Additional information can be found in the following references:

- **Parsons, 2007. *Final Integrated Natural Resource Management Plan*. Prepared for Camp Stanley Storage Activity, Boerne, Texas. October 2007. Available online: [CSSA EE \(Volume 1.6, Other Plans and Approaches\)](#)**
- **Parsons, 2009. *Final Species and Habitat Distributions of Black-Capped Vireos and Golden-Cheeked Warblers, 2009 Breeding/Nesting Season*. Prepared for Camp Stanley Storage Activity, Boerne, Texas. September 2009. Available online: [CSSA EE \(Volume 1.6, Other Plans and Approaches\)](#)**

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

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 **See explanation** No

Explain:

Based on Table 1 of this RIR there are no longer any COCs at the site. What contaminated soil horizon that was present at the site was removed during excavation activities.

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

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)

August 2, 2011 (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)

August 2, 2011 (Date Signed)

APPENDIX C

Confirmation Sample Results for All Analytes at AOC-45

Appendix C. Confirmation Sample Results for All Analytes at AOC-45

Chemicals Tested	CAS Number	Tier 1 Soil PCLs		TCEQ-Approved Background Metal Concentrations	Sample Locations																													
		Residential Source Area 30 acre																																
		Soil mg/kg [1]	Soil mg/kg [2]		AOC45-SS10-DUP 07-Apr-2011 mg/kg	Qual	DF	AOC45-SS11 07-Apr-2011 mg/kg	Qual	DF	AOC45-SS12 07-Apr-2011 mg/kg	Qual	DF	AOC45-SS13 07-Apr-2011 mg/kg	Qual	DF	AOC45-SS14 07-Apr-2011 mg/kg	Qual	DF	AOC45-SS15 20-Apr-2011 mg/kg	Qual	DF	AOC45-SS16 20-Apr-2011 mg/kg	Qual	DF	AOC45-SS16-DUP 20-Apr-2011 mg/kg	Qual	DF	AOC45-SS17 20-Apr-2011 mg/kg	Qual	DF	AOC45-SS18 16-May-2011 mg/kg	Qual	DF
Volatile Organics																																		
1,1,1,2-Tetrachloroethane	630-20-6	3.90E+01	c	7.10E-01	c	na	--	--	--	--	0.00080	U	1	0.00080	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1,1-Trichloroethane	71-55-6	3.20E+04	n	8.10E-01	m	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1,2,2-Tetrachloroethane	79-34-5	4.00E+00	c	1.20E-02	c	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1,2-Trichloroethane	79-00-5	1.00E+01	c	1.00E-02	m	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1-Dichloroethane	75-34-3	2.60E+03	n	9.20E+00	n	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1-Dichloroethene	75-35-4	1.60E+03	n	2.50E-02	m	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,1-Dichloropropene	563-58-6	2.60E+01	c	6.70E-02	c	na	--	--	--	--	0.0012	U	1	0.0012	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2,3-Trichlorobenzene	87-61-6	1.90E+02	n	1.30E+01	n	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2,3-Trichloropropane	96-18-4	8.70E-01	c	1.10E-03	c	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2,4-Trichlorobenzene	120-82-1	6.10E+02	n	2.40E+00	m	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2,4-Trimethylbenzene	95-63-6	7.30E+01	n	4.90E+00	n	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2-Dibromo-3-chloropropane	96-12-8	8.00E-02	c	8.70E-04	m	na	--	--	--	--	0.0020	U	1	0.0020	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2-Dibromoethane (EDB)	106-93-4	4.30E-01	c	1.00E-04	m	na	--	--	--	--	0.0013	U	1	0.0013	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2-Dichlorobenzene	95-50-1	3.90E+02	n	8.90E+00	m	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2-Dichloroethane	107-06-2	6.40E+00	c	6.90E-03	m	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,2-Dichloropropane	78-87-5	3.10E+01	n	1.10E-02	m	na	--	--	--	--	0.00070	U	1	0.00070	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	5.90E+01	n	2.70E+01	n	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,3-Dichlorobenzene	541-73-1	6.20E+01	n	3.40E+00	n	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,3-Dichloropropane	142-28-9	2.60E+01	c	3.20E-02	c	na	--	--	--	--	0.00070	U	1	0.00070	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1,4-Dichlorobenzene	106-46-7	2.50E+02	c	1.10E+00	m	na	--	--	--	--	0.00080	U	1	0.00080	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
1-Chlorohexane	544-10-5	2.30E+03	n	2.00E+01	n	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
2,2-Dichloropropane	594-20-7	3.10E+01	n	6.00E-02	c	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
2-Chlorotoluene	95-49-8	8.30E+02	n	4.50E+00	n	na	--	--	--	--	0.0013	U	1	0.0013	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
4-Chlorotoluene	106-43-4	2.50E+00	n	1.90E+01	n	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Benzene	71-43-2	4.80E+01	c	1.30E-02	m	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Bromobenzene	108-86-1	7.90E+01	n	2.90E+00	n	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Bromochloromethane	74-97-5	3.50E+02	n	1.50E+00	n	na	--	--	--	--	0.00080	U	1	0.00080	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Bromodichloromethane	75-27-4	9.80E+01	c	3.30E-02	c	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Bromoform	75-25-2	2.80E+02	c	3.20E-01	c	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Bromomethane	74-83-9	2.90E+01	n	6.50E-02	n	na	--	--	--	--	0.00070	U	1	0.00070	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Carbon tetrachloride	56-23-5	9.70E+00	c	3.10E-02	m	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Chlorobenzene	108-90-7	3.20E+02	n	5.50E-01	m	na	--	--	--	--	0.00070	U	1	0.00070	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Chloroethane	75-00-3	2.30E+04	n	1.50E+01	n	na	--	--	--	--	0.0015	U	1	0.0015	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Chloroform	67-66-3	8.00E+00	c	5.10E-01	n	na	--	--	--	--	0.00070	U	1	0.00070	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Chloromethane	74-87-3	8.40E+01	c	2.00E-01	c	na	--	--	--	--	0.0015	U	1	0.0015	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
cis-1,2-Dichloroethene	156-59-2	7.20E+02	n	1.20E-01	m	na	--	--	--	--	0.00080	U	1	0.00080	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
cis-1,3-Dichloropropene	10061-01-5	7.10E+00	n	3.30E-03	c	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Dibromochloromethane	124-48-1	7.20E+01	c	2.50E-02	c	na	--	--	--	--	0.00090	U	1	0.00090	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Dibromomethane	74-95-3	1.40E+02	n	5.60E-01	c	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Dichlorodifluoromethane	75-71-8	1.20E+04	n	1.20E+02	n	na	--	--	--	--	0.0018	U	1	0.0018	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Ethylbenzene	100-41-4	4.00E+03	n	3.80E+00	m	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Hexachlorobutadiene	87-68-3	1.20E+01	c	1.60E+00	c	na	--	--	--	--	0.0011	U	1	0.0011	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Isopropylbenzene	98-82-8	3.00E+03	n	1.70E+02	n	na	--	--	--	--	0.0010	U	1	0.0010	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
m,p-Xylene	179601-23-1	3.72E+03	n	3.54E+01	m	na	--	--	--	--	0.0018	U	1	0.0018	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Methylene chloride	75-09-2	2.60E+02	c	6.50E-03	m	na	--	--	--	--	0.0013	U	1	0.0013	U	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Naphthalene	91-20-3	1.20E+02	n	1.60E+01	n	na	--	--	--	--	0.0010	U	1	0.0010</																				

Appendix C. Confirmation Sample Results for All Analytes at AOC-45

Chemicals Tested	CAS Number	Tier 1 Soil PCLs			TCEQ-Approved Background Metal Concentrations	Sample Locations																							
		Residential		Soil mg/kg [3]		AOC45-SS10-DUP		AOC45-SS11		AOC45-SS12		AOC45-SS13		AOC45-SS14		AOC45-SS15		AOC45-SS16		AOC45-SS16-DUP		AOC45-SS17		AOC45-SS18					
		Source Area 30 acre				07-Apr-2011	07-Apr-2011	07-Apr-2011	07-Apr-2011	07-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	20-Apr-2011	16-May-2011	16-May-2011								
		Soil mg/kg [1]	Soil mg/kg [2]			mg/kg	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF			
Semi-Volatile Organics																													
1,2,4-Trichlorobenzene	120-82-1	6.10E+02	n	2.40E+00	m	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
1,2-Dichlorobenzene	95-50-1	3.90E+02	n	8.90E+00	m	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
1,3-Dichlorobenzene	541-73-1	6.20E+01	n	3.40E+00	n	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
1,4-Dichlorobenzene	106-46-7	2.50E+02	c	1.10E+00	m	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2,4,5-Trichlorophenol	95-95-4	4.10E+03	n	1.70E+01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2,4,6-Trichlorophenol	88-06-2	6.70E+01	n	8.70E-02	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2,4-Dichlorophenol	120-83-2	1.90E+02	n	1.80E-01	n	na	--	--	--	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--					
2,4-Dimethylphenol	105-67-9	8.80E+02	n	1.60E+00	n	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
2,4-Dinitrophenol	51-28-5	1.30E+02	n	4.70E-02	n	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
2,4-Dinitrotoluene	121-14-2	6.90E+00	c	2.70E-03	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2,6-Dinitrotoluene	606-20-2	6.90E+00	c	2.40E-03	c	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
2-Chloronaphthalene	91-58-7	5.00E+03	n	3.30E+02	n	na	--	--	--	0.040	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
2-Chlorophenol	95-57-8	3.60E+02	n	8.20E-01	n	na	--	--	--	0.050	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
2-Methyl-4,6-dinitrophenol	534-52-1	5.20E+00	n	2.30E-03	n	na	--	--	--	0.020	U	1	0.020	U	1	--	--	--	--	--	--	--	--	--					
2-Methylnaphthalene	91-57-6	2.50E+02	n	8.50E+00	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2-Methylphenol	95-48-7	1.00E+03	n	3.60E+00	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
2-Nitroaniline	88-74-4	1.10E+01	n	1.10E-02	n	na	--	--	--	0.020	U	1	0.020	U	1	--	--	--	--	--	--	--	--	--					
2-Nitrophenol	88-75-5	1.00E+02	n	6.70E-02	n	na	--	--	--	0.010	U	1	0.010	U	1	--	--	--	--	--	--	--	--	--					
3,3'-Dichlorobenzidine	91-94-1	1.00E+01	c	3.10E-02	c	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
3-Nitroaniline	99-09-2	1.90E+01	n	1.30E-02	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Bromophenyl phenyl ether	101-55-3	2.70E-01	c	1.80E-01	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Chloro-3-methyl phenol	59-50-7	3.30E+02	n	2.30E+00	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Chloroaniline	106-47-8	2.30E+01	c	1.00E-02	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Chlorophenyl phenyl ether	7005-72-3	1.50E-01	c	1.60E-02	c	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
4-Methylphenol (p-cresol)	106-44-5	2.70E+02	n	3.20E-01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Nitroaniline	100-01-6	1.90E+02	n	5.40E-02	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
4-Nitrophenol	100-02-7	5.10E+01	n	5.00E-02	n	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
Acenaphthene	83-32-9	3.00E+03	n	1.20E+02	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Acenaphthylene	208-96-8	3.80E+03	n	2.00E+02	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Anthracene	120-12-7	1.80E+04	n	3.40E+03	n >S	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
Benzo(a)anthracene	56-55-3	5.60E+00	c	8.90E+00	c	na	--	--	--	0.060	U	1	0.060	U	1	--	--	--	--	--	--	--	--	--					
Benzo(a)pyrene	50-32-8	5.60E-01	c	3.80E+00	m	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Benzo(b)fluoranthene	205-99-2	5.70E+00	c	3.00E+01	c	na	--	--	--	0.020	U	1	0.020	U	1	--	--	--	--	--	--	--	--	--					
Benzo(g,h,i)perylene	191-24-2	1.80E+03	n	2.30E+04	n >S	na	--	--	--	0.12	U	1	0.12	U	1	--	--	--	--	--	--	--	--	--					
Benzoic acid	65-85-0	3.50E+02	n	9.50E+01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Benzyl alcohol	100-51-6	4.00E+03	n	1.50E+01	n	na	--	--	--	0.060	U	1	0.060	U	1	--	--	--	--	--	--	--	--	--					
Benzyl butyl phthalate	85-68-7	1.60E+03	c	1.30E+02	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
bis(2-Chloroethoxy)methane	111-91-1	2.50E+00	c	5.90E-03	c	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
bis(2-Chloroethyl)ether	111-44-4	1.40E+00	c	1.10E-03	c	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
bis(2-Chloroisopropyl)ether	108-60-1	4.10E+01	c	9.50E-02	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
bis(2-Ethylhexyl) phthalate	117-81-7	4.30E+01	c	8.20E+01	m	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Chrysene	218-01-9	5.60E+02	c	7.70E+02	c >S	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Dibenzo(a,h)anthracene	53-70-3	5.50E-01	c	7.60E+00	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Dibenzofuran	132-64-9	2.70E+02	n	1.70E+01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Diethyl phthalate	84-66-2	1.40E+03	n	7.80E+01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Dimethyl phthalate	131-11-3	6.60E+02	n	3.10E+01	n	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
Di-n-butyl phthalate	84-74-2	4.40E+03	n	1.70E+03	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Di-n-octyl phthalate	117-84-0	1.30E+03	n	8.10E+05	n >S	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Fluoranthene	206-44-0	2.30E+03	n	9.60E+02	n >S	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
Fluorene	86-73-7	2.30E+03	n	1.50E+02	n	na	--	--	--	0.060	U	1	0.060	U	1	--	--	--	--	--	--	--	--	--					
Hexachlorobenzene	118-74-1	1.00E+00	c	5.60E-01	m	na	--	--	--	0.030	U	1	0.030	U	1	--	--	--	--	--	--	--	--	--					
Hexachlorobutadiene	87-68-3	1.20E+01	c	1.60E+00	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Hexachlorocyclopentadiene	77-47-4	7.20E+00	n	9.60E+00	m	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Hexachloroethane	67-72-1	6.70E+01	n	9.20E-01	n	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Indeno(1,2,3-cd)pyrene	193-39-5	5.70E+00	c	8.70E+01	c	na	--	--	--	0.040	U	1	0.040	U	1	--	--	--	--	--	--	--	--	--					
Isophorone	78-59-1	1.20E+03	n	1.50E+00	c	na	--	--	--	0.050	U	1	0.050	U	1	--	--	--	--	--	--	--	--	--					
Naphthalene	91-20-3	1.20E+02	n	1.60E+0																									

Appendix C. Confirmation Sample Results for All Analytes at AOC-45

Chemicals Tested	CAS Number	Tier 1 Soil PCLs		TCEQ-Approved Background Metal Concentrations	Sample Locations																			
		Residential Source Area 30 acre			AOC45-SS01 07-Apr-2011		AOC45-SS02 07-Apr-2011		AOC45-SS03 07-Apr-2011		AOC45-SS04 07-Apr-2011		AOC45-SS05 07-Apr-2011		AOC45-SS06 07-Apr-2011		AOC45-SS07 07-Apr-2011		AOC45-SS08 07-Apr-2011		AOC45-SS09 07-Apr-2011		AOC45-SS10 07-Apr-2011	
		Soil mg/kg [1]	Soil mg/kg [2]		mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual
Explosives																								
1,3,5-Trinitrobenzene	99-35-4	2.00E+03	n	9.10E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dinitrobenzene	99-65-0	6.30E+00	n	3.80E-03	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene (TNT)	118-96-7	1.70E+01	n	8.60E-02	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	6.90E+00	c	2.70E-03	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	6.90E+00	c	2.40E-03	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitrotoluene	88-72-2	2.10E+01	c	1.60E-02	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Nitrotoluene	99-08-1	2.70E+02	n	9.20E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrotoluene	99-99-0	1.70E+02	n	2.20E-01	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetrazocine (RDX)	121-82-4	2.50E+01	n	1.80E-02	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene	98-95-3	3.40E+01	c	1.80E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine (HMX)	2691-41-0	2.00E+02	n	1.20E+00	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetryl	479-45-8	3.40E+01	n	5.50E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chemicals Tested	CAS Number	Tier 1 Soil PCLs		TCEQ-Approved Background Metal Concentrations	Sample Locations																			
		Residential Source Area 30 acre			AOC45-SS10-DUP 07-Apr-2011		AOC45-SS11 07-Apr-2011		AOC45-SS12 07-Apr-2011		AOC45-SS13 07-Apr-2011		AOC45-SS14 07-Apr-2011		AOC45-SS15 20-Apr-2011		AOC45-SS16 20-Apr-2011		AOC45-SS16-DUP 20-Apr-2011		AOC45-SS17 20-Apr-2011		AOC45-SS18 16-May-2011	
		Soil mg/kg [1]	Soil mg/kg [2]		mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual
Explosives																								
1,3,5-Trinitrobenzene	99-35-4	2.00E+03	n	9.10E-01	n	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
1,3-Dinitrobenzene	99-65-0	6.30E+00	n	3.80E-03	n	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene (TNT)	118-96-7	1.70E+01	n	8.60E-02	n	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	6.90E+00	c	2.70E-03	c	na	--	--	--	0.17	F	1	0.080	U	1	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	6.90E+00	c	2.40E-03	c	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
2-Nitrotoluene	88-72-2	2.10E+01	c	1.60E-02	c	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
3-Nitrotoluene	99-08-1	2.70E+02	n	9.20E-01	n	na	--	--	--	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--
4-Nitrotoluene	99-99-0	1.70E+02	n	2.20E-01	c	na	--	--	--	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--
Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetrazocine (RDX)	121-82-4	2.50E+01	n	1.80E-02	c	na	--	--	--	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--
Nitrobenzene	98-95-3	3.40E+01	c	1.80E-01	n	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--
Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine (HMX)	2691-41-0	2.00E+02	n	1.20E+00	n	na	--	--	--	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--
Tetryl	479-45-8	3.40E+01	n	5.50E-01	n	na	--	--	--	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--

Chemicals Tested	CAS Number	Tier 1 Soil PCLs		TCEQ-Approved Background Metal Concentrations	Sample Locations																			
		Residential Source Area 30 acre			AOC45-SS19 16-May-2011		AOC45-SS19-DUP 16-May-2011		AOC45-SS20 16-May-2011		AOC45-SS21 16-May-2011		AOC45-SS22 16-May-2011		AOC45-SS23 16-May-2011		AOC45-SS24 16-May-2011		AOC45-SS25 16-May-2011		AOC45-SS26 16-May-2011		AOC45-SS27 24-May-2011	
		Soil mg/kg [1]	Soil mg/kg [2]		mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual	DF	mg/kg	Qual
Explosives																								
1,3,5-Trinitrobenzene	99-35-4	2.00E+03	n	9.10E-01	n	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dinitrobenzene	99-65-0	6.30E+00	n	3.80E-03	n	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene (TNT)	118-96-7	1.70E+01	n	8.60E-02	n	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	6.90E+00	c	2.70E-03	c	na	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	6.90E+00	c	2.40E-03	c	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitrotoluene	88-72-2	2.10E+01	c	1.60E-02	c	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
3-Nitrotoluene	99-08-1	2.70E+02	n	9.20E-01	n	na	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrotoluene	99-99-0	1.70E+02	n	2.20E-01	c	na	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--	--	--	--
Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetrazocine (RDX)	121-82-4	2.50E+01	n	1.80E-02	c	na	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene	98-95-3	3.40E+01	c	1.80E-01	n	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--
Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine (HMX)	2691-41-0	2.00E+02	n	1.20E+00	n	na	0.080	U	1	0.080	U	1	--	--	--	--	--	--	--	--	--	--	--	--
Tetryl	479-45-8	3.40E+01	n	5.50E-01	n	na	0.075	U	1	0.075	U	1	--	--	--	--	--	--	--	--	--	--	--	--

Appendix C. Confirmation Sample Results for All Analytes at AOC-45

Chemicals Tested	CAS Number	Tier 1 Soil PCLs Residential Source Area 30 acre		TCEQ-Approved Background Metal Concentrations mg/kg	Sample Locations																																
		Soil mg/kg	Soil mg/kg		AOC45-SS01 07-Apr-2011	Qual	DF	AOC45-SS02 07-Apr-2011	Qual	DF	AOC45-SS03 07-Apr-2011	Qual	DF	AOC45-SS04 07-Apr-2011	Qual	DF	AOC45-SS05 07-Apr-2011	Qual	DF	AOC45-SS06 07-Apr-2011	Qual	DF	AOC45-SS07 07-Apr-2011	Qual	DF	AOC45-SS08 07-Apr-2011	Qual	DF	AOC45-SS09 07-Apr-2011	Qual	DF	AOC45-SS10 07-Apr-2011	Qual	DF			
		[1]	[2]		mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg					
Metals																																					
Arsenic	7440-38-2	24.2	n	2.5	m >S	19.6	††	4.3	F	1	3.1	F	1	3.3	F	1	4.5	M	1	5.0	F	1	3.9	F	1	2.5	F	1	2.2	F	1	2.1	F	1	3.8	F	1
Barium	7440-39-3	7840.5	n	221.9	m >S	300	†††	22			28			24			42	M	1	44			14			16			14			14			31		
Cadmium	7440-43-9	52.4	n	0.8	m >S	3	††	0.030	U	1	0.030	U	1	0.040	F	1	0.17	M	1	0.16	F	1	0.050	F	1	0.030	U	1	0.030	U	1	0.030	U	1	0.050	F	1
Chromium	7440-47-3	23053.9	n	1200.1	m >S	40.2	††	5.2	F	1	6.8	F	1	7.1	F	1	11	M	1	12	F	1	6.8	F	1	3.1	F	1	4.0	F	1	3.1	F	1	9.7	F	1
Copper	7440-50-8	547.6	n	521.2	a >S	23.2	††	13			6.6			5.3			11	M	1	11			7.1			5.6			7.2			6.6			6.1		
Lead	7439-92-1	500.0	n	1.5	a >S	84.5	††	18,000	J	200	15	J	1	13	J	1	27	M	1	83	J	1	62	J	1	20	J	1	56	J	1	130	J	1	29	J	1
Mercury	7439-97-6	2.1	n	0.0	m	0.77	††	0.020	F	1	0.010	U	1	0.030	F	1	0.080	F	1	0.030	F	1	0.020	F	1	0.050	F	1	0.010	U	1	0.010	U	1	0.010	U	1
Nickel	7440-02-0	832.1	n	78.7	n >S	35.5	††	4.5			5.3			5.9			9.0	M	1	9.3			6.4			3.6			3.9			3.7			6.0		
Zinc	7440-66-6	9921.5	n	1180.2	n >S	73.2	††	22			23			15			29	M	1	29			16			15			11			11			18		

Chemicals Tested	CAS Number	Tier 1 Soil PCLs Residential Source Area 30 acre		TCEQ-Approved Background Metal Concentrations mg/kg	Sample Locations																																
		Soil mg/kg	Soil mg/kg		AOC45-SS10-DUP 07-Apr-2011	Qual	DF	AOC45-SS11 07-Apr-2011	Qual	DF	AOC45-SS12 07-Apr-2011	Qual	DF	AOC45-SS13 07-Apr-2011	Qual	DF	AOC45-SS14 07-Apr-2011	Qual	DF	AOC45-SS15 20-Apr-2011	Qual	DF	AOC45-SS16 20-Apr-2011	Qual	DF	AOC45-SS16-DUP 20-Apr-2011	Qual	DF	AOC45-SS17 20-Apr-2011	Qual	DF	AOC45-SS18 16-May-2011	Qual	DF			
		[1]	[2]		mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg					
Metals																																					
Arsenic	7440-38-2	24.2	n	2.5	m >S	19.6	††	3.8	F	1	3.7	F	1	4.1	F	1	2.3	F	1	2.4	F	1	--		--		--		--		--		--		--		--
Barium	7440-39-3	7840.5	n	221.9	m >S	300	†††	27			42			28			14			22			--		--		--		--		--		--		--		--
Cadmium	7440-43-9	52.4	n	0.8	m >S	3	††	0.030	U	1	0.17	F	1	0.090	F	1	0.11	F	1	0.070	F	1	--		--		--		--		--		--		--		--
Chromium	7440-47-3	23053.9	n	1200.1	m >S	40.2	††	8.6	F	1	8.9	F	1	8.2	F	1	4.8	F	1	5.4	F	1	--		--		--		--		--		--		--		--
Copper	7440-50-8	547.6	n	521.2	a >S	23.2	††	5.2			11			7.2			150			16			--		--		--		--		--		--		--		--
Lead	7439-92-1	500.0	n	1.5	a >S	84.5	††	61	J	1	56	J	1	48	J	1	9,400	J	100	300	J	1	24		1	17		1	15		1	15		1	230	J	1
Mercury	7439-97-6	2.1	n	0.0	m	0.77	††	0.010	U	1	0.10	U	1	0.030	F	1	0.060	F	1	0.050	F	1	--		--		--		--		--		--		--		--
Nickel	7440-02-0	832.1	n	78.7	n >S	35.5	††	5.4			7.3			7.0			1.4	F	1	4.1			--		--		--		--		--		--		--		--
Zinc	7440-66-6	9921.5	n	1180.2	n >S	73.2	††	18			29			18			50			28			--		--		--		--		--		--		--		--

Chemicals Tested	CAS Number	Tier 1 Soil PCLs Residential Source Area 30 acre		TCEQ-Approved Background Metal Concentrations mg/kg	Sample Locations																																	
		Soil mg/kg	Soil mg/kg		AOC45-SS19 16-May-2011	Qual	DF	AOC45-SS19-DUP 16-May-2011	Qual	DF	AOC45-SS20 16-May-2011	Qual	DF	AOC45-SS21 16-May-2011	Qual	DF	AOC45-SS22 16-May-2011	Qual	DF	AOC45-SS23 16-May-2011	Qual	DF	AOC45-SS24 16-May-2011	Qual	DF	AOC45-SS25 16-May-2011	Qual	DF	AOC45-SS26 16-May-2011	Qual	DF	AOC45-SS27 24-May-2011	Qual	DF				
		[1]	[2]		mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg						
Metals																																						
Arsenic	7440-38-2	24.2	n	2.5	m >S	19.6	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Barium	7440-39-3	7840.5	n	221.9	m >S	300	†††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Cadmium	7440-43-9	52.4	n	0.8	m >S	3	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Chromium	7440-47-3	23053.9	n	1200.1	m >S	40.2	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Copper	7440-50-8	547.6	n	521.2	a >S	23.2	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Lead	7439-92-1	500.0	n	1.5	a >S	84.5	††	93	M	1	55	J	1	53	J	1	43	J	1	26	J	1	110	J	1	45	J	1	17	J	1	11,000	J	100	58	J	1	
Mercury	7439-97-6	2.1	n	0.0	m	0.77	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Nickel	7440-02-0	832.1	n	78.7	n >S	35.5	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--
Zinc	7440-66-6	9921.5	n	1180.2	n >S	73.2	††	--			--		--			--			--			--		--		--		--		--		--		--		--		--

NOTES:
† TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: March 25, 2009).
†† 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] ^{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] ^{Soil_{gw}} = 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.
mg/kg = milligrams per kilogram.
c = carcinogenic.
n = noncarcinogenic.
m = primary MCL-based.
a = EPA Action Level-based.
>S = solubility limit exceeded during calculation.
na = not applicable.

QA NOTES AND DATA QUALIFIERS:
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 associated concentration is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M - Analyte was positively identified but the associated concentration is an estimation due to an associated matrix effect.
Values shown in BOLD indicate detections above the MDL.

APPENDIX D

Data Verification Summary Report

DATA VERIFICATION SUMMARY REPORT**for samples collected from AOC 45****CAMP STANLEY STORAGE ACTIVITY****BOERNE, TEXAS**

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples and the associated field QC samples collected from CSSA under Environmental Protection Support, Investigations, and Treatability Studies on May 16, 2011. The samples in the following Sample Delivery Group (SDG) included samples collected from AOC 45:

64652

Samples were analyzed for explosives and lead. Not all samples were analyzed for all parameters. In addition, there were three waste characterization soil samples included in the shipment. Those samples were analyzed for TCLP-metals.

Field QC samples collected in association with this SDG included one set of matrix spike/matrix spike duplicate (MS/MSD) for and one set of parent and field duplicate (FD) for explosives and lead.

All samples were collected by Parsons and analyzed by APPL in Clovis, California, 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 4.0°C which was within the recommended range is 2-6° C.

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 packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; COC forms and the cooler receipt checklist. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, Version 1.0, were met.

LEAD

General

The lead portion of this SDG consisted of nine (9) soil samples, one (1) pair of MS/MSD, and one (1) FD. All samples were collected on May 16, 2011 and were analyzed for lead.

The lead analyses were performed using USEPA SW846 Method 6010B. All samples in this SDG 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 non-waste characterization soil samples were digested in one batch.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the laboratory control sample (LCS) and one set of MS/MSD. AOC45-SS19 was designated for the MS/MSD analyses on the COC.

The LCS recovery was within acceptance criteria.

The percent recovery (%R) of MS (72%) failed to meet the 75 – 125% criteria. “M” flag was applied to the lead result of the parent sample.

Precision

Precision was evaluated with the relative percent difference (%RPD) of the MS/MSD results and parent/FD results. Sample AOC45-SS19 was collected in duplicate.

The %RPD of MS/MSD met the 20% criteria.

AOC45-SS19

Metal	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Lead	92.89	54.59	52	≤20

“J” flags were applied to lead results of all non-waste characterization samples 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 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 times required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The initial calibration verification (ICV) was prepared using a secondary source.
- All interference check criteria were met.
- All internal standard criteria were met.
- Dilution test (DT) was analyzed on sample AOC45-SS19:

AOC45-SS19

Metal	%D	Criteria
Lead	26	%D ≤ 10

- A post digestion spike (PDS) was analyzed on the same samples as the DT.

AOC45-SS19

Metal	%R	Criteria
Lead	68	75-125%

- “J” flags were applied to all lead results of non-waste characterization samples in this SDG

There were one method blank (MB) and several calibration blanks associated with the lead analyses in this SDG. All blanks were free of lead at or above the reporting limit (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 lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

EXPLOSIVES

General

This data package consisted of one (1) soil sample and one (1) FD. The samples were collected on May 16, 2011 and were analyzed for a full list of explosives by SW8330B.

The explosive analyses were performed using USEPA SW846 Method 8330B. The samples were analyzed in one analytical batch under one set of initial calibration (ICAL) curves. Both

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

Accuracy

Accuracy was evaluated using the %R obtained from the LCS, MS, MSD, and the surrogate spikes. MS/MSD analyses were performed with sample AOC45-SS19.

All LCS, MS, MSD, and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated with the %RPD of the MS/MSD results and parent/FD results. Sample AOC45-SS19 was collected in duplicate.

All %RPDs of MS/MSD met the 20% criteria.

Neither the parent nor the FD had any of the target explosive compounds detected at or above 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 blank for cross contamination of samples during analysis.

Both samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. Both 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.
- The LCS was prepared with a secondary source. All second source verification criteria were met.
- All ICV criteria were met.
- All continuing calibration verification (CCV) criteria were met.

There were one MB and few calibration blanks associated with the explosive analyses in this SDG. All blanks were non-detect for all target explosives.

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 explosive 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%.

TCLP-ICP METALS

General

The TCLP-ICP metal portion of this SDG consisted of three (3) soil samples. All samples were collected on May 16, 2011 and were analyzed for TCLP-silver, arsenic, barium, cadmium, chromium, lead, and selenium.

The TCLP-ICP metal analyses were performed using USEPA SW846 Method 1311/6010B. All samples in this SDG 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 three waste characterization soil samples were digested in one batch.

Accuracy

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

All LCS recoveries were within acceptance criteria.

Precision

Due to the lack of duplicate analyses, the precision could not be measured.

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 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 times required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met.

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

There were one MB and several calibration blanks associated with the lead analyses in this SDG. All blanks were free of target metals 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 TCLP-metal results for the waste characterization samples in this SDG were considered usable. The completeness for the TCLP-ICP metal portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

TCLP-MERURY

General

The TCLP-mercury portion of this SDG consisted of three (3) soil samples. All samples were collected on May 16, 2011 and were analyzed for TCLP-mercury.

The TCLP-mercury analyses were performed using USEPA SW846 Method 1311/7470A. All samples in this SDG 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 three waste characterization soil samples were digested in one batch.

Accuracy

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

The LCS recovery was within acceptance criteria.

Precision

Due to the lack of duplicate analyses, the precision could not be measured.

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 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 times required by the method.

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

There were one MB and several calibration blanks associated with the TCLP-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 TCLP-mercury for the waste characterization samples in this SDG were considered usable. The completeness for the TCLP-mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

APPENDIX E

TCEQ Approval for Non-Hazardous Soils Reuse, April 19, 2006



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:

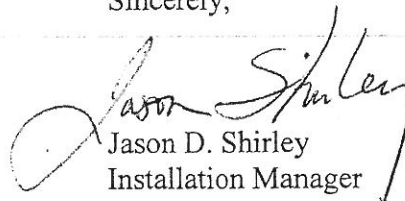
The Camp Stanley Storage Activity (CSSA), McAlester Army Ammunition Plant, U.S. Army Field Support Command, Army Material Command, U.S. Army, is providing this letter to notify the TCEQ of CSSA's plan to move and manage non-hazardous metals-impacted soils generated during remedial actions at CSSA's Solid 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-45

Appendix F. Waste Characterization Sampling Results for AOC-45

SAMPLE ID: DATE SAMPLED: LAB SAMPLE ID:		AOC45-WC01 5/16/2011 AY37578	AOC45-WC02 5/16/2011 AY37579	AOC45-WC03 5/16/2011 AY37580
TCLP Metals - SW6010B/SW7470A	Units			
Arsenic	mg/L	0.035	0.035	0.035
Barium	mg/L	0.49	0.51	0.39
Cadmium	mg/L	0.0019 F	0.0018 F	0.0016 F
Chromium	mg/L	0.0040 F	0.0050 F	0.0050 F
Lead	mg/L	0.34	0.018 F	0.063
Mercury	mg/L	0.000100 U	0.000100 U	0.000100 U
Selenium	mg/L	0.0020 U	0.0020 U	0.0020 U
Silver	mg/L	0.010	0.011	0.011

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 Statistical Calculation Summary for Lead in AOC-45 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

Lead

General Statistics

Number of Valid Observations 22

Number of Distinct Observations 22

Raw Statistics

Minimum 12.79
Maximum 230.1
Mean 56.47
Median 46.68
SD 50.43
Std. Error of Mean 10.75
Coefficient of Variation 0.893
Skewness 2.18

Log-transformed Statistics

Minimum of Log Data 2.549
Maximum of Log Data 5.439
Mean of log Data 3.727
SD of log Data 0.792

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic 0.772
Shapiro Wilk Critical Value 0.911

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.957
Shapiro Wilk Critical Value 0.911

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 74.97

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995) 79.49
95% Modified-t UCL (Johnson-1978) 75.8

Assuming Lognormal Distribution

95% H-UCL 84.72

95% Chebyshev (MVUE) UCL 100.5
97.5% Chebyshev (MVUE) UCL 119.8
99% Chebyshev (MVUE) UCL 157.8

Gamma Distribution Test

k star (bias corrected) 1.566
Theta Star 36.05
MLE of Mean 56.47
MLE of Standard Deviation 45.12
nu star 68.92
Approximate Chi Square Value (.05) 50.81
Adjusted Level of Significance 0.0386
Adjusted Chi Square Value 49.65

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL 76.59
95% Adjusted Gamma UCL 78.38

Potential UCL to Use

Data Distribution

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

95% CLT UCL 74.15
95% Jackknife UCL 74.97
95% Standard Bootstrap UCL 73.83
95% Bootstrap-t UCL 85.73
95% Hall's Bootstrap UCL 151.3
95% Percentile Bootstrap UCL 75.16
95% BCA Bootstrap UCL 79.96
95% Chebyshev(Mean, Sd) UCL 103.3
97.5% Chebyshev(Mean, Sd) UCL 123.6
99% Chebyshev(Mean, Sd) UCL 163.4

Use 95% Approximate Gamma UCL 76.59

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.