# RELEASE INVESTIGATION REPORT

# AREA OF CONCERN 59
# CAMP STANLEY STORAGE ACTIVITY

*Prepared for:*

## Camp Stanley Storage Activity
## Boerne, Texas

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## EXECUTIVE SUMMARY

Area of Concern (AOC) 59 is an approximately 0.2 acre site located in the southern portion of Camp Stanley Storage Activity's (CSSA) East Pasture. It was first identified as a potential AOC based on review of a 1966 aerial photograph indicating the location of a potential trench-type anomaly/soil mound. Work performed at the site included geophysical surveying, test trenching, environmental sampling, x-ray fluorescence (XRF) analysis of soil samples, the removal and proper disposal of soil containing contaminants above Tier 1 protective concentration levels (PCLs), and proper documentation of all activities, including preparation of this RIR. This Release Investigation Report (RIR) requests No Further Action (NFA) at AOC-59.

In summary, activities at AOC-59 as described in this RIR showed the following results:

- A geophysical survey showed a few isolated pieces of metal debris. No other buried waste, munitions debris (MD), or unexploded ordnance (UXO) was found during the investigation.
- The only contaminant of concern (COC) identified above soil background concentrations at AOC-59 was lead. Areas of lead contamination exceeding the Tier 1 PCL of 84.5 milligrams per kilogram (mg/kg), were excavated and removed from the site, or were used to calculate a 95% upper confidence limit (UCL) of 60.4 mg/kg per Texas Administrative Code (TAC) §350.79(2)(A) which does not exceed the Tier 1 PCL. Therefore, per TAC §350.79(2)(A), further response action for lead is not required at AOC-59.

From information presented in this report, the results of the investigation at AOC-59 meet the three criteria as described in the Texas Commission on Environmental Quality (TCEQ) (2003) guidance *Determining Which Releases are Subject to* Texas Risk Reduction Program (TRRP). Thus, the following three criteria were met:

- Soil found to have a COC concentration above the Tier 1 PCL for lead was either excavated from the site or used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-59. Soil that was found to have concentrations of lead above the PCLs was excavated and removed, so there will be no future impact to groundwater, surface water, or sediment from AOC-59.
- AOC-59 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, AOC-59 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and to request an NFA decision from TCEQ.

# TABLE OF CONTENTS

# LIST OF TABLES



# LIST OF FIGURES



# APPENDICES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC | Area of Concern |
| AL | action level |
| APPL | Agriculture & Priority Pollutants Laboratory, Inc. |
| BS | Bexar Shale |
| CC | Cow Creek |
| COC | contaminant of concern |
| CSSA | Camp Stanley Storage Activity |
| CY | cubic yards |
| DQO | Data Quality Objective |
| EE | Environmental Encyclopedia |
| EM | electromagnetic |
| FSP | Field Sampling Plan |
| ft | feet |
| $^{GW}Soil_{Ing}$ | soil to groundwater ingestion pathway (PCL) |
| IM | Interim Measures |
| LGR | Lower Glen Rose |
| MCL | maximum contaminant level |
| MD | munitions debris |
| MDL | method detection limit |
| MEC | munitions and explosives of concern |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| MQL | method quantification limit |
| NFA | No Further Action |
| PCE | tetrachloroethene |
| 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 |
| $^{Tot}Soil_{Comb}$ | total soil combined pathway (PCL) |
| TRRP | Texas Risk Reduction Program |
| UCL | upper confidence limit |
| UGR | Upper Glen Rose |
| USEPA | United States Environmental Protection Agency |
| UXO | unexploded ordnance |
| VOC | volatile organic compound |
| WMP | Waste Management Plan |
| XRF | x-ray fluorescence |

## 1.0 INTRODUCTION

Parsons is under contract to provide investigations and environmental services for waste sites located at Camp Stanley Storage Activity (CSSA) in Boerne, Texas (**Figure 1**). This contract includes characterization of selected waste disposal sites and preparation of appropriate documentation, including a Release Investigation Report (RIR) for Area of Concern (AOC) 59 (**Figure 2**). AOC-59 is a small site, approximately 0.2 acre in size, located in the southern portion of CSSA's East Pasture. 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-59. Work included geophysical surveying, 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-59. Section 3 describes the objectives and rationale for preparing an RIR for AOC-59 and the findings from environmental investigations for the site. The groundwater and surface water for CSSA and the area near AOC-59 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 10 through 19). References cited in this report can be found in the CSSA Environmental Encyclopedia (EE) (Volume 1-1, Bibliography).

## 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-59

### 2.2.1 Overview

AOC-59 was identified based on review of a 1966 aerial photograph that indicated the location of a potential trench-type anomaly/soil mound area in proximity to the East Pasture Test Pad, the active range management unit designated RMU-1 (**Figure 3**). Other than the suspected anomaly/soil mound discovered on the 1966 aerial photograph, there are no records or any visible evidence of past military practices, waste handling, or disposal activities at the site. Investigation of the site began in January 2006 with a geophysical survey. The results of the 2006 investigation are discussed in Section 2.2.3.

The analytical results for contaminants of concern (COCs) remaining at the site are discussed in Section 3.1. A series of historical aerial photos of the site are shown on Figure 3 and photographs showing investigation and excavation activities at the site are provided in **Appendix A**. The history of the site and previous investigations are discussed below.

### 2.2.2 Setting, Size, and Description

AOC-59 is a small site, approximately 0.2 acre, located in the southern portion of East Pasture at CSSA (Figure 2). The site is approximately 2,875 feet (ft) from the east boundary and 1,160 ft from the south boundary of the installation. The distance to the Inner Cantonment/ East Pasture boundary is approximately 1,170 ft to the west. Prior to the excavation activities described herein, the area was open and covered with grass.

A soil mound, approximately 0.1 acre in size, originally occupied the northern half of the site (Appendix A, Photos 1 through 3). The soil mound was approximately 90 ft long (northwest to southeast), 5 ft tall, and ranged from about 15 ft wide near the southeast end to about 50 ft wide towards the center, as shown in **Figure 4**. There was a flat, slightly shallow depressed area south of the soil mound. World War I-era "zig zag" training trenches, considered a cultural resource, are located approximately 40 ft west of the site and can be seen in the 1934 photograph

in Figure 3. Additional background information on AOC-59 can be found in the CSSA EE (Volume 3-2, AOC-59).

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

The initial investigation of AOC-59 took place in January 2006 as part of the ordnance investigation performed in the southern portion of the East Pasture. The purpose of the investigation was to reduce the risk associated with possible remaining munitions items during construction activities just to the south and east of AOC-59. The site was identified for a geophysical survey, test trenching in the soil mound area, and investigative sampling.

An electromagnetic (EM) geophysical survey was performed at AOC-59 to digitally map locations of potentially buried metal (*e.g.*, metal debris, spent munitions, unexploded ordnance [UXO]). A Schoenstedt hand-held magnetometer was also used in the field to locate potential UXO and other potential explosives and/or metals. A map showing geophysical anomalies at and just east of RMU-1, including the AOC-59 area, are shown on **Figure 5**. No trench-type anomalies were found during the survey.

Four test trenches, each about 5 ft long and 3 to 5 ft deep (Figure 4), were dug along the top and to the west of the soil mound area and revealed a large square block of old cement, a small amount of metal debris, and a piece of copper tubing. All locations where debris was encountered were excavated during the 2011 effort. No additional evidence of disposal activities was encountered at the site during the trenching. As described in Section 3.1.2, composite soil samples were collected from the test trenches.

The remainder of the site was visibly surveyed for any evidence of disposal activities. In addition, surface soils in the depressed area south of the soil mound were scraped and examined. No evidence of any disposal activities was found during either investigation.

## 3.0 OBJECTIVES OF RIR FOR AOC-59

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

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

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

As referred to in the criteria listed above, the Tier 1 residential soil action levels are provided by TCEQ (2010) and were selected following TCEQ guidance (TCEQ, 2007). These action levels are referred to as protective concentration levels (PCL) and are selected for each chemical detected at the site (*i.e.*, COC). The PCLs are based on the general size of the site, which is also referred to as the "source area" size. The source area is either assumed to be 0.5 acre if the site is less than 0.5 acre in size, or assumed to be 30 acres if the site is larger than 0.5 acre. Thus, the soil action levels for AOC-59 are based on a 0.5-acre source area, since the size of the site is only approximately 0.2 acre. The PCL is then selected based on the lower of the two PCLs listed for either (1) the total soil combined pathway ($^{Tot}Soil_{Comb}$) (*i.e.*, exposure to a COC from incidental ingestion, dermal contact, inhalation of volatiles and particulates, and vegetable consumption); or (2) the soil to groundwater pathway ($^{GW}Soil_{Ing}$) (*i.e.*, soil-to-groundwater leaching of a COC to groundwater, where the PCL is the highest concentration of COC allowed in soil to be protective of Class 1 or Class 2 groundwater).

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

## 3.1 AOC-59 FIELD ACTIVITIES AND INVESTIGATIONS

A summary of the cleanup confirmation results at the site are shown in Table 1 (detected compounds only) and **Appendix C** (all analytes), and the confirmation soil sampling locations are shown on Figure 4. 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 is described in Section 3.1.3. Additional information about past activities and investigations at the sites can be found in the CSSA EE (Volume 3-2, AOC-59).

In order to further delineate the boundary for AOC-59 and fill in data gaps remaining from the 2006 investigation, an XRF analytical survey was performed in November 2010 and additional surface soil sampling was performed in January 2011. This section describes the results from the 2006 sampling effort as well as the more recent remedial activities in 2010 and 2011.

### 3.1.1 Sampling and Analytical Procedures

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

The CSSA QAPP (1) was prepared for use by contractors that perform environmental services at CSSA to ensure that the data are scientifically valid and defensible; (2) establishes the analytical protocols and documentation requirements to ensure that the samples are collected and analyzed, and that the data are reviewed and validated in a specified manner; and (3) provides detailed guidance for using the Data Quality Objective (DQO) process for specific investigations. The CSSA QAPP and delivery/task order specific Field Sampling Plans (FSP) constitute the CSSA Sampling and Analysis Plan (SAP). The SAP defines data quality for a specific project. Information regarding post-wide and site-specific plans and TCEQ correspondence can be found in the CSSA EE (Volume1-1, Correspondence).

Following the CSSA-specific plans, the investigative soil analyses for AOC-59 were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 8260B (volatile organic compounds [VOC]); Method 8270C (semivolatile organic compounds [SVOC]); Method 8330 (explosives); and Method 6010 (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analyses.

### 3.1.2 Test Trench Soil Sampling

Four soil samples (BOT01 through BOT04) were collected from the four test trenches described above in January 2006. The samples, composites of the sides and bottoms (3 to 5 ft deep) of the test trenches, were analyzed for VOCs, SVOCs, and the CSSA nine metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc). VOC and SVOC analyses were included to test for the presence of contaminants commonly associated with disposal sites. Metals analyses were included to assess whether any metallic wastes, such as those commonly generated at CSSA, had been disposed of in this area.

Results of the test trench sampling showed all sample results were below the TCEQ Tier 1 residential soil action levels (TCEQ, 2010). A summary of the chemicals detected at AOC-59 is provided in Table 1, and the sampling locations are shown on Figure 4. As shown in Table 1, inorganic metals were detected at low concentrations at each of the sampling locations. None of the sample results showed metal concentrations above the PCLs, or the background concentrations when used as the PCL.

Low concentrations (below PCLs) of two organic compounds, benzene and toluene, were detected at one sample location, BOT01 (Figure 4). The concentration of benzene detected at BOT01 was 0.0046 milligram per kilogram (mg/kg), which is well below the benzene PCL of 0.026 mg/kg. The concentration of toluene was 0.0031 mg/kg, well below the 8.2 mg/kg PCL for toluene. The concentration of toluene was flagged with an "F" qualifier which indicates that the detected concentration is an estimated value between the method detection limit (MDL) and the RL.

Three other organics, methylene chloride, di-*n*-butyl phthalate, and *bis*(2-ethylhexyl)phthalate were also detected in the samples at low concentrations below their respective PCLs (Table 1).

### 3.1.3 Excavation, Removal, and Confirmation Sampling

In November 2010, surface samples from across AOC-59 were tested with an XRF analyzer to further delineate potential metals concentrations present at the site (**Figure 6**). In January 2011, four surface soil samples (SS01 through SS04) were collected for laboratory analysis of CSSA 9 metals and explosives. No explosives were detected; however, the lead results for SS03 and SS04 both exceeded the Tier 1 PCL of 84.5 mg/kg.

Excavation activities to remove soils with lead concentrations above the Tier 1 PCL occurred on March 7 and 8, 2011. Approximately 1,200 cubic yards (CY) of soils were removed from a 0.2 acre area. This included completely removing the soil mound and the top 2 ft of the site. Confirmation samples collected on March 29, 2011 showed all lead concentrations in soil at the site were below the Tier 1 PCL with the exception of one location, BOT06, where lead slightly exceeded the Tier 1 PCL with a concentration of 91 milligrams per kilogram (mg/kg) (see Table 1 and Figure 5). Additional samples were collected on April 20, 2011 to delineate the extent of lead concentrations above the PCL. One additional sample (BOT08) still exceeded the Tier 1 PCL for lead with a concentration of 130 mg/kg, but all other samples were below the PCL. A 95% upper confidence limit (UCL) was calculated for the lead concentrations remaining in site soils using USEPA's ProUCL 4.1 software. The resulting UCL of 60.43 mg/kg did not exceed the Tier 1 PCL of 84.5 mg/kg. Per TAC §350.79(2)(A), a 95% UCL may be calculated to determine if there is a statistical basis for no further action on a particular COC. Therefore, per TAC §350.79(2)(A), further response action for lead is not required at AOC-59. The ProUCL calculation output summary is included as **Appendix E**.

### 3.1.4 Waste Characterization

Waste characterization efforts were performed in accordance with requirements of CSSA's *RCRA Facility Investigation (RFI) and Interim Measures (IM) Waste Management Plan (WMP) – Revised*, dated May 2006 (approved by TCEQ in August 2006) and the RFI/IM WMP Addendum for AOC-59, dated March 2011. Excavated material was stockpiled adjacent to the excavation site during the excavation for waste characterization. Approximately 1,200 CY of

soils were transported to the East Pasture Berm for reuse, as per TCEQ approval April 19, 2006 (**Appendix F**).

## 3.2 GEOLOGY/HYDROGEOLOGY

Based on the sampling results and the geological and hydrogeological characteristics of the site, surface water and groundwater have not been affected by historical activities at AOC-59. 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-59 Groundwater and Surface Water

No site-specific information regarding groundwater is available for AOC-59. Historical data for CSSA suggest that the groundwater gradient is generally to the southeast, but can seasonally vary to more southerly or easterly gradients. Based on these potential groundwater gradients, the nearest downgradient well to AOC-59 is the CSSA supply well CS-1, located 2,000 ft south of AOC-59 on Camp Bullis property. Groundwater samples have been collected from this well and analyzed for metals and VOCs since 1996. Lead has been detected slightly above its action level (AL) of 0.015 milligrams per liter (mg/L) on four occasions (December 1996, January 1996, March 1996, and March 2000) at concentrations ranging up to 0.023 mg/L. Although lead was a COC at AOC-59, no pattern in the lead detections has been identified and lead has not been detected above trace levels in the well since 2000. No other analytes have exceeded maximum contaminant levels (MCL). Sporadic low-level tetrachloroethene (PCE) detections at CS-1 are associated with the SWMU B-3 plume.

As shown on **Figure 7**, the closest surface water to AOC-59 is an unnamed tributary to Salado Creek, which is approximately 80 ft southwest (downgradient) of the site. Salado Creek is intermittent in the CSSA area and only has water during and immediately following rain events. The closest perennial surface water body to AOC-59 is an unnamed pond approximately 7,240 ft upgradient from the site. The pond is located along the same unnamed tributary which is close to AOC-59 (described above). The distance to the closest perennial surface water body downgradient of AOC-59 is more than 2 miles to the southeast. Since no COCs were detected above PCLs at AOC-59, no significant degradation of high quality receiving waters is anticipated from AOC-59. Additional information on surface water in the area is described in the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

## 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-59. Thus, based on the absence of any complete or significant ecological exposure pathways, AOC-59 may be excluded from further ecological assessment.

## 5.0 SUMMARY AND RECOMMENDATIONS

AOC-59 is an approximately 0.2 acre site located in the southern portion of CSSA's East Pasture. There are no records or any visible evidence of past military practices, waste handling, or disposal activities at the site. The site was identified as a potential AOC based on review of a 1966 aerial photograph indicating the location of a potential trench-type anomaly/soil mound area. The initial AOC-59 investigation took place in 2006 and included a geophysical survey, test

trenching, and investigative sampling to determine if waste, munitions debris (MD), or UXO was present at the site. Additional investigation activities took place in December 2010 (XRF survey), January 2011 (surface soil sampling), and March and April 2011 (excavation and soil sampling).

From information presented in this report, the results of the investigation at AOC-59 meet the three criteria as described in TCEQ's (2003) guidance *Determining Which Releases are Subject to* TRRP. Thus, the following three criteria were met:

- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-59. Soils that were found to have concentrations of metals above their PCLs were excavated and removed, so there will be no future impact to groundwater, surface water, or sediment from AOC-59.
- AOC-59 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

The following conclusions for AOC-59 are based on the information presented in this RIR.

- The geophysical survey showed a few isolated pieces of metal debris. No other buried waste, MD, or UXO was found during the investigation.
- The COC identified above soil background concentrations at AOC-59 was lead. Areas of lead contamination exceeding the Tier 1 PCL of 84.5 mg/kg, have been 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. Therefore, per TAC §350.79(2)(A), no further response action for lead is required at AOC-59.

From information presented in this report, the results of the investigation at AOC-59 meet the three criteria as described in TCEQ's (2003) guidance *Determining Which Releases are Subject to* TRRP. Thus, the following three criteria were met:

- Soils found to have COC concentrations above Tier 1 PCLs were either excavated from the site or were used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL;
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-59; and
- AOC-59 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, AOC-59 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and to request an NFA decision from the TCEQ.

# TABLES AND FIGURES

# Table 1. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC-59-BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59-BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59-BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59-BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 66.0 | c | 0.026 | m | na | **0.0046** | | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | |
| Methylene chloride | 75-09-2 | 390.0 | c | 0.013 | m | na | **0.0019** | F | 1 | **0.017** | | 1 | **0.0088** | | 1 | **0.0052** | | 1 | -- | | | -- | | | -- | | | -- | | |
| Toluene | 108-88-3 | 5900.0 | n | 8.2 | m | na | **0.0031** | F | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 66.0 | c | 0.026 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Methylene chloride | 75-09-2 | 390.0 | c | 0.013 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Toluene | 108-88-3 | 5900.0 | n | 8.2 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 66.0 | c | 0.026 | m | na | -- | | | -- | | | -- | | | -- | | |
| Methylene chloride | 75-09-2 | 390.0 | c | 0.013 | m | na | -- | | | -- | | | -- | | | -- | | |
| Toluene | 108-88-3 | 5900.0 | n | 8.2 | m | na | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC-59-BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59-BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59-BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59-BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| bis(2-Ethylhexyl) phthalate | 117-81-7 | 43.0 | c | 160.0 | m | na | 0.030 | U | 1 | 0.030 | U | 1 | **0.040** | F | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | |
| Di-n-butyl phthalate | 84-74-2 | 5100 | n | 3300 | n | na | 0.040 | U | 1 | **0.10** | F | 1 | **0.080** | F | 1 | **0.19** | F | 1 | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| bis(2-Ethylhexyl) phthalate | 117-81-7 | 43.0 | c | 160.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Di-n-butyl phthalate | 84-74-2 | 5100 | n | 3300 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations †† mg/kg [3] | Sample Locations: AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organics** | | | | | | | | | | | | | | | | | | |
| bis(2-Ethylhexyl) phthalate | 117-81-7 | 43.0 | c | 160.0 | m | na | -- | | | -- | | | -- | | | -- | | |
| Di-n-butyl phthalate | 84-74-2 | 5100 | n | 3300 | n | na | -- | | | -- | | | -- | | | -- | | |

# Table 1. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC-59-BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59-BOT02 04-Jan-2006 mg/kg | Qual | DF | AOC-59-BOT03 04-Jan-2006 mg/kg | Qual | DF | AOC-59-BOT04 04-Jan-2006 mg/kg | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7440-38-2 | 24.2 | n | 5.0 | m | >S | 19.6 †† | **4.6** | M | 2 | **5.1** | M | 2 | **5.1** | M | 2 | **5.5** | M | 2 | -- | | | -- | | | -- | | | -- | | |
| Barium | 7440-39-3 | 8095.5 | n | **443.8** | m | >S | 300 ††† | **94** | M | 1 | **89** | M | 1 | **74** | M | 1 | **89** | M | 1 | -- | | | -- | | | -- | | | -- | | |
| Cadmium | 7440-43-9 | 52.4 | n | 1.5 | m | >S | 3 †† | **0.29** | M | 1 | **0.27** | M | 1 | **0.29** | M | 1 | **0.30** | M | 1 | -- | | | -- | | | -- | | | -- | | |
| Chromium | 7440-47-3 | 32607.1 | n | **2400.1** | m | >S | 40.2 †† | **18** | F | 1 | **15** | F | 1 | **16** | F | 1 | **17** | F | 1 | -- | | | -- | | | -- | | | -- | | |
| Copper | 7440-50-8 | **548.2** | n | 1042.5 | a | >S | 23.2 †† | **12** | M | 1 | **9.3** | M | 1 | **10** | M | 1 | **12** | M | 1 | -- | | | -- | | | -- | | | -- | | |
| Lead | 7439-92-1 | 500.0 | n | 3.0 | a | >S | 84.5 †† | **53** | M | 20 | **30** | M | 10 | **45** | M | 10 | **45** | M | 20 | **9.5** | F | 1 | **91** | | 1 | **20** | | 1 | **130** | | 1 |
| Mercury | 7439-97-6 | 3.6 | n | 0.0078 | m | | 0.77 †† | **0.020** | F | 1 | **0.030** | F | 1 | **0.040** | F | 1 | **0.020** | F | 1 | -- | | | -- | | | -- | | | -- | | |
| Nickel | 7440-02-0 | 839.6 | n | **157.4** | n | >S | 35.5 †† | **13** | M | 1 | **11** | M | 1 | **11** | M | 1 | **12** | M | 1 | -- | | | -- | | | -- | | | -- | | |
| Zinc | 7440-66-6 | 9921.5 | n | **2360.5** | n | >S | 73.2 †† | **21** | | 1 | **16** | | 1 | **18** | | 1 | **21** | | 1 | -- | | | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7440-38-2 | 24.2 | n | 5.0 | m | >S | 19.6 †† | **3.5** | F | 1 | **3.8** | F | 1 | **4.0** | F | 1 | **3.5** | M | 1 | **3.4** | F | 1 | -- | | | -- | | | -- | | |
| Barium | 7440-39-3 | 8095.5 | n | **443.8** | m | >S | 300 ††† | **44** | | 1 | **45** | | 1 | **49** | | 1 | **43** | M | 1 | **45** | | 1 | -- | | | -- | | | -- | | |
| Cadmium | 7440-43-9 | 52.4 | n | 1.5 | m | >S | 3 †† | **0.19** | F | 1 | **0.20** | F | 1 | **0.23** | F | 1 | **0.26** | M | 1 | **0.19** | F | 1 | -- | | | -- | | | -- | | |
| Chromium | 7440-47-3 | 32607.1 | n | **2400.1** | m | >S | 40.2 †† | **11** | F | 1 | **11** | F | 1 | **11** | F | 1 | **11** | M | 1 | **11** | F | 1 | -- | | | -- | | | -- | | |
| Copper | 7440-50-8 | **548.2** | n | 1042.5 | a | >S | 23.2 †† | **10** | | 1 | **11** | | 1 | **11** | | 1 | **11** | M | 1 | **22** | | 1 | -- | | | -- | | | -- | | |
| Lead | 7439-92-1 | 500.0 | n | 3.0 | a | >S | 84.5 †† | **33** | | 1 | **34** | | 1 | **39** | | 1 | **540** | M | 1 | **110** | | 1 | **19** | | 1 | **17** | | 1 | **19** | | 1 |
| Mercury | 7439-97-6 | 3.6 | n | 0.0078 | m | | 0.77 †† | **0.060** | F | 1 | **0.060** | F | 1 | **0.050** | F | 1 | **0.050** | F | 1 | **0.050** | F | 1 | -- | | | -- | | | -- | | |
| Nickel | 7440-02-0 | 839.6 | n | **157.4** | n | >S | 35.5 †† | **9.4** | | 1 | **9.3** | | 1 | **9.3** | | 1 | **9.7** | M | 1 | **11** | | 1 | -- | | | -- | | | -- | | |
| Zinc | 7440-66-6 | 9921.5 | n | **2360.5** | n | >S | 73.2 †† | **21** | | 1 | **25** | | 1 | **32** | | 1 | **39** | M | 1 | **22** | | 1 | -- | | | -- | | | -- | | |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7440-38-2 | 24.2 | n | 5.0 | m | >S | 19.6 †† | -- | | | -- | | | -- | | | -- | | |
| Barium | 7440-39-3 | 8095.5 | n | **443.8** | m | >S | 300 ††† | -- | | | -- | | | -- | | | -- | | |
| Cadmium | 7440-43-9 | 52.4 | n | 1.5 | m | >S | 3 †† | -- | | | -- | | | -- | | | -- | | |
| Chromium | 7440-47-3 | 32607.1 | n | **2400.1** | m | >S | 40.2 †† | -- | | | -- | | | -- | | | -- | | |
| Copper | 7440-50-8 | **548.2** | n | 1042.5 | a | >S | 23.2 †† | -- | | | -- | | | -- | | | -- | | |
| Lead | 7439-92-1 | 500.0 | n | 3.0 | a | >S | 84.5 †† | **27** | | 1 | **26** | | 1 | **26** | | 1 | **65** | | 1 |
| Mercury | 7439-97-6 | 3.6 | n | 0.0078 | m | | 0.77 †† | -- | | | -- | | | -- | | | -- | | |
| Nickel | 7440-02-0 | 839.6 | n | **157.4** | n | >S | 35.5 †† | -- | | | -- | | | -- | | | -- | | |
| Zinc | 7440-66-6 | 9921.5 | n | **2360.5** | 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] $^{Tot}Soil_{Comb}$ = 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:**

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.

Shaded value exceeded the TQEQ Tier 1 PCL for lead of 84.5 mg/kg.

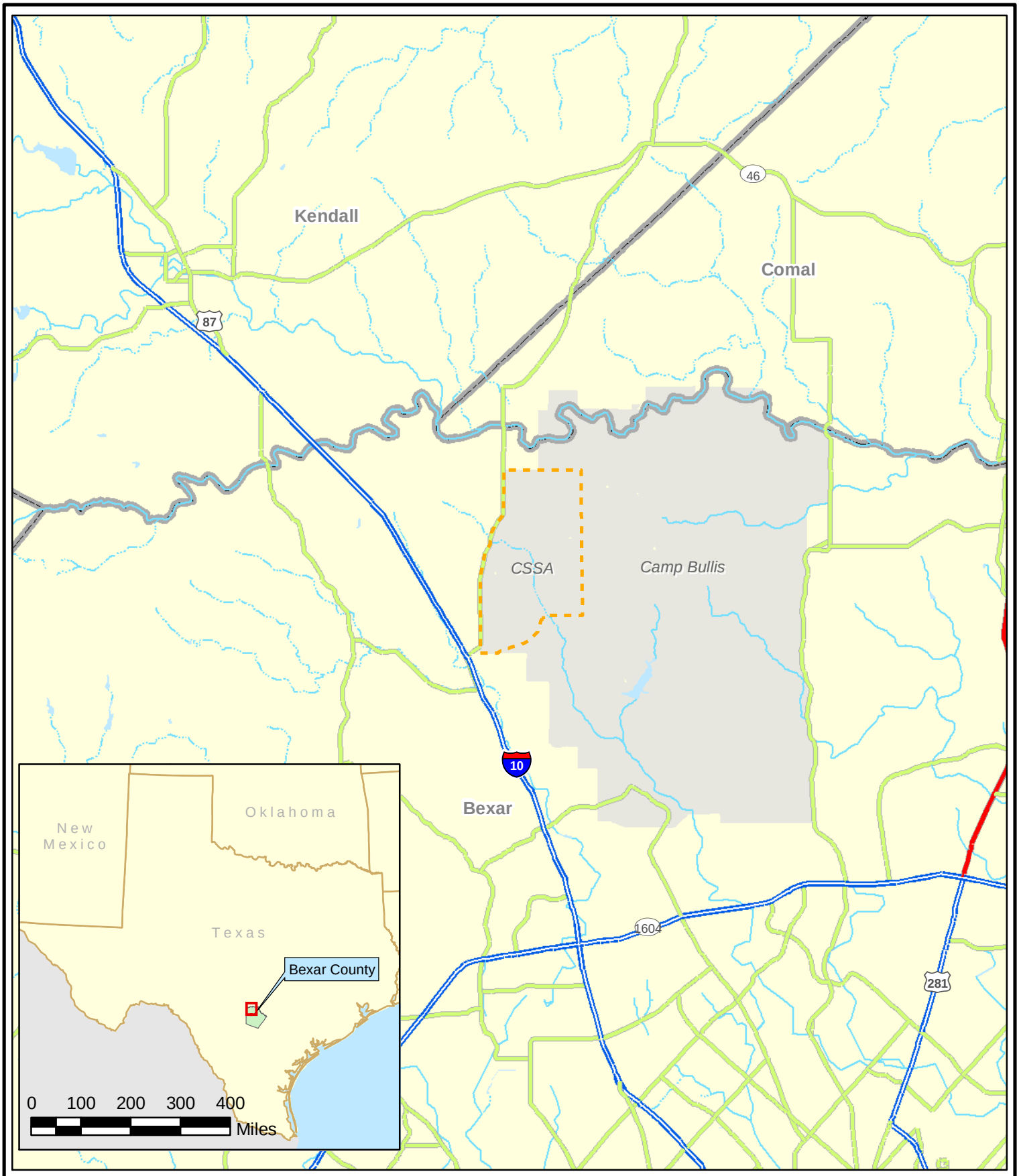
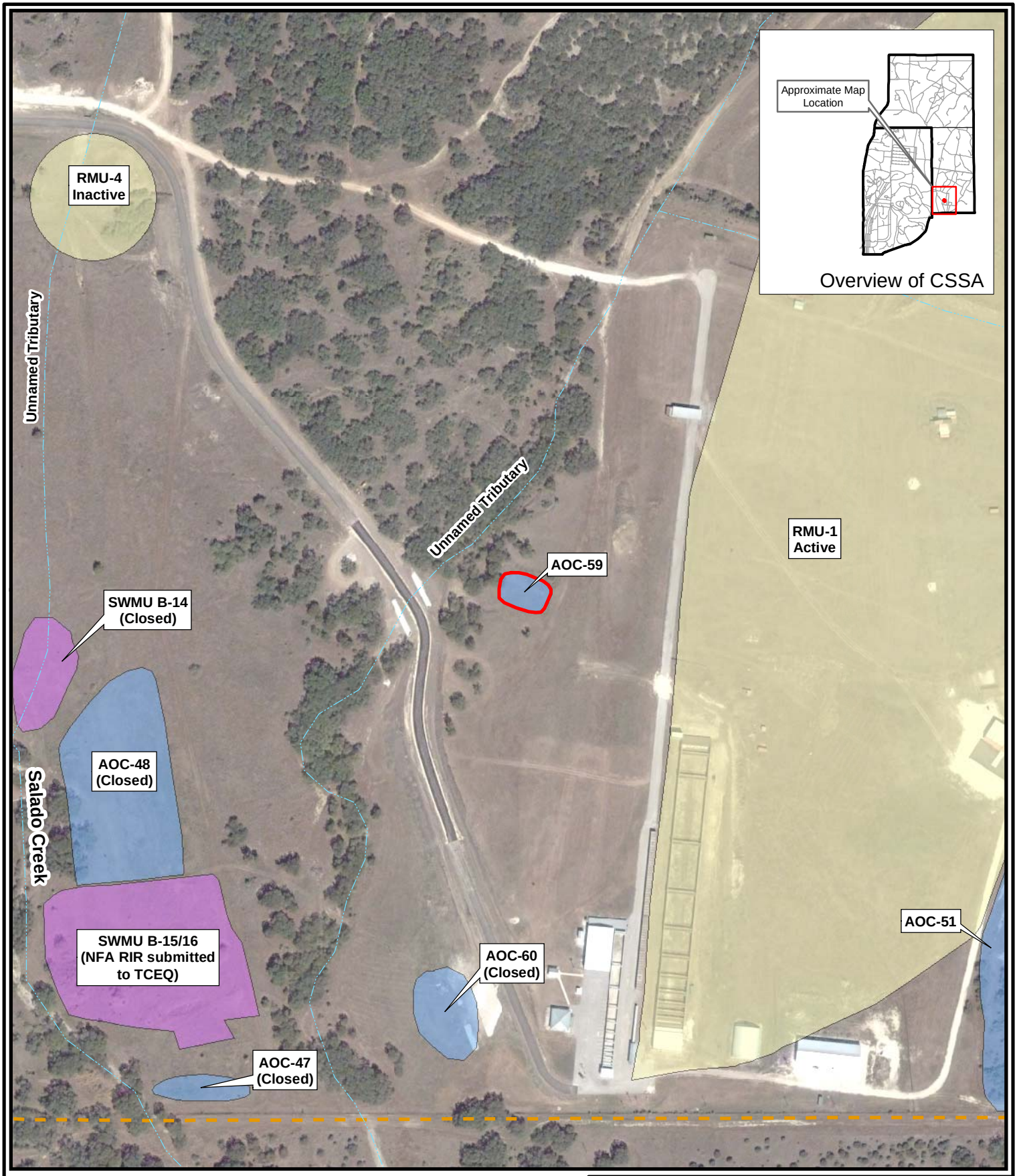



Figure 1

CSSA Location Map
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\Non Site Specific\Maps\cssa_site_location_zoom.mxd - 2/22/2011 @ 3:58:15 PM




Aerial Photo Date: 2009

N
W E
S

300 150 0 300 Feet

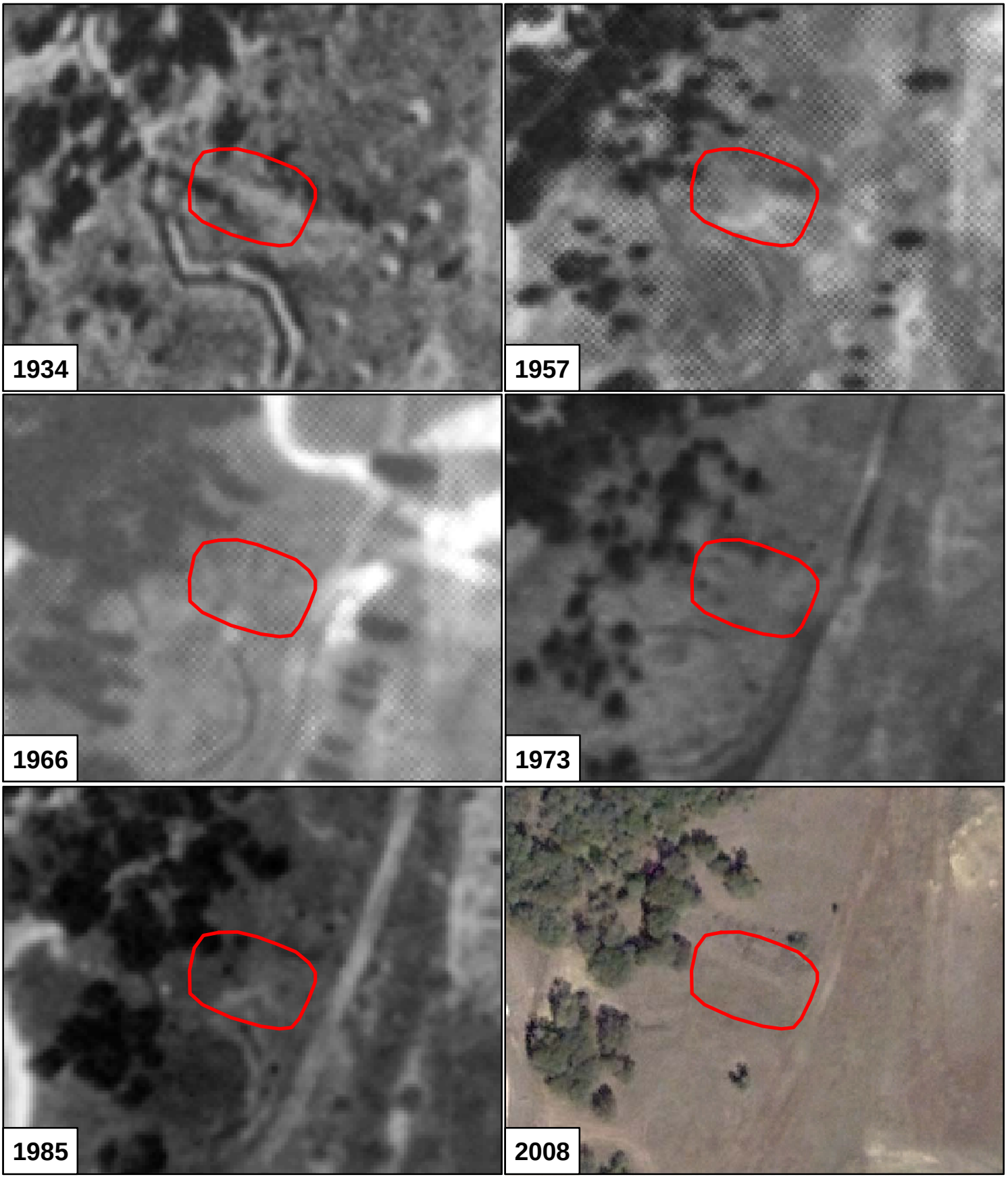
AOC-59
AOC Boundary
RMU Boundary
SWMU Boundary
Stream
CSSA Outer Fence Line

Figure 2

AOC-59
Site Location Map
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\AOC59_RIR_site_location_map.mxd - 7/22/2011 @ 1:25:31 PM




N
W E
S

AOC-59

0 62.5 125 250
Feet

Figure 3

AOC-59
Aerial Photographs
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\AOC59_RIR_historical_photos.mxd - 6/20/2011 @ 8:23:24 AM

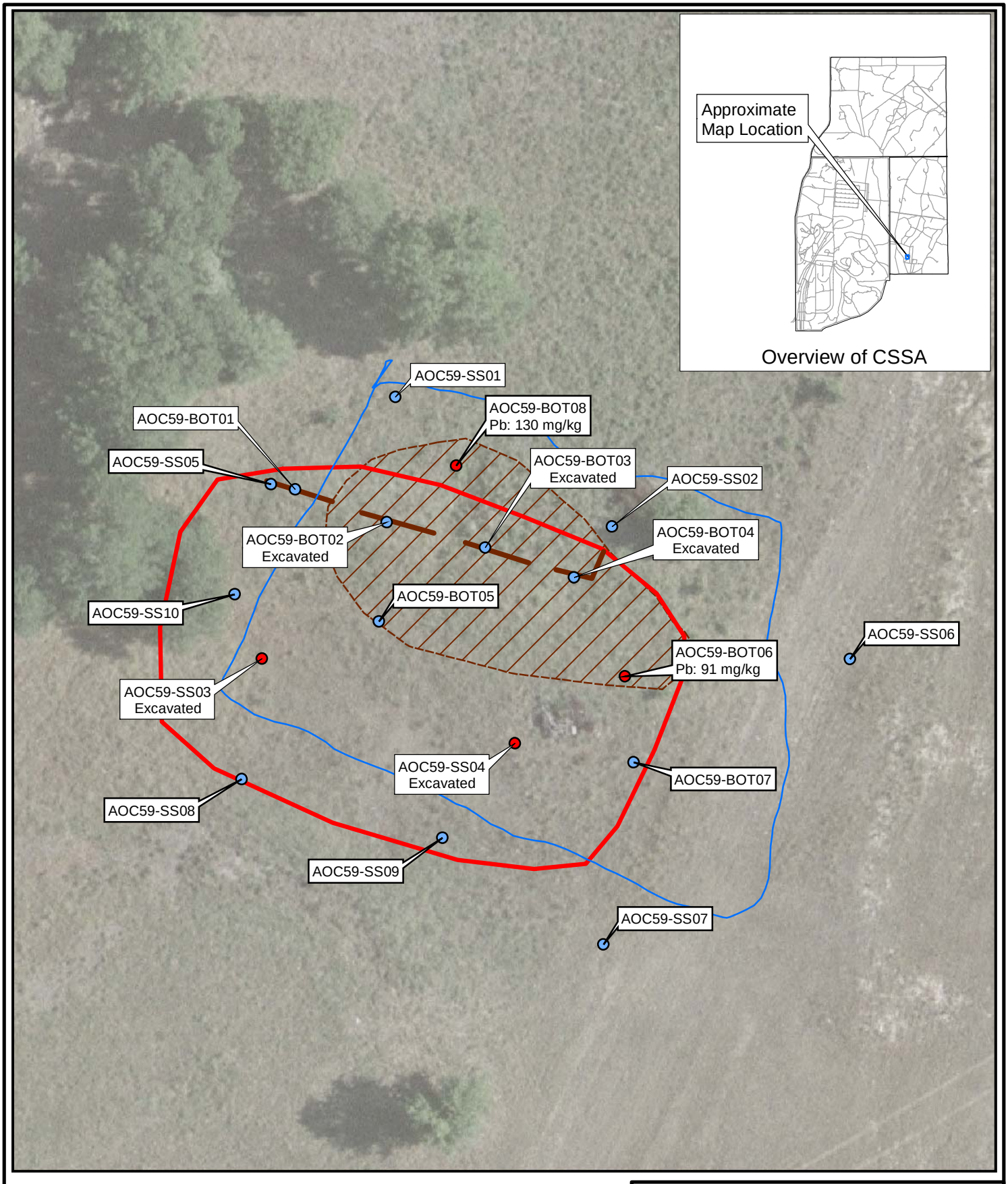



**Figure 4**

AOC-59 Sample Locations and Site Features
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\AOC59_RIR_sample_locations.mxd - 7/22/2011 @ 1:26:09 PM

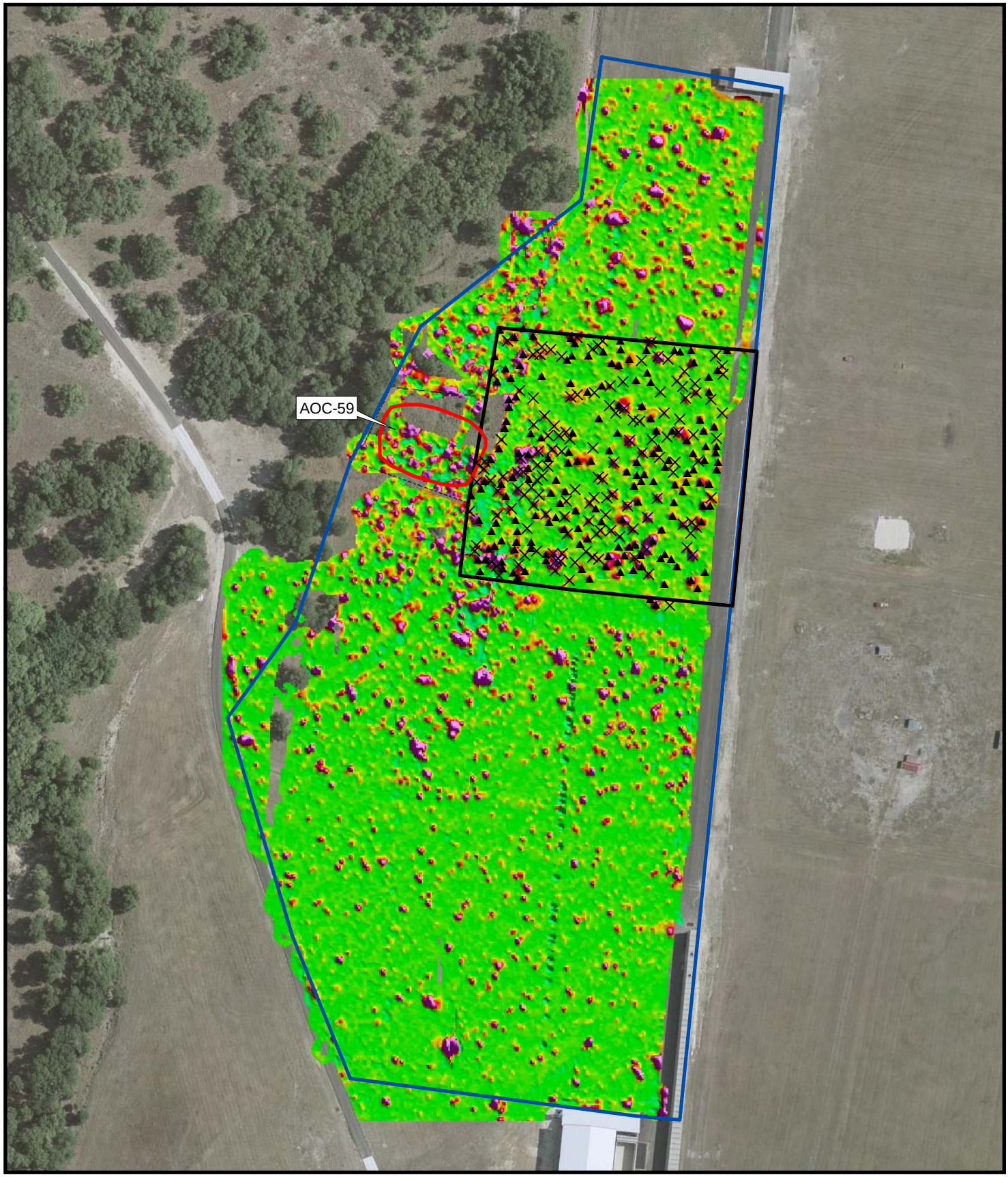



**Figure 5**

East Pasture
Anomaly Location Map
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\aoc59_RIR_geophysical_map.mxd - 7/19/2011 @ 12:51:35 PM

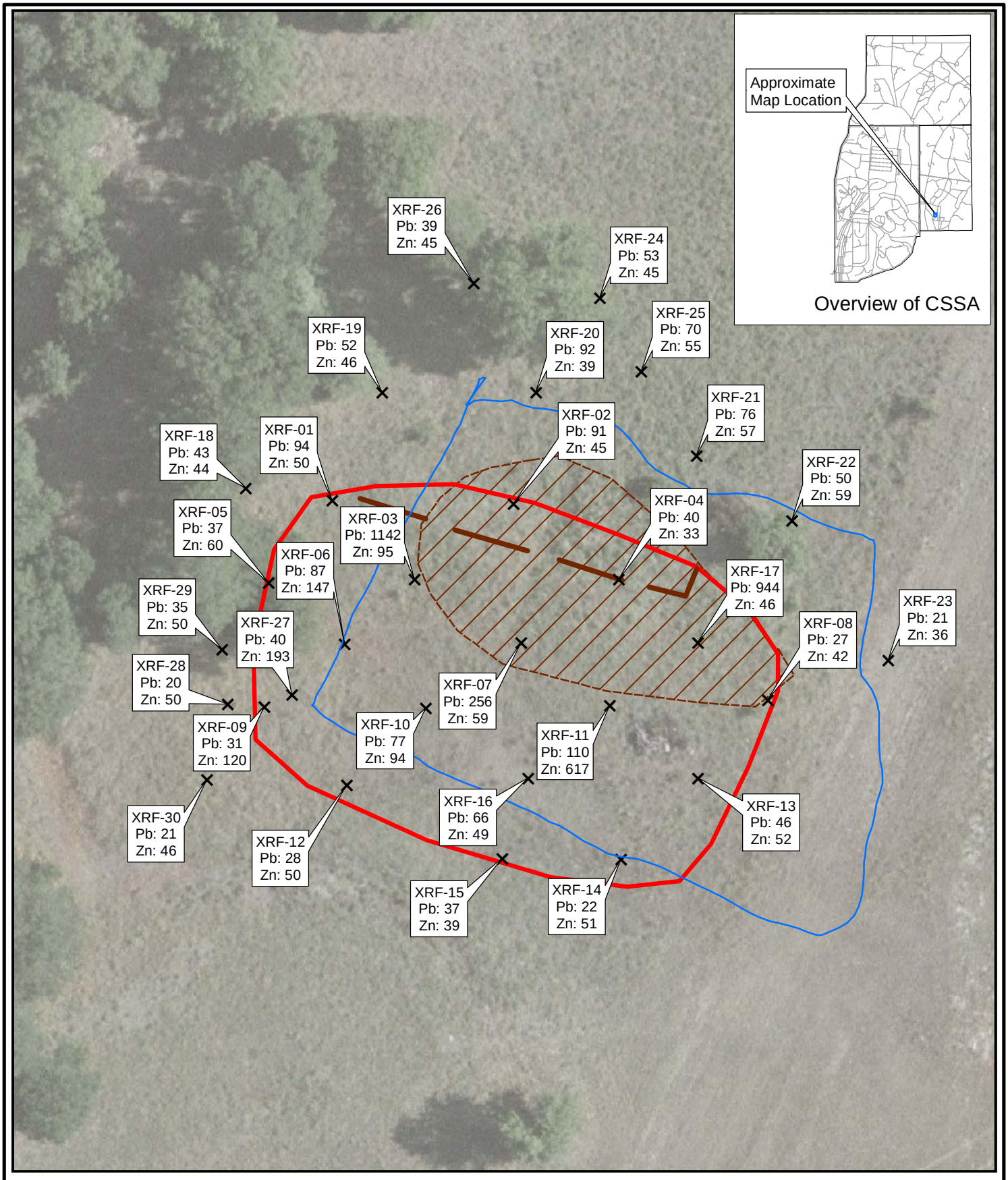
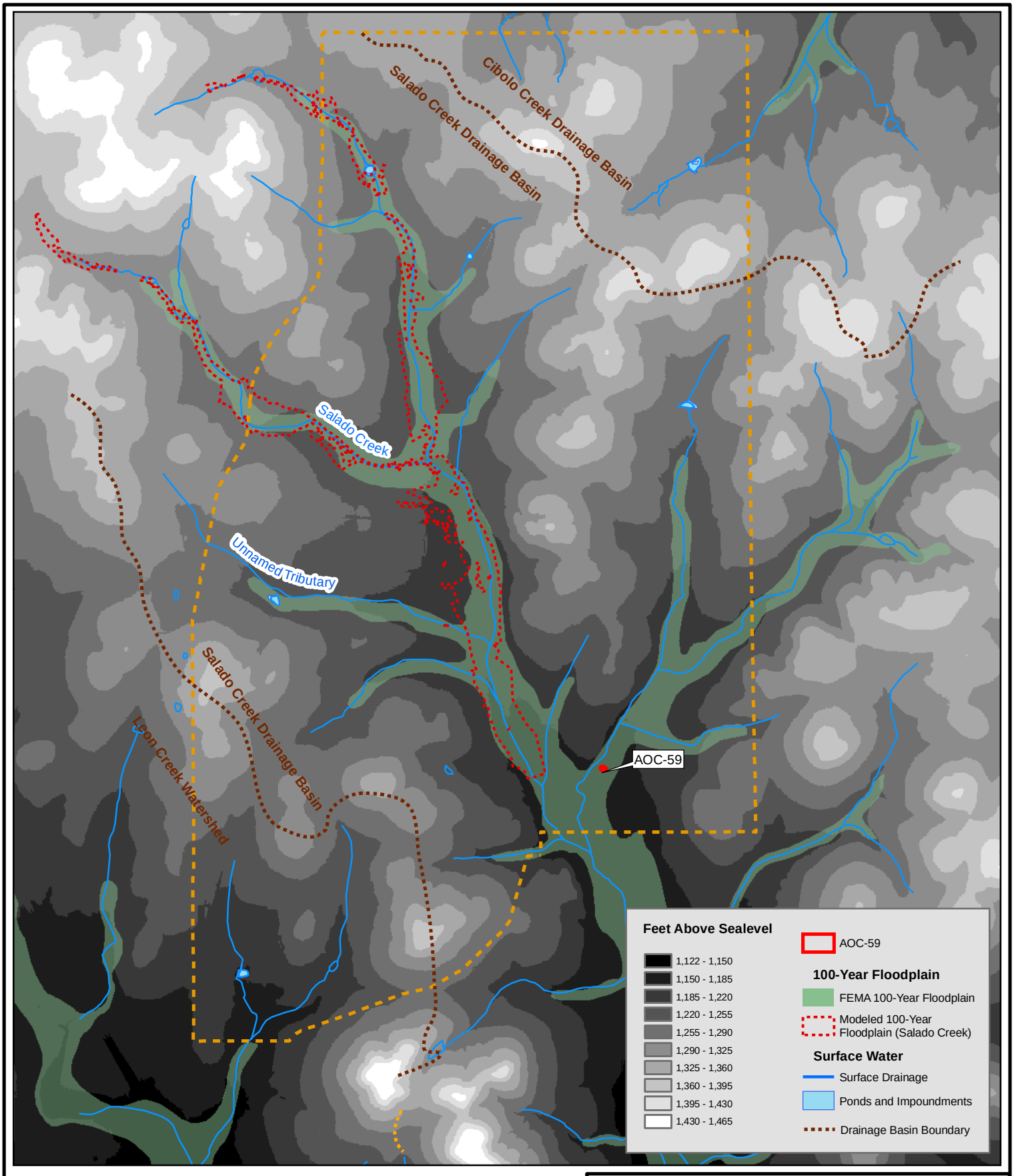


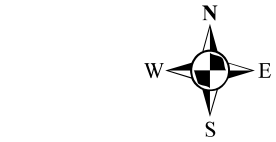

**Figure 6**

AOC-59
XRF Sampling Results
Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\AOC59_RIR_XRF_sample_locations.mxd - 7/22/2011 @ 1:42:36 PM




0 0.25 0.5 0.75 1 Miles

Figure 7

AOC-59 Topography, Surface Water, and Floodplains Camp Stanley Storage Activity

PARSONS

J:\CSSA\GIS\AOC59\Maps\AOC59_RIR_topo_map.mxd - 7/19/2011 @ 1:15:43 PM

# APPENDIX A

## Site Photographs


**Photo 1. AOC-59 facing west (soil mound on right). (December 2001)**


**Photo 2. AOC-59 facing west (soil mound in center). (January 2006)**


**Photo 3. AOC-59 facing west (soil mound in center). (January 2006)**


**Photo 4. AOC-59 (use of Schonstedt magnetometer in test trench/soil mound area). (January 2006)**


**Photo 5. AOC-59 (test trenching in the soil mound area). (January 2006)**


**Photo 6. AOC-59 (view of soil mound facing north). (February 2010)**


**Photo 7. AOC-59 facing east from west side of soil mound. (February 2010)**


**Photo 8. AOC-59 facing south. (February 2010)**


**Photo 9. AOC-59 facing west (soil mound in center). (February 2010)**


**Photo 10. AOC-59 facing west from east side of soil mound. (February 2010)**


**Photo 11. AOC-59 partially buried old stone wall. (February 2010)**


**Photo 12. Excavation of AOC-59, looking west. (March 2011)**


**Photo 13. Excavation of AOC-59, looking north. (March 2011)**


**Photo 14. Excavation of AOC-59, looking west (March 2011)**

# APPENDIX B

## Tier 1 Ecological Exclusion Criteria Checklist

Figure: 30 TAC §350.77(b)

## TIER 1: Exclusion Criteria Checklist

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

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

Name of Facility:

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

Affected Property Location:

**Area of concern (AOC) 59 (AOC-59) is a small site (approximately 0.2 acre) located in the southern portion of East Pasture at CSSA (see Figure 2 of the RIR). The site is approximately 2,875 feet from the east boundary and 1,160 feet from the south boundary of the installation. The distance to the Inner Cantonment/East Pasture boundary is approximately 1,170 feet.**

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)

### Definitions[1]

**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

[1]These 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 solid waste management units (SWMU), AOCs, and range management units (RMU). 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-59: AOC-59 is a small site, approximately 0.2 acre, located in the southern portion of East Pasture at CSSA. The site is approximately 2,875 feet from the east boundary and 1,160 feet from the south boundary of the installation. The distance to the Inner Cantonment/East Pasture boundary is approximately 1,170 feet.**

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 AOC-59 and the southern portion of East Pasture are shown on Figure 3 of the RIR. Figure 2 of the RIR shows the location of AOC-59 and the surrounding area.**

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

| Known/Suspected COC Location | Based on sampling data? | |
|---|---|---|
| ☐ **NO –** Soil ≤ 5 ft below ground surface | ☐ Yes | ☐ √No |
| ☐ **NO –** Soil >5 ft below ground surface | ☐ Yes | ☐ √No |
| ☐ **NO –** Groundwater | ☐ Yes | ☐ √No |
| ☐ **NO –** Surface Water/Sediments | ☐ Yes | ☐ √No |

Explain (previously submitted information may be referenced):

**Based on soil samples collected at AOC-59, there are no VOCs, SVOCs, or explosives at the site that exceed their respective PCL (see Appendix C of this RIR). Metals with concentrations exceeding Tier 1 PCLs at the site were excavated and removed or used to calculate a 95% UCL per TAC §350.79(2)(A) that does not exceed the Tier 1 PCL. There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-59. Over the past 16 years, there have been samples collected from the closest well to AOC-59 (supply well CS-1, located 2,000 ft downgradient of the site) and analyzed for metals and VOCs. Lead has been detected slightly above its MCL of 0.015mg/L on four occasions at concentrations ranging from 0.015 mg/L to 0.023 mg/L. Although lead was a COC at AOC-59, no pattern in the lead detections has been identified and lead has not been detected above trace levels in the well since 2000. No other analytes have exceeded MCLs. Sporadic low-level PCE detections (below the MCL) at CS-1 are associated with the SWMU B-3 plume. Additionally, since soils found to have concentrations of metals above their PCLs were excavated and removed, there will be no impact to groundwater, surface water or sediment from AOC-59.**

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

a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and

b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

The nearest surface water body, **an unnamed tributary to Salado Creek**, is **approximately 80 feet southwest (downgradient) from** the affected property **(AOC-59).** The water body is best described as a:

☐ freshwater stream: _____ perennial (has water all year)

__√__ intermittent (dries up completely for at least 1 week a year) **[only has water during and immediately after rain events.]**

_____ intermittent with perennial pools

☐ freshwater swamp/marsh/wetland

☐ saltwater or brackish marsh/swamp/wetland

☐ reservoir, lake, or pond; approximate surface acres**:**

☐ drainage ditch

☐ tidal stream ☐ bay ☐ estuary

☐ other; specify

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

☐√ **Yes** Segment # _____ Use Classification: **1910**

☐ No

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

Name:

**Salado Creek Drainage Basin**

Segment #:

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

Use Classification:

**Salado Creek is classified as an intermittent creek upstream (south) of CSSA to Loop 410 in San Antonio. The creek is classified as perennial downstream of Loop 410. Although water uses are not distinguished between the upstream intermittent and the downstream perennial sections, the designated uses of Segment 1910 as a whole are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-59.**

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

**The nearest surface water body is an unnamed tributary to Salado Creek and is approximately 80 feet southwest (downgradient) from the site. This unnamed tributary is intermittent. Salado Creek is intermittent and only contains water during and immediately following rain events. Salado Creek is intermittent in the area due to limited-duration flowing springs during the winter and spring.**

**PART II. Exclusion Criteria and Supportive Information**

**Subpart A. Surface Water/Sediment Exposure**

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

a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and

b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

☐ Yes ☐√ No

Explain:

**There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-59. Since soils that were found to have concentrations of metals above their PCLs were removed or used to calculate a 95% upper confidence limit (UCL) that does not exceed the Tier 1 PCL, there will be no impact to groundwater, surface water, or sediment from AOC-59.**

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

**Subpart B. Affected Property Setting**

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

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

☐ Yes ☐√ No

Explain:

**AOC-59 is a small, approximately 0.2 acre site located in the southern portion of East Pasture at CSSA. Figure 2 of the RIR shows the location of AOC-59 and the surrounding area.**

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

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

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

☐ Yes ☐ No

Explain:

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

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

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

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

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

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

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

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

☐ Yes ☐ No

Explain how conditions are met/not met:

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

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

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

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

Principal Geologist *(Title)*

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-59

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC-59_BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59_BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | 65.0 | c | 1.4 | c | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,1-Trichloroethane | 71-55-6 | 52000.0 | n | 1.6 | m | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 6.9 | c | 0.023 | c | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,2-Trichloroethane | 79-00-5 | 18.0 | c | 0.020 | m | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloroethane | 75-34-3 | 4500.0 | n | 18.0 | n | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloroethene | 75-35-4 | 2300.0 | n | 0.1 | m | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloropropene | 563-58-6 | 36.0 | c | 0.1 | c | na | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,3-Trichlorobenzene | 87-61-6 | 190.0 | n | 26.0 | n | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,3-Trichloropropane | 96-18-4 | 0.9 | c | 0.0023 | c | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | 640.0 | n | 4.8 | m | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,4-Trimethylbenzene | 95-63-6 | 130.0 | n | 9.7 | n | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | 0.2 | c | 0.0017 | m | na | 0.0020 | U | 1 | 0.0020 | U | 1 | 0.0020 | U | 1 | 0.0020 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 0.7 | c | 0.00021 | m | na | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichlorobenzene | 95-50-1 | 720.0 | n | 18.0 | m | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichloroethane | 107-06-2 | 11.0 | c | 0.014 | m | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichloropropane | 78-87-5 | 61.0 | n | 0.023 | m | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3,5-Trimethylbenzene (Mesitylene) | 108-67-8 | 110.0 | n | 53.0 | n | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichlorobenzene | 541-73-1 | 120.0 | n | 6.7 | n | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichloropropane | 142-28-9 | 36.0 | c | 0.1 | c | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,4-Dichlorobenzene | 106-46-7 | 250.0 | c | 2.1 | m | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1-Chlorohexane | 544-10-5 | 2700.0 | n | 39.0 | n | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,2-Dichloropropane | 594-20-7 | 61.0 | n | 0.1 | c | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chlorotoluene | 95-49-8 | 1000.0 | n | 9.1 | n | na | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chlorotoluene | 106-43-4 | 4.8 | n | 38.0 | n | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzene | 71-43-2 | 66.0 | c | 0.026 | m | na | **0.0046** | | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromobenzene | 108-86-1 | 150.0 | n | 5.8 | n | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromochloromethane | 74-97-5 | 620.0 | n | 3.0 | n | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromodichloromethane | 75-27-4 | 98.0 | c | 0.1 | c | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromoform | 75-25-2 | 400.0 | c | 0.6 | c | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromomethane | 74-83-9 | 46.0 | n | 0.1 | n | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Carbon tetrachloride | 56-23-5 | 16.0 | c | 0.1 | m | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chlorobenzene | 108-90-7 | 520.0 | n | 1.1 | m | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloroethane | 75-00-3 | 27000.0 | n | 31.0 | n | na | 0.0015 | U | 1 | 0.0015 | U | 1 | 0.0015 | U | 1 | 0.0015 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloroform | 67-66-3 | 16.0 | c | 1.0 | n | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloromethane | 74-87-3 | 140.0 | c | 0.4 | c | na | 0.0015 | U | 1 | 0.0015 | U | 1 | 0.0015 | U | 1 | 0.0015 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| cis-1,2-Dichloroethene | 156-59-2 | 770.0 | n | 0.3 | m | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| cis-1,3-Dichloropropene | 10061-01-5 | 7.6 | n | 0.0066 | c | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibromochloromethane | 124-48-1 | 72.0 | c | 0.049 | c | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibromomethane | 74-95-3 | 260.0 | n | 1.1 | c | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dichlorodifluoromethane | 75-71-8 | 13000.0 | n | 240.0 | n | na | 0.0018 | U | 1 | 0.0018 | U | 1 | 0.0018 | U | 1 | 0.0018 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Ethylbenzene | 100-41-4 | 5300.0 | n | 7.6 | m | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobutadiene | 87-68-3 | 20.0 | c | 3.3 | c | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Isopropylbenzene | 98-82-8 | 4300.0 | n | 350.0 | n | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| m,p-Xylene | 179601-23-1 | 29000.0 | n | 35.0 | m | na | 0.0018 | U | 1 | 0.0018 | U | 1 | 0.0018 | U | 1 | 0.0018 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Methylene chloride | 75-09-2 | 390.0 | c | 0.013 | m | na | **0.0019** | F | 1 | **0.017** | | 1 | **0.0088** | | 1 | **0.0052** | | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Naphthalene | 91-20-3 | 220.0 | n | 31.0 | n | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Butylbenzene | 104-51-8 | 1900.0 | n | 120.0 | n | na | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Propylbenzene | 103-65-1 | 2200.0 | n | 45.0 | n | na | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| o-Xylene | 95-47-6 | 48000.0 | n | 71.0 | m | na | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | 0.00070 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| p-Cymene (p-Isopropyltoluene) | 99-87-6 | 3700.0 | n | 230.0 | n | na | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| sec-Butylbenzene | 135-98-8 | 2100.0 | n | 85.0 | n | na | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | 0.0011 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Styrene | 100-42-5 | 6700.0 | n | 3.3 | m | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| tert-Butylbenzene | 98-06-6 | 1900.0 | n | 100.0 | n | na | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Tetrachloroethene (PCE) | 127-18-4 | 100.0 | c | 0.1 | m | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Toluene | 108-88-3 | 5900.0 | n | 8.2 | m | na | **0.0031** | F | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | 0.0010 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| trans-1,2-Dichloroethene | 156-60-5 | 590.0 | n | 0.5 | m | na | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | 0.00080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| trans-1,3-Dichloropropene | 10061-02-6 | 36.0 | c | 0.036 | c | na | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | 0.00090 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Trichloroethene (TCE) | 79-01-6 | 120.0 | n | 0.034 | m | na | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | 0.0012 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Trichlorofluoromethane | 75-69-4 | 16000.0 | n | 130.0 | n | na | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Vinyl chloride | 75-01-4 | 3.4 | c | 0.011 | m | na | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | 0.0013 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | 65.0 | c | 1.4 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,1-Trichloroethane | 71-55-6 | 52000.0 | n | 1.6 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 6.9 | c | 0.023 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1,2-Trichloroethane | 79-00-5 | 18.0 | c | 0.020 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloroethane | 75-34-3 | 4500.0 | n | 18.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloroethene | 75-35-4 | 2300.0 | n | 0.1 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,1-Dichloropropene | 563-58-6 | 36.0 | c | 0.1 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,3-Trichlorobenzene | 87-61-6 | 190.0 | n | 26.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,3-Trichloropropane | 96-18-4 | 0.9 | c | 0.0023 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | 640.0 | n | 4.8 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2,4-Trimethylbenzene | 95-63-6 | 130.0 | n | 9.7 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | 0.2 | c | 0.0017 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 0.7 | c | 0.00021 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichlorobenzene | 95-50-1 | 720.0 | n | 18.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichloroethane | 107-06-2 | 11.0 | c | 0.014 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichloropropane | 78-87-5 | 61.0 | n | 0.023 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3,5-Trimethylbenzene (Mesitylene) | 108-67-8 | 110.0 | n | 53.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichlorobenzene | 541-73-1 | 120.0 | n | 6.7 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichloropropane | 142-28-9 | 36.0 | c | 0.1 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,4-Dichlorobenzene | 106-46-7 | 250.0 | c | 2.1 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1-Chlorohexane | 544-10-5 | 2700.0 | n | 39.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,2-Dichloropropane | 594-20-7 | 61.0 | n | 0.1 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chlorotoluene | 95-49-8 | 1000.0 | n | 9.1 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chlorotoluene | 106-43-4 | 4.8 | n | 38.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzene | 71-43-2 | 66.0 | c | 0.026 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromobenzene | 108-86-1 | 150.0 | n | 5.8 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromochloromethane | 74-97-5 | 620.0 | n | 3.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromodichloromethane | 75-27-4 | 98.0 | c | 0.1 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromoform | 75-25-2 | 400.0 | c | 0.6 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Bromomethane | 74-83-9 | 46.0 | n | 0.1 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Carbon tetrachloride | 56-23-5 | 16.0 | c | 0.1 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chlorobenzene | 108-90-7 | 520.0 | n | 1.1 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloroethane | 75-00-3 | 27000.0 | n | 31.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloroform | 67-66-3 | 16.0 | c | 1.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chloromethane | 74-87-3 | 140.0 | c | 0.4 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| cis-1,2-Dichloroethene | 156-59-2 | 770.0 | n | 0.3 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| cis-1,3-Dichloropropene | 10061-01-5 | 7.6 | n | 0.0066 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibromochloromethane | 124-48-1 | 72.0 | c | 0.049 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibromomethane | 74-95-3 | 260.0 | n | 1.1 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dichlorodifluoromethane | 75-71-8 | 13000.0 | n | 240.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Ethylbenzene | 100-41-4 | 5300.0 | n | 7.6 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobutadiene | 87-68-3 | 20.0 | c | 3.3 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Isopropylbenzene | 98-82-8 | 4300.0 | n | 350.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| m,p-Xylene | 179601-23-1 | 29000.0 | n | 35.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Methylene chloride | 75-09-2 | 390.0 | c | 0.013 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Naphthalene | 91-20-3 | 220.0 | n | 31.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Butylbenzene | 104-51-8 | 1900.0 | n | 120.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Propylbenzene | 103-65-1 | 2200.0 | n | 45.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| o-Xylene | 95-47-6 | 48000.0 | n | 71.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| p-Cymene (p-Isopropyltoluene) | 99-87-6 | 3700.0 | n | 230.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| sec-Butylbenzene | 135-98-8 | 2100.0 | n | 85.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Styrene | 100-42-5 | 6700.0 | n | 3.3 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| tert-Butylbenzene | 98-06-6 | 1900.0 | n | 100.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Tetrachloroethene (PCE) | 127-18-4 | 100.0 | c | 0.1 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Toluene | 108-88-3 | 5900.0 | n | 8.2 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| trans-1,2-Dichloroethene | 156-60-5 | 590.0 | n | 0.5 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| trans-1,3-Dichloropropene | 10061-02-6 | 36.0 | c | 0.036 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Trichloroethene (TCE) | 79-01-6 | 120.0 | n | 0.034 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Trichlorofluoromethane | 75-69-4 | 16000.0 | n | 130.0 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Vinyl chloride | 75-01-4 | 3.4 | c | 0.011 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC-59_BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59_BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | 640.0 | n | **4.8** | m | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichlorobenzene | 95-50-1 | 720.0 | n | **18.0** | m | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichlorobenzene | 541-73-1 | 120.0 | n | **6.7** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,4-Dichlorobenzene | 106-46-7 | 250.0 | c | **2.1** | m | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4,5-Trichlorophenol | 95-95-4 | 5100.0 | n | **34.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4,6-Trichlorophenol | 88-06-2 | 67.0 | n | **0.17** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dichlorophenol | 120-83-2 | 200.0 | n | **0.35** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dimethylphenol | 105-67-9 | 1100.0 | n | **3.2** | n | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dinitrophenol | 51-28-5 | 130.0 | n | **0.094** | n | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dinitrotoluene | 121-14-2 | 6.9 | c | **0.0053** | c | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,6-Dinitrotoluene | 606-20-2 | 6.9 | c | **0.0048** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chloronaphthalene | 91-58-7 | 5000.0 | n | **670.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chlorophenol | 95-57-8 | 380.0 | n | **1.6** | n | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | 5.8 | n | **0.0047** | n | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methylnaphthalene | 91-57-6 | 250.0 | n | **17.0** | n | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methylphenol | 95-48-7 | 1500.0 | n | **7.1** | n | na | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Nitroaniline | 88-74-4 | 14.0 | n | **0.022** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Nitrophenol | 88-75-5 | 110.0 | n | **0.13** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 3,3'-Dichlorobenzidine | 91-94-1 | 10.0 | c | **0.063** | c | na | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 3-Nitroaniline | 99-09-2 | 20.0 | n | **0.026** | n | na | 0.0100 | U | 1 | 0.0100 | U | 1 | 0.0100 | U | 1 | 0.0100 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Bromophenyl phenyl ether | 101-55-3 | **0.28** | c | 0.35 | c | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chloro-3-methyl phenol | 59-50-7 | 330.0 | n | **4.5** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chloroaniline | 106-47-8 | 23.0 | c | **0.021** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | 0.16 | c | **0.032** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Methylphenol (p-cresol) | 106-44-5 | 300.0 | n | **0.63** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Nitroaniline | 100-01-6 | 220.0 | n | **0.1** | c | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Nitrophenol | 100-02-7 | 73.0 | n | **0.1** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Acenaphthene | 83-32-9 | 3000.0 | n | **240.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Acenaphthylene | 208-96-8 | 3800.0 | n | **410.0** | n | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Anthracene | 120-12-7 | 18000.0 | n | **6900.0** | n >S | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(a)anthracene | 56-55-3 | **5.7** | c | 18.0 | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(a)pyrene | 50-32-8 | **0.6** | c | 7.6 | m | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(b)fluoranthene | 205-99-2 | **5.7** | c | 60.0 | c | na | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(g,h,i)perylene | 191-24-2 | **1800.0** | n | 46000.0 | n >S | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzoic acid | 65-85-0 | 690.0 | n | **190.0** | n | na | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | 0.020 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzyl alcohol | 100-51-6 | 7100.0 | n | **29.0** | n | na | 0.12 | U | 1 | 0.12 | U | 1 | 0.12 | U | 1 | 0.12 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzyl butyl phthalate | 85-68-7 | 1600.0 | c | **260.0** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroethoxy)methane | 111-91-1 | 3.1 | c | **0.012** | c | na | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroethyl)ether | 111-44-4 | 2.2 | c | **0.0021** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 51.0 | c | **0.2** | c | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Ethylhexyl) phthalate | 117-81-7 | **43.0** | c | 160.0 | m | na | 0.030 | U | 1 | 0.030 | U | 1 | **0.040** | F | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chrysene | 218-01-9 | **560.0** | c | 1500.0 | c >S | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibenzo(a,h)anthracene | 53-70-3 | **0.6** | c | 15.0 | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibenzofuran | 132-64-9 | 270.0 | n | **33.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Diethyl phthalate | 84-66-2 | 2700.0 | n | **160.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dimethyl phthalate | 131-11-3 | 1300.0 | n | **62.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Di-n-butyl phthalate | 84-74-2 | 5100.0 | n | **3300.0** | n | na | 0.040 | U | 1 | **0.10** | F | 1 | **0.080** | F | 1 | **0.19** | F | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Di-n-octyl phthalate | 117-84-0 | **1300.0** | n | 1000000 | n >S | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Fluoranthene | 206-44-0 | 2300.0 | n | **1900.0** | n >S | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Fluorene | 86-73-7 | 2300.0 | n | **300.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobenzene | 118-74-1 | **1.1** | c | **1.1** | m | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobutadiene | 87-68-3 | 20.0 | c | **3.3** | c | na | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | 0.060 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorocyclopentadiene | 77-47-4 | **14.0** | n | 19.0 | m | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachloroethane | 67-72-1 | 67.0 | n | **1.8** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | **5.7** | c | 170.0 | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Isophorone | 78-59-1 | 2200.0 | n | **3.0** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Naphthalene | 91-20-3 | 220.0 | n | **31.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Nitrobenzene | 98-95-3 | 66.0 | c | **0.4** | n | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Nitrosodi-n-propylamine | 621-64-7 | 0.4 | c | **0.00035** | c | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Nitrosodiphenylamine | 86-30-6 | 570.0 | c | **2.8** | c | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Pentachlorophenol | 87-86-5 | 2.4 | c | **0.018** | m | na | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | 0.030 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Phenanthrene | 85-01-8 | 1700.0 | n | **420.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Phenol | 108-95-2 | 2900.0 | n | **19.0** | n | na | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | 0.040 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Pyrene | 129-00-0 | 1700.0 | n | **1100.0** | n >S | na | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | 0.050 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organics** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | 640.0 | n | **4.8** | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,2-Dichlorobenzene | 95-50-1 | 720.0 | n | **18.0** | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dichlorobenzene | 541-73-1 | 120.0 | n | **6.7** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,4-Dichlorobenzene | 106-46-7 | 250.0 | c | **2.1** | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4,5-Trichlorophenol | 95-95-4 | 5100.0 | n | **34.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4,6-Trichlorophenol | 88-06-2 | 67.0 | n | **0.17** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dichlorophenol | 120-83-2 | 200.0 | n | **0.35** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dimethylphenol | 105-67-9 | 1100.0 | n | **3.2** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dinitrophenol | 51-28-5 | 130.0 | n | **0.094** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dinitrotoluene | 121-14-2 | 6.9 | c | **0.0053** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,6-Dinitrotoluene | 606-20-2 | 6.9 | c | **0.0048** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chloronaphthalene | 91-58-7 | 5000.0 | n | **670.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Chlorophenol | 95-57-8 | 380.0 | n | **1.6** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | 5.8 | n | **0.0047** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methylnaphthalene | 91-57-6 | 250.0 | n | **17.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Methylphenol | 95-48-7 | 1500.0 | n | **7.1** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Nitroaniline | 88-74-4 | 14.0 | n | **0.022** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Nitrophenol | 88-75-5 | 110.0 | n | **0.13** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 3,3'-Dichlorobenzidine | 91-94-1 | 10.0 | c | **0.063** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 3-Nitroaniline | 99-09-2 | 20.0 | n | **0.026** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Bromophenyl phenyl ether | 101-55-3 | **0.28** | c | 0.35 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chloro-3-methyl phenol | 59-50-7 | 330.0 | n | **4.5** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chloroaniline | 106-47-8 | 23.0 | c | **0.021** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | 0.16 | c | **0.032** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Methylphenol (p-cresol) | 106-44-5 | 300.0 | n | **0.63** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Nitroaniline | 100-01-6 | 220.0 | n | **0.1** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Nitrophenol | 100-02-7 | 73.0 | n | **0.1** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Acenaphthene | 83-32-9 | 3000.0 | n | **240.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Acenaphthylene | 208-96-8 | 3800.0 | n | **410.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Anthracene | 120-12-7 | 18000.0 | n | **6900.0** | n | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(a)anthracene | 56-55-3 | **5.7** | c | 18.0 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(a)pyrene | 50-32-8 | **0.6** | c | 7.6 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(b)fluoranthene | 205-99-2 | **5.7** | c | 60.0 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzo(g,h,i)perylene | 191-24-2 | **1800.0** | n | 46000.0 | n | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzoic acid | 65-85-0 | 690.0 | n | **190.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzyl alcohol | 100-51-6 | 7100.0 | n | **29.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Benzyl butyl phthalate | 85-68-7 | 1600.0 | c | **260.0** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroethoxy)methane | 111-91-1 | 3.1 | c | **0.012** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroethyl)ether | 111-44-4 | 2.2 | c | **0.0021** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 51.0 | c | **0.2** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| bis(2-Ethylhexyl) phthalate | 117-81-7 | **43.0** | c | 160.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chrysene | 218-01-9 | **560.0** | c | 1500.0 | c | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibenzo(a,h)anthracene | 53-70-3 | **0.6** | c | 15.0 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dibenzofuran | 132-64-9 | 270.0 | n | **33.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Diethyl phthalate | 84-66-2 | 2700.0 | n | **160.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Dimethyl phthalate | 131-11-3 | 1300.0 | n | **62.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Di-n-butyl phthalate | 84-74-2 | 5100.0 | n | **3300.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Di-n-octyl phthalate | 117-84-0 | **1300.0** | n | 1000000 | n | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Fluoranthene | 206-44-0 | 2300.0 | n | **1900.0** | n | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Fluorene | 86-73-7 | 2300.0 | n | **300.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobenzene | 118-74-1 | **1.1** | c | **1.1** | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorobutadiene | 87-68-3 | 20.0 | c | **3.3** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachlorocyclopentadiene | 77-47-4 | **14.0** | n | 19.0 | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexachloroethane | 67-72-1 | 67.0 | n | **1.8** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | **5.7** | c | 170.0 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Isophorone | 78-59-1 | 2200.0 | n | **3.0** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Naphthalene | 91-20-3 | 220.0 | n | **31.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Nitrobenzene | 98-95-3 | 66.0 | c | **0.4** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Nitrosodi-n-propylamine | 621-64-7 | 0.4 | c | **0.00035** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| n-Nitrosodiphenylamine | 86-30-6 | 570.0 | c | **2.8** | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Pentachlorophenol | 87-86-5 | 2.4 | c | **0.018** | m | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Phenanthrene | 85-01-8 | 1700.0 | n | **420.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Phenol | 108-95-2 | 2900.0 | n | **19.0** | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Pyrene | 129-00-0 | 1700.0 | n | **1100.0** | n | >S | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC-59_BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59_BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Explosives** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | 2000.0 | n | 1.8 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| 1,3-Dinitrobenzene | 99-65-0 | 6.5 | n | 0.0076 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| 2,4,6-Trinitrotoluene (TNT) | 118-96-7 | 23.0 | n | 0.2 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| 2,4-Dinitrotoluene | 121-14-2 | 6.9 | c | 0.0053 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.080 | U | 1 | 0.080 | U | 1 |
| 2,6-Dinitrotoluene | 606-20-2 | 6.9 | c | 0.0048 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| 2-Nitrotoluene | 88-72-2 | 21.0 | c | 0.0310 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| 3-Nitrotoluene | 99-08-1 | 380.0 | n | 1.8 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.080 | U | 1 | 0.080 | U | 1 |
| 4-Nitrotoluene | 99-99-0 | 200.0 | n | 0.4 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.080 | U | 1 | 0.080 | U | 1 |
| Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetraz | 121-82-4 | 43.0 | c | 0.0370 | c | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.080 | U | 1 | 0.080 | U | 1 |
| Nitrobenzene | 98-95-3 | 66.0 | c | 0.4 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |
| Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Te | 2691-41-0 | 350.0 | n | 2.3 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.080 | U | 1 | 0.080 | U | 1 |
| Tetryl | 479-45-8 | 59.0 | n | 1.1 | n | na | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | 0.075 | U | 1 | 0.075 | U | 1 |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Explosives** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | 2000.0 | n | 1.8 | n | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 1,3-Dinitrobenzene | 99-65-0 | 6.5 | n | 0.0076 | n | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4,6-Trinitrotoluene (TNT) | 118-96-7 | 23.0 | n | 0.2 | n | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,4-Dinitrotoluene | 121-14-2 | 6.9 | c | 0.0053 | c | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2,6-Dinitrotoluene | 606-20-2 | 6.9 | c | 0.0048 | c | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 2-Nitrotoluene | 88-72-2 | 21.0 | c | 0.0310 | c | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 3-Nitrotoluene | 99-08-1 | 380.0 | n | 1.8 | n | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| 4-Nitrotoluene | 99-99-0 | 200.0 | n | 0.4 | c | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetraz | 121-82-4 | 43.0 | c | 0.0370 | c | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Nitrobenzene | 98-95-3 | 66.0 | c | 0.4 | n | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Te | 2691-41-0 | 350.0 | n | 2.3 | n | na | 0.080 | U | 1 | 0.080 | U | 1 | 0.080 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Tetryl | 479-45-8 | 59.0 | n | 1.1 | n | na | 0.075 | U | 1 | 0.075 | U | 1 | 0.075 | U | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

# Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-59

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC-59_BOT01 04-Jan-2006 mg/kg | Qual | DF | AOC-59_BOT02 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT03 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC-59_BOT04 04-Jan-2006 mg/kg EXCAVATED | Qual | DF | AOC59-BOT05 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT06 29-Mar-2011 mg/kg | Qual | DF | AOC59-BOT07 20-Apr-2011 mg/kg | Qual | DF | AOC59-BOT08 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS01 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS01-DUP 12-Jan-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7440-38-2 | 24.2 | n | 5.0 | m | >S | 19.6 †† | **4.6** | M | 2 | **5.1** | M | 2 | **5.1** | M | 2 | **5.5** | M | 2 | -- | | | -- | | | -- | | | -- | | | **3.5** | F | 1 | **3.8** | F | 1 |
| Barium | 7440-39-3 | 8095.5 | n | 443.8 | m | >S | 300 ††† | **94** | M | 1 | **89** | M | 1 | **74** | M | 1 | **89** | M | 1 | -- | | | -- | | | -- | | | -- | | | **44** | | 1 | **45** | | 1 |
| Cadmium | 7440-43-9 | 52.4 | n | 1.5 | m | >S | 3 †† | **0.29** | M | 1 | **0.27** | M | 1 | **0.29** | M | 1 | **0.30** | M | 1 | -- | | | -- | | | -- | | | -- | | | **0.19** | F | 1 | **0.20** | F | 1 |
| Chromium | 7440-47-3 | 32607.1 | n | 2400.1 | m | >S | 40.2 †† | **18** | F | 1 | **15** | F | 1 | **16** | F | 1 | **17** | F | 1 | -- | | | -- | | | -- | | | -- | | | **11** | F | 1 | **11** | F | 1 |
| Copper | 7440-50-8 | 548.2 | n | 1042.5 | a | >S | 23.2 †† | **12** | M | 1 | **9.3** | M | 1 | **10** | M | 1 | **12** | M | 1 | -- | | | -- | | | -- | | | -- | | | **10** | | 1 | **11** | | 1 |
| Lead | 7439-92-1 | 500.0 | n | 3.0 | a | >S | 84.5 †† | **53** | M | 20 | **30** | M | 10 | **45** | M | 10 | **45** | M | 20 | **9.5** | F | 1 | **91** | | 1 | **20** | | 1 | **130** | | 1 | **33** | | 1 | **34** | | 1 |
| Mercury | 7439-97-6 | 3.6 | n | 0.0078 | m | | 0.77 †† | **0.020** | F | 1 | **0.030** | F | 1 | **0.040** | F | 1 | **0.020** | F | 1 | -- | | | -- | | | -- | | | -- | | | **0.060** | F | 1 | **0.060** | F | 1 |
| Nickel | 7440-02-0 | 839.6 | n | 157.4 | n | >S | 35.5 †† | **13** | M | 1 | **11** | M | 1 | **11** | M | 1 | **12** | M | 1 | -- | | | -- | | | -- | | | -- | | | **9.4** | | 1 | **9.3** | | 1 |
| Zinc | 7440-66-6 | 9921.5 | n | 2360.5 | n | >S | 73.2 †† | **21** | | 1 | **16** | | 1 | **18** | | 1 | **21** | | 1 | -- | | | -- | | | -- | | | -- | | | **21** | | 1 | **25** | | 1 |

| Chemicals Tested | CAS Number | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [1] | | Tier 1 Soil PCLs† Residential Source Area 0.5 acre Soil mg/kg [2] | | | TCEQ-Approved CSSA Background Metal Concentrations mg/kg [3] | Sample Locations: AOC59-SS02 12-Jan-2011 mg/kg | Qual | DF | AOC59-SS03 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS04 12-Jan-2011 mg/kg EXCAVATED | Qual | DF | AOC59-SS05 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS06 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS07 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS08 29-Mar-2011 mg/kg | Qual | DF | AOC59-SS09 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS09-DUP 20-Apr-2011 mg/kg | Qual | DF | AOC59-SS10 20-Apr-2011 mg/kg | Qual | DF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7440-38-2 | 24.2 | n | 5.0 | m | >S | 19.6 †† | **4.0** | F | 1 | **3.5** | M | 1 | **3.4** | F | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Barium | 7440-39-3 | 8095.5 | n | 443.8 | m | >S | 300 ††† | **49** | | 1 | **43** | M | 1 | **45** | | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Cadmium | 7440-43-9 | 52.4 | n | 1.5 | m | >S | 3 †† | **0.23** | F | 1 | **0.26** | M | 1 | **0.19** | F | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Chromium | 7440-47-3 | 32607.1 | n | 2400.1 | m | >S | 40.2 †† | **11** | F | 1 | **11** | M | 1 | **11** | F | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Copper | 7440-50-8 | 548.2 | n | 1042.5 | a | >S | 23.2 †† | **11** | | 1 | **11** | M | 1 | **22** | | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Lead | 7439-92-1 | 500.0 | n | 3.0 | a | >S | 84.5 †† | **39** | | 1 | **540** | M | 1 | **110** | | 1 | **19** | | 1 | **17** | | 1 | **19** | | 1 | **27** | | 1 | **26** | | 1 | **26** | | 1 | **65** | | 1 |
| Mercury | 7439-97-6 | 3.6 | n | 0.0078 | m | | 0.77 †† | **0.050** | F | 1 | **0.050** | F | 1 | **0.050** | F | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Nickel | 7440-02-0 | 839.6 | n | 157.4 | n | >S | 35.5 †† | **9.3** | | 1 | **9.7** | M | 1 | **11** | | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| Zinc | 7440-66-6 | 9921.5 | n | 2360.5 | n | >S | 73.2 †† | **32** | | 1 | **39** | M | 1 | **22** | | 1 | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

**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 for detected compounds 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:**

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.

Shaded value exceeded the TQEQ Eco Benchmark value for zinc of 156 mg/kg (subsequently excavated).

# APPENDIX D

## Data Verification Summary Report

**DATA VERIFICATION SUMMARY REPORT**

**for samples collected from AOC-59**

**CAMP STANLEY STORAGE ACTIVITY**

**BOERNE, TEXAS**

Data Verification by: Tammy Chang
Parsons - Austin

## INTRODUCTION

The following data verification summary report covers soil samples and associated field quality control samples collected from Camp Stanley Storage Activity (CSSA) under Environmental Protection Support, Investigations, and Treatability Studies on April 20, 2011. The samples in the following Sample Delivery Group (SDG) were analyzed for lead:

64466

There were two field duplicate (FD) samples collected as field quality control samples in association with this SDG.

These samples were collected by Parsons and analyzed by Agriculture & Priority Pollutants Laboratories, Inc. (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 3.5° C which was within the 2-6° C range recommended by the CSSA QAPP.

## EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data 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

This SDG consisted of nine (9) samples which were collected on April 20, 2011 and were analyzed for lead only. 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.

The lead samples were digested, and analyzed in one batch.

**Accuracy**

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

All LCS recovery was within acceptance criteria.

**Precision**

Precision was evaluated by comparing parent and FD results. Samples AOC59-SS09 and AOC45-SS16 were collected in duplicate.

**AOC59-SS09**

| Metal | Parent, mg/kg | FD, mg/kg | %RPD | Criteria, %RPD |
|---|---|---|---|---|
| Lead | 26.18 | 26.17 | 0 | ≤ 20 |

**AOC45-SS16**

| Metal | Parent, mg/kg | FD, mg/kg | %RPD | Criteria, %RPD |
|---|---|---|---|---|
| Lead | 16.61 | 15.06 | 9.8 | ≤ 20 |

**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.
- The dilution test (DT) was performed with sample AOC58-BOT01 from SDG 64465. Since none of samples in this SDG were collected from AOC58, therefore, the DT result was not evaluated.

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

# APPENDIX E

## ProUCL Calculation for Lead in AOC-59 Soils

## General UCL Statistics for Full Data Sets

Number of Bootstrap Operations 2000

**Lead**

### General Statistics

Number of Valid Observations 13 | Number of Distinct Observations 13

| Raw Statistics | | Log-transformed Statistics | |
|---|---|---|---|
| Minimum | 9.48 | Minimum of Log Data | 2.249 |
| Maximum | 131.5 | Maximum of Log Data | 4.879 |
| Mean | 40.32 | Mean of log Data | 3.425 |
| Median | 26.18 | SD of log Data | 0.73 |
| SD | 35.29 | | |
| Std. Error of Mean | 9.788 | | |
| Coefficient of Variation | 0.875 | | |
| Skewness | 1.848 | | |

### Relevant UCL Statistics

| Normal Distribution Test | | Lognormal Distribution Test | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.754 | Shapiro Wilk Test Statistic | 0.94 |
| Shapiro Wilk Critical Value | 0.866 | Shapiro Wilk Critical Value | 0.866 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| **Assuming Normal Distribution** | | **Assuming Lognormal Distribution** | |
| 95% Student's-t UCL | 57.76 | 95% H-UCL | 66.7 |
| **95% UCLs (Adjusted for Skewness)** | | 95% Chebyshev (MVUE) UCL | 75.37 |
| 95% Adjusted-CLT UCL (Chen-1995) | 61.78 | 97.5% Chebyshev (MVUE) UCL | 91.05 |
| 95% Modified-t UCL (Johnson-1978) | 58.6 | 99% Chebyshev (MVUE) UCL | 121.9 |
| **Gamma Distribution Test** | | **Data Distribution** | |
| k star (bias corrected) | 1.585 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 25.44 | | |
| MLE of Mean | 40.32 | | |
| MLE of Standard Deviation | 32.03 | | |
| nu star | 41.2 | | |
| Approximate Chi Square Value (.05) | 27.49 | **Nonparametric Statistics** | |
| Adjusted Level of Significance | 0.0301 | 95% CLT UCL | 56.42 |
| Adjusted Chi Square Value | 25.9 | 95% Jackknife UCL | 57.76 |
| | | 95% Standard Bootstrap UCL | 55.76 |
| Anderson-Darling Test Statistic | 0.715 | 95% Bootstrap-t UCL | 77.74 |
| Anderson-Darling 5% Critical Value | 0.743 | 95% Hall's Bootstrap UCL | 76.47 |
| Kolmogorov-Smirnov Test Statistic | 0.233 | 95% Percentile Bootstrap UCL | 57.56 |
| Kolmogorov-Smirnov 5% Critical Value | 0.239 | 95% BCA Bootstrap UCL | 61.78 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 82.98 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 101.4 |
| **Assuming Gamma Distribution** | | 99% Chebyshev(Mean, Sd) UCL | 137.7 |
| 95% Approximate Gamma UCL | 60.43 | | |
| 95% Adjusted Gamma UCL | 64.13 | | |
| **Potential UCL to Use** | | Use 95% Approximate Gamma UCL | 60.43 |

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.

# APPENDIX F

## 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 Engineeriong 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 !