

RELEASE INVESTIGATION REPORT

SOLID WASTE MANAGEMENT UNIT B-15/16 CAMP STANLEY STORAGE ACTIVITY



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EXECUTIVE SUMMARY

Solid Waste Management Unit (SWMU) B-15/16 was used as a landfill area for the disposal of target vehicles and weapons mounts. Between February 2010 and March 2011, waste material from the trenches and soil containing contaminants above Tier 1 Protective Concentration Levels (PCLs) was removed and properly disposed. SWMU B-15/16 is located in the East Pasture, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas. The site lies approximately 150 feet north of the CSSA/Camp Bullis boundary fence, and covers approximately 3.3 acres. This Release Investigation Report (RIR) requests No Further Action (NFA) at SWMU B-15/16.

In summary, activities at SWMU B-15/16 as described in this RIR showed the following results:

- One round of excavation, removal, and confirmation sampling was performed at SWMU B-15/16.
- Contaminants of concern (COCs) identified above soil background concentrations at SWMU B-15/16 were barium, chromium, copper, and zinc. Areas of metals contamination exceeding Tier 1 PCLs have been excavated and removed from the site; confirmation sampling has shown no remaining metals concentrations above residential Tier 1 PCLs.

From the information summarized above and presented in this report, the results of the investigations at SWMU B-15/16 meet the three criteria as described in Texas Commission on Environmental Quality (TCEQ) (2003) guidance *Determining Which Releases are Subject to the Texas Risk Reduction Program (TRRP)*. Thus, the following criteria were met:

- Concentrations of chemicals in soil samples do not exceed Tier 1 residential soil PCLs. Soils found to have metal concentrations above their respective PCLs were excavated and removed from the site.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at SWMU B-15/16. Inorganic groundwater contamination has not been reported in the closest well to SWMU B-15/16 (well CS-1 located approximately 965 feet downgradient). Since soils that were found to have concentrations of metals above their PCLs were excavated and removed, there will be no impact to groundwater, surface water, or sediment from SWMU B-15/16.
- SWMU B-15/16 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, SWMU B-15/16 is not subject to TRRP. Therefore, this RIR was prepared to document the results and a NFA decision is requested from the TCEQ.

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ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
AOC	Area of Concern
APPL	Agriculture & Priority Pollutants Laboratory, Inc.
BCVI	Black-capped vireo
BOT	bottom (sample)
BS	Bexar Shale
CC	Cow Creek
COC	contaminant of concern
CSSA	Camp Stanley Storage Activity
CY	cubic yard
DQO	Data Quality Objective
EE	Environmental Encyclopedia
FD	field duplicate
FSP	Field Sampling Plan
GCWA	Golden-cheeked warbler
^{GW} Soil _{Ing}	Soil to groundwater ingestion pathway (PCL)
IM	Interim Measures
LGR	Lower Glen Rose
MCL	Maximum Contaminant Level
MD	munitions debris
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MQL	method quantitation 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
SW	Sidewall (sample)
SWMU	Solid Waste Management Unit

TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TCLP	toxicity characteristic leaching procedure
^{Tot} Soil _{Comb}	combined soil (PCL)
TPH	total petroleum hydrocarbon
TRRP	Texas Risk Reduction Program
UGR	Upper Glen Rose
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UXO	unexploded ordnance
VOC	volatile organic compound
WMI	Waste Management, Inc.
WMP	Waste Management Plan

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 Solid Waste Management Unit (SWMU) B-15/16 (**Figure 2**). SWMU B-15/16 is located in the East Pasture, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas. The site covers approximately 3.3 acres. This work was performed in accordance with requirements of the Resource Conservation and Recovery Act (RCRA) 3008(h) Order in effect for CSSA and in accordance with 30 Texas Administrative Code (TAC) §350, the Texas Risk Reduction Program (TRRP) of the Texas Commission on Environmental Quality (TCEQ). This RIR was prepared following TCEQ reporting and documentation requirements for releases that do not trigger applicability to the TRRP rule.

This report describes environmental investigation activities at SWMU B-15/16. Work included 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 SWMU B-15/16. Section 3 describes the objectives and rationale for preparing an RIR for SWMU B-15/16 and the findings from environmental investigations for the site. The groundwater and surface water for CSSA and the area near SWMU B-15/16 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 12 through 19). References cited in this report can be found in the CSSA Environmental Encyclopedia (EE) (**Volume 1-1, Bibliography**) www.stanley.army.mil.

2.0 HISTORICAL BACKGROUND

2.1 CAMP STANLEY STORAGE ACTIVITY

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

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

In October 1917, the installation was re-designated Camp Stanley. Extensive construction was started during World War I to provide housing for temporary cantonments and support facilities. In 1931, the installation was selected as an ammunition depot, and construction of standard magazines and igloo magazines began in 1938. Land was also used to test, fire and overhaul ammunition components. As a result of these historic activities, CSSA has several historical waste sites, including SWMU, areas of concern (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 SWMU B-15/16

2.2.1 Overview

In 1993, SWMU B-15 was observed in the field to be an area of settled soil and stressed vegetation. Also during this year, a field survey of SWMU B-16 indicated two trenches in which metal objects were visible on the surface partly covered by soil that had settled into the trenches. During subsequent geophysical surveys, it was decided that the two SWMUs were actually one unit consisting of two large rectangular areas of settled soil and stressed vegetation.

According to interviews and records, both SWMU B-15 and B-16 were used as solid waste landfill areas used for the disposal of target vehicles and weapons mounts. Visible metal debris, including vehicle parts, was present in the landfill areas. Investigation of the site began in 1995 with a geophysical survey, and soil samples were collected in 2000. Results of these previous investigations are provided in Section 2.2.4.

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 sites are shown on **Figure 3** and photographs showing investigation, excavation, and removal activities at the sites are provided in **Appendix A**. The history of the sites and previous investigations at the sites are discussed below.

2.2.2 Setting, Size, and Description

SWMU B-15/16 is located in the East Pasture, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas. The site lies approximately 150 feet north of the CSSA/Camp Bullis southern boundary fence. SWMU B-15/16 covers approximately 3.3 acres. Prior to the excavation activities described herein, the area was open and covered by grass both inside and outside of the trenches. Some low brush had grown up in areas around the site. Oak trees dot the western and northwestern edges of the site. Salado Creek, an intermittent stream bed, bounds the site to the west, while a dirt access road bounds the site on the east.

Three large trenches originally trended from east to west across the site. Prior to excavating, the original dimensions of Trench 1 (northernmost) were estimated to be 300 feet long and 20 feet wide, and Trenches 2 and 3 were estimated to be approximately 200 feet long and 40 feet wide. Large mounds of dirt were located at each end of the southern trench and were assumed to be from its original excavation. Each mound was approximately eight feet tall with a base diameter of approximately 50 feet. Two shorter dirt mounds were observed north of the northern trench. Additional background information on SWMU B-15/16 can be found in [CSSA EE, Volume 3-1](#).

2.2.4 Potential Contaminant Sources and Chemicals of Concern

Surface geophysical surveys were conducted in the northern portion of the site in 1995 and 1999. These surveys did not include the two southern trenches. Only the 1995 survey included the northern trench. The surveys did identify a linear feature to the north of the site, but this was determined to likely be associated with a historic utility line. A buried utility junction vault (**Photo 6, Appendix A**) was found during the most recent investigation that is in line with the linear feature (**Figure 4**). This vault box appeared to have utility conduit leading into it from two different directions which correspond with the linear anomalies identified in the area during the 1995 geophysical survey. The northernmost of the three anomalies was found to converge with the approximate north-south trending linear anomaly in AOC-48 (delisted in November 2004 and shown Figure 2). Further ground-penetrating radar investigation of the northern portion of SWMU B-15/16 and southern portion of AOC-48, as described in the RFI for AOC-48, indicated that the remaining northern portion of the site had no evidence of waste management activities ([CSSA EE, Volume 3-2, AOC-48 RFI and Delisting Reports](#)). All remaining anomalies at SWMU B-15/16 identified in previous investigations were investigated using a Schoenstadt prior to the excavation and waste management activities described in Section 3.1 of this RIR.

A soil gas survey conducted in 1995 detected no significant concentrations of volatile organic compounds (VOCs). In 2000, nine soil borings were advanced adjacent to the known trenches and 13 soil samples were collected for VOCs, metals, and explosives analyses. Sampling results indicated concentrations of analytes only slightly exceeded the background levels for several metal analytes (barium, chromium, copper, nickel, and zinc) and one VOC analyte (methylene chloride). The results of this sampling effort were discussed in detail in a RCRA Facility Investigation Report (RFI) ([CSSA EE, Volume 3-1](#)). In summary, COCs were detected slightly above background levels in 6 of the 13 soil samples. The maximum concentrations detected in surface soil samples in 2000 are shown in **Table 1**.

In February 2010, excavation of the material in the trenches was initiated. The northern trench was excavated and a large amount of waste and recyclable materials were encountered, including an empty drum labeled “perchloroethylene,” numerous munitions debris items, metal scrap, scrap from target vehicles (including tires), and other debris (see Section 3.1.2.1). The northernmost trench was excavated in its entirety. Due to the clayey nature of the soil, and the numerous munitions debris items in the excavated waste, additional efforts to certify that the

excavated material contained no munitions and explosives of concern (MEC) were required. Excavation work was resumed after work scope changes and funding issues were resolved.

Soil samples collected during the 2010 effort indicated no COCs were identified above TRRP Tier 1 residential soil criteria.

3.0 OBJECTIVES OF RIR FOR SWMU B-15/16

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

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

When these three criteria are met for a site, the release is not subject to TRRP. For such sites, an RIR can be submitted to document the results and an NFA decision can be requested from the TCEQ.

As referred to in the criteria listed above, the Tier 1 residential soil action levels are provided by TCEQ and were selected following TCEQ guidance (TCEQ, 2007). The most current action levels were used (March 2010). These action levels are referred to as protective concentration levels (PCL) and are selected for each chemical detected at the site (i.e., COCs). The PCLs are based on the general size of the site, which is also referred to as the “source area” size. If the source area is greater than 0.5 acre, then the source area is assumed to be 30 acres. Thus, the soil action levels for SWMU B-15/16 are based on a 30-acre source area. The PCL is then selected based on the lower of the two PCLs listed for either (1) the total soil combined pathway ($T^{ot}Soil_{Comb}$) (i.e., exposure to a COC from incidental ingestion, dermal contact, inhalation of volatiles and particulates, and vegetable consumption); or (2) the soil to groundwater pathway ($^{GW}Soil_{Ing}$) (i.e., soil-to-groundwater leaching of a COC to groundwater, where the PCL is the highest concentration of COC allowed in soil to be protective of Class 1 or Class 2 groundwater).

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

for four of the nine metals are based on the background concentrations (these four metals are arsenic, cadmium, lead, and mercury).

3.1 FIELD ACTIVITIES AND INVESTIGATIONS

A summary of the cleanup confirmation results at the sites are shown in Table 2 (detected compounds only) and **Appendix C** (all analytes), and the confirmation soil sampling locations are shown on **Figure 5**. Analytical results for samples collected from stockpiled soil excavated as part of this effort are shown in **Appendix F**. The soil stockpiles at the ends of the trenches described in the RFI Report were also sampled along with the newly excavated soil, and used as backfill following the excavation. As shown on Figure 5, excavation at the sites occurred within the boundaries of SWMU B-15/16.

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 at [CSSA EE, Volume 1-4](#). 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 at [CSSA EE, Volume 1-1, Correspondence](#).

Following the CSSA-specific plans, the investigative soil analyses for SWMU B-15/16 were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 8260B (VOCs); Method 8270C (semi-volatile organic compounds [SVOCs]); Method 8081 (pesticides); Method 8151A (herbicides); and Method 6010 (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc). Prior to soil/waste disposal, waste characterization samples were collected from the excavated material and analyzed for toxicity characteristic leaching procedure (TCLP) metals (Methods SW1311/6010B and SW1311/7470A) and total petroleum hydrocarbons (TPH) (Method TX1005). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analyses.

3.1.2 SWMU B-15/16 Sampling, Excavation, and Removal Activities

As stated above, the list of the analytical results for soils remaining at the site is provided in Table 2. The data verification summary report for the sampling and analytical results is provided in **Appendix D**. Sample locations for soils remaining at the site are shown on Figure 5. The clearance areas where soils were excavated and removed are also shown on Figure 5. Waste characterization sampling and off-post removal activities are described in Section 3.1.2.2. Additional information about past activities and investigations at the sites can be found in the [CSSA EE \(Volume 3, SWMU B-15/16\)](#). Photos 1 through 9 in Appendix A show the excavation, removal, and confirmation sampling activities for SWMU B-15/16.

3.1.2.1 Excavation, Removal, and Confirmation Sampling at SWMU B-15/16

Excavation activities at SWMU B-15/16 were initiated on February 1, 2010 to remove the contents of three trenches located at the site. The northernmost trench was excavated first while two unexploded ordnance (UXO) technicians performed inspections on the excavated material as it was stockpiled. The project was halted in April 2010 due to funding constraints and re-mobilized in January 2011 with additional equipment and personnel.

Once all three trenches were excavated (**Photo 2, Appendix A**) and materials were placed into stockpiles, an excavator was used to remove larger metal debris from the soil matrix. After the excavator had worked through the stockpiles, a front end loader was used to spread out the material in 2-3 inch layers in the inspection area. UXO technicians, assisted by laborers, handpicked foreign debris from the soil matrix (**Photo 3, Appendix A**). When munitions items were (MD) observed during this effort a UXO technician would identify it as MEC or MD, certify it as inert (if appropriate), and place it in a secure area. No MEC was found in any of the trenches. All MD was segregated from other metal debris, removed from the site, and stored at CSSA in temporary storage containers (Conex) for future management at the discretion of CSSA (e.g., disposal, de-milling, or recycling). All MD removed from the trenches during this effort is listed in **Appendix E**.

Trench 1 (northernmost trench) was excavated to approximately 320 feet long, 12 feet wide, and varied in depth from 8 to 10 feet. In February 2010, excavation of Trench 1 was initiated, and a large amount of waste and recyclable materials were encountered, including an empty drum labeled “perchloroethylene” (**Photo 4, Appendix A**) numerous munitions debris items, metal scrap, scrap from target vehicles (including tires), other miscellaneous debris, and a small amount of asbestos-containing material (ACM) in the form of Transite pipe. The Transite pipe pieces were classified as non-friable, placed in one 55-gallon drum, and managed with the Class 2 Non-hazardous waste material removed from SWMU B-15/16.

This trench contained most of the waste found during this removal effort including: a pickup truck frame that appeared to have been used for target practice (**Photo 5, Appendix A**), numerous pieces of cast iron plumbing pipe, concrete construction debris, an assortment of tires, miscellaneous metal debris, and 80 cubic yards (CY) of styrofoam trash. An electrical vault box (**Photo 6, Appendix A** and shown on Figure 5) located approximately 60 feet northwest of the northwest corner of Trench 1 was discovered in a Schoenstadt sweep of the area. It is assumed that this vault housed electrical equipment used to control targets. The vault was left in place

and the area was backfilled. MD related to flares, 3-inch Stokes mortars, 75mm projectile casings, grenades, and rocket-propelled grenade items were found. These were inspected, verified, and certified to be free of explosive hazards, and then placed in a secure area pending disposal. The remaining soils, debris, and trash were disposed of as described in Section 3.1.2.2. Based on the dimensions of Trench 1, a total of approximately 1,772 CY of soil and waste were excavated.

One sample was collected at the location where the empty drum labeled “perchloroethylene,” was found (B1516-NT-BOT5, Table 2). Analytical results for that sample showed zinc levels in excess of the TCEQ ecological benchmark concentration of 156 mg/kg. No other metals were detected in confirmation samples above background, and there were no detections of VOCs, petroleum hydrocarbons, pesticides, or herbicides. Even though the zinc concentration at B1516-NT-BOT did not exceed the Tier 1 PCL, a conservative approach was taken. The location was excavated an additional 1-2 inches deeper, resampled, and analyzed for zinc (B1516-T1-BOT06, Table 2). The analytical results for the new sample showed a zinc concentration (8.9 mg/kg) below the CSSA background concentration of 73.2 mg/kg.

Trench 2 was excavated to approximately 220 feet long, 12 feet wide, and varied in depth from 8 to 10 feet. This trench contained machine gun barrels (**Photo 7, Appendix A**), live and expended small arms cartridge casings (.38-.50 caliber), miscellaneous metal debris, and approximately 200 CY of material containing asphalt shingles and other construction-type debris. The construction debris material was segregated from the rest of the stockpiled material and characterized for non-hazardous disposal at Covel Gardens Landfill in San Antonio, TX. The remaining soils, debris, and trash were disposed of as described in Section 3.1.2.2. Based on the dimensions of Trench 2, a total of approximately 1,173 CY of soil and waste were excavated.

Trench 3 was excavated to approximately 185 feet long, 12 feet wide, and varied in depth from 8 to 10 feet. This trench contained three large gun turrets, long rifle barrels (Photo 7, Appendix A), machine gun parts and barrels, and an assortment of metal debris. The long barrel rifle barrels and machine gun barrels were stored in a secure area pending disposal. The remaining soils, debris, and trash were disposed of as described in Section 3.1.2.2. Based on the dimensions of Trench 3, approximately 986 CY of soil and waste were excavated.

Following completion of the excavation effort all trench bottoms and sidewalls were sampled (**Photo 8, Appendix A**) and the results are shown in Table 2.

3.1.2.2 Waste Characterization and Off-Post Disposal Activities

Waste characterization efforts were performed in accordance with requirements of CSSA’s *RFI and Interim Measures (IM) Waste Management Plan (WMP) – Revised*, dated May 2006 (approved by TCEQ in August 2006) and the RIF/IM WMP Addendum for SWMU B-15/16, dated December 2010. Waste characterization sample results for excavated soils are included in Appendix F.

Results of waste characterization showed that the impacted media from SWMU B-15/16 met State of Texas Class 2 non-hazardous criteria (30 TAC §335 Subchapter R). Approximately 400 CY (274,640 pounds) of miscellaneous metal debris were sent for recycling to Monterrey Iron

and Metal Company in San Antonio, Texas. In addition, the 80 CY of Styrofoam were bagged and sent to the landfill as municipal trash. The remaining 160 CY of Class 2 non-hazardous soils were transported and disposed off-post at Waste Management, Inc. (WMI), Covell Gardens Landfill in San Antonio, Texas. The soil disposed of at Covell Gardens is represented by sample B1516-WC05 in Appendix F. The waste manifests and profile data, including the waste analytical results, are kept on file at the CSSA Environmental Office. Approximately 3,360 CY of non-impacted soils remaining at the site were sampled, analyzed by the lab to confirm they did not exceed Tier 1 PCLs or background metals concentrations, and used as trench backfill. Analytical waste characterization results for these soils are shown in Appendix F. The excavated trenches were backfilled and graded to provide a gentler slope into the depressions which will be planted with native grass and wildflower seeds (**Photo 9, Appendix A**).

3.2 SITE GEOLOGY/HYDROGEOLOGY

Based on the sampling results and the geological and hydrogeological characteristics of the site, surface water and groundwater have not been affected by historical activities at SWMU B-15/16. 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 feet 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 feet 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 foot ([CSSA EE, Volume 3-1, RFI](#)). 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 SWMU B-15/16 Groundwater and Surface Water

No site-specific information regarding groundwater is available. However, between October 1992 and June 2010, measured water levels at Well CS-1, which is located approximately 965 feet south of the site (Figure 2), have ranged from 65.5 feet below top of casing (ft BTOC) (December 2004) to 355.9 ft BTOC (December 2006). Well CS-1 is a supply well that is monitored quarterly. Over the past 16 years, there have been samples collected from CS-1. Lead has been sporadically detected slightly above the action level (0.015 milligrams per liter [mg/L]) on four occasions (December 1996, January 1996, March 1996, and March 2000) at concentrations ranging from 0.015 mg/L to 0.023 mg/L. No pattern in the lead detections has been identified, and given that no lead was detected above background at SWMU B-15/16, it is very unlikely that this site is the source of those lead detections. No other analytes have exceeded action levels or Maximum Contaminant Levels (MCLs). Sporadic low-level tetrachloroethene (PCE) detections at CS-1 are associated with the SWMU B-3 plume.

Surface waters drain to the west into Salado Creek which runs along the western portion of the SWMU (Figure 6). The north-south trending creek exits the CSSA boundary approximately 400 feet south-southeast of the site. Samples were not collected from this intermittent creek because, other than immediately after a rain even, remained dry throughout the removal action. Furthermore, no contamination is likely due to the lack of COCs above background or PCLs at the site itself.

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 SWMU B-15/16. Thus, based on the absence of any complete or significant ecological exposure pathways, SWMU B-15/16 may be excluded from further ecological assessment.

5.0 SUMMARY AND RECOMMENDATIONS

SWMU B-15/16 is located in the East Pasture, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas. The site lies approximately 150 feet north of the CSSA/Camp Bullis southern boundary fence. SWMU B-15/16 covers approximately 3.3 acres of disturbed soil and partially open trenches. Three large trenches originally trended from

east to west across the site. One of them was approximately 300 feet long and 20 feet wide and the other two were approximately 200 feet long and 40 feet wide.

In summary, activities at SWMU B-15/16 as described in this RIR showed the following results:

- One round of excavation, removal, and confirmation sampling was performed at SWMU B-15/16.
- COCs initially identified above soil background concentrations at SWMU B-15/16 were barium, chromium, copper, and zinc. Areas of metals contamination exceeding Tier 1 PCLs have been excavated and removed from the site; confirmation sampling has shown no remaining metals concentrations above Tier 1 PCLs.
- Over 640 CY of waste materials in three trenches were excavated, inspected for MEC, and properly disposed of.
- Confirmation samples were collected from trench bottoms and sidewalls to confirm all waste had been removed.

From the information summarized above and presented in this report, the results of the investigations at SWMU B-15/16 meet the three criteria as described in TCEQ (2003) guidance *Determining Which Releases are Subject to the Texas Risk Reduction Program (TRRP)*. Thus, the following criteria were met:

- Concentrations of chemicals in soil samples do not exceed Tier 1 residential soil action levels. Soils found to have metal concentrations above their respective PCLs were excavated and removed from the site.
- SWMU B-15/16 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).
- COC concentrations remaining in soil at SWMU B-15/16 were all below Tier 1 residential PCLs, which are protective of groundwater; therefore, no other media (surface water, sediment, or groundwater) have been affected, nor will be affected in the future, by the site.

Because these three criteria are met, SWMU B-15/16 is not subject to TRRP. Therefore, this RIR was prepared to document the results and a NFA decision is requested from the TCEQ.

TABLES AND FIGURES

Table 1 – Comparison of Maximum Detected Concentrations (March 2000) to CSSA Background Concentration Values

Analyte	Background Concentration (mg/kg) ^{a/}	Maximum Detected Concentration (mg/kg)
Barium	186	103.88 M ^{b/}
Chromium	40.2	22.7
Copper	23.2	28.02 J ^{c/}
Nickel	35.5	16.7
Zinc	73.2	42.46 J

^{a/} mg/kg = milligrams per kilogram

^{b/} M = A matrix effect was present.

^{c/} The analyte was positively identified, however the quantitation is an estimation.

Table 2. Summary of Chemical Constituents Remaining in Soils at SWMU B-15/16

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†] Residential		TCEQ-Approved CSSA Background Metal Concentrations ^{††} mg/kg	Sample Locations											
		Source Area 30 acre			B1516-NT-BOT05	B1516-T1-BOT06	B1516-T2-BOT01	B1516-T2-BOT01-Dup	B1516-T2-BOT02	B1516-T2-SW01	B1516-T2-SW02	B1516-T2-SW03	B1516-T2-SW04			
		Soil mg/kg	Soil mg/kg		11-Mar-2010 mg/kg	13-Jan-2011 mg/kg										
Inorganic Metals		[1]	[2]	[3]	EXCAVATED	RESAMPLE OF BOT05										
Arsenic	7440-38-2	24.2 n	2.5 m >S	19.6	3.7 F 1	--	2.9 F 1	4.0 F 1	1.5 F 1	5.1 F 1	3.1 F 1	5.1 F 1	4.3 F 1			
Barium	7440-39-3	7840.5 n	221.9 m >S	186	90 U 1	--	46 J 1	82 J 1	27 J 1	80 J 1	48 J 1	110 J 1	66 J 1			
Cadmium	7440-43-9	52.4 n	0.8 m >S	3.0	0.73 U 1	--	0.030 U 1	0.030 U 1	0.030 U 1	0.060 F 1	0.030 U 1	0.040 F 1	0.030 U 1			
Chromium	7440-47-3	23053.9 n	1200.1 m >S	40.2	18 F 1	--	7.3 F 1	7.8 F 1	5.1 F 1	20 F 1	9.8 F 1	19 F 1	9.9 F 1			
Copper	7440-50-8	547.6 n	521.2 a >S	23.2	8.6 F 1	--	2.1 J 1	3.4 J 1	1.5 F 1	12 J 1	1.8 F 1	6.0 F 1	3.2 F 1			
Lead	7439-92-1	500.0 n	1.5 a >S	84.5	12 F 1	--	5.2 F 1	9.8 F 1	3.2 F 1	10 F 1	5.0 F 1	11 F 1	7.4 F 1			
Mercury	7439-97-6	2.1 n	0.0 m	0.8	0.0100 U 1	--	0.0100 U 1	0.0100 U 1	0.0100 U 1	0.030 F 1	0.0100 U 1	0.0100 U 1	0.0100 U 1			
Nickel	7440-02-0	832.1 n	78.7 n >S	35.50	13 U 1	--	12 J 1	22 J 1	6.6 J 1	13 J 1	7.5 J 1	17 J 1	10 J 1			
Zinc	7440-66-6	9921.5 n	1180.2 n >S	73.2	220 U 1	8.9 U 1	15 J 1	12 J 1	7.6 J 1	31 J 1	12 J 1	27 J 1	14 J 1			

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†] Residential		TCEQ-Approved CSSA Background Metal Concentrations ^{††} mg/kg	Sample Locations									
		Source Area 30 acre			B1516-T3-BOT01	B1516-T3-SW01	B1516-T3-SW02	B1516-T3-SW02-Dup	B15-MDDL TRNCH	B15-NORTH TRNCH	B15-SOUTH TRNCH	B15-NT-BOT01	B15-NT-BOT02	
		Soil mg/kg	Soil mg/kg		13-Jan-2011 mg/kg	13-Jan-2011 mg/kg	13-Jan-2011 mg/kg	13-Jan-2011 mg/kg	4-Mar-2010 mg/kg	4-Mar-2010 mg/kg	4-Mar-2010 mg/kg	11-Mar-2010 mg/kg	11-Mar-2010 mg/kg	
Inorganic Metals		[1]	[2]	[3]										
Arsenic	7440-38-2	24.2 n	2.5 m >S	19.6	3.7 F 1	4.0 F 1	4.0 F 1	3.5 F 1	4.4 F 1	4.8 F 1	4.4 F 1	3.2 F 1	2.4 F 1	
Barium	7440-39-3	7840.5 n	221.9 m >S	186	43 U 1	120 U 1	62 U 1	68 U 1	78 J 1	84 J 1	76 J 1	78 J 1	73 J 1	
Cadmium	7440-43-9	52.4 n	0.8 m >S	3.0	0.030 U 1	0.030 U 1	0.040 F 1	0.030 U 1	0.56 F 1	0.82 F 1	0.27 F 1	0.36 F 1	0.81 F 1	
Chromium	7440-47-3	23053.9 n	1200.1 m >S	40.2	9.2 F 1	8.1 F 1	16 F 1	14 F 1	12 F 1	14 F 1	15 F 1	19 F 1	19 F 1	
Copper	7440-50-8	547.6 n	521.2 a >S	23.2	3.5 F 1	3.2 F 1	4.3 F 1	4.3 F 1	10 F 1	16 F 1	12 F 1	12 F 1	17 F 1	
Lead	7439-92-1	500.0 n	1.5 a >S	84.5	5.6 F 1	7.6 F 1	8.2 F 1	8.6 F 1	11 F 1	16 F 1	15 F 1	11 F 1	23 F 1	
Mercury	7439-97-6	2.1 n	0.0 m	0.8	0.0100 U 1	0.0100 U 1	0.0100 U 1	0.0100 U 1	0.030 U 1	0.030 U 1	0.027 F 1	0.015 F 1	0.024 F 1	
Nickel	7440-02-0	832.1 n	78.7 n >S	35.50	9.9 U 1	13 U 1	10 U 1	11 U 1	12 U 1	12 U 1	12 U 1	14 U 1	13 U 1	
Zinc	7440-66-6	9921.5 n	1180.2 n >S	73.2	13 U 1	12 U 1	21 U 1	21 U 1	71 J 1	80 J 1	22 J 1	25 J 1	97 J 1	

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†] Residential		TCEQ-Approved CSSA Background Metal Concentrations ^{††} mg/kg	Sample Locations									
		Source Area 30 acre			B15-NT-BOT03	B15-NT-BOT04	B15-NT-BOT04-Dup	B15-NT-NSW01	B15-NT-NSW02	B15-NT-SSW01	B15-NT-SSW02	B15-NT-SSW03		
		Soil mg/kg	Soil mg/kg		11-Mar-2010 mg/kg									
Inorganic Metals		[1]	[2]	[3]										
Arsenic	7440-38-2	24.2 n	2.5 m >S	19.6	1.7 F 1	4.4 F 1	5.3 F 1	1.9 F 1	4.8 F 1	1.6 F 1	2.9 F 1	2.8 F 1		
Barium	7440-39-3	7840.5 n	221.9 m >S	186	120 U 1	98 U 1	110 U 1	72 U 1	110 U 1	71 U 1	96 U 1	80 U 1		
Cadmium	7440-43-9	52.4 n	0.8 m >S	3.0	0.33 F 1	0.44 F 1	0.23 F 1	0.32 F 1	0.32 F 1	0.31 F 1	0.28 F 1	0.28 F 1		
Chromium	7440-47-3	23053.9 n	1200.1 m >S	40.2	16 F 1	21 F 1	24 F 1	15 F 1	21 F 1	18 F 1	18 F 1	20 F 1		
Copper	7440-50-8	547.6 n	521.2 a >S	23.2	9.2 F 1	9.9 F 1	11 F 1	8.6 F 1	10 F 1	10 F 1	9.6 F 1	9.5 F 1		
Lead	7439-92-1	500.0 n	1.5 a >S	84.5	11 F 1	13 F 1	14 F 1	10 F 1	14 F 1	9.6 F 1	11 F 1	10 F 1		
Mercury	7439-97-6	2.1 n	0.0 m	0.8	0.0100 U 1	0.012 F 1	0.0100 U 1	0.0100 U 1	0.0100 U 1	0.011 F 1	0.0100 U 1	0.0100 U 1		
Nickel	7440-02-0	832.1 n	78.7 n >S	35.50	12 U 1	15 U 1	17 U 1	12 U 1	18 U 1	12 U 1	12 U 1	12 U 1		
Zinc	7440-66-6	9921.5 n	1180.2 n >S	73.2	20 U 1	78 U 1	31 U 1	20 U 1	24 U 1	20 U 1	19 U 1	22 U 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 PCLs and CSSA background values coded in this table as [1, 2, 3].
 [1] ^{††}Soil_{comb} = PCL for COPC in soil for a 30 acre source area and a potential future resident (combined exposure for ingestion, dermal contact, inhalation of volatiles and particulates, and ingestion of above-ground and below-ground vegetables).
 [2] ^{††}Soil_{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.

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.
 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)

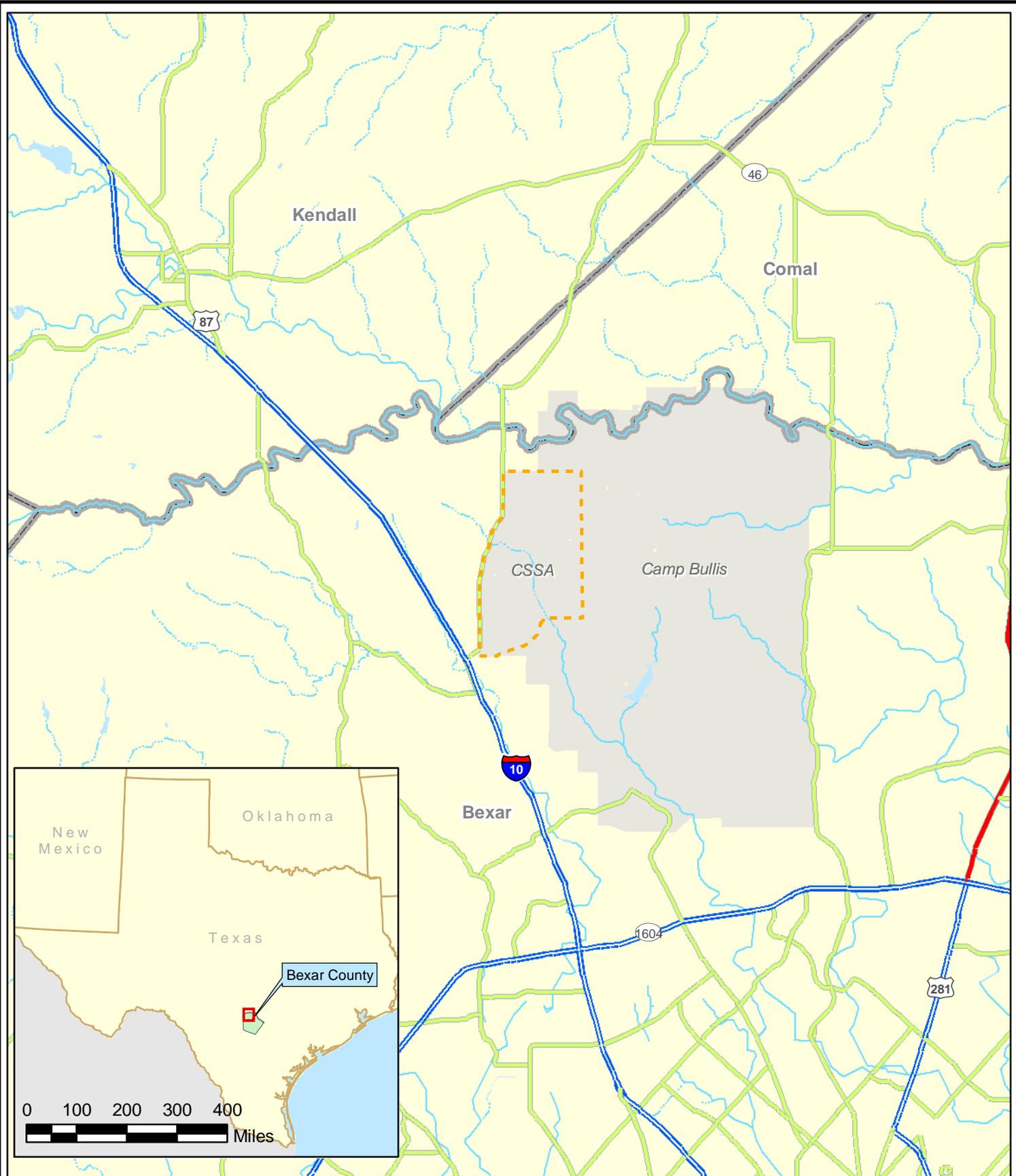


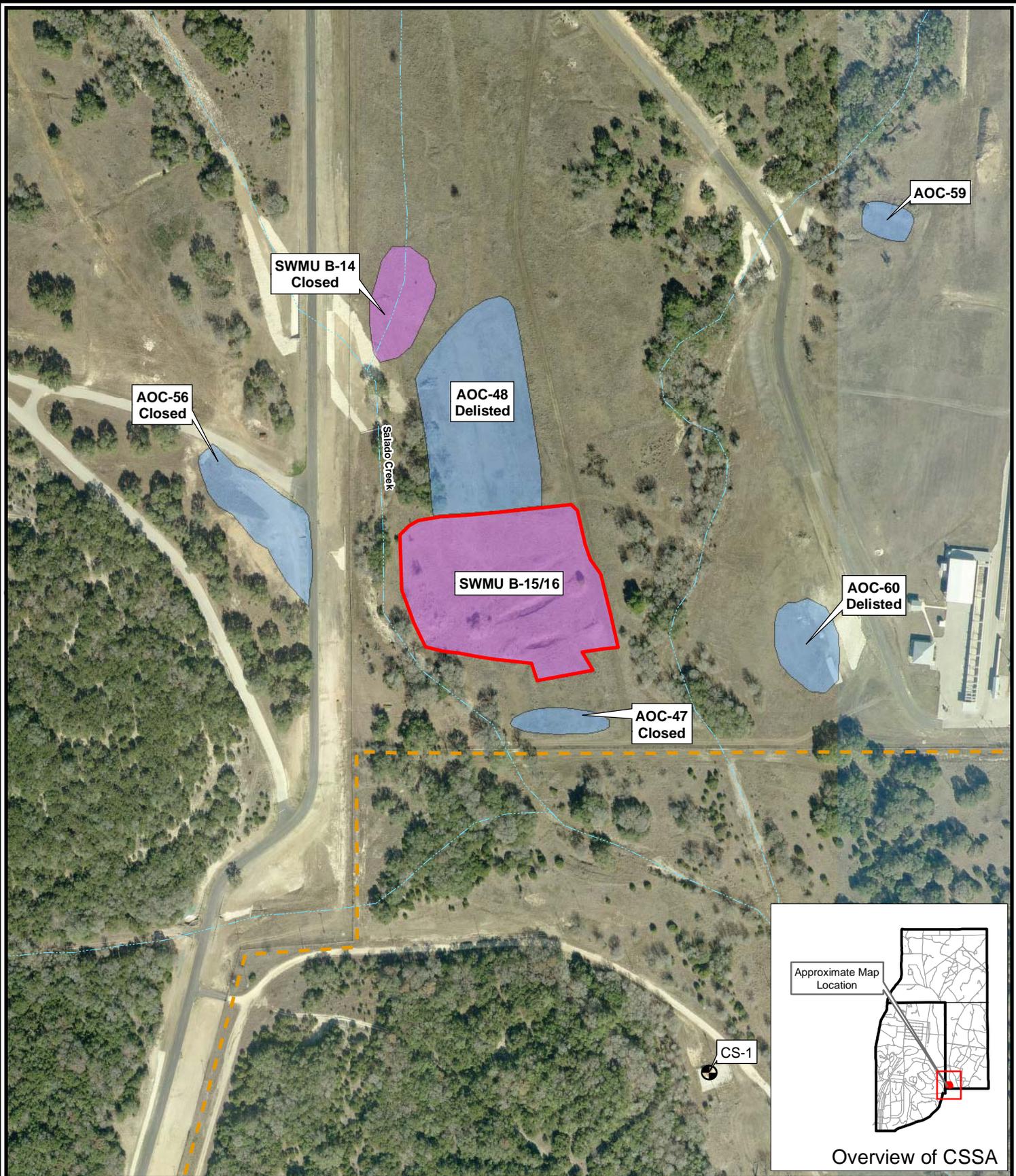
Figure 1

CSSA Location Map
Camp Stanley Storage Activity

PARSONS



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



Aerial Photo Date: 2009



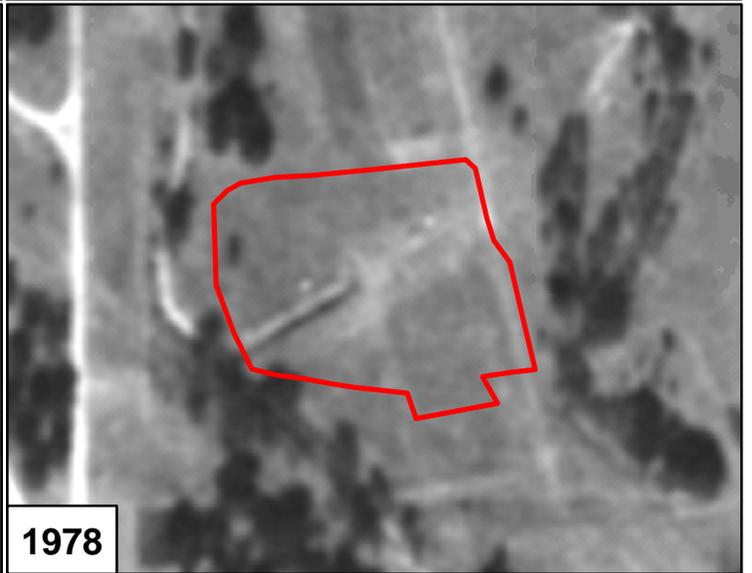
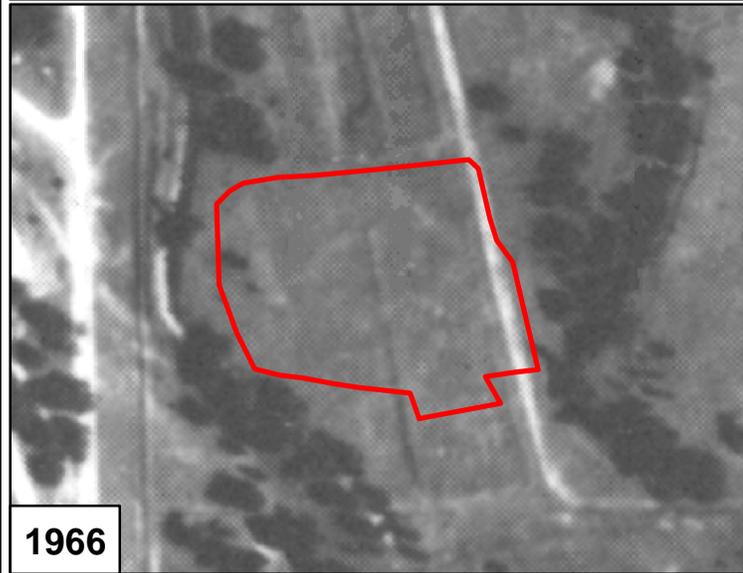
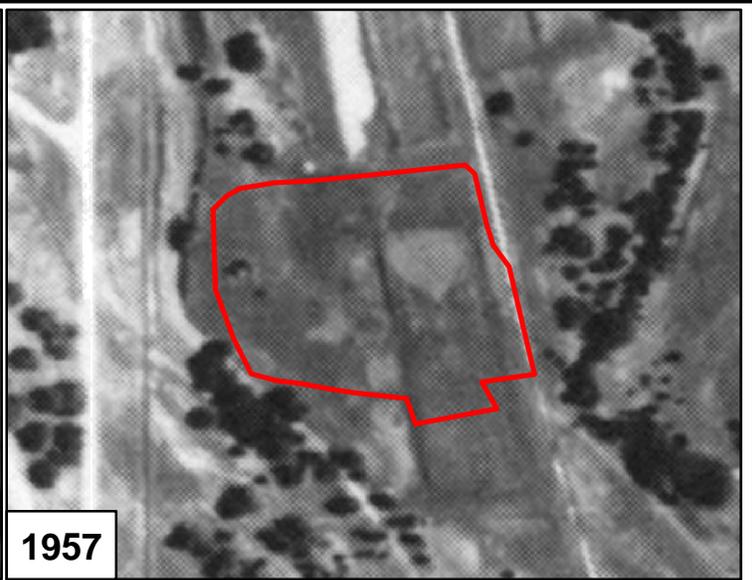
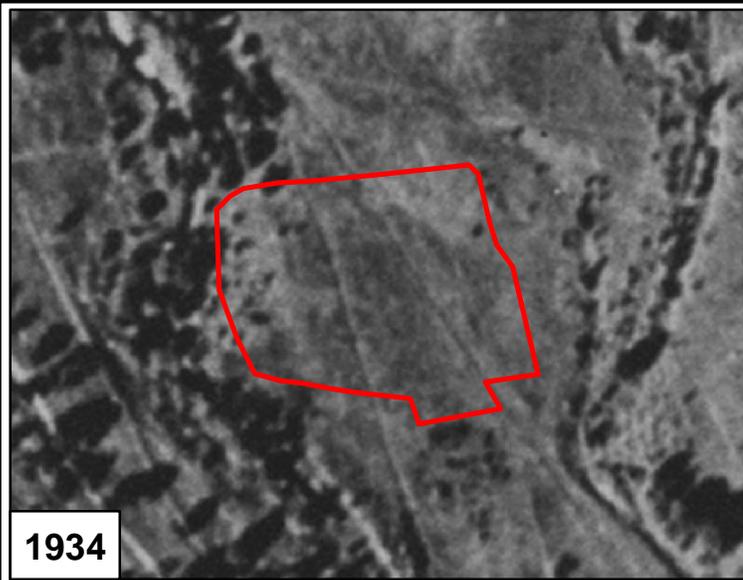
300 150 0 300 Feet

- Water Well
- SWMU B-15/16
- AOC Boundary
- SWMU Boundary
- Stream
- CSSA Outer Fence Line

Figure 2

SWMU B-15/16
Site Location Map
Camp Stanley Storage Activity

PARSONS



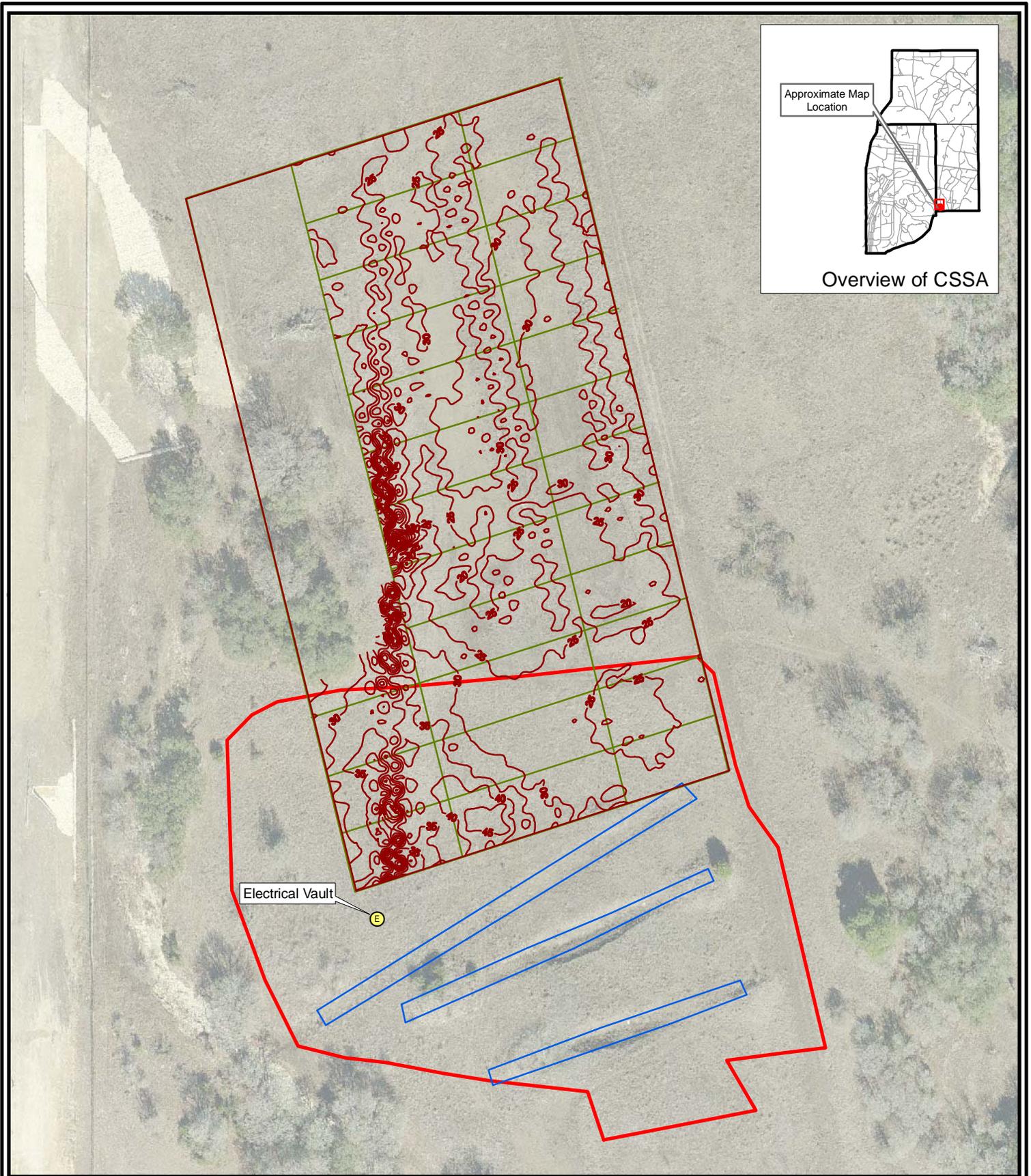
 SWMU B-15/16

0 150 300 600
Feet

Figure 3

SWMU B-15/16
Aerial Photographs
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009



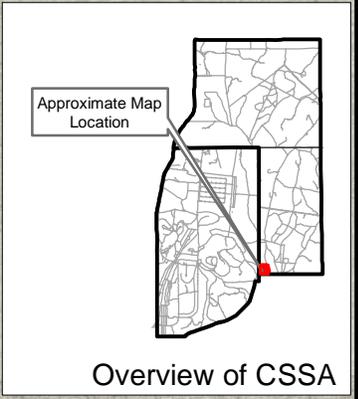
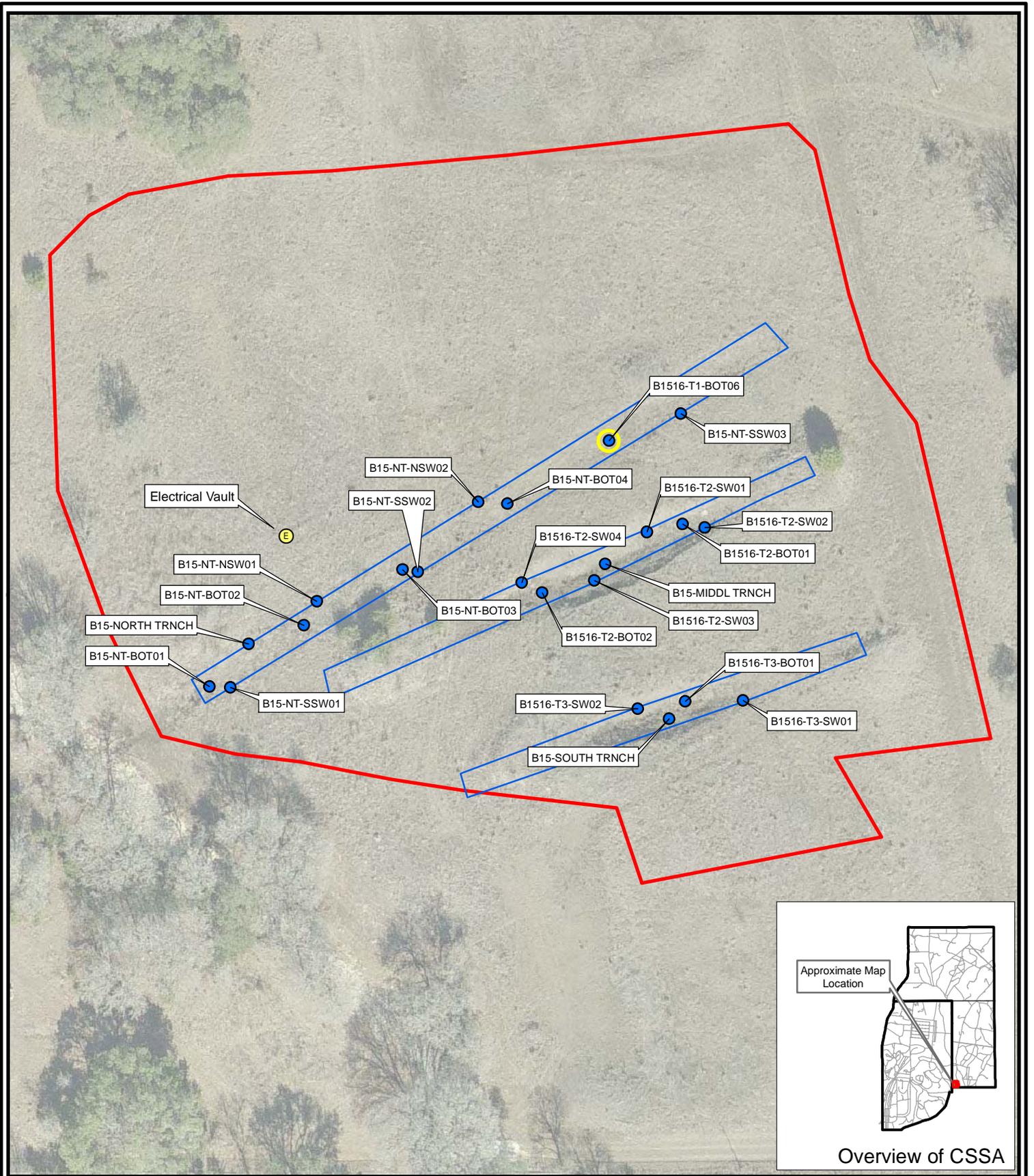
110 55 0 110 Feet

- Electrical Vault (located in 2010)
- Geophysical Survey Results (1999)
- Survey Grid
- ▭ Trench Location
- ▭ SWMU B-15/16

Figure 4

1999 Geophysical Survey at
SWMU B-15/16
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009



- Soil Sample
- ⓔ Electrical Vault
- Drum Labeled "PCE"
- Excavation Extent
- SWMU B-15/16

Figure 5

**SWMU B-15/16
Sample Locations
Camp Stanley Storage Activity**

PARSONS

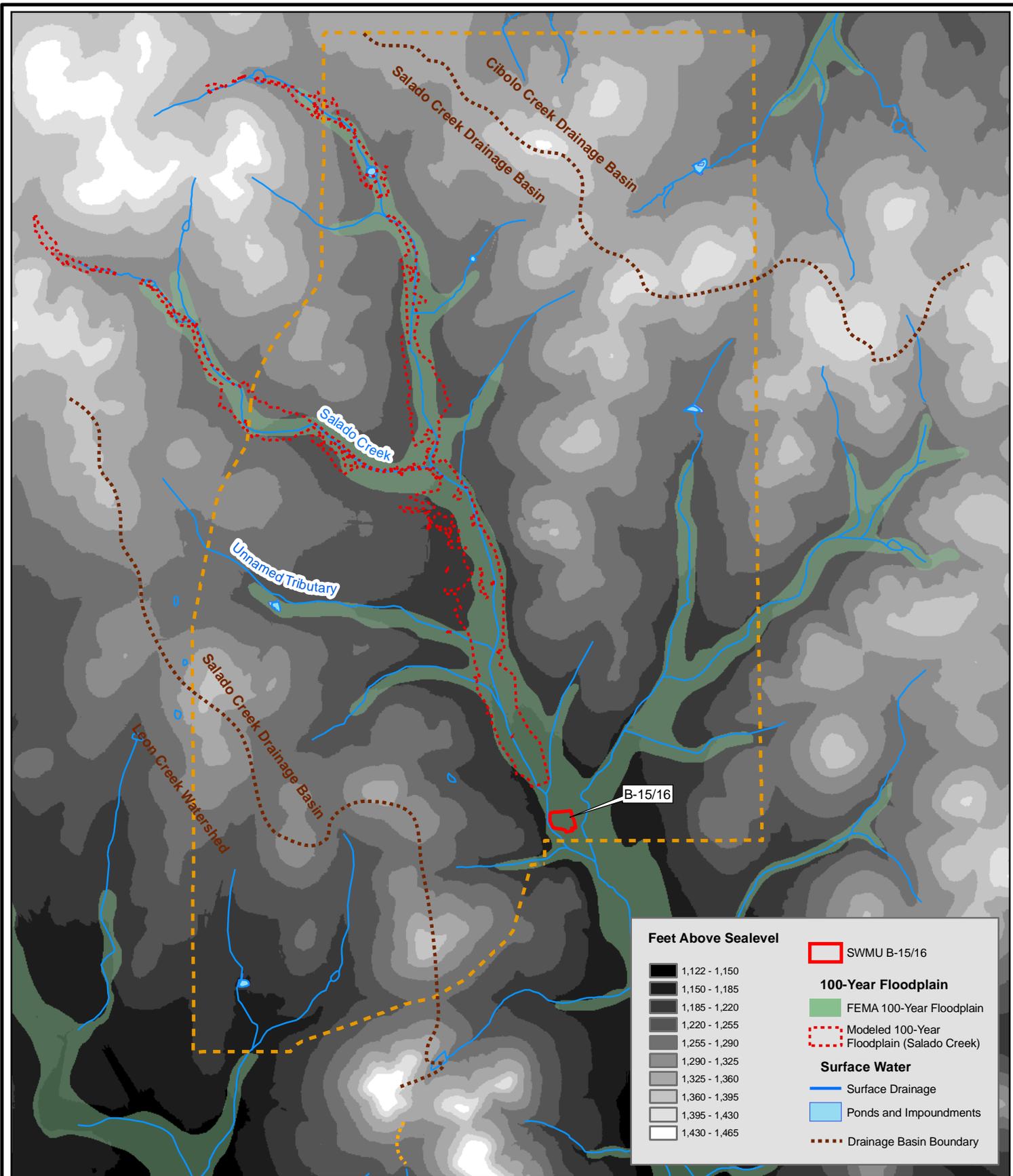


Figure 6

SWMU B-15/16 Topography, Surface Water, and Floodplains
Camp Stanley Storage Activity

PARSONS

APPENDIX A
Site Photographs



Photo 1. SWMU B-15/16 prior to excavation, looking south (February 2010).



Photo 2. Excavation of the north trench (Trench 1), looking east.



Photo 3. Inspection and removal of foreign objects.



Photo 4. PCE Drum encountered in Trench 1.



Photo 5. Debris and target vehicles found in Trench 1.



Photo 6. Electrical vault box uncovered northwest of Trench



Photo 7. Gun barrels found in Trenches 2 and 3.



Photo 8. Confirmation sample locations (circled) in Trench 2, looking east.



Photo 9. Post-excavation view of SWMU B-15/16, looking east.

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:

SWMU B-15/16 is located in the East Pasture area, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas of CSSA (see Figure 2 of this RIR). The site lies approximately 150 feet north of the CSSA/Camp Bullis southern boundary fence. SWMU B-15/16 covers approximately 3.3 acres. The area is open and covered by grass both inside and outside of the trenches. Some low brush had grown up in areas around the site. Oak trees dot the western and northwestern edges of the site. An intermittent stream (Salado Creek) bounds the site to the west while a dirt access road bounds the site on the east. The site is located entirely within the FEMA 1—year flood plain of Salado Creek.

Mailing Address:

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

TNRCC Case Tracking #s:

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

Solid Waste Registration #s:

Texas Solid Waste Registration No.: 69026.

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

EPA I.D. #s:

USEPA Identification No.: TX2210020739.

Figure: 30 TAC §350.77(b)

Definitions¹

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(E) The normal application of fertilizer.

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

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

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

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

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

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

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

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

PART I. Affected Property Identification and Background Information

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

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

SWMU B-15/16 is located in the East Pasture, approximately 100 feet east of the boundary fence separating the inner and outer cantonment areas. The site lies approximately 150 feet north of the CSSA/Camp Bullis southern boundary fence. SWMU B-15/16 covers approximately 3.3 acres. Prior to the excavation activities described herein, the area was open and covered by grass both inside and outside of the trenches. Some low brush had grown up in areas around the site. Oak trees dot the western and northwestern edges of the site. An intermittent creek bed bounds the site to the west while a dirt access road bounds the site on the east.

Three large trenches originally trended from east to west across the site. One of them was approximately 300 feet long and 20 feet wide and the other two were approximately 200 feet long and 40 feet wide. Large mounds of dirt were located at each end of the southern trench and were assumed to be from its original excavation. Each mound was approximately eight feet tall with a base diameter of approximately 50 feet. Two shorter dirt mounds were observed north of the northern trench.

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

- Topo map
- Aerial photo
- Other

Aerial photos of the site and land adjacent to the site are shown on Figure 3 of the RIR. Figure 2 of the RIR shows the general location of SWMU B-15/16.

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

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

Explain (previously submitted information may be referenced):

Based on soil samples collected at SWMU B-15/16, there are no VOCs or SVOCs at the sites (see Appendix C of this RIR). Metals with concentrations exceeding Tier 1 PCLs at the site were excavated and removed. There is no evidence of other affected or threatened environmental media (groundwater,

surface water, or sediment) at SWMU B-15/16. Inorganic groundwater contamination has not been reported in the closest well to SWMU B-15/16 (well CS-1 located approximately 965 feet downgradient) since 2000. Over the past 16 years, there have been samples collected from CS-1. Lead has been sporadically detected slightly above the action level (0.015 mg/L) on four occasions (December 1996, January 1996, March 1996, and March 2000) at concentrations ranging from 0.015 mg/L to 0.023 mg/L. No pattern in the lead detections has been identified, and given that no lead was detected above background at SWMU B-15/16, it is very unlikely that this site is the source of those lead detections. No other analytes have exceeded action levels or Maximum Contaminant Levels (MCLs). Sporadic low-level PCE detections 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 SWMU B-15/16.

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, **Salado Creek**, is **approximately 36 feet** from the affected property (**southwest of SWMU B-15/16**). 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 # 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. The distance downgradient of SWMU B-15/16 to perennial surface water of Salado Creek is approximately 20.8 miles. 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 SWMU B-15/16.**

Salado Creek, as well as all other creeks at CSSA, are intermittent and only have water during and immediately following rain events.

No

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

Name:

Segment #:

Use Classification:

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

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 SWMU B-15/16. Since soils that were found to have concentrations of metals above their PCLs were excavated/removed, there will be no impact to groundwater, surface water, or sediment from SWMU B-15/16.

The closest surface water body to SWMU B-15/16 is Salado Creek approximately 36 feet to the southwest of the site. This creek, and all other creeks at CSSA, are intermittent and only contain water during and immediately following rain events.

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

Subpart B. Affected Property Setting

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

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

Yes No

Explain:

Concentrations of chemicals detected in soil samples at SWMU B-15/16 do not exceed Tier 1 residential soil action levels. Soils found to have metals concentrations above their PCLs were excavated and removed from the site.

There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at SWMU B-15/16. Since soils found to have concentrations of metals above their PCLs were excavated/removed, there will be no impact to groundwater, surface water, or sediment in the area. Inorganic groundwater contamination has not been reported in the closest well to SWMU B-15/16 (well CS-1 located approximately 965 feet downgradient).

Additionally, several surveys have been conducted at CSSA for T&E species. The only T&E species that have been documented at CSSA are the black-capped vireo (*Vireo atricapillus*) [BCVI] and golden-cheeked warbler (*Dendroica chrysoparia*) [GCWA]. SWMU B-15/16 is not located within BCVI or GCWA habitat. The nearest potential habitats for local endangered species are approximately 500 feet southwest (Golden-Cheeked Warbler) and 2,100 feet northeast (Black-Capped Vireo). Additional information can be found in the following references:

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

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

Subpart C. Soil Exposure

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

Yes **See explanation** No

Explain:

The site is located on exposed bedrock, on a topographic high. What contaminated soil horizon that was present at the site was removed during excavation activities.

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

Subpart D. *De Minimus* Land Area **Subpart D skipped based on answers to Subpart C.**

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

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

- Similar but unimpacted habitat exists within a half-mile radius.
 - The affected property is not known to be located within one-quarter mile of sensitive environmental areas (e.g., rookeries, wildlife management areas, preserves). (Will likely require consultation with wildlife management agencies.)
 - There is no reason to suspect that the COCs associated with the affected property will migrate such that the affected property will become larger than one acre.
- 1) Using human health protective concentration levels as a basis to determine the extent of the COCs, does the affected property consist of one acre or less and does it meet all of the conditions above?
- Yes No

Explain how conditions are met/not met:

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

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

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

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

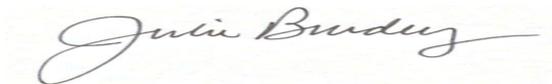
Principle Geologist (Title)

May 23, 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)

May 23, 2011 (Date Signed)

APPENDIX C

Confirmation Sample Results for All Analytes at SWMU B-15/16

Appendix C. Summary of Chemical Constituents Remaining in Soils at SWMU B-15/16

Chemicals Tested	CAS Number	Tier 1 Soil PCLs ¹		TCEQ-Approved CSSA Background Metal Concentrations ¹¹	Sample Locations																			
		Source Area 30 acre			B1516-NT-BOT05	B1516-T1-BOT06	B1516-T2-BOT01	B1516-T2-BOT01-Dup	B1516-T2-BOT02	B1516-T2-SW01	B1516-T2-SW02	B1516-T2-SW03	B1516-T2-SW04	B1516-T3-BOT01	B1516-T3-SW01	B1516-T3-SW02	B1516-T3-SW02-Dup							
		Soil mg/kg [1]	Soil mg/kg [2]		11-Mar-2010 mg/kg EXCAVATED	13-Jan-2011 mg/kg RESAMPLE OF BOT05	13-Jan-2011 mg/kg																	
Explosives																								
1,3,5-Trinitrobenzene	99-35-4	2.00E+03	n	9.10E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
1,3-Dinitrobenzene	99-65-0	6.30E+00	n	3.80E-03	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
2,4,6-Trinitrotoluene (TNT)	118-96-7	1.70E+01	n	8.60E-02	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
2,4-Dinitrotoluene	121-14-2	6.90E+00	c	2.70E-03	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
2,6-Dinitrotoluene	606-20-2	6.90E+00	c	2.40E-03	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
2-Nitrotoluene	88-72-2	2.10E+01	c	1.60E-02	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
3-Nitrotoluene	99-08-1	2.70E+02	n	9.20E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
4-Nitrotoluene	99-99-0	1.70E+02	n	2.20E-01	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Hexahydro-1,3,5-Trinitro-1,3,5,7-Tetrazocine (RDX)	121-82-4	2.50E+01	n	1.80E-02	c	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Nitrobenzene	98-95-3	3.40E+01	c	1.80E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine (HMX)	2691-41-0	2.00E+02	n	1.20E+00	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Tetryl	479-45-8	3.40E+01	n	5.50E-01	n	na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Petroleum Hydrocarbons																								
Petroleum Hydrocarbons C6 - C12	PHC C6-C12	na		na		na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Petroleum Hydrocarbons C12 - C28	PHC C12-C28	na		na		na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Pesticides																								
4,4'-DDD	72-54-8	1.40E+01	c	6.50E+00	c	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
4,4'-DDE	72-55-9	1.00E+01	c	5.90E+00	c	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
4,4'-DDT	50-29-3	5.40E+00	c	7.40E+00	c	na	--	0.0012	U 1	0.0012	U 1	0.0012	U 1	--	--	--	--	--	--	--	--			
Aldrin	309-00-2	5.00E-02	c	5.10E-02	c	na	--	0.0014	U 1	0.0014	U 1	0.0014	U 1	--	--	--	--	--	--	--	--			
alpha-Endosulfan	959-98-8	4.70E+01	n	1.50E+01	n	na	--	0.0010	U 1	0.0010	U 1	0.0010	U 1	--	--	--	--	--	--	--	--			
alpha-BHC	319-84-6	2.50E-01	c	4.00E-03	c	na	--	0.0010	U 1	0.0010	U 1	0.0010	U 1	--	--	--	--	--	--	--	--			
alpha-Chlordane	5103-71-9	1.30E+01	c	3.70E+02	c	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
beta-Endosulfan	33213-65-9	2.70E+02	n	4.60E+01	n	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
beta-BHC	319-85-7	9.20E-01	c	1.40E-02	c	na	--	0.0010	U 1	0.0010	U 1	0.0010	U 1	--	--	--	--	--	--	--	--			
delta-BHC	319-86-8	2.90E+00	c	8.70E-02	c	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Dieldrin	60-57-1	1.50E-01	c	2.40E-02	c	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Endosulfan sulfate	1031-07-8	3.80E+02	n	2.30E+03	n >5	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Endrin	72-20-8	8.70E+00	n	3.80E-01	m	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Endrin aldehyde	7421-93-4	1.90E+01	n	3.10E+02	n	na	--	0.0010	U 1	0.0010	U 1	0.0010	U 1	--	--	--	--	--	--	--	--			
gamma-BHC (Lindane)	58-89-9	1.10E+00	c	4.60E-03	m	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
gamma-Chlordane	57-74-9	7.30E+00	c	2.10E+01	c	na	--	0.00090	U 1	0.00090	U 1	0.00090	U 1	--	--	--	--	--	--	--	--			
Heptachlor	76-44-8	1.30E-01	c	9.40E-02	m	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Heptachlor Epoxide	1024-57-3	2.40E-01	c	2.90E-02	m	na	--	0.0011	U 1	0.0011	U 1	0.0011	U 1	--	--	--	--	--	--	--	--			
Methoxychlor	72-43-5	2.70E+02	n	6.20E+01	m	na	--	0.0010	U 1	0.0010	U 1	0.0010	U 1	--	--	--	--	--	--	--	--			
Toxaphene	8001-35-2	1.20E+00	c	5.80E+00	m	na	--	0.0090	U 1	0.0090	U 1	0.0090	U 1	--	--	--	--	--	--	--	--			
Herbicides																								
2,4-DB	94-82-6	5.30E+02	n	1.90E-01	n	na	--	0.040	U 1	0.040	U 1	0.040	U 1	--	--	--	--	--	--	--	--			
2,4,5-T	93-76-5	4.80E+02	n	4.90E-01	n	na	--	0.0100	U 1	0.0100	U 1	0.0100	U 1	--	--	--	--	--	--	--	--			
2,4,5-TP (Silvex)	93-72-1	5.10E+02	n	2.60E+00	m	na	--	0.0100	U 1	0.0100	U 1	0.0100	U 1	--	--	--	--	--	--	--	--			
2,4-D	94-75-7	3.70E+02	n	1.30E+00	m	na	--	0.020	U 1	0.020	U 1	0.020	U 1	--	--	--	--	--	--	--	--			
Dalapon	75-99-0	2.00E+03	n	2.90E-01	m	na	--	0.050	U 1	0.050	U 1	0.050	U 1	--	--	--	--	--	--	--	--			
Dicamba	1918-00-9	6.30E+02	n	7.30E-01	n	na	--	0.0100	U 1	0.0100	U 1	0.0100	U 1	--	--	--	--	--	--	--	--			
Dichlorprop	120-36-5	6.70E+02	n	2.30E-01	n	na	--	0.020	U 1	0.020	U 1	0.020	U 1	--	--	--	--	--	--	--	--			
Dinoseb	88-85-7	6.70E+01	n	1.80E-01	m	na	--	0.0100	U 1	0.0100	U 1	0.0100	U 1	--	--	--	--	--	--	--	--			
MCPA	94-74-6	3.30E+01	n	1.20E-02	n	na	--	3.8	U 1	3.8	U 1	3.8	U 1	--	--	--	--	--	--	--	--			
MCPP	93-65-2	6.70E+01	n	2.30E-02	n	na	--	4.4	U 1	4.4	U 1	4.4	U 1	--	--	--	--	--	--	--	--			
Inorganic Metals																								
Arsenic	7440-38-2	24.2	n	2.5	m >5	19.6	3.7	F 1	2.9	F 1	4.0	F 1	1.5	F 1	5.1	F 1	4.3	F 1	3.7	F 1	4.0	F 1		
Barium	7440-39-3	7840.5	n	221.9	m >5	186	90	J 1	46	J 1	82	J 1	27	J 1	80	J 1	66	J 1	43	J 1	120	J 1		
Cadmium	7440-43-9	52.4	n	0.8	m >5	3.0	0.73	F 1	0.030	F 1	0.030	F 1	0.030	F 1	0.060	F 1	0.030	F 1	0.030	F 1	0.030	F 1		
Chromium	7440-47-3	23053.9	n	1200.1	m >5	40.2	18	F 1	7.3	F 1	7.8	F 1	5.1	F 1	20	F 1	9.8	F 1	9.9	F 1	8.1	F 1		
Copper	7440-50-8	547.6	n	521.2	a >5	23.2	8.6	J 1	2.1	J 1	3.4	J 1	1.5	F 1	12	F 1	1.8	F 1	3.2	F 1	4.3	F 1		
Lead	7439-92-1	500.0	n	1.5	a >5	84.5	12	F 1	5.2	F 1	9.8	F 1	3.2	F 1	10	F 1	5.0	F 1	11	F 1	7.4	F 1		
Mercury	7439-97-6	2.1	n	0.0	m	0.8	0.01	U 1	0.0100	U 1	0.0100	U 1	0.0100	U 1	0.030	F 1	0.0100	U 1	0.0100	U 1	0.0100	U 1		
Nickel	7440-02-0	832.1	n	78.7	n >5	35.50	13	J 1	12	J 1	22	J 1	6.6	J 1	13	J 1	7.5	J 1	10	J 1	13	J 1		
Zinc	7440-66-6	9921.5	n	1180.2	n >5	73.2	220	J 1	15	J 1	12	J 1	7.6	J 1	31	J 1	12	J 1	14	J 1	21	J 1		

APPENDIX D

Data Verification Summary Report

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

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples and associated field quality control (QC) water samples collected from Camp Stanley Storage Activity (CSSA) under BRAC 50 on January 13, 2011. The samples in the following Sample Delivery Group (SDG) were analyzed for pesticides, herbicides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals:

63656

Not all samples were analyzed for all parameters. Field QC samples collected in association with this SDG included (1) one trip blank for VOCs; (2) one equipment blank for all above listed parameters; and (3) two pairs of parent and field duplicate (FD) samples for all above listed parameters..

All 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. This cooler was received by the laboratory at a temperature of 3.0° C which was within the 2-6° C range recommended by the CSSA QAPP.

There was one sample which was tested for TCLP-TX 11 metals and TPH for waste disposal purpose. All data related to this sample was not validated.

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.

ICP METALS

General

The ICP metals portion of this SDG consisted of thirteen (13) soil samples and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for arsenic, barium, cadmium, chromium, copper, lead, nickel and zinc. One of the soil samples was analyzed for zinc only.

The ICP metals 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 ICP metals samples were digested in two batches, one for soil and one for water.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two laboratory control samples (LCS), one for each analytical batch.

All LCS recoveries were within acceptance criteria for both LCSs.

Precision

Precision was evaluated with the relative percent difference (%RPD) of the two sets of parent and FD samples. %RPD calculation is only applicable when both results are greater than reporting limit (RL).

B1516-T3-SW02

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	61.6	67.8	9.6	≤ 20
Copper	4.34	4.32	0.5	
Nickel	10.41	10.72	2.9	
Zinc	20.6	20.6	0	

B1516-T2-BOT01

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	45.9	82.0	56	≤ 20
Copper	2.10	3.42	48	
Nickel	11.95	22.42	61	
Zinc	15.1	12.2	21	

Since one of the two sets of parent/FD had compliant %RPDs, "J" flags were only applied to the result of the above listed metals of B1516-T2-BOT01 and its FD.

Representativeness

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

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during collection and 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.
- Dilution test (DT) was analyzed on sample B1516-T2-SW04. The DT was applicable for all metals detected in the parent sample at a concentration of 50 times the MDL or greater. All applicable metals failed to meet criteria in the DT, as follows:

B1516-T2-SW04

Metal	%D	Criteria
Barium	40	%D ≤ 10
Chromium	38	
Nickel	38	

- A post digestion spike (PDS) was analyzed on the same samples as the DT. All metals met criteria in the PDS:

B1516-T2-SW04

Metal	%R	Criteria
Arsenic	84	75-125%
Barium	96	
Cadmium	78	
Chromium	81	
Copper	85	

Nickel	82	
Lead	79	
Zinc	77	

There were two method blanks (MBs), one EB and several calibration blanks associated with the ICP analyses in this SDG. All blanks were free of any target metals at or above the RL.

Completeness

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

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

MERCURY

General

The mercury portion of this SDG consisted of twelve (12) soil samples and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for mercury.

The mercury analyses were performed using USEPA SW846 Method 7471A/7470A. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The mercury samples were prepared in two analytical batches, one for soil and one for EB.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs.

Both LCS recoveries were within acceptance criteria.

Precision

Precision was evaluated with the %RPD of the two sets of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since both sets of parent and FD samples had no detection of mercury at RL, the %RPD calculation was not applicable.

Representativeness

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

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

- Examining laboratory blanks and EB for cross contamination of samples during sample collection and 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 initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

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

Completeness

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

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

PESTICIDES

General

The pesticide portion of this SDG consisted of three (3) soil samples and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for pesticides.

The pesticides analyses were performed using USEPA SW846 Method 8081. 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 pesticide samples were prepared in two analytical batches, one for each matrix.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs and surrogates.

All LCS and surrogates recoveries were within acceptance criteria for both analytical batches.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

Representativeness

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

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank and EB for cross contamination of samples during collection and 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 initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

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

HERBICIDES

General

The herbicides portion of this SDG consisted of three (3) soil samples and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for herbicides.

The herbicides analyses were performed using USEPA SW846 Method 8151A. 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 herbicide samples were prepared in two analytical batches, one for each matrix.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs and surrogate.

Both LCSs and surrogate recoveries were within acceptance criteria.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

Representativeness

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

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and 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 initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

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

VOLATILES

General

This data package consisted of four (4) soil samples, one (1) TB, and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for a full list of VOCs.

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

Accuracy

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

All LCS and surrogate spike recoveries were within acceptance criteria for both batches.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

Representativeness

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

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

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

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- Both LCS sample was prepared with a secondary source. All second source verification criteria were met.

- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

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

Completeness

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

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

SEMI-VOLATILES

General

This data package consisted of four (4) soil samples, one (1) TB, and one (1) EB. The samples were collected on January 13, 2011 and were analyzed for a full list of SVOCs.

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

Accuracy

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

All LCS and surrogate spike recoveries were within acceptance criteria for both batches.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

Representativeness

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

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

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

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

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

Completeness

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

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

APPENDIX E

List of Munitions Debris Found at SWMU B-15/16

**SWMU B-15/16
Munitions Debris**

Item Description
<ul style="list-style-type: none"> • Signal, Illumination, Ground, Clusters; Signal, Illumination, Ground, Parachute Series
<ul style="list-style-type: none"> • Signal, Illumination, Aircraft, Single Star Series
<ul style="list-style-type: none"> • Signal, Marine, Smoke and Illumination, Mk13
<ul style="list-style-type: none"> • Fuze, Grenade, Delay, M206
<ul style="list-style-type: none"> • Grenade, 85mm, Rocket Propelled, HEAT, RP-G7G (tail boom assemblies only)
<ul style="list-style-type: none"> • Grenade, Hand, Smoke
<ul style="list-style-type: none"> • Grenade, Rifle, Smoke
<ul style="list-style-type: none"> • Grenade, Hand, Smoke, White Phosphorus (WP), M34 (Body tops)
<ul style="list-style-type: none"> • Case, Cartridge, 105mm
<ul style="list-style-type: none"> • Projectile, 75mm, Shrapnel, MkI
<ul style="list-style-type: none"> • Mortar, 3 Inch, Practice, Stokes, MkI
<ul style="list-style-type: none"> • Projectile, 60mm (Tail Fin Only)
<ul style="list-style-type: none"> • Machine Gun Barrels and parts
<ul style="list-style-type: none"> • Rifle Barrels and parts
All items encountered were expended or fragments of items listed.

APPENDIX F

Waste Characterization Sampling Results for SWMU B-15/16

**Appendix F
Waste Characterization Sampling Results for SWMU B-15/16**

SAMPLE ID: DATE SAMPLED: LAB SAMPLE ID:		B1516-WC01 1/10/2011 AY29830	B1516-WC02 1/10/2011 AY29831	B1516-WC03 1/10/2011 AY29832	B1516-WC04 1/10/2011 AY29833	B1516-WC05 1/10/2011 AY29834	B1516-WC06 1/10/2011 AY29835	B1516-WC07 1/13/2011 AY30126
Units								
Organochlorine Pesticides - SW8081A								
4,4'-DDD	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
4,4'-DDE	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
4,4'-DDT	mg/Kg	--	--	--	0.0012 U	--	0.0012 U	--
Aldrin	mg/Kg	--	--	--	0.0014 U	--	0.0014 U	--
alpha Endosulfan	mg/Kg	--	--	--	0.0010 U	--	0.0010 U	--
alpha-BHC	mg/Kg	--	--	--	0.0010 U	--	0.0010 U	--
alpha-Chlordane	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
beta Endosulfan	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
beta-BHC	mg/Kg	--	--	--	0.0010 U	--	0.0010 U	--
delta-BHC	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Dieldrin	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Endosulfan sulfate	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Endrin	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Endrin aldehyde	mg/Kg	--	--	--	0.0010 U	--	0.0010 U	--
gamma-BHC (Lindane)	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
gamma-Chlordane	mg/Kg	--	--	--	0.00090 U	--	0.00090 U	--
Heptachlor	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Heptachlor Epoxide	mg/Kg	--	--	--	0.0011 U	--	0.0011 U	--
Methoxychlor	mg/Kg	--	--	--	0.0010 U	--	0.0010 U	--
Toxaphene	mg/Kg	--	--	--	0.0090 U	--	0.0090 U	--
Chlorinated Herbicides - SW8151A								
2,4 DB	mg/Kg	--	--	--	0.040 U	--	0.040 U	--
2,4,5-T	mg/Kg	--	--	--	0.0100 U	--	0.0100 U	--
2,4,5-TP (Silvex)	mg/Kg	--	--	--	0.0100 U	--	0.0100 U	--
2,4-D	mg/Kg	--	--	--	0.020 U	--	0.020 U	--
Dalapon	mg/Kg	--	--	--	0.050 U	--	0.050 U	--
Dicamba	mg/Kg	--	--	--	0.0100 U	--	0.0100 U	--
Dichlorprop	mg/Kg	--	--	--	0.020 U	--	0.020 U	--
Dinoseb	mg/Kg	--	--	--	0.0100 U	--	0.0100 U	--
MCPA	mg/Kg	--	--	--	3.8 U	--	3.8 U	--
MCPP	mg/Kg	--	--	--	4.4 U	--	4.4 U	--
Metals - SW6010B/SW7471A								
Arsenic	mg/Kg	4.2 F	4.7 F	4.6 F	3.3 F	--	3.2 F	3.0 F
Barium	mg/Kg	67 J	68 J	80 J	43 J	--	47 J	51 J
Cadmium	mg/Kg	0.42 F	0.45 F	0.24 F	0.39 F	--	0.19 F	0.030 U
Chromium	mg/Kg	12 F	16 F	14 F	10 F	--	9.4 F	11 F
Copper	mg/Kg	10	10	7.7	9.3	--	6.4	4.4
Lead	mg/Kg	11	13	11	21	--	6.6 F	7.9 F
Mercury	mg/Kg	0.020 F	0.020 F	0.020 F	0.020 F	--	0.020 F	0.0100 U
Nickel	mg/Kg	11	12	11	13	--	7.8	8.3
Zinc	mg/Kg	45	43	53	61	--	24	19
Petroleum Hydrocarbons - TX1005								
PHC as Diesel Fuel	µg/Kg	--	--	--	--	14,000 U	--	--
TCLP Metals - SW 6010B/SW7470A								
Antimony	mg/L	--	--	--	--	0.0020 F	--	--
Arsenic	mg/L	--	--	--	--	0.0020 U	--	--
Barium	mg/L	--	--	--	--	0.44	--	--
Beryllium	mg/L	--	--	--	--	0.00020 U	--	--
Cadmium	mg/L	--	--	--	--	0.0010 F	--	--
Chromium	mg/L	--	--	--	--	0.0010 U	--	--
Lead	mg/L	--	--	--	--	0.0012 U	--	--
Mercury	mg/L	--	--	--	--	0.000100 U	--	--
Nickel	mg/L	--	--	--	--	0.0020 F	--	--
Selenium	mg/L	--	--	--	--	0.0020 U	--	--
Silver	mg/L	--	--	--	--	0.0035 F	--	--

QA NOTES AND DATA QUALIFIERS:

(NO CODE) - Confirmed identification.

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

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

J - Analyte was positively identified, but the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

Detections are **bolded**.