

**TO19 DATA VERIFICATION SUMMARY REPORT**  
**for samples collected from**  
**CAMP STANLEY STORAGE ACTIVITY**  
**BOERNE, TEXAS**

Data Verification by: Katherine LaPierre and Tammy Chang  
Parsons - Austin

**INTRODUCTION**

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on December 20, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for pesticides, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCS), explosives, and metals:

46221

The field quality control (QC) samples collected in association with this SDG included one field duplicate and one trip blank. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The trip blank was analyzed for volatiles only. The field duplicate was analyzed for the same parameters as the parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 4.1 °C which is within the 2-6 °C range recommended by the QAPP.

**EVALUATION CRITERIA**

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt form and chain-of-custody (COC) forms. 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.

**PESTICIDES**

**General**

The pesticide portion of this SDG consisted of six (6) samples, including five (5) environmental soil samples and one field duplicate. The samples were collected on December 20, 2004 and were analyzed for the full list of pesticides as specified in the CSSA QAPP. Only the samples from AOC53 required analysis for pesticides.

The pesticide analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 Method 8081A. 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.

### **Accuracy**

Accuracy was evaluated using the percent recovery (%R) obtained from the Laboratory Control Spike (LCS) sample and the surrogate spikes. It should be noted that, due to laboratory oversight, no LCS was analyzed for toxaphene. All other analytes met criteria in the LCS and all surrogate recoveries were within criteria.

“R” flags were applied to all toxaphene data in this data package.

### **Precision**

Precision is normally evaluated using the relative percent difference (RPD) obtained from the field duplicate analyte results. Sample AOC53-BOT02 was collected in duplicate. The second soil jar for this sample was submitted and analyzed as a field duplicate.

All analytes were non-detect in both the parent and field duplicate samples, so 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 for cross contamination of samples during analysis.

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

- All breakdown check criteria were met.
- All initial calibration (ICAL) criteria were met. One ICAL was analyzed for Toxaphene and a second ICAL was analyzed for all other target analytes.
- All second source verification criteria were met. The standards analyzed immediately following the ICALs were prepared using a secondary source.
- All calibration verification criteria were met, except for the following:

Standard ID	Column	Analyte	%D	Criteria
OCL-4 12/14/04 (ICV)	1	alpha-BHC	17	%D ≤ 15
		delta-BHC	17	
OCL-2 12/14/04 (CCV)	2	4,4'-DDD	17	%D ≤ 15

No target analytes were detected in any of the samples, so no second column confirmation was needed. The laboratory used the “2” column as primary for alpha-BHC and delta-BHC, so no corrective action was necessary for these analytes. The laboratory used the “1” column as primary for 4,4'-DDD, so no corrective action was necessary for this analyte.

- All manual integrations were reviewed and approved.

One method blank was analyzed in association with the pesticide analyses in this SDG. The blank was free of all target 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 pesticide results for the samples in this SDG were considered usable except toxaphene. The completeness of the pesticide portion of this SDG is 95%, which meets the minimum acceptance criteria of 90%.

## SEMIVOLATILES

### General

The SVOC portion of this SDG consisted of six (6) samples, including five (5) environmental soil samples and field duplicate. The samples were collected on December 20, 2004 and were analyzed for the full list of SVOCs as specified in the CSSA QAPP. Only the samples from AOC53 required analysis for semivolatiles.

The SVOC analyses were performed according to USEPA SW846 Method 8270C. 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.

### Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the surrogate spikes. No sample was designated for MS/MSD analysis on the COC.

All LCS and surrogate spike recoveries were within acceptance criteria.

### Precision

Precision is normally evaluated using the RPD obtained from the field duplicate analyte results. Sample AOC53-BOT02 was collected in duplicate. The second soil jar for this sample was submitted and analyzed as a field duplicate.

All analytes were non-detect in both the parent and field duplicate samples, so 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 for cross contamination of samples during analysis.

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

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All second source verification criteria were met. The LCS sample was prepared using a secondary source.
- All calibration verification criteria were met.
- All internal standard criteria were met.
- All manual integrations were reviewed and found to be acceptable.

One method blank was analyzed in association with the VOC analyses in this SDG. The blank was free of all target SVOCs 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 SVOC results for the samples in this SDG were considered usable. The completeness of the SVOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **VOLATILES**

### **General**

The VOC portion of this SDG consisted of fifteen (15) samples, including thirteen (13) environmental soil samples, one field duplicate and one trip blank. The samples were collected on December 20, 2004 and were analyzed for VOCs. Only the samples from AOC53 required analysis for the full list of volatiles as specified in the CSSA QAPP. The samples from B2 required analysis for toluene only.

The VOC analyses were performed according to USEPA SW846 Method 8260B. 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 VOC analyses were performed in four different analytical batches, three for soils and one for the water trip blank. The analyses were performed on two different instruments and each analytical batch was run using a separate ICAL.

### **Accuracy**

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS/LCSD samples, and the surrogate spikes. No sample was designated for MS/MSD analysis on the COC.

One soil batch and the water batch contained an LCS only. The remaining two soil batches contained both an LCS and LCSD. All LCS and LCSD recoveries were within acceptance criteria.

All surrogate spike recoveries were within acceptance criteria.

### **Precision**

Precision is normally evaluated using the RPD obtained from the LCS/LCSD samples (when analyzed) and the field duplicate analyte results. Sample AOC53-BOT02 was collected in duplicate. The second soil jar for this sample was submitted and analyzed as a field duplicate.

All LCS/LCSD RPDs were within acceptance criteria.

All analytes were below the RL in both the parent and field duplicate samples, so 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 field and laboratory blanks for cross contamination of samples during sample transit 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 time required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met. There were four ICALs associated with this SDG, three for soils and one for waters.
- The LCS and LCSD samples were prepared using a secondary source. All second source verification (SSV) criteria were met, except for the following:

SSV ID	Analyte	%D	Criteria
041228A LCS-1SC	Bromochloromethane	31	%D ≤ 25

The bromochloromethane results for all samples associated with this SSV were flagged “R” in accordance with the CSSA QAPP.

- Only one continuing calibration verification (CCV) sample was analyzed because for all other batches, the samples were analyzed immediately following the initial calibration. All criteria were met for the one CCV, except for the following:

ICV ID	Analyte	%D	Criteria
Vol Std 12-28-04@20mg/kg	Bromochloromethane	24	%D ≤ 20

The bromochloromethane results for all samples associated with this CCV were flagged “R” in accordance with the CSSA QAPP.

- All internal standard criteria were met, except for the following:

Sample ID	Internal Standard	Area Counts	Minimum AC
B2-SS07	1,4-Dichlorobenzene-d4	38558	43134
B2-SS08	1,4-Dichlorobenzene-d4	28746	43134
	Chlorobenzene-d5	92548	93864

No corrective action was necessary for 1,4-Dichlorobenzene-d4 because these samples were analyzed for toluene only and toluene is not quantitated using this internal standard. Toluene is quantitated against Chlorobenzene-d5 which failed in sample B2-SS08. However, no corrective action was necessary because the toluene result for this sample was below the RL. (The “F” flag supercedes the “J” flag in the AFCEE QAPP flag hierarchy.)

- All manual integrations were reviewed and approved.

Four method blanks (three soil and one water) and one Trip Blank were analyzed in association with the VOC analyses in this SDG. All three soil method blanks and the trip blank were free of toluene at or above the RL. The water method blank contained the following detections above the RL:

Blank ID	Analyte	Conc. (µg/L)	RL (µg/L)
041229A BKK-1WM	1,2,3-Trichlorobenzene	1.1	0.3
	1,2,4-Trichlorobenzene	0.64	0.4
	Bromomethane	2.5	1.1
	Naphthalene	0.83	0.4

No corrective action was necessary since this method blank was only associated with the trip blank and all analytes were non-detect in the trip blank.

## Completeness

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

All VOC results for the samples in this SDG were considered usable, with the exception of bromochloromethane in the samples analyzed on instrument Chico on December 27, 2004. A total of five results were rejected. Therefore, the completeness of the VOC portion of this SDG is 98.8%, which meets the minimum acceptance criteria of 90%. The completeness for bromochloromethane in this SDG is only 28.6%.

## EXPLOSIVES

### General

The explosives portion of this SDG consisted of eight (8) environmental soil samples. The samples were collected on December 20, 2004 and were analyzed for the full list of explosives as specified in the CSSA QAPP. Only the samples from site B2 required analysis for explosives.

The explosives analyses were performed according to USEPA SW846 Method 8330. 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.

### Accuracy

Accuracy was evaluated using the recovery obtained from the LCS sample, MS/MSD samples and the surrogate spikes. Although no sample was designated for MS/MSD analysis on the COC, the laboratory analyzed an MS/MSD on sample B2-SS01.

All LCS recoveries were within acceptance criteria, except for the following:

LCS ID	Analyte	%D	Criteria
041228S LCSB	RDX	192	65-142%

No corrective action was necessary because the analyte was recovered high and was not detected in any of the samples.

All MS/MSD recoveries were within acceptance criteria, except for the following:

Parent	Analyte	MS %D	MSD %D	Criteria
B2-SS01	RDX	(104)	172	65-142%

( ) indicates the recovery met criteria.

The CSSA QAPP indicates that all sample results should be flagged "M" due to the high MSD recovery. However, after reviewing the raw data and other lab QC, it does not appear that the high MSD recovery is due to matrix. The LCS was also recovered high for RDX, indicating a possible high instrument bias. RDX was not detected in any of the samples, so the high bias did not adversely affect data quality. Thus, based on Parsons'

review of the raw data and the professional judgment of the data validator, no flags were deemed necessary for RDX.

The lab used 1,2-Dinitrobenzene as the surrogate. The laboratory used the CSSA QAPP soil accuracy tolerances for 1,3-Dinitrobenzene (65-135%) as the surrogate tolerances since the two compounds are similar in chemical structure. All surrogate spike recoveries were within the specified criteria.

### **Precision**

Precision was evaluated using the RPD obtained from the MS/MSD samples.

All MS/MSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

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

- All samples were non-detect for explosives, so no secondary column analysis was required.
- All initial calibration criteria were met for the primary column.
- All second source verification criteria were met for the primary column.
- All calibration verification criteria were met. It should be noted that there were twelve injections between the ICAL and the CCV (ten environmental samples plus an LCS and a method blank). The CSSA QAPP indicates that a CCV must be run after every 10 samples, so the data was considered acceptable and no corrective action was necessary.

There was one method blank associated with the Explosives analyses in this SDG. No target analytes were detected at or above the RL in the method blank.

### **Completeness**

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

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

## **ICP METALS**

### **General**

The ICP metals portion of this SDG consisted of eight (8) environmental soil samples. The samples were collected on December 20, 2004 and were analyzed for chromium and nickel only. Only the samples from site B2 required analysis for metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The 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.

### **Accuracy**

Accuracy was evaluated using the %R obtained from the LCS/LCSD. No sample was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD samples.

All LCS/LCSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- The initial calibration was analyzed using multiple points and the low point was below the RL for chromium and nickel, so no RL check standard was necessary.
- A dilution test was analyzed on sample B2-SS08. Both chromium and nickel met criteria.

- No post digestion spike was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

## **Completeness**

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

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

## **CADMIUM**

### **General**

The cadmium portion of this SDG consisted of eight (8) environmental soil samples. The samples were collected on December 20, 2004 and were analyzed for cadmium using USEPA SW846 Method 7421. Only the samples from site B2 required analysis for cadmium.

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

It should be noted that four of the eight samples required dilutions due to the high concentration of cadmium present.

### **Accuracy**

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD samples.

The LCS/LCSD RPD was within acceptance criteria.

### **Representativeness**

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

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

- Examining laboratory blanks for cross contamination of samples during analysis.

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- A dilution test (DT) was analyzed on sample B2-SS04. The DT failed to meet criteria as follows:

Sample ID	Metal	%D	Criteria
B2-SS04	Cadmium	17.7	%D ≤ 10

No MS/MSD was analyzed for cadmium, so all sample results were flagged “M” in accordance with the CSSA QAPP.

- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium 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 cadmium results for the samples in this SDG were considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **LEAD**

### **General**

The lead portion of this SDG consisted of eight (8) environmental soil samples. The samples were collected on December 20, 2004 and were analyzed for lead using USEPA SW846 Method 7421. Only the samples from site B2 required analysis for lead.

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

It should be noted that all of the samples required a dilution due to the high levels of lead present.

### **Accuracy**

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

**Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD samples.

The LCS/LCSD RPD was within acceptance criteria.

**Representativeness**

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

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

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

- All initial calibration (ICAL) criteria were met. There were two ICALs associated with the data. All samples were analyzed under the first ICAL. However, due to analyst error, the dilution test was not analyzed until several days later. The second ICAL was associated with the dilution test only.
- All initial and continuing calibration verification criteria were met for the diluted analyses. The laboratory performed the diluted analyses for all samples first, and then reanalyzed the samples undiluted in accordance with the CSSA QAPP. Because the samples contained such high levels of lead, the calibration verification sample analyzed after the undiluted runs exceeded criteria due to carry-over. The undiluted analyses were not used as all lead concentrations exceeded the linear range of the instrument. Therefore, no corrective action was necessary.
- All second source calibration criteria were met for both ICALs. The ICV samples were prepared using a secondary source.
- The dilution test was analyzed on sample B2-SS01. It should be noted that the DT was performed several days after the original sample analysis due to analyst error. The DT was assessed using the 20x dilution and 100x dilution for sample B2-SS01. The DT failed to meet criteria as follows:

<b>Metal</b>	<b>%D</b>	<b>Criteria</b>
Lead	18.3	%D ≤ 10

No MS/MSD was analyzed in this batch so all sample results for lead were flagged “M” in accordance with the CSSA QAPP.

- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

### **Completeness**

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

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

**TO19 DATA VERIFICATION SUMMARY REPORT**  
**for samples collected from**  
**CAMP STANLEY STORAGE ACTIVITY**  
**BOERNE, TEXAS**

Data Verification by: Katherine LaPierre and Tammy Chang  
Parsons - Austin

**INTRODUCTION**

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 2, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for metals:

46489

The field quality control (QC) samples collected in association with this SDG included two field duplicates and two matrix spike/matrix spike duplicate (MS/MSD) pairs. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The QC samples were analyzed for the same parameters as the associated parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 3.5°C which is within the 2-6°C range recommended by the QAPP.

**EVALUATION CRITERIA**

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt form and chain-of-custody (COC) forms. 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 eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for barium, chromium, copper, nickel and zinc. The samples from site B2 did not require analysis for ICP metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The 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.

**Accuracy**

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, with the following exceptions:

Parent Sample	Metal	MS %R	MSD %R	Criteria
AOC46-SS05	Barium	68.8	69.3	75-125
	Copper	62.9	57.6	75-125
	Nickel	(75.9)	74.3	75-125
	Zinc	69.0	63.9	75-125
AOC53-SW11	Barium	8.7	-20.0	75-125
	Nickel	73.1	70.4	75-125
	Zinc	48.9	31.4	75-125

( ) indicates the recovery met criteria.

All sample results for barium, copper, nickel and zinc were flagged “M” due to the low bias demonstrated by the MS/MSD samples.

**Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was not applicable for chromium since both the parent sample and the field duplicate sample concentrations for chromium were below the RL. The field duplicate RPDs for all other target metals were within acceptance criteria as follows:

Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
Barium	36.36	37.14	2.1	RPD ≤ 20
Copper	11.91	11.02	7.8	
Nickel	5.93	6.68	11.9	
Zinc	28.43	27.02	5.1	

## Representativeness

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

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

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- The initial calibration was analyzed using multiple points and the low point was below the RL for all metals, so no RL check standard was necessary.
- A dilution test (DT) was analyzed on sample AOC46-SS05. The dilution test was not applicable for nickel because the parent sample concentration for this metal was less than 50 times the MDL. The DT met criteria for chromium and copper, but both barium and zinc failed as follows:

Sample ID	Metal	%D	Criteria
AOC46-SS05	Barium	11.4	%D ≤ 10
	Chromium	3.5	
	Copper	6.5	
	Zinc	11.3	

No corrective action was necessary since all barium and zinc results were previously flagged “M” due to the failing MS/MSD recoveries.

- No post digestion spike was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

## Completeness

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

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

## ARSENIC

### General

The arsenic portion of this SDG consisted of eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for arsenic using USEPA SW846 Method 7060A. The samples from site B2 did not require analysis for arsenic.

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

The samples in this SDG were digested in two different batches and analyzed in a single batch under one initial calibration.

### Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for arsenic, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, with the following exception:

Parent Sample	Metal	MS %R	MSD %R	Criteria
AOC53-SW11	Arsenic	(90.0)	70.8	74-120%

( ) indicates the recovery met criteria.

Since two MS/MSD pair were analyzed and three of the four spikes met criteria, it is the professional opinion of the data verifier that the results do not illustrate a matrix effect was present and thus "M" flagging the data was not warranted. Discussions were held with Dr. Joe Fernando and Mr. Willie Sekula, both of Portage Environmental, Inc., and they agreed that because the failing MSD showed only a marginal exceedance and all other spike recoveries for arsenic were well within the acceptance criteria, no "M" flags should be applied.

### Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was within acceptance criteria as follows:

<b>Metal</b>	<b>Parent Conc. (mg/kg)</b>	<b>FD Conc. (mg/kg)</b>	<b>RPD</b>	<b>Criteria</b>
Arsenic	4.38	3.95	10.3	RPD ≤ 25

### **Representativeness**

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

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

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

- There was one four-point initial calibration established for arsenic. All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV sample was prepared using a secondary source.
- A dilution test (DT) was performed on samples AOC46-SS05 and on sample AOC53-SW11. Arsenic failed to meet criteria in both dilution tests as follows:

<b>Sample ID</b>	<b>Metal</b>	<b>%D</b>	<b>Criteria</b>
AOC46-SS05	Arsenic	12.1	%D ≤ 10
AOC53-SW11	Arsenic	12.9	%D ≤ 10

All arsenic results were flagged “J” due to the failing dilution test results.

- No PDS was required as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic 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 arsenic result for the samples in this SDG was considered usable. The completeness for the arsenic portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **CADMIUM**

## General

The cadmium portion of this SDG consisted of eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for cadmium using USEPA SW846 Method 7421. The samples from site B2 did not require analysis for cadmium.

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

The samples in this SDG were digested in two different batches and analyzed in a single batch under one initial calibration.

## Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for cadmium, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

## Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was within acceptance criteria as follows:

Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
Cadmium	0.26	0.23	12.2	RPD $\leq$ 25

## Representativeness

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

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

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- A dilution test (DT) was not required since all sample results were less than 25 times the MDL in the raw data. It should be noted that several samples had concentrations above 25 times the MDL after the calculation was performed to take the percent moisture into account. However, the bench analyst did not have the percent moisture data and thus, no DT was analyzed.
- No PDS was required, as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium 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 cadmium results for the samples in this SDG were considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **LEAD**

### **General**

The lead portion of this SDG consisted of twenty-five (25) samples, including nineteen (19) environmental soil samples, two MS/MSD pair, and two field duplicates. The samples were collected on February 2, 2005 and were analyzed for lead using USEPA SW846 Method 7421. The samples from site B2 required analysis for lead only.

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

It should be noted that all of the samples required a dilution due to the high levels of lead present. The samples in this SDG were digested in two different batches and analyzed in a two batches under two different initial calibrations.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for cadmium, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries failed to meet acceptance criteria due to the high concentration of lead present in the parent sample. The amount of lead in the parent sample was greater than ten times the concentration spiked in the MS/MSD samples. All lead results were flagged “M” due to the non-compliant MS/MSD recoveries.

### Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Samples AOC53-BOT03 and B2-SS12 were collected in duplicate. The second jar from each of these locations was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD RPDs were within acceptance criteria.

The RPD for the MS/MSD analyzed on sample AOC46-SS05 was within acceptance criteria. However, the RPD for the MS/MSD analyzed on sample AOC53-SW11 exceeded the acceptance criteria ( $RPD \leq 25$ ) at 25.6. All lead results were previously flagged “M” due to the anomalous MS/MSD recoveries, so no corrective action was necessary.

All field duplicate RPDs were within acceptance criteria as follows:

Parent Sample	Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
AOC53-BOT03	Lead	31.83	34.40	7.8	$RPD \leq 25$
B2-SS12	Lead	141.83	139.02	2.0	$RPD \leq 25$

### Representativeness

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

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

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

- All initial calibration (ICAL) criteria were met. There were two ICALs associated with the data. Both ICALs met all criteria.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met for both ICALs. The ICV samples were prepared using a secondary source.

- A dilution test was analyzed on samples AOC46-SS05 and AOC53-SW11. The DT analyzed on sample AOC46-SS05 was assessed using the 25x dilution and the 125x dilution. The DT analyzed on sample AOC53-SW11 was assessed using the 50x dilution and the 250x dilution. Both dilution tests met criteria as follows:

Parent Sample	Metal	%D	Criteria
AOC46-SS05	Lead	0.9	%D ≤ 10
AOC53-SW11	Lead	5.3	%D ≤ 10

- No PDS was required, as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

### **Completeness**

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

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

## **MERCURY**

### **General**

The mercury portion of this SDG consisted of eighteen (18) samples, including thirteen environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for mercury using USEPA SW846 Method 7471A. The samples from site B2 did not require analysis for mercury.

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

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples. The field duplicate analyte results were also reviewed for precision. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Both the parent and field duplicate results were non-detect for mercury, so 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 for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The 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.

One method blank and several calibration blanks were analyzed in association with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

### **Completeness**

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

The mercury results for all 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%.

# **TO19 DATA VERIFICATION SUMMARY REPORT**

## **for samples collected from CAMP STANLEY STORAGE ACTIVITY**

### **BOERNE, TEXAS**

Data Verification by: Katherine LaPierre and Tammy Chang  
Parsons - Austin

## **INTRODUCTION**

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 16, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for volatile organic compounds (VOCS), semivolatile organic compounds (SVOCs), pesticides and metals:

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The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD) pair and one trip blank. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The trip blank was analyzed for volatiles only. The MS/MSD was analyzed for the same parameters as the parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 2.5°C which is within the 2-6°C range recommended by the QAPP.

This data verification report does not cover the waste characterization sample (AOC46-WC01) included on the chain of custody. Samples for waste characterization do not require data verification per the client's instructions. In addition, one sample (AOC53-BOT04) was analyzed for polychlorinated biphenyls (PCBs) because the analyst thought he recognized a PCB pattern for this sample when he reviewed the pesticide data. The sample was found not to contain any PCBs above the RL, so the PCB data was used as screening only and a detailed verification of the PCB analyses was not performed.

## **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; cooler receipt form and chain-of-custody (COC) forms. 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.

## VOLATILES

### General

The VOC portion of this SDG consisted of six (6) samples, including five soil samples and one trip blank. The samples were collected on February 16, 2005 and were analyzed for the full list of VOCs as specified in the CSSA QAPP. It should be noted that several analytes failed to meet criteria in the second source standard, requiring the data to be rejected (flagged "R"). The affected samples were recollected on March 10, 2005 and analyzed for the affected target analytes at no cost to the client. The recollected samples were reported in SDG 46805.

The VOC analyses were performed according to USEPA SW846 Method 8260B. 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 VOC analyses were performed in four analytical batches, three for soils and one for the water trip blank. The analyses were performed on four different instruments and each analytical batch was run using a separate ICAL.

### Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) and LCS duplicate (LCSD) samples and the surrogate spikes. No VOC sample was designated for MS/MSD analysis on the COC.

Two batches contained an LCS only and two batches contained an LCS/LCSD pair. All analytes met criteria in the LCS/LCSD samples analyzed for soils except for the following:

AAB #	Analyte	%R	Criteria
050218AM-84348	1,3,5-Trimethylbenzene	250	62-135%
	2-Chlorotoluene	169	63-135%
	4-Chlorotoluene	220	64-135%

This LCS was only associated with sample AOC53-BOT05. All non-compliant analytes were recovered high and were non-detect in the sample, so no corrective action was necessary.

All analytes met criteria in the LCS/LCSD analyzed for the water batch, except for the following:

AAB #	Analyte	LCS %R	LCSD %R	Criteria
050302AS-84351	Bromomethane	131	130	72-125%

This LCS/LCSD pair was only associated with the trip blank. This compound was recovered slightly high in the LCS/LCSD and was not detected in the trip blank, so no corrective action was required.

All surrogate spike recoveries were within acceptance criteria.

## Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD concentrations.

All LCS/LCSD RPDs were within acceptance criteria, except for the following:

AAB #	Analyte	RPD	Criteria
050302AS-84351	Dichlorodifluoromethane	26.5	RPD $\leq$ 20

This LCS/LCSD pair was only associated with the trip blank. This compound was not detected in the trip blank, so no corrective action was required

## 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 field and laboratory blanks for cross contamination of samples during sample transit 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 time required by the method.

- All instrument tune criteria were met.
- There were four initial calibrations (ICALs) associated with this SDG, three for soils and one for waters. All initial calibration criteria were met, except for the following: For AAB number 0502318AM-84348, the average response factor (RF) for bromoform did not meet the minimum requirement of 0.10. The RF for bromoform was 0.0638. For AAB number 050301AC-84359, the relative standard deviation (RSD) for methylene chloride exceeded the maximum criteria of 15% at 79%. All bromoform and methylene chloride results were flagged "R" as rejected in the associated samples.
- The LCS samples were prepared using a secondary source. All secondary source verification (SSV) criteria were met, except for the following:

AAB #	Analyte	%D	Criteria	Assoc. Samples
050226AC-84347	1,2,4-Trichlorobenzene	33	%D ≤ 25	AOC53-BOT04
050218AM-84348	1,3,5-Trimethylbenzene	150	%D ≤ 25	AOC53-BOT05
	2-Chlorotoluene	69		
	4-Chlorotoluene	120		
	Bromoform	26		
	Naphthalene	29		
	Vinyl chloride	39		
050301AC-74359	Methylene chloride	29	%D ≤ 25	AOC53-SW15
	trans-1,2-Dichloroethene	27		AOC53-SW16 AOC53-SW17
050302AS-84351	Bromomethane	31	%D ≤ 25	TB-1

All non-compliant analytes were flagged “R” as rejected in the associated samples in accordance with the CSSA QAPP. These samples (except the TB-1) were recollected and reanalyzed for the failing analytes.

- All continuing calibration verification criteria were met.
- All internal standard criteria were met.

Four method blanks and one Trip Blank were analyzed in association with the VOC analyses in this SDG. All blanks were free of target VOCs at or above the reporting limit (RL), with the following exceptions:

AAB #	Analyte	Conc.	RL
050302AS-84351	1,2,3-Trichlorobenzene	0.47 µg/L	0.3 µg/L
	Naphthalene	0.41 µg/L	0.4 µg/L

This method blank was associated with the Trip Blank only. The trip blank was non-detect for both analytes, so no corrective action was necessary.

### Completeness

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

All VOC results for the samples in this SDG were considered usable, with the exception of 14 data points rejected due to analytes that failed ICAL and/or SSV criteria. Therefore, the completeness of the VOC portion of this SDG is 96.1%, which meets the minimum acceptance criteria of 90%.

## SEMIVOLATILES

### General

The SVOC portion of this SDG consisted of five (5) soil samples. These samples were collected on February 16, 2005 and were analyzed for the full list of SVOCs as listed in the CSSA QAPP.

The SVOC analyses were performed according to USEPA SW846 Method 8270C. 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.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the surrogate spikes. No SVOC sample was designated for MS/MSD analysis on the COC.

All LCS and surrogate spike recoveries were within acceptance criteria.

### **Precision**

Precision could not be evaluated for the SVOC portion of this SDG since no duplicate analyses were performed.

### **Representativeness**

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

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

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

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All secondary source criteria were met.
- All continuing calibration verification criteria were met.
- All internal standard criteria were met.

One method blank was analyzed in association with the SVOC analyses in this SDG. The blank was free of target SVOCs 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 SVOC results for the samples in this SDG were considered usable. Therefore, the completeness of the SVOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **PESTICIDES**

### **General**

The pesticide portion of this SDG consisted of five (5) environmental soil samples. The samples were collected on February 16, 2005 and were analyzed for the full list of pesticides as specified in the CSSA QAPP.

The pesticide analyses were performed according to USEPA SW846 Method 8081A. 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.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the surrogate spikes.

All LCS and surrogate percent recoveries were within acceptance criteria.

### **Precision**

Precision could not be evaluated for the pesticide portion of this SDG since no duplicate analyses were performed.

### **Representativeness**

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

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

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

- All breakdown check criteria were met.
- All initial calibration criteria were met. The laboratory provided information for both columns.
- All second source verification criteria were met. The standards analyzed immediately following the ICALs were prepared using a secondary source.
- All calibration verification criteria were met.

One method blank was analyzed in association with the pesticide analyses in this SDG. The blank was free of target 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 pesticide results for the samples in this SDG were considered usable. The completeness of the pesticide portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## **ICP METALS**

### **General**

The ICP metals portion of this SDG consisted of twenty-one (21) samples, including nineteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for barium, chromium, copper, nickel, and zinc. Not all samples were analyzed for all metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The 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 samples in this SDG were analyzed in three different batches.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples and the MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

There were three LCS/LCSD pair analyzed, one for each batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated using the RPDs obtained from the LCS/LCSD and the MS/MSD concentrations.

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

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

- Three ICALs were analyzed for ICP metals. All initial calibration criteria were met.
- All second source verification criteria were met. The initial calibration verification was prepared using a secondary source.
- All continuing calibration verification criteria were met, except for the following:

CCV Date & Time	Metal	%D	Criteria
21-Feb-05 21:35	Zinc	13.0	%D ≤ 10
21-Feb-05 22:38	Zinc	18.2	%D ≤ 10

All samples associated with the CCV analyzed at 22:38 were reanalyzed with passing CCVs for zinc. Several samples were associated with the CCV analyzed at 21:35 and were not reanalyzed. All samples associated with this CCV had detections of zinc above the RL. However, because this CCV was only slightly outside criteria (3% low) and the CCV analyzed immediately prior to these samples met criteria, rejection of the data was deemed unnecessary. Conversations were held with Dr. Joe Fernando of Portage Environmental, Inc. and, based on the professional opinions of Portage and Parsons, the zinc results for the samples associated with the CCV of 21-Feb-05 21:35 were flagged “J” as estimated. The zinc results for these samples may exhibit a slight low bias, but the data is considered usable.

- All interference check criteria were met.
- The initial calibrations were analyzed using multiple points and the low point was below the RL for all metals, so no RL check standard was necessary.
- A dilution test (DT) was analyzed on samples AOC46-BOT01 and BLDG43-SW08 for all metals. A DT was analyzed on sample BLDG43-SW10 for copper only. All metals met DT criteria, except for the following:

AAB #	Sample ID	Metal	%D	Criteria
050218A-83966	AOC46-BOT01	Barium	13.0	%D ≤ 10
050223A-84060	BLDG43-SW08	Barium	12.0	%D ≤ 10
		Nickel	18.8	
		Zinc	10.9	

Barium met criteria in the MS/MSD analyzed for AAB number 050218A-83966, so the barium results for all samples analyzed in this AAB were flagged “J” as estimated due to the failing DT. The only sample analyzed in AAB 050223A-84060 was the parent sample for the DT. The results for the non-compliant metals were flagged “M” in sample BLDG43-SW08 in accordance with the CSSA QAPP.

- No post digestion spike was required, as per the CSSA QAPP.

Three method blanks and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

### **Completeness**

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

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

## **ARSENIC**

### **General**

The arsenic portion of this SDG consisted of seventeen (17) samples, including fifteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for arsenic using USEPA SW846 Method 7060A.

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

It should be noted that sample BLDG43-SW07 required a 2x dilution due to the high concentration of arsenic present.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS met criteria, but the MSD failed to meet criteria as follows:

<b>Metal</b>	<b>MS %R</b>	<b>MSD %R</b>	<b>Criteria</b>
Arsenic	79.6	72.4	74-120%

All sample results for arsenic were flagged “M” due to the low bias demonstrated by the MSD recovery.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A DT was performed on sample AOC46-BOT01. The DT met criteria for arsenic with a %D of 4.6.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic at or above the RL.

### **Completeness**

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

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

## **CADMIUM**

### **General**

The cadmium portion of this SDG consisted of seventeen (17) samples, including fifteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for cadmium using USEPA SW846 Method 7131A.

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

It should be noted that several samples required dilution due to the high concentration of cadmium present.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet criteria as follows:

<b>Metal</b>	<b>MS %R</b>	<b>MSD %R</b>	<b>Criteria</b>
Cadmium	73.3	60.0	80-122%

All sample results for cadmium were flagged “M” due to the low bias demonstrated by the MS/MSD recoveries.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

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

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A DT was performed on sample AOC46-BOT01 but was not applicable because this sample did not contain cadmium at a concentration greater than 25x the MDL.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium at or above the RL.

### **Completeness**

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

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

## LEAD

### General

The lead portion of this SDG consisted of nineteen (19) samples, including seventeen (17) environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for lead using USEPA SW846 Method 7421.

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

It should be noted that all but two of the samples required a dilution due to the high levels of lead present.

### Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet criteria as follows:

Metal	MS %R	MSD %R	Criteria
Lead	-369	-381	74-124%

The anomalous recoveries were due to the low spike amount (2.5 mg/kg) relative to the parent sample concentration (107 mg/kg). All sample results for lead were flagged "M" in accordance with the CSSA QAPP.

### Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

### Representativeness

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

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

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

- All initial calibration criteria were met. Two ICALs were analyzed for lead.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A dilution test was analyzed on sample AOC46-BOT01. The %D for lead exceeded criteria ( $\%D \leq 10$ ) at 12.1%. All sample results for lead were previously flagged “M” due to the non-compliant MS/MSD recoveries, so no additional corrective action was necessary.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

### **Completeness**

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

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

## **MERCURY**

### **General**

The mercury portion of this SDG consisted of eighteen (18) samples, including sixteen (16) environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for mercury using USEPA SW846 Method 7471A.

The 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 samples in this SDG were analyzed in two batches.

### **Accuracy**

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for mercury, one for each batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

### **Precision**

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

### **Representativeness**

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

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

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The 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.

Two method blanks and several calibration blanks were analyzed in association 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%.

**TO19 DATA VERIFICATION SUMMARY REPORT**  
**for samples collected from**  
**CAMP STANLEY STORAGE ACTIVITY**  
**BOERNE, TEXAS**

Data Verification by: Tammy Chang and Katherine LaPierre  
Parsons - Austin

**INTRODUCTION**

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on March 10, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for toxaphene and a selected list of volatile organic compounds (VOCS):

46805

The field quality control (QC) samples collected in association with this SDG included one field duplicate and one trip blank. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The trip blank was analyzed for volatiles only. The field duplicate was analyzed for the same parameters as the parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 4.0°C which is within the 2-6°C range recommended by the QAPP.

**EVALUATION CRITERIA**

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt form and chain-of-custody (COC) forms. 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.

**PESTICIDES**

**General**

The pesticide portion of this SDG consisted of six (6) samples, including five (5) environmental soil samples and one field duplicate. These samples were originally collected on December 20, 2004 and were analyzed for the full list of pesticides as specified in the CSSA QAPP. (See APPL SDG #46221, Parsons' data package ID TO19-#49.) However, the laboratory accidentally did not include a LCS for toxaphene in the

original report. Therefore, the samples were recollected on March 10, 2005 and the laboratory analyzed them for toxaphene only, at no expense to the client.

The toxaphene analyses were performed according to United States Environmental Protection Agency (USEPA) SW846 Method 8081A. 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.

### **Accuracy**

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

All LCS and surrogate percent recoveries were within acceptance criteria.

### **Precision**

Precision is normally evaluated using the relative percent difference (RPD) obtained from the field duplicate analyte results. Sample AOC53-BOT02 was collected in duplicate. The second soil jar for this sample was submitted and analyzed as a field duplicate.

Toxaphene was non-detect in both the parent and field duplicate samples, so 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 blank for cross contamination of samples during analysis.

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

- All breakdown check criteria were met.
- All initial calibration (ICAL) criteria were met. The laboratory provided information for both columns even though the second column was not required because all samples were non-detected.
- All second source verification criteria were met. The standards analyzed immediately following the ICALs were prepared using a secondary source.
- All calibration verification criteria were met.

One method blank was analyzed in association with the toxaphene analyses in this SDG. The blank was free of toxaphene 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 toxaphene results for the samples in this SDG were considered usable. The completeness of the toxaphene portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

## VOLATILES

### General

The VOC portion of this SDG consisted of six (6) samples, including five environmental soil samples and one trip blank. These samples were originally collected on February 16, 2005 and were analyzed for VOCs. (See APPL SDG #46616, Parsons' data package ID TO19-#52.) In the original data package, several analytes failed to meet criteria in the second source standard and/or initial calibration, requiring the data to be rejected (flagged "R"). The affected samples were recollected on March 10, 2005 and analyzed for the affected target analytes at no cost to the client. The samples were analyzed for one or more of the following compounds: 1,2,4-trichlorobenzene, 1,3,5-trimethylbenzene, 2-chlorotoluene, 4-chlorotoluene, bromoform, naphthalene, vinyl chloride and *trans*-1,2-DCE. The target compounds for each sample were determined by the previous data gap.

The VOC analyses were performed according to USEPA SW846 Method 8260B. 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 VOC analyses were performed in two analytical batches, one for soils and one for the water trip blank. The analyses were performed on two different instruments and each analytical batch was run using a separate ICAL.

### Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS samples and the surrogate spikes. No sample was designated for MS/MSD analysis on the COC.

Two LCS samples were analyzed, one for the soil batch and one for the water batch. All analytes met criteria for the LCS analyzed in the soil batch. All analytes met criteria for the LCS analyzed in the water batch, except for the following:

LCS ID	Analyte	%R	Criteria
050323A LCS-1WS	1,3,5-Trimethylbenzene	114	72-112%

This LCS was only associated with the trip blank. This compound was recovered slightly high in the LCS and was not detected in the trip blank, so no corrective action was required.

All surrogate spike recoveries were within acceptance criteria.

## **Precision**

Precision could not be evaluated for the VOC portion of this SDG since no duplicate analyses were performed.

## **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 field and laboratory blanks for cross contamination of samples during sample transit 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 time required by the method.

- All instrument tune criteria were met.
- There were two ICALs associated with this SDG, one for soils and one for waters. All initial calibration criteria were met.
- All secondary source criteria were met. The LCS samples were prepared using a secondary source.
- All continuing calibration verification criteria were met.
- All internal standard criteria were met.

Two method blanks and one Trip Blank were analyzed in association with the VOC analyses in this SDG. All blanks were free of target VOCs 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 VOC results for the samples in this SDG were considered usable. Therefore, the completeness of the VOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.