

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

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INTRODUCTION

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on July 13, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for metals:

44873

The only field quality control (QC) sample collected in association with this SDG was one equipment blank (EB).

All samples were collected by Parsons and analyzed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by the laboratory at a temperature of 4° C which is within the 2-6° C range recommended by the QAPP.

It should be noted that the chain-of-custody submitted for this data package incorrectly cited method SW6020 for arsenic and cadmium. APPL performs analyses for arsenic using method SW7060 and analysis for cadmium using method SW7131 in order to meet the reporting limits required by the CSSA QAPP for these metals.

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; chain-of-custody (COC) forms and cooler receipt checklists. 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 seven (7) samples, including six (6) environmental soil samples and one (1) equipment blank. The samples were collected on July 13, 2004 and were analyzed for a reduced list of ICP metals which included barium, chromium, copper, nickel and zinc. 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. The samples were prepared in two analytical batches, one for soils and one for the equipment blank. All samples were analyzed within the holding time required by the method

Accuracy

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

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

Precision

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

Both 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 field and laboratory blanks 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 time required by the method.

- There was one three-point initial calibration curve established for ICP metals. 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.
- All interference check criteria were met.
- Two dilution tests (DT) were performed for this SDG. A DT was analyzed on samples Bldg 43-BOT01 and Bldg 43-SW05. The DT results were as follows:

Bldg 43-BOT01

Metal	%D	Criteria
Ba	18.3	%D ≤ 10
Cr	14.7	
Ci	14.6	
Ni	NA	
Zn	20.4	

Bldg 43-SW05

Metal	%D	Criteria
Ba	137.5	%D ≤ 10
Cr	138.7	
Ci	134.8	
Ni	NA	
Zn	200.5	

The dilution test for sample Bldg43-SW05 was re-prepared and re-analyzed for confirmation. Results were comparable to the initial dilution test results according to the case narrative.

The dilution test was not applicable for nickel since this metal was below 50 times the MDL in all samples.

No MS/MSD was analyzed in this SDG, so all soil sample results for barium, chromium, copper and zinc were flagged "M" in accordance with the CSSA QAPP.

- No PDS was required as per the CSSA QAPP.

One equipment blank, two method blanks, and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of the 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 seven (7) samples, including six (6) environmental soil samples and one (1) equipment blank. The samples were collected on July 13, 2004 and were analyzed for arsenic using USEPA SW846 Method 7060A.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared in two analytical batches, one for soils and one for the equipment blank. All samples were analyzed within the holding time required by the method.

It should be noted that three samples required a two fold dilution due to the high level of arsenic present.

Accuracy

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

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

Precision

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

Both 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 field and laboratory blanks 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 in two analytical batches and analyzed within the holding time required by the method.

- There were two initial calibration curves established for this SDG, one for soils and one for waters. All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV samples were prepared using a secondary source.

- A dilution test was analyzed on samples Bldg 43-BOT01 and Bldg 43-SW05. The DT analyzed on sample Bldg 43-SW05 met criteria, but the DT analyzed on sample Bldg 43-BOT01 failed to meet criteria as follows:

Metal	%D	Criteria
Arsenic	20.5	%D ≤ 10

Since no MS/MSD was analyzed, the arsenic results for all soil samples in this SDG were flagged with “M” in accordance with the CSSA QAPP

- No PDS was required as per the CSSA QAPP.

One equipment blank, 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 results for the samples in this SDG were 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 seven (7) samples, including six (6) environmental soil samples and one (1) equipment blank. The samples were collected on July 13, 2004 and were analyzed for cadmium using USEPA SW846 Method 7421.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared in two analytical batches, one for soils and one for the equipment blank. All samples were analyzed within the holding time required by the method.

It should be noted that three samples required a two fold dilution due to the high level 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.

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

Precision

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

Both 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 field and laboratory blanks for cross contamination of samples during sample collection and analysis.

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

- There was one initial calibration curve established for both water and soil matrixes. 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.
- The dilution test was analyzed on sample Bldg 43-SW05. The DT failed to meet criteria as follows:

Metal	%D	Criteria
Cadmium	16.9	%D ≤ 10

Since no MS/MSD was analyzed, the cadmium results for all soil samples in this SDG were flagged with “M” in accordance with the CSSA QAPP.

- No PDS was required as per the CSSA QAPP.

One equipment blank, 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 seven (7) samples, including six (6) environmental soil samples and one (1) equipment blank. The samples were collected on July 13, 2004 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 in two analytical batches, one for soils and one for the equipment blank. All samples were analyzed within the holding time required by the method.

It should be noted that all samples except Bldg 43-BOT01 required 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.

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

Precision

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

Both 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 field and laboratory blanks 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 with two analytical batches and analyzed within the holding time required by the method.

- There was one initial calibration curve established for both water and soil matrixes. 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.

- Two dilution tests were analyzed for this SDG, on samples Bldg 43-BOT01 and Bldg 43-SW02. Both DTs failed to meet criteria for lead. Since no MS/MSD was analyzed, the lead results for all soil samples were flagged “M” in accordance with the CSSA QAPP.
- No PDS was required as per the CSSA QAPP.

One equipment blank, 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 seven (7) samples, including six (6) environmental soil samples and one (1) equipment blank. The samples were collected on July 13, 2004 and were analyzed for mercury using USEPA SW846 Method 7470A for waters and Method 7471A for soils.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared in two analytical batches, one for soils and one for the equipment blank. All samples were analyzed within the holding time required by the method.

Accuracy

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

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

Precision

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

Both 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 field and laboratory blanks for cross contamination of samples during sample collection and analysis.

Both samples 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 for both the water and soil initial calibration curves.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. Both ICV samples were prepared using a second source standard.

One equipment blank, one method blank and several calibration blanks were analyzed in association with the mercury analysis 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 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%.

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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:

46616

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:

Metal	MS %R	MSD %R	Criteria
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:

Metal	MS %R	MSD %R	Criteria
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 3, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for metals:

46747

There were no field quality control (QC) samples collected in association with this SDG.

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 3.0°C which is within the 2-6°C range recommended by the QAPP.

This data verification report does not cover the two waste characterization samples included on the chain of custody, samples BLDG93-01 and EP RANGE-01. Samples for waste characterization do not require data verification per the client's instructions.

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; 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 eight (8) environmental soil samples. The samples were collected on March 3, 2005 and were analyzed for barium, copper, and zinc. Not all samples were analyzed for all three 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 two batches, one for zinc only and the other for barium and copper.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) samples.

All LCS/LCSD recoveries were within acceptance criteria.

Precision

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

All LCS/LCSD RPD 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.
- 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 BLDG43-SW15 for barium and copper. The dilution test was not applicable for zinc because the parent sample concentration for this metal was less than 50 times the MDL. The DT met criteria for copper, but barium failed as follows:

Metal	%D	Criteria
Barium	11.8	%D ≤ 10
Copper	7.8	

Only one sample in this SDG required analysis for barium. The barium result for sample AOC53-SW18 was flagged “M” in accordance with the CSSA QAPP.

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

Two 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%.

CADMIUM

General

The cadmium portion of this SDG consisted of one (1) environmental soil sample. This sample was collected on March 3, 2005 and was analyzed for cadmium using USEPA SW846 Method 7131A.

This sample was 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 the sample was analyzed at a 2x dilution due to the high concentration of cadmium present.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples.

All 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 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 BLDG43-SW14 and was evaluated using the 2x dilution and the 10x dilution of this sample. The %D for cadmium failed to meet criteria at 11.7%. The cadmium result for the one sample in this SDG was 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.

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 four (4) environmental soil samples. The samples were collected on March 3, 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 three of the four 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 samples.

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 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.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A dilution test was analyzed on sample BLDG43-SW14 and was evaluated using the 5x dilution and the 25x dilution of this sample. The %D for lead met criteria at 3.0%.
- 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: Tammy Chang and Katherine LaPierre
Parsons - Austin

INTRODUCTION

The following data verification summary report covers one soil sample collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on March 22, 2005. The sample in the following Sample Delivery Group (SDG) was analyzed for copper:

46906

There were no field quality control (QC) samples collected in association with this SDG.

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.

This data verification report does not cover the waste characterization sample (AOC53-WC01) included on the chain of custody. Samples for waste characterization do not require data verification per the client's instructions.

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; 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 one (1) environmental soil sample. The sample was collected on March 22, 2005 and was analyzed for copper only.

The copper analyses were performed using USEPA SW846 Method 6010B. The sample in this SDG was analyzed following the procedures outlined in the CSSA QAPP. This sample was 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.

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 sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. This 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.
- 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.
- Only one sample in this SDG required copper analysis. The copper result for sample BLDG43-BOT06 was less than 50 times of MDL. Therefore, the dilution test was not applicable.
- No post digestion spike was not required, as per the CSSA QAPP.

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