

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 March 18, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semivolatile organic compounds (SVOCs) and metals:

43982

The only field quality control (QC) sample collected in association with this SDG were two field duplicate (FD) samples. 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.

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 4.0° 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; 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.

SEMIVOLATILES (SVOCs)

General

The SVOC portion of this SDG consisted of nine (9) samples, including six environmental soil samples, one field duplicate and one MS/MSD pair. The samples were collected on March 18, 2004 and were analyzed for SVOCs according to the United States Environmental Protection Agency (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 (%R) obtained from the laboratory control spike (LCS) sample, the MS/MSD samples and the surrogate spikes. Sample B29-SW06 was designated for MS/MSD analysis on the COC.

All LCS and surrogates recoveries were within acceptance criteria.

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

Analyte	MS %R	MSD %R	Criteria
Benzoic Acid	6.3	7.4	25-172%

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

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD and field duplicate analyte results. Sample B29-SW05 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

All MS/MSD RPDs were within acceptance criteria.

The RPD could not be evaluated for the field duplicate pair because all analytes were below the RL.

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.
- 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. No target SVOCs 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 SVOCs results for the samples in this SDG were considered usable. The completeness of the SVOCs 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 sixteen (16) samples, including twelve environmental soil samples, two field duplicates and one MS/MSD pair. The samples were collected on March 18, 2004 and were analyzed for a reduced list of ICP metals. The samples were analyzed for one or more of the following metals: chromium, copper, nickel, and zinc. Each sample has its own specific target list 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. The samples were prepared and analyzed in two batches and within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for ICP metals. All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD samples and the field duplicate analyte results. Sample B29-SW05 and sample DD-SW16 were collected in duplicate. The second jar for each sample was submitted and analyzed as a field duplicate.

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

For the field duplicate pair analyzed on sample B29-SW05, the RPDs for chromium and zinc could not be calculated because these metals were below the RL in both the parent and field duplicate. The RPD for nickel met criteria as follows:

Metal	B29-SW05 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Nickel	3.62	3.42	5.7	RPD \leq 20

For the field duplicate pair analyzed on sample DD-SW16, the RPD for copper met criteria, but the RPD for zinc exceeded criteria as follows:

Metal	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Copper	17.17	15.83	8.1	RPD ≤ 20
Zinc	17.36	13.59	24.4	

The AFCEE QAPP indicates all zinc detections above the RL should be flagged “J”. However, all zinc results above the RL were flagged “M” due to the failing dilution test. Since the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy, no corrective action was taken based on the high field duplicate RPD for zinc.

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.

- The instrument was calibrated twice on March 24, 2004 due to instrument drift. All initial calibration criteria were met for both initial calibration curves (ICALs).
- 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 ICV was injected after the first ICAL only since both calibrations were analyzed on the same day.
- All interference check criteria were met.
- No dilution test (DT) was required for analytical batch 040323A-74363 since all chromium results were below the RL and all copper, nickel and zinc detections were less than 50 times associated MDLs.
- A DT was required for analytical batch 040323A-74364 since both copper and zinc were detected above 50 times the MDL in one or more samples in this analytical batch. The DT was performed with sample DD-SW18. Both copper and zinc had non-compliant recoveries, as follows:

Metal	%D	Criteria
Copper	32.5	%D ≤ 10
Zinc	15.2	

No MS/MSD was available for this analytical batch, so all copper and zinc results were flagged “M” for the samples in this batch in accordance with the CSSA QAPP.

- No PDS 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%.

ARSENIC

General

The arsenic portion of this SDG consisted of nine (9) samples, including six (6) environmental soil samples, one field duplicate and one MS/MSD pair. The samples were collected on March 18, 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 and analyzed within the holding time required by the method.

It should be noted that sample B29-SW05 required a 2x dilution due to the high level of arsenic present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 was 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 and MS/MSD samples, and the field duplicate analyte results. Sample B29-SW05 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

All LCS/LCSD, MS/MSD and field duplicate 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.
- The DT was analyzed on sample B29-SW06. Arsenic failed to meet the criteria ($\%D \leq 10$) with a %D of 13.2. Because the MS/MSD met criteria for this metal, all arsenic results were flagged “J” 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 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%.

LEAD

General

The lead portion of this SDG consisted of twenty-two (22) samples, including eighteen (18) environmental soil samples, two field duplicates and one MS/MSD pair. The samples were collected on March 18, 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 and analyzed in two analytical batches and within the holding time required by the method.

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

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for lead. All LCS/LCSD recoveries were within acceptance criteria.

The lead recovery was slightly above tolerance in the MS, but met criteria in the MSD as follows:

Analyte	MS %R	MSD %R	Criteria
Lead	126	88.4	74-124%

All lead results were flagged “M” in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD samples, and the field duplicate analyte results. Samples B29-SW05 and DD-SW16 were both collected in duplicate. The second jar for each sample was submitted and analyzed as a field duplicate.

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

For the field duplicate pair analyzed on sample B29-SW05, the RPD for lead met criteria as follows:

Metal	B29-SW05 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Lead	3.76	4.08	8.2	RPD ≤ 25

For the field duplicate pair analyzed on sample DD-SW16, the RPD for lead exceeded criteria as follows:

Metal	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Lead	370.18	104.10	112.2	RPD ≤ 25

All lead results above the RL were previously flagged “M” due to the failing MS recovery, so no corrective action was necessary for the high field duplicate RPD (since the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy).

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.

- There were two initial calibration curves analyzed for lead. Both curves met all initial calibration criteria.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The two ICV samples (one for each ICAL) were prepared using a secondary source.
- Two dilution tests were analyzed. The DT run on sample B29-SW06 was evaluated using the 2x and 10x dilutions. The DT run on sample DD-SW19 was evaluated using the undiluted result and the 5x dilution. Both DTs met criteria for lead.
- 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 seven (7) samples, including six (6) environmental soil samples and one filed duplicate. The samples were collected on March 18, 2004 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.

It should be noted that sample DD-SW17 required a 5x dilution due to the high level of mercury 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 and the field duplicate analyte results. Sample DD-SW16 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The field duplicate RPD for sample DD-SW16 exceeded criteria as follows:

Analyte	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Mercury	0.56	0.76	30	RPD \leq 25

All mercury results above the RL were flagged “J” due to the high RPD.

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.

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 two soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on March 23, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semi-volatile organic compounds (SVOCs) and selected metals:

44016

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

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.

One of the samples listed on the chain-of-custody was reported separately (SDG 44015) due to different turn-around-time requirements.

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 checklist, and 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.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of two (2) environmental soil samples. The samples were collected on March 23, 2004 and were analyzed for the full list of semivolatiles as specified in the CSSA QAPP

The SVOC analyses were performed according to the United States Environmental Protection Agency (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 (%R) obtained from the LCS sample, MS/MSD samples and the surrogate spikes. No sample was designated for MS/MSD analysis on the COC. However, the laboratory performed an MS/MSD on sample B29-SW07.

All LCS and surrogate spike recoveries were within acceptance criteria.

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

Analyte	MS %R	MSD %R	Criteria
2,4-Dinitrophenol	20.5	20.5	25 - 161%
Benzoic Acid	7.8	6.6	25 - 172%

The sample results for these two compounds were flagged “M” in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD results.

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 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 instrument tune criteria were met.
- All initial calibration criteria were met.
- All second source verification criteria were met.
- No continuing calibration verification (CCV) was necessary since the samples were analyzed immediately following the calibration. Thus, no CCV was analyzed.
- All internal standard criteria were met.

One method blank was analyzed in association with the SVOC analyses in this SDG. The method blank was free of all target analytes 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%.

ICP METALS

General

The ICP metals portion of this SDG consisted of two (2) environmental soil samples. The samples were collected on March 23, 2004 and were analyzed for a reduced list of ICP metals which included chromium, 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. 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.
- A dilution test was performed on sample B29-SW08. The zinc concentrations for both samples in this SDG were less than 50 times the MDL, therefore, the dilution test was not required for zinc. Chromium and nickel failed to meet criteria as follows:

Metal	%D	Criteria
Chromium	10.5	%D ≤ 10
Nickel	14.2	

Since there was no MS/MSD analyzed for ICP, the sample results for chromium and nickel were flagged “M” in accordance with 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 two (2) environmental soil samples. The samples were collected on March 23, 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 and analyzed within the holding time required by the method.

It should be noted that one sample required a five fold dilution due to the high level of arsenic 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.
- The dilution test was analyzed on the five fold dilution of sample B29-SW08. The twenty-five (25) fold dilution was non-detect for arsenic. Therefore, the %D calculation was not applicable. All associated arsenic data were flagged "M".

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.

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%.

LEAD

General

The lead portion of this SDG consisted of two (2) environmental soil samples. The samples were collected on March 23, 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 and analyzed within the holding time required by the method.

It should be noted that both 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 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 the ten fold dilution of sample B29-SW08. The DT result met criteria as follows:

Metal	%D	Criteria
Lead	4.5	%D ≤ 10

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 soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on March 25, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semi-volatile organic compounds (SVOCs) and selected metals:

44052

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

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; laboratory quality control results; calibrations; case narratives; raw data; cooler receipt checklist, and 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.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of three (3) environmental soil samples. Only the samples collected from B29 required analysis for SVOCs. The samples were collected on March 25, 2004 and were analyzed for the full list of semivolatiles as specified in the CSSA QAPP

The SVOC analyses were performed according to the United States Environmental Protection Agency (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 (%R) obtained from the LCS and the surrogate spikes. No sample was designated for MS/MSD analysis on the COC.

All LCS recoveries were within acceptance criteria.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision could not be evaluated for the SVOC portion of this SDG because 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 instrument tune criteria were met.
- All initial calibration criteria were met.
- All second source verification criteria were met.
- There was one continuing calibration verification analyzed. All continuing calibration criteria were met.
- All internal standard criteria were met.

One method blank was analyzed in association with the SVOC analyses in this SDG. The method blank was free of all target analytes 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 for the SVOC 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 four (4) environmental soil samples. The samples were collected on March 25, 2004 and were analyzed for a reduced list of ICP metals. The sample collected from AOC56 required analysis for chromium, copper, and zinc. Samples collected from B29 required analysis for chromium, 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. 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.

- A dilution test was analyzed on sample B29-SW11. Copper and zinc met criteria, but chromium and nickel failed as follows:

Metal	%D	Criteria
Chromium	10.8	%D ≤ 10
Nickel	24.8	
Zinc	9.8	
Copper	9.1	

Since no MS/MSD was analyzed, all chromium and nickel results were flagged “M” in accordance with 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 three (3) environmental soil samples. Only samples collected from B29 required analysis for arsenic. The samples were collected on March 25, 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 and analyzed within the holding time required by the method.

It should be noted that two samples required a dilution due to the high levels of arsenic 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.
- The dilution test was analyzed on the five fold dilution of sample B29-SW11. The twenty-five (25) fold dilution was non-detect for arsenic, so the %D calculation was not-applicable. All arsenic results were flagged "M" since no MS/MSD was analyzed.

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.

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 one (1) environmental soil sample. Only sample AOC50-BOT06 required analysis for cadmium. The sample was collected on March 25, 2004 and was analyzed for cadmium using USEPA SW846 Method 7421.

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

It should be noted that this sample required a five 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.

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.
- The dilution test was analyzed on the five fold dilution for sample AOC50-BOT06. The DT failed to meet criteria as follows:

Metal	%D	Criteria
Cadmium	11.0	%D ≤ 10

Since no MS/MSD was analyzed, the cadmium result for sample AOC50-BOT06 was flagged “M” in accordance with 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 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 25, 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 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 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 the ten fold dilution of sample B29-SW11. The DT result met criteria as follows:

Metal	%D	Criteria
Lead	10.2	%D ≤ 10

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 June 14, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semivolatile organic compounds (SVOCs) and metals:

44676

The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD) pair and three field duplicates. 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. All field QC samples were analyzed for the same parameters as the associated parent sample.

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 3.0° 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; 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.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of sixteen (16) samples, including eleven (11) environmental soil samples, one MS/MSD pair and three field duplicates. The samples were collected on June 14, 2004 and were analyzed for the full list of semivolatiles as specified in the CSSA QAPP

The SVOC analyses were performed according to the United States Environmental Protection Agency (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.

All samples in this SDG were analyzed in a single batch. However, the MS/MSD was analyzed under a separate ICAL in a different batch.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS sample, the MS/MSD samples and the surrogate spikes. Sample B29-SW14 was designated for MS/MSD analysis on the COC.

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

Analyte	%R	Criteria
Di-n-octylphthalate	145	28-137%

No corrective action was necessary since this analyte was recovered above the upper control limit and was non-detect in all samples.

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

Analyte	MS %R	MSD %R	Criteria
Benzo(b)fluoranthene	136	141	27-135%
Benzoic Acid	11.4	11.0	25-172%
Pyrene	163	153	37-146%

The non-compliant analytes were flagged “M” in all samples.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD samples and the field duplicate analyte results. Samples B29-BOT04, B29-SW12 and B29-SW13 were collected in duplicate. The second container for each of these sites was submitted and analyzed as a field duplicate (FD).

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

Analyte	RPD	Criteria
4-Chloroaniline	34.4	RPD ≤ 30

No corrective action was necessary because all sample results were non-detect for this analyte.

The field duplicate RPDs for sample B29-BOT04 and its duplicate could not be calculated because all analytes were non-detect in both the parent and FD. The field duplicate RPDs for sample B29-SW12 and its duplicate could not be calculated because all analytes were below the RL in both the parent and FD. The field duplicate RPDs for sample B29-SW13 and its duplicate could not be calculated because all analytes were below the RL in both the parent and FD.

Representativeness

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

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory 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 instrument tune criteria were met.
- There were two initial calibrations (ICALs) associated with this SDG. All criteria were met for both ICALs.
- There were two second source verification (SSV) samples analyzed for this SDG, one for each ICAL. All SSV criteria were met.
- There were two continuing calibration verification (CCV) samples analyzed for this SDG, one for each ICAL. All CCV 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 SVOC analyses in this SDG. The method blank was free of all target analytes 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 for the SVOC 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 sixteen (16) samples, including eleven (11) environmental soil samples, one MS/MSD pair and three field duplicates. The samples were collected on June 14, 2004 and were analyzed for a reduced list of ICP metals, which included chromium, 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 and within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW14 was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

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

Analyte	MS %R	MSD %R	Criteria
Nickel	65.0	64.2	75-125%
Zinc	(77.2)	67.9	75-125%

() indicates the recovery met criteria.

The non-compliant analytes were flagged “M” in all samples.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Samples B29-BOT04, B29-SW12 and B29-SW13 were collected in duplicate. The second container for each of these sites was submitted and analyzed as a field duplicate (FD).

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

For the field duplicate pair analyzed on sample B29-BOT04, all three metals failed RPD criteria as follows:

Analyte	Parent Result (mg/kg)	Duplicate Result (mg/kg)	RPD	Criteria
Chromium	15.40	8.50	57.7	RPD ≤ 20
Nickel	8.14	3.23	86.4	
Zinc	15.45	7.04	74.8	

All sample results for nickel and zinc were previously flagged “M” due to the non-compliant MS/MSD recoveries. No corrective action was necessary for these metals because the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy. All sample results for chromium were flagged “J” due to the high degree of variability observed in the field duplicate results.

For the field duplicate pair analyzed on sample B29-SW12, chromium met criteria, but nickel and zinc failed RPD criteria as follows:

Analyte	Parent Result (mg/kg)	Duplicate Result (mg/kg)	RPD	Criteria
Chromium	7.80	7.20	(8.0)	RPD ≤ 20
Nickel	1.15	0.72	46.0	
Zinc	6.50	4.76	30.9	

() indicates the RPD met criteria.

All sample results for nickel and zinc were previously flagged “M” due to the non-compliant MS/MSD recoveries. No corrective action was necessary for these metals because the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy.

For the field duplicate pair analyzed on sample B29-SW13, chromium and nickel met criteria, but zinc failed RPD criteria as follows:

Analyte	Parent Result (mg/kg)	Duplicate Result (mg/kg)	RPD	Criteria
Chromium	6.70	7.60	(12.6)	RPD ≤ 20
Nickel	1.81	2.15	(17.2)	
Zinc	6.44	10.7	49.7	

() indicates the RPD met criteria.

All sample results for zinc were previously flagged “M” due to the non-compliant MS/MSD recoveries. No corrective action was necessary for zinc because the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy.

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.
- A dilution test was not applicable for zinc because all sample results were below 50 times the MDL for this metal. The dilution test analyzed on sample B29-SW14 was applicable for chromium and nickel only. Both chromium and nickel failed to meet criteria in the DT as follows:

Analyte	%D	Criteria
Chromium	16.4	%D ± 10
Nickel	86.5	

No corrective action was necessary since chromium was previously flagged “J” due to the non-compliant field duplicate RPD and nickel was previously flagged “M” due to the non-compliant MS/MSD recoveries.

- No PDS 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 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 sixteen (16) samples, including eleven (11) environmental soil samples, one MS/MSD pair and three field duplicates. The samples were collected on June 14, 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 and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW14 was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

Both MS/MSD recoveries were below acceptance criteria, as follows:

Analyte	MS %R	MSD %R	Criteria
Arsenic	18.0	31.6	74-120%

The arsenic results were flagged “M” in all samples.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Samples B29-BOT04, B29-SW12 and B29-SW13 were collected in duplicate. The second container for each of these sites was submitted and analyzed as a field duplicate (FD).

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

The field duplicate RPDs were all within acceptance criteria as follows:

Parent Sample	Parent Result (mg/kg)	Duplicate Result (mg/kg)	RPD	Criteria
B29-BOT04	4.00	4.12	(3.0)	RPD ≤ 25
B29-SW12	2.50	2.20	(12.8)	
B29-SW13	3.21	3.29	(2.5)	

() indicates the RPD met 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 sample was prepared using a secondary source.
- A dilution test (DT) was analyzed on sample B29-SW14. The DT failed to meet criteria ($\%D \pm 10$) with a $\%D$ of 121. No corrective action was necessary because all arsenic results were previously flagged “M” due to the non-compliant MS/MSD results.
- 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.

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%.

LEAD

General

The lead portion of this SDG consisted of sixteen (16) samples, including eleven (11) environmental soil samples, one MS/MSD pair and three field duplicates. The samples were collected on June 14, 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 and analyzed within the holding time required by the method.

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

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW14 was designated for MS/MSD analysis on the COC.

The LCS/LCSD recoveries were within acceptance criteria.

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

Analyte	MS %R	MSD %R	Criteria
Lead	96464	244	74-124%

The anomalous recoveries were due to the low spike amount relative to the native parent sample concentration. Lead was present in the parent sample at a concentration greater than 10 times the amount spiked. All lead results were flagged "M" due to the non-compliant MS/MSD recoveries. Due to the high degree of variation in the lead content measured in the parent and the Matrix Spike, the project manager was consulted. The decision was made to excavate more soil from this site before resampling is performed.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Samples B29-BOT04, B29-SW12 and B29-SW13 were collected in duplicate. The second container for each of these sites was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD RPDs were within acceptance criteria.

The MS/MSD RPD failed to meet criteria the criteria (RPD \leq 25) AT 189%. All associated sample results were already flagged "M" due to the failing MS/MSD recoveries, so no corrective action was necessary.

The field duplicate RPDs met criteria for two of the field duplicate pairs, but failed criteria in the third, as follows:

Parent Sample	Parent Result (mg/kg)	Duplicate Result (mg/kg)	RPD	Criteria
B29-BOT04	37.85	34.05	(10.6)	RPD ≤ 25
B29-SW12	89.23	50.07	56.2	
B29-SW13	39.74	39.77	(0.08)	

() indicates the RPD met criteria.

All lead results were previously flagged “M” due to the non-compliant MS/MSD results, so no corrective action was necessary.

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 calibration verification criteria were met.
- All second source calibration criteria were met. The ICV sample was prepared using a secondary source.
- All continuing calibration verification criteria were met, with one exception. The final CCV analyzed in the batch had a %D that exceeded criteria ($\%D \pm 10$) at 40.0. This CCV was run after the undiluted analyses of the samples and was recovered above tolerance due to the high concentration of lead in the samples. The samples bracketed by this CCV all had concentrations of lead that exceeded the upper limit of the ICAL range and thus were flagged “R”. All CCVs bracketing the diluted analyses met criteria, so data quality was not affected and no corrective action was necessary.
- A dilution test (DT) was analyzed on sample B29-SW14. The DT was evaluated using the 20x dilution and the 100x dilution of this sample. The DT exceeded criteria ($\%D \pm 10$) for lead with a percent difference of 131. All sample results were previously flagged “M” due to the non-compliant MS/MSD recoveries, so no 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, with one exception. The final CCB analyzed in the batch contained lead above the RL (0.5 mg/kg)

at 0.78 mg/kg. This CCB was run after the undiluted analyses of the samples and the lead was due to carry-over from the high concentration of lead in the samples. The samples bracketed by this CCB all had concentrations of lead that exceeded the upper limit of the ICAL range and thus were flagged “R”. All CCBs bracketing the diluted analyses met criteria, so data quality was not affected and 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 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%.