APPENDIX F

DATA QUALITY ASSESSMENT REPORT

EcoChem, Inc.

Environmental Science and Chemistry

DATA QUALITY ASSESSMENT

TOOELE ARMY DEPOT—SOUTH AREA
DAAA15-90-D-0007, TASK 0001

SOLID WASTE MANAGEMENT UNIT (SWMU) 13

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EcoChem Project Number: 8901-48

March 4, 1994

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DATA QUALITY ASSESSMENT SUMMARY

BASIS FOR DATA QUALITY ASSESSMENT

This report summarizes the results of data quality assessment performed on soil and water samples and associated laboratory quality control samples. Refer to the Sample Index for sample identifications.

Samples were analyzed for the following parameters and were reviewed by the chemists listed below:

Test	Lot	Method (Matrix)	Primary Reviewer	Secondary Reviewer
Breakdown Products	AEOA	IC-DC-COOH (water)	Mark Brindle	Radu Nicoara
Breakdown Products	ADZU	IC-DC-COOH (soil)	Mark Brindle	Radu Nicoara
Thiodiglycols	AENC	OG-DC-TDG/WD (water)	Mark Brindle	Radu Nicoara
Thiodiglycols	ADSC	LL9 (soil)	Mark Brindle	Radu Nicoara
BETX	AEAP	EPA 8020 Modified (soil)	Mark Brindle	Radu Nicoara
BETX	AEPP	EPA 8020 Modified (water)	Mark Brindle	Radu Nicoara
TPH	AELF	EPA 8015 Modified (water)	Mark Brindle	Radu Nicoara
TPH	AEAO	EPA 8015 Modified (soil)	Mark Brindle	Radu Nicoara
Volatile Organics	AEND	UM21 (water)	Shawna Kennedy	Eric Strout
Volatile Organics	ADSQ	LM23 (soil)	Shawna Kennedy	Eric Strout
Semivolatile Organics	AELB	UM25 (water)	Frank Pernat	Eric Strout
Semivolatile Organics	ADSM	LM25 (soil)	Frank Pernat	Eric Strout
Antimony	ADTB	EPA 7041 (soil)	Jason Ai	Radu Nicoara
Antimony	AEIJ	EPA 7041 (water)	Jason Ai	Radu Nicoara
Arsenic	ADSY	B9 (soil)	Jason Ai	Radu Nicoara
Arsenic	AEIG	AX8 (water)	Jason Ai	Radu Nicoara
Lead	ADSZ	JD21 (soil)	Jason Ai	Radu Nicoara
Lead	AEIH	SD18 (water)	Jason Ai	Radu Nicoara
Mercury	ADRR	Y9 (soil)	Jason Ai	Radu Nicoara
Mercury	AELV	CC8 (water)	Jason Ai	Radu Nicoara
Uranium, total	ADXW	KPLP (water)	Jason Ai	Radu Nicoara
Uranium, total	AEDY	KPLP (soil)	Jason Ai	Radu Nicoara
ICP-Metals	ADSX	JS12 (soil)	Jason Ai	Radu Nicoara
ICP-Metals	AEIF	SD12 (water)	Jason Ai	Radu Nicoara
Explosives	ADST	LW23 (soil)	Mark Brindle	Radu Nicoara
Explosives	AEKX	UW25 (water)	Mark Brindle	Radu Nicoara
Gross Alpha/Gross Beta	AFER	Rad (Water)	Cari Sayler	Jason Ai

Data assessment was based on the QC criteria recommended in the above listed methods, the Tooele Army Depot—South Area QC Plan, USEPA Functional Guidelines for Organic and Inorganic Data Review, and USATHAMA (USAEC) Quality Assurance Program (PAM 11-41).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are assigned a J or UJ, data may be used for site evaluation and risk assessment purposes, but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the above-referenced documents and method.

Copies of the qualified transfer files are included as Appendix A. Data Quality Assessment Worksheets, Communication, and Corrective Action Records have been placed in labeled envelopes with the original data packages.

DATA VALIDATION QUALIFIER CODES

U	The material was analyzed for, but was not detected. The associated numerical value is the certified reporting limit.
R	Unreliable result. Data should not be used. Analyte may or may not be present in the sample.
J	Analyte present. Reported value is an estimate that may not be accurate or precise. Data Quality Assessment Report should be consulted for reason.
UJ	Not detected. Detection limit may be inaccurate or imprecise and may not be equal to certified reporting limit. Data Quality Assessment Report should be consulted for reason.

SITE DATA QUALITY SUMMARY

Fluoroacetic Acid and Isopropylmethylphosphonic Acid (breakdown products). Two lots using DataChem Method IC-DC-COOH were reviewed; one lot contained soil samples and the other lot contained water samples. All results were found to be acceptable for use without qualification.

Thiodiglycols and Chloroacetic Acid

Thiodiglycols and chloroacetic acid were analyzed for in soil samples using Method LL9. Thiodiglycol results are acceptable for use without qualification. Chloroacetic acid results were all non-detects, and have been qualified as estimated (UJ) because of low recoveries on both the

low and high spikes. The laboratory qualified the data as potentially biased low (L), due to low recoveries and USAEC concurred in their response letter.

Thiodiglycols were measured in water samples using DataChem Method OG-DC-TDG/WD. One lot, AENC, was reviewed. All results were found to be acceptable for use without qualification.

BETX. Two lots were analyzed for benzene, ethylbenzene, toluene, and total xylenes (BETX) by EPA Method 8020, modified for the shorter list of analytes; one lot contained soil samples and the other lot contained water samples. All results were found to be acceptable for use without qualification.

TPH. Two lots were analyzed for total petroleum hydrocarbons (TPH) using DataChem Method OV SW-Modified 8015, a modified version of EPA Method 8015. One lot contained soil samples and the other lot contained water samples. All results were found to be acceptable for use without qualification.

Explosives. Two explosives lots were reviewed; one containing soil samples and one containing water samples. 1,3,5-Trinitrobenzene recoveries were below action levels on both the high and low spikes associated with the soil lot (ADST). The laboratory qualified all non-detects for 1,3,5-trinitrobenzene as "L," the USAEC Chemistry Branch concurred. This corresponds to qualifying all non-detects as estimated (UJ) at the certified reporting limit. These data are usable, but are potentially biased low indicating that 1,3,5-trinitrobenzene could be present in the samples at concentrations at or slightly above the CRL and not be detected.

Volatile Organics. Two volatile organics lots were reviewed; one containing soil samples and one containing water samples. The water sample results were found to be acceptable for all uses without qualification; however, matrix spike and matrix spike duplicates were not analyzed with this lot, as they are not required as part of the USAEC program for this method. Since surrogate recoveries were consistently acceptable and similar (low RPD between samples), matrix problems do not appear likely.

Five soil samples were found to have low recoveries for one or more surrogates; surrogate recoveries for blank spikes were acceptable. All target analytes were qualified in these five samples as "UJ" at the CRL. No analytes were detected in these samples. All surrogate recoveries were above 65%; consequently, the results, although qualified, are usable with the understanding that the target analytes could be present at the CRL and not detected.

Semivolatile Organics. Two semivolatile organic lots were reviewed; one containing soil samples and the other containing water samples. Analytical results were qualified in both lots. In Lot ADSM, containing soil samples, all results for 27 analytes were qualified as undetected (UJ) at concentrations significantly above their CRL due to the inability of the laboratory to detect the analytes during initial calibration. Results for four additional analytes were rejected based on initial calibration; they were either not detected during calibration or were detected in so few standards (three or less) that a meaningful calibration was not possible. Results for four more

analytes were qualified as estimated, J(+)/UJ(-), due to significant loss of sensitivity between continuing and initial calibration. Many of the remaining analytes were qualified in specific samples (see Section 8 of Lot ADSM) because of decreased sensitivity as measured by unacceptably low internal standard recoveries.

Initial and continuing calibration results are significantly better in Lot AELB. All results for 6 analytes were qualified based on initial calibrations, and recommended reporting limits for those analytes were typically less than 10 times the CRL. Continuing calibration results were acceptable, and internal standards recoveries were acceptable except for chrysene-d12 in one sample.

Antimony. Two antimony lots were reviewed, one containing soil samples and one containing water samples. The water sample results were found to be acceptable for all uses without qualification. The soil sample results were qualified as estimated due to low pre-digestion sample recovery and high spike recoveries. Both recoveries were just outside the acceptable ranges, but in opposite directions; consequently, the data are considered acceptable for most uses, with the understanding that the data may be biased as low as 50% of true or as high as 140% of true.

Arsenic. Two arsenic lots were reviewed, one containing soil samples and one containing water samples. All arsenic data are acceptable for use without qualification.

Mercury. Two mercury lots were reviewed, one containing soil samples and one containing water samples. All arsenic data are acceptable for use without qualification.

Lead. Two lead lots were reviewed; one containing soil samples and one containing water samples. The soil sample results were found to be acceptable for all uses without qualification. The water sample results were qualified as estimated, J(+)/UJ(-), due to low matrix spike recoveries. Both pre- and post-digestion recoveries were low (43% to 46%) and very similar, indicating the potential for a fairly constant low bias in the lot samples. Blank spike recoveries were acceptable (100% to 102% recoveries). The data is useable with qualification, and should be considered to be potentially biased low by as much as 45% of the true value.

Total Uranium. Two uranium lots were reviewed; one containing soil samples and one containing water samples. All soil samples were acceptable for use without qualification. All water sample results were found to be acceptable for use without qualification. The preparation blank for the lot of aqueous samples was found to contain 0.09 +/- 0.01 µg/l of uranium. This blank contamination resulted in the qualification of a single detection of uranium in sample 13ER-07 at 0.08 as non-detected (U). Since the only sample qualified was the field blank (13ER-07), the preparation blank contamination problem had no affect on the sample data quality.

ICP-Metals. Two ICP-metals lots were reviewed; one containing soil samples and one containing water samples. All soil sample results were found to be acceptable for use without qualification, except for silver and barium. All silver and barium results in soil lot ADSX were qualified as estimated, J(+)/UJ(-), due to low matrix spike recoveries. The silver data are useable with the

understanding that the silver concentrations are potentially biased low by as much as 34% of the true value. For barium, both the precision and accuracy of the matrix spikes are poor; the barium results are biased low, but the amount of bias is not known.

All water sample results were found to be acceptable for use without qualification, with the single exception of sodium in sample 13FB-03 (the field blank), which was qualified as non-detected (U) due to preparation blank contamination.

Gross alpha/Gross beta. One lot of water samples analyzed for gross alpha and gross beta radiation using DCL Method WREP-300 was reviewed. All sample results were acceptable without qualification.

DATA QUALITY ASSESSMENT
FLUOROACETIC ACID AND ISOPROPYLMETHYLPHOSPHONIC ACID ANALYSES: WATER
METHOD: IC-DC-COOH
LOT NO.: AEOA

I. Deliverables and Documentation

All necessary documentation for lot AEOA were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. DataChem QA Status Reports and USAEC Control Chart Response were not required for this method. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot AEOA. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEOA. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13FB-02 and 13FB-03 from lot AEOA were identified as field blanks on the chain-of-custody forms. Fluoroacetic acid or isopropylmethylphosphonic acid compounds were not detected in the blanks.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All water samples in lot AEOA were analyzed within 27 days of collection. The laboratory's 28-day analysis holding time limit was met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curves for fluoroacetic acid and isopropylmethylphosphonic acid. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25%. Daily calibrations were performed with each reanalysis.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One water method blank was associated with the samples in lot AEOA. Fluoroacetic acid or isopropylmethylphosphonic acid were not detected in the method blank at or above the certified reporting limit (CRL). The method-required frequency of one blank per 20 field samples was met.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on Sample S-92-91 from lot AEOA. The percent recovery and relative percent difference (RPD) values were within control limits. The method requirement of one MS/MSD pair per 20 field samples was met.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AEOA were reviewed for fluoroacetic acid and isopropylmethylphosphonic acid; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. Positive identifications of fluoroacetic acid or isopropylmethylphosphonic acid were not reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. Transcription errors were not noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary ACCEPTABLE/All criteria met.

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
FLUOROACETIC ACID AND ISOPROPYLMETHYLPHOSPHONIC ACID ANALYSES:
SOIL
METHOD: IC-DC-COOH
LOT NO.: ADZU

I. Deliverables and Documentation

All necessary documentation for lot ADZU were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. The sample percent moisture values on the transfer files could not be confirmed. DataChem QA Status Reports and USAEC Control Chart Response were not required for this method. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: Changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot ADZU. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot ADZU. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13WL-01 / 13WL-01 (DUP); 13CU-02-3 / 13CU-02-3 (DUP), and 13PP-04-2 / 13PP-04-2 (DUP) from lot ADZU were identified as field duplicate samples on the chain-of-custody forms. Fluoroacetic acid or isopropylmethylphosphonic acid compounds were not detected in the pairs. Field duplicate precision was not calculable.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in lot ADZU were analyzed within 20 days of collection. The laboratory's 28-day analysis holding time limit was met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curves for fluoroacetic acid and isopropylmethylphosphonic acid. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25%. Daily calibrations were performed with each reanalysis.

4.0 Blank Analysis: ACCEPTABLE/With the following discussion.

Qualified Data: None.

One soil method blank was associated with the samples in lot ADZU. Fluoroacetic acid or isopropylmethylphosphonic acid were not detected in the method blank at or above the certified reporting limit (CRL). The method-required frequency of one blank per 20 field samples was not met. Twenty-one field samples were analyzed with only one method blank. Data qualifiers were not assigned.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

The laboratory performed MS/MSD analyses on Sample 13PP-06-1 from lot ADZU. The percent recovery and relative percent difference (RPD) values were within control limits. The method requirement of one MS/MSD pair per 20 field samples was not met. One MS/MSD pair was prepared and analyzed with 21 field samples. Data qualifiers were not assigned.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot ADZU were reviewed for fluoroacetic acid and isopropylmethylphosphonic acid; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. Positive identifications of fluoroacetic acid or isopropylmethylphosphonic acid were not reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. Transcription errors were not noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary ACCEPTABLE/All criteria met.

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
THIODIGLYCOL ANALYSES: WATER
METHOD: OG-DC-TDG/WD
LOT NO.: AENC

I. Deliverables and Documentation

All necessary documentation for lot AENC were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. DataChem QA Status Reports and USAEC Control Chart Response were not required for this method. Final sample results were submitted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot AENC. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AENC. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13WL-01 / 13WL-01 (DUP) and 13CU-02-3 / 13CU-02-3 (DUP) from lot AENC were identified as field duplicate samples on the chain-of-custody forms. Thiodiglycol was not detected in either pair. Field duplicate precision was not able to be evaluated.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All water samples in lot AENC were analyzed by direct injection within 39 days of collection. The laboratory's 40-day analysis holding time limit was met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for thiodiglycol. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25%. Daily calibrations were performed with each reanalysis.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

Two water method blanks were associated with the samples in lot AENC. Thiodiglycol was not detected in the method blanks at or above the certified reporting limit (CRL).

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on Samples 13FB-01 and S-59-90 from lot AENC. The percent recovery and relative percent difference (RPD) values were within control limits.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AENC were reviewed for thiodiglycol; false negatives or false positives were not found. There were no discrepancies between the raw data and the final sample results. Positive identifications of thiodiglycol were not reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. Transcription errors were not noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary ACCEPTABLE/All criteria met.

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
THIODIGYLCOL AND CHLOROACETIC ACID ANALYSES: SOIL
METHOD: LL9
LOT NO.: ADSC

I. Deliverables and Documentation

All necessary documentation for lot ADSC were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages. The sample percent moisture values on the transfer files could not be confirmed. DataChem QA Status Reports and USAEC Control Chart Response were submitted. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot ADSC. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot ADSC. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

Samples 13WL-01 / 13WL-01 (DUP) and 13CU-02-3 / 13CU-02-3 (DUP) from lot ADSC were identified as field duplicate samples on the chain-of-custody forms. Thiodiglycol or chloroacetic acid compounds were not detected in either pair. Field duplicate precision was assumed to be acceptable.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in lot ADSC were extracted within 5 days of collection and were analyzed within 40 days of extraction. The 7-day extraction holding time and 40-day analysis holding time limits were met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curves for thiodiglycol and chloroacetic acid. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25%. Daily calibrations were performed with each reanalysis.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One soil method blank was associated with the samples in lot ADSC. Thiodiglycol and chloroacetic acid were not detected in the method blank at or above the certified reporting limit (CRL).

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: NOT ANALYZED

The laboratory did not perform MS/MSD analyses with the samples from lot ADSC.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot ADSC were reviewed for thiodiglycol and chloroacetic acid; no false negatives or false positives were found. There were no discrepancies between the raw data and the transfer files. Positive identifications of thiodiglycol and chloroacetic acid were not reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. No transcription errors were noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	Reason
Chloroacetic acid	UJ at CRL	All samples in Lot ADSC	High spike and Low spike recovery values below control limits

Discussion:

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found.

An examination of the DataChem QA Status Report that includes lot ADSC revealed the following items: chloroacetic acid results in the high spike were below the lower control limit and chloroacetic acid results in the low spike were below the lower control limit. The laboratory notes that the reason for the low chloroacetic acid recovery values is not known.

The trends and outliers noted from the DataChem QA Status Report for lot ADSC resulted in the laboratory's qualification of all non-detected chloroacetic acid sample results with an "L" flag. The reviewer recommends that all chloroacetic acid results for lot ADSC be qualified UJ at the certified reporting limit. The data qualifiers are summarized in the table above.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
BENZENE, TOLUENE, ETHYL BENZENE AND XYLENE (BTEX) ANALYSES: SOIL
METHOD: EPA 8020 MODIFIED
LOT NO.: AEAP

I. Deliverables and Documentation

All necessary documentation for lot AEAP were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. The sample percent moisture values on the transfer files could not be confirmed. The QA Status Report and Control Charts were not required for this method. Final sample results were submitted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEAP. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All samples listed on lot AEAP chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEAP. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, the final sample results, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13FS-27 and 13FS-27 (DUP) were identified as field duplicates for lot AEAP at Tooele South Site. Benzene, ethyl benzene and toluene were not detected in the duplicate samples. Since xylene was detected in only one of the two samples, the relative percent difference (RPD) value was not calculable.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in lot AEAP were analyzed within 6 days of collection, thus the 14-day holding time criterion was met by all soil samples.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for BTEX compounds. Linearity was acceptable for the standard curve.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25%. The laboratory analyzed the complete sequence of calibration standards before and after the analysis of the field samples.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One soil method blank was associated with the samples in lot AEAP. BTEX compounds were not detected in the method blank at or above the reporting limit.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on 13ER-01. The MS/MSD results were within control limits for percent recovery and relative percent difference.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AEAP were reviewed for BTEX compounds; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. All identifications were reviewed and are acceptable.

7.0 Compound Quantitation and Reported Detection Limits: ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The reporting limits on the final sample results met those listed in the method.

V. Overall Assessment/QC Summary

On the basis of this evaluation, the laboratory followed the specified method. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
BENZENE, TOLUENE, ETHYL BENZENE AND XYLENE (BTEX) ANALYSES: WATER
METHOD: EPA 8020 MODIFIED
LOT NO.: AEPP

I. Deliverables and Documentation

All necessary documentation for lot AEPP were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. The QA Status Report and Control Charts were not required for this method. Final sample results were submitted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEPP. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All samples listed on lot AEPP chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEPP. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, the final sample results, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13ER-13, 13ER-14 and 13ER-15 were identified as drill equipment rinsate blanks for lot AEPP at Tooele South Site. Sample 13FB-04 was identified as a field blank for lot AEPP at Tooele South Site. BTEX compounds were not detected in the drill equipment rinsate blanks or the field blank.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All water samples in lot AEPP were analyzed within 8 days of collection, thus the 14-day holding time criterion was met by all soil samples.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for BTEX compounds. Linearity was acceptable for the standard curve. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25% The laboratory analyzed the complete sequence of calibration standards before and after the analysis of the field samples.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One soil method blank was associated with the samples in lot AEPP. BTEX compounds were not detected in the method blank at or above the reporting limit.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on Sample S-56-90. The MS/MSD results were within control limits for percent recovery and relative percent difference.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AEPP were reviewed for BTEX compounds; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. All identifications were reviewed and are acceptable.

7.0 Compound Quantitation and Reported Detection Limits: ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The reporting limits on the final sample results met those listed in the method.

V. Overall Assessment/QC Summary

On the basis of this evaluation, the laboratory followed the specified method. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
TOTAL PETROLEUM HYDROCARBONS ANALYSES: WATER
METHOD OV-SW 8015 MODIFIED
LOT NO.: AELF

I. Deliverables and Documentation

All necessary documentation for lot AELF were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. DataChem QA Status Reports and USAEC Control Charts were not required with this method. Final sample results were submitted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South Site sample in lot AELF. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All Tooele South Site samples listed on lot AELF chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AELF. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, the final sample results, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

Sample 13FB-03 was identified as a field blank sample. TPH compounds were not detected in the sample.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All water samples in lot AELF were analyzed within 13 days of collection.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for TPH compounds. Linearity was acceptable for the standard curve. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25% The laboratory analyzed the complete sequence of calibration standards before and after the analysis of the field samples.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One water method blank was associated with the samples in lot AELF. TPH compounds were not detected in the method blank at or above the reporting limit.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on Sample S-81-91 from Tooele South Site. The MS/MSD results are as follows: MS 106% and MSD 110%, with a relative percent difference (RPD) value of 3.7%. The control limits of 39% to 150% recovery and ≤50% RPD were met.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AELF were reviewed for TPH compounds; false negatives or false positives were not found. There were no discrepancies between the raw data and the final sample results. All identifications were reviewed and are acceptable.

7.0 Compound Quantitation and Reported Detection Limits: ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The reporting limits on the raw data met those listed in the method.

8.0 Laboratory Duplicate Analysis: NOT ANALYZED

V. Overall Assessment/QC Summary

On the basis of this evaluation, the laboratory followed the specified method. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
TOTAL PETROLEUM HYDROCARBONS ANALYSES: SOIL
METHOD: OV SW-MODIFIED 8015
LOT NO.: AEAO

I. Deliverables and Documentation

All necessary documentation for lot AEAO were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages. The sample percent moisture values on the transfer files could not be confirmed. Final sample results were submitted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEAO. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All Tooele South Site samples listed on lot AEAO chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEAO. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, the final sample results, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

Samples 13FS-27 and 13FS-27 (DUP) were identified as field duplicate samples. TPH compounds were not detected in either sample. Field duplicate precision was not able to be evaluated.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in lot AEAO were analyzed within six days of collection.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for TPH compounds. Linearity was acceptable for the standard curve. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/All criteria met.

The results of the daily calibration standard agreed with the initial calibration standard within 25% The laboratory analyzed the complete sequence of calibration standards before and after the analysis of the field samples.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One soil method blank was associated with the samples in lot AEAO. TPH compounds were not detected in the method blank at or above the reporting limit.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/All criteria met.

The laboratory performed MS/MSD analyses on Sample 13FS-27 from Tooele South Site. The MS/MSD results are as follows: MS 87% and MSD 142%, with a relative percent difference (RPD) value of 48%. The control limits of 32% to 160% recovery and ≤50% for RPD were met.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AEAO were reviewed for TPH compounds; no false negatives or false positives were found. There were no discrepancies between the raw data and the final sample results. All identifications were reviewed and are acceptable.

7.0 Compound Quantitation and Reported Detection Limits: ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The reporting limits on the raw data met those listed in the method.

8.0 Laboratory Duplicate Analysis: NOT ANALYZED

V. Overall Assessment/QC Summary

On the basis of this evaluation, the laboratory followed the specified method. Technical deficiencies were not found.

The data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
VOLATILE ORGANIC ANALYSES: WATER
METHOD: UM21
LOT NO.: AEND

I. Deliverables and Documentation

All necessary documentation for lot AEND were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. MS/MSD analyses were not submitted. USATHAMA PAM 11-41 does not require MS/MSD analyses for Class 1A analyses. The state of Utah may require MS/MSD analyses for the assessment of sites within Utah. Transfer files, coding forms and DataChem QA Status Reports were provided. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each sample in lot AEND. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All samples submitted in this lot were listed on the field chain-of-custody.

Laboratory chain-of-custody forms were present and complete for each sample in lot AEND. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for Samples S-76-91 and 13FB-03 were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

The chain-of-custody forms do not identify any field duplicate or equipment blank samples. An assessment of field precision could not be made. The chain-of-custody forms list the following samples as trip blanks: 13TB-26, 13TB-27 and 13TB-28. There were no target or unknown analytes detected in these blanks. The chain-of-custody lists sample 13FB-03 as a field blank. Chloroform was detected in this field blank.

Associated samples with positive results for chloroform less than the action level are qualified as estimated (see section 4.0).

IV. Technical Assessment

1.0 Sample Holding Times: ACCEPTABLE/All criteria met.

The analytical holding time criterion listed in Method UM21 for water matrices is 14 days from date of sampling. All analyses were performed within 12 days of sampling.

2.0 GC/MS Instrument Performance Check: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Bromofluorobenzene (BFB) was analyzed at the beginning of each calibration sequence as required. All appropriate BFB data were provided and all results were within the specified control limits listed in the data package. The ion abundance criteria listed in the data package and those listed in Method UM21 differ slightly for mass 173. The data package criterion is "less than 1% of mass 95" while Method UM21 states "less than 2% of mass 174". For both BFB calibrations submitted with this data package, mass 173 meets each set of criteria. No further action was taken.

3.0 Initial and Continuing Calibration: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

The initial calibration was performed at the proper frequency. Five standards were used, meeting USATHAMA PAM 11-41 criterion for Class 1A. Response factors and percent relative standard deviation (%RSD) were calculated for several compounds (see Data Quality Assessment Worksheets). During data assessment, only positive results in the associated samples would be qualified based on outlying curve linearity. All sample positive results were associated with compound calibration curves with acceptable linearity.

Daily calibrations were run at the correct frequency (before and after sample analyses). All daily calibrations met the Method UM21 criteria. The calibrations had several percent difference (%D) values between daily and initial response factors above 25%. Outlying compounds and %D are listed in the Data Quality Assessment Worksheets. There were no positive results for compounds associated with a non-compliant %D value. The certified reporting limits (CRL) were not significantly affected, and no action was taken.

4.0 Blank Analyses: ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	Blank Concentration	QC Criteria
Chloroform	U At Reported Level	S-76-91 S-78-91	4.3 15.8	Action level 5X field blank concentration, based on 9.584 µg/L in 13FB-03

Discussion:

The method blank was analyzed at the proper frequency (one for each lot). The blank was free of target and unknown analytes above the CRL. Three trip blanks were submitted with this lot. They were free of target and unknown analytes above the CRL. The field blank, 13FB-03, had a positive result for chloroform. An action level of five times the concentration detected in the field blank was established for data assessment. Associated samples with positive results for chloroform less than the action level were qualified as U at the reported concentration, as summarized in the above table.

5.0 Surrogate Recovery: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Surrogate compound percent recoveries (%R) were reviewed by recalculation. See the Data Quality Assessment Worksheets for examples of surrogate calculations. The upper and lower surrogate percent recovery limits from the control charts in the DataChem QA Status Report are based upon a standard matrix (ASTM Type II water) surrogate quality control spike. There are no control charts for field sample (natural matrix) surrogate recovery. For data assessment purposes, the surrogate percent recoveries were compared to the limits specified in the three day moving average percent recovery control charts in the DataChem QA Status Report, and the surrogate recovery limits specified in the EPA Contract Laboratory Program (CLP) 3/90 Statement Of Work (SOW). The CLP SOW does not specify recovery limits for two of the USATHAMA-specified surrogate compounds, methylene chloride-d2 and ethylbenzene-d10. For these compounds, a recovery limit of ±20% (80% to 120% recovery range) was used to assess the field sample results.

All surrogate recoveries were within the limits specified by the EPA CLP 3/90 SOW. For surrogate compounds not specified in the EPA CLP 3/90 SOW, all recoveries fell within the 80% to 120% acceptance range.

In the seven field and QC sample analyses, all analyses had all surrogate compound percent recoveries within the control limits established by the three day moving average percent recovery control charts in the DataChem QA Status Report, with the exception of

toluene-d8 in Sample 13FB-03 at 91.1% (control chart lower limit is 92.3%). No qualifiers were issued based on surrogate percent recovery.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analyses: NOT SUBMITTED.

7.0 Laboratory Control Sample (LCS): NOT SUBMITTED.

8.0 Internal Standards Performance: ACCEPTABLE/All criteria met.

Analysis of areas and retention times for internal standards was conducted (see Data Quality Assessment Worksheets). No quality control criteria for internal standards are specified in USATHAMA PAM 11-41 or the laboratory method. For data assessment purposes, the criteria from U.S. EPA National Functional Guidelines was used to assess the internal standards.

All internal standard areas were within the acceptance window of 50% - 200% of the continuing calibration internal standard area. All retention times were within ± 30 seconds of the continuing calibration internal standard retention time.

9.0 Compound Identification: ACCEPTABLE/All criteria met.

All target compound identifications reviewed were acceptable.

10.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion

The quantitation of target analytes and unknowns was reviewed by recalculation (see Data Quality Assessment Worksheets). All compound quantitations were calculated correctly. The certified reporting limits met those listed in Method UM21 with the following exceptions. Method UM21 lists CRL of 1.0 µg/L for 1,4-dichlorobenzene and 1,2/1,4-dimethylbenzenes (m,p-xylenes). The transfer file and coding form list CRL of 2.0 µg/L for these analytes in all samples. No transcription errors were noted.

11.0 Unknown Compounds: ACCEPTABLE/All criteria met.

There were no non-target (unknown) compounds detected in any of the samples in lot AEND.

12.0 System Performance: ACCEPTABLE/All criteria met.

No signs of degraded instrument performance were observed. The analytical system was judged to have been in tune, within control, and stable during the course of these analyses.

V. Overall Assessment/QC Summary

Based on this evaluation, the laboratory adhered to the specified analytical method.

MS/MSD analyses were not submitted, so precision could not be evaluated. Accuracy was acceptable, as demonstrated the surrogate spike recoveries.

The laboratory Quality Assurance Status Report states that there were no points outside control limits in lot AEND, and recommends that lot AEND be accepted. Recoveries were trending above the mean for the surrogates ETBD10 and MEC6D8. These trends had no significant affect on the sample results in lot AEND.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
VOLATILE ORGANIC ANALYSES: SOIL
METHOD: LM23
LOT NO.: ADSQ

I. Deliverables and Documentation

All necessary documentation for lot ADSQ were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages and spiked sample (MS/MSD and/or LCS) analyses. Sample moisture was provided on the transfer file but moisture raw data logbook pages were not provided. Spiked sample analyses are not required by USATHAMA PAM 11-41, although the State of Utah may require MS/MSD analyses for assessment of sites in Utah. Transfer files, coding forms and DataChem QA Status Reports were provided. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each sample in lot ADSQ. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. There were several samples listed on the field chain-of-custody that were not submitted with lot ADSQ. All samples submitted in this lot were listed on the field chain-of-custody.

Laboratory chain-of-custody forms were present and complete for each sample in lot ADSQ. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for Samples 13CU-03-1 and 13WL-01 were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

The chain-of-custody forms list sample sets 13CU-02-3 / 13CU-02-3(D) and 13WL-01 / 13WL-01(D) as field duplicates. There were no target analytes detected in any of the field duplicate sample sets. An assessment of field precision could not be made. No trip blank or equipment blank data were submitted with lot ADSQ.

IV. Technical Assessment

1.0 Sample Holding Times: ACCEPTABLE/All criteria met.

The extraction holding time criterion listed in Method LM23 for soil matrices is 7 days from date of sampling to date of extraction. All samples were extracted within 7 days of sampling. The analytical holding time criterion listed in Method LM23 for soil matrices is 14 days from date of sampling. All analyses were performed within 11 days of sampling.

2.0 GC/MS Instrument Performance Check: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Bromofluorobenzene (BFB) was analyzed at the beginning of each calibration sequence as required. All appropriate BFB data were provided and all results were within the specified control limits listed in the data package. The ion abundance criteria listed in the data package and those listed in Method LM23 differ slightly for mass 173. The data package criterion is "less than 1% of mass 95" while Method LM23 states "less than 2% of mass 174". For both BFB calibrations submitted with this data package, mass 173 meets each set of criteria. No further action was taken.

3.0 Initial and Continuing Calibration: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

The initial calibration was performed at the proper frequency. Five standards were used, meeting USATHAMA PAM 11-41 criterion for Class 1A. Response factors and percent relative standard deviation (%RSD) were calculated for several compounds (see Data Quality Assessment Worksheets). During data assessment, only positive results in the associated samples would be qualified based on outlying curve linearity. There were no positive results in any of the samples. No action required.

Daily calibrations were run at the correct frequency (before and after sample analyses). All daily calibrations met the Method LM23 criteria. The calibrations had several percent difference (%D) values between daily and initial response factors above 25%. Outlying compounds and %D are listed in the Data Quality Assessment Worksheets. There were no positive results for compounds associated with a non-compliant %D value. The CRL for associated compounds were not significantly affected, and no action was taken.

4.0 Blank Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

The method blank was analyzed at the proper frequency (one for each lot). The blank was free of target analytes above the CRL. One unknown was detected in the blank. The laboratory did not report non-target (unknown) compounds in a sample if the non-target compound was detected in the method blank at a similar level. No action was taken.

No field blanks (trip or rinse) were submitted with this lot.

5.0 Surrogate Recovery: ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	Surrogate %R	QC Criteria
All target analytes	UJ	13WL-01	Methylene chloride-d2 = 74.8% Toluene-d8 = 74.7% Ethylbenzene-d10 = 73.1%	80-120 84-138 80-120
		13WL-01(D	Toluene-d8 = 81.2%	84-138
		13WL-02	Methylene chloride-d2 = 73% Toluene-d8 = 71.8% Ethylbenzene-d10 = 70.3%	80-120 84-138 80-120
		13WL-03	Toluene-d8 = 80.5% Ethylbenzene-d10 = 79.7%	84-138 80-120
		13WL-04	Methylene chloride-d2 = 73.2% Toluene-d8 = 70.0% Ethylbenzene-d10 = 68.4%	80-120 84-138 80-120

Discussion:

Surrogate compound percent recoveries (%R) were reviewed by recalculation. See the Data Quality Assessment Worksheets for examples of surrogate calculations. The upper and lower surrogate percent recovery limits from the control charts in the DataChem QA Status Report are based upon a standard matrix (ASTM Type II water) surrogate quality control spike. There are no control charts for field sample (natural matrix) surrogate recovery. For data assessment purposes, the surrogate percent recoveries were compared to the limits specified in the three day moving average percent recovery control charts in the DataChem QA Status Report, and the surrogate recovery limits specified in the EPA Contract Laboratory Program (CLP) 3/90 Statement Of Work (SOW). The CLP SOW does not specify recovery limits for two of the USATHAMA-specified surrogate compounds, methylene chloride-d2 and ethylbenzene-d10. For these compounds, a recovery limit of ±20% (80% to 120% recovery range) was used to validate the field sample results.

Several surrogate compounds in the samples had percent recoveries below the lower control limits specified in either the CLP SOW or the ±20% recovery range. These surrogate recoveries were also below the LCL (lower control limit) values specified in the DataChem QA Status Report control chart. There were no positive target compound results in any sample. The

certified reporting limits (CRL) for all non-detected compounds are estimated to reflect the possible low bias. Qualified data are summarized in the above table. All other surrogate recoveries were within the limits specified by the EPA CLP 3/90 SOW. For surrogate compounds not specified in the EPA CLP 3/90 SOW, all recoveries fell within the 80% to 120% acceptance range.

In the 13 field and QC sample analyses, five analyses had all four surrogate compound percent recoveries less than the control limits established by the three day moving average percent recovery control charts in the DataChem QA Status Report. These surrogates were below the CLP limits, and are qualified as noted in the above table. One sample (13CU-03-2) had only one surrogate below the lower control limit, for a total of 21 surrogates (of 52) outside the recovery limits specified by the DataChem QA Status Report control charts. The samples and the surrogate outliers are listed in the Data Quality Assessment Worksheet. For Sample 13CU-03-2, as the surrogate percent recovery met the CLP limit, and as the surrogate recovery was not significantly outside the control chart limits, no qualifiers were issued to Sample 13CU-03-2 based on surrogate percent recovery.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analyses: NOT SUBMITTED.

7.0 Laboratory Control Sample (LCS): NOT SUBMITTED.

8.0 Internal Standards Performance: ACCEPTABLE/All criteria met.

Analysis of areas and retention times for internal standards was conducted (see Data Quality Assessment Worksheets). No quality control criteria for internal standards are specified in USATHAMA PAM 11-41 or the laboratory method. For data assessment purposes, the criteria from U.S. EPA National Functional Guidelines was used to assess the internal standards.

All internal standard areas were within the acceptance window of 50% to 200% of the continuing calibration internal standard area. All retention times were within ± 30 seconds of the continuing calibration internal standard retention time.

9.0 Compound Identification: ACCEPTABLE/All criteria met.

All target compound identifications reviewed were acceptable.

10.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The quantitation of target analytes and unknowns were reviewed by recalculation (see Data Quality Assessment Worksheets). All compound quantitations were calculated correctly. The certified reporting limits met those listed in Method LM23. No transcription errors were noted.

11.0 Unknown Compounds: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion

Mass spectral library searches to identify unknowns were performed as required and all identifications are acceptable. Only one unknown compound was detected in each sample and the method blank. As discussed in Section 4.0, non-target (unknown) compounds were not reported by the laboratory if the non-target compound was detected in the method blank at a similar level. No non-target compounds were reported on the transfer file.

12.0 System Performance: ACCEPTABLE/All criteria met.

No signs of degraded instrument performance were observed. The analytical system was judged to have been in tune, within control, and stable during the course of these analyses.

V. Overall Assessment/QC Summary

Based on this evaluation, the laboratory adhered to the specified analytical method.

MS/MSD analyses were not submitted so laboratory precision could not be evaluated. Accuracy was acceptable, as demonstrated by most of the surrogate spike recoveries.

The laboratory Quality Assurance Status Report states that there were no points outside control limits in lot ADSQ and recommends that lot ADSQ be accepted. No outliers or trends were noted.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
SEMIVOLATILE ORGANIC ANALYSES: WATER
METHOD: UM25
LOT NO.: AELB

I. Deliverables and Documentation

All necessary documentation for Lot AELB were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. MS/MSD analyses were not submitted. USATHAMA PAM 11-41 does not require MS/MSD analyses for Class 1A analyses. The state of Utah may require MS/MSD analyses for the assessment of sites within Utah. Transfer files, coding forms, DataChem QA Status Reports, and the USAEC Control Chart Response were provided. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes and corrections were struck out by a single line and the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the raw data; proper units for numerical values were used; the laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each sample in lot AELB. All forms were signed and dated. The field chain-of-custody forms indicate no problems with sample receipt and/or sample condition. All samples listed on the field chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for all samples in Lot AELB. All forms were signed and dated. The laboratory lot and sample identifications suffixes were clearly indicated on all laboratory chain-of-custody forms. No discrepancy was found in the field ID and laboratory ID in tracking Samples S-82-91 and S-28-88 from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data.

III. Field Quality Control

There were no field quality control samples submitted with this lot.

IV. Technical Assessment.

1.0 Sample Holding Times: ACCEPTABLE/All criteria met.

The extraction holding time criterion listed in Method UM25 for semivolatiles in a water matrix is 7 days from date sampled to extraction date. The analytical holding time criterion for semi-

volatile compounds in a water matrix is 40 days from extraction date to date of analysis. All water samples were extracted within 4 days of sampling, and analyzed within 29 days of extraction.

2.0 GC/MS Instrument Performance Check: ACCEPTABLE/All criteria met.

DFTPP was analyzed at the beginning of each 12-hour analytical sequence, as required. All DFTPP data were provided, and all results were within the specified control limits.

3.0 Initial and Daily Calibration: ACCEPTABLE/With the following exceptions.

Qualified Data:

Compounds	Code	Qualifier	Sample Number	Method CRL (µg/L)	Recommended reporting limit (µg/L)
Naphthalene	NAP	UJ	S-55-90	0.23	2.0
Di-n-octyl phthalate	DNOP	UJ	All Samples	1.4	5.0
2,3,6-Trichlorophenol	236TCP			1.6	20
2-Chlorophenol	2CLP			2.8	20
Bromacil	BRMCIL			2.9	20
Endrin Aldehyde	ENDRNA			5.0	20
3,3-dichlorobenzidine	33DCDB			5.0	20

Discussion:

The initial calibration was performed at the proper frequency. Six standards were used, meeting USATHAMA PAM 11-41 criterion for Class 1A analyses. No Lack of Fit or Zero Intercept tests were submitted. During data assessment, only positive results in the associated samples would be qualified based on outlying curve linearity. All sample positive results were associated with compound calibration curves with acceptable linearity.

Only one analyte, other than internal standards and surrogates, was detected in the lowest standard (0.5 µg/L) of the initial calibration (ICAL). Only 15 (of 108) target analytes were detected in the 2.0 µg/L standard. In several instances, the sample certified reporting limit (CRL) is less than the lowest calibration standard concentration detected in the ICAL. Due to this decreased sensitivity, there is an uncertainty whether or not these analytes can be consistently detected at low concentrations in a field sample, even if present at a concentration equal to or slightly above the CRL. Therefore, the CRL for each analyte was compared to the concentrations in the lowest standard in which the analyte was detected. The first detectable concentration for that analyte should be used as its reporting limit. This (revised) reporting limit has been flagged as UJ because it is an estimate of the true reporting limit for the analyte. The true reporting limit of the analyte is somewhere between the concentration of the last standard in which an analyte was not detected, and the concentration of the first standard in which the analyte was detected. The estimated reporting limits are therefore conservative estimates that

may overestimate the reporting limit by the distance between adjacent standards. Naphthalene was detected in two of the three field samples. Only the CRL for the non-detect is estimated (UJ), as summarized in the above table.

Two compounds (chlordane and endosulfan II) were detected in only three of the ICAL standards (100, 200 and 300 µg/L). The CRL for these compounds are 37 µg/L and 42 µg/L, respectively. Although the CRL for these compounds are acceptable (the compounds were detected in all standards with concentrations greater than the CRL), a three point calibration curve was used for these compounds, which does not meet the Class 1A criteria. As there are no positive results for these compounds, no action was taken.

Daily calibrations (DCAL) were run at the correct frequency (before and after sample analyses). All daily calibrations met the Method UM25 criteria, in that two-thirds of the DCAL target analyte relative error values [percent difference (%D) values] were less than 25% when compared to the initial calibration curve. The %D values that exceeded the 25% upper control limit are listed in the Data Quality Assessment Worksheet. There were no positive compound results associated with a non-compliant %D value. The CRL for non-detected were not significantly affected. No data qualifiers were assigned.

4.0 Blank Analyses: ACCEPTABLE/All criteria met.

A method blank was analyzed at the required frequency. The blank was free of target compounds and unknown compounds above the CRL.

5.0 Surrogate Recovery: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

All surrogate spiking compound recoveries were reviewed The upper and lower surrogate percent recovery (%R) limits from the DataChem QA Status Report control are based upon a standard matrix (ASTM Type II water) surrogate quality control spike. There are no control charts for field sample (natural matrix) surrogate recovery. For data quality assessment purposes, the surrogate percent recoveries were compared to the limits specified in the three day moving average percent recovery control charts in the DataChem QA Status Report, and the limits established for surrogate recovery in the EPA Contract Laboratory Program (CLP) 3/90 Statement of Work (SOW). The CLP SOW does not specify recovery limits for two of the USATHAMA specified surrogate compounds. For these compounds, the limits recommended by the CLP SOW for additional surrogate compounds (20% - 130%) were used to assess the data.

Twenty-two (of 50 total) surrogate %R values in the field and QC analyses had recoveries outside the limits established by the DataChem QA Status Report control charts. The non-compliant surrogate recoveries are listed in the Data Quality Assessment Worksheets. Two

samples had surrogate recoveries outside the CLP SOW control limits. One sample had a low %R value for an acid fraction analyte while the second sample had a low acid fraction %R value and a high base/neutral (BN) fraction %R value. No action is taken unless two surrogates of the same fraction (BN or acid) are outside the CLP SOW control limits, and also outside the three day moving average percent recovery control chart limits. No data qualifiers were assigned.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analyses: NOT SUBMITTED.

7.0 Field Duplicates: NOT SUBMITTED.

8.0 Internal Standards Performance: ACCEPTABLE/with the following exceptions.

Qualified Data:

Compounds	Qualifier	Sample Number	QC Value	QC Criteria
Analytes associated with chrysene-d12 (see attached)	UJ	S-82-91	IS Area = 13107	13437 to 53746

Discussion:

Analysis of areas and retention times for internal standards was conducted (see Data Quality Assessment Worksheets). No quality control criteria are specified in USATHAMA PAM 11-41 or the laboratory method for internal standard assessment. For data assessment purposes, the criteria from EPA National Functional Guidelines was used to assess the internal standards.

Sample S-82-91 has an internal standard (IS) area for chrysene-d12 outside the technical acceptance window (50% to 200% of associated continuing calibration internal standard area). There were no positive results for any of the associated analytes (see attached for a list of internal standards and associated analytes. The CRL for the analytes associated with the noncompliant IS are qualified as estimated (UJ). All other IS areas fell within the specified acceptance limits. All IS retention times were within plus or minus 30 seconds of the associated continuing calibration IS retention time for the samples. Data qualified are summarized in the above table.

9.0 Compound Identification: ACCEPTABLE/All criteria met.

All compound identifications were reviewed and are found to be acceptable.

10. Compound Quantitation and Compound Reporting Limits (CRL): ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Target compound quantitation was performed by the laboratory using a Finnegan instrument generated linear regression method. Insufficient data are present in the data package to accurately replicate the compound quantitations. Several compound quantitations were recalculated using the method described in the CLP SOW, with results similar to those reported by the laboratory. The compound quantitations were judged to be acceptable. The certified reporting limits (CRL) met those listed in Method UM25. No transcription errors were found.

11. Unknown Compounds: ACCEPTABLE/With the following exceptions.

Qualified Data: All unknown compounds were qualified as estimated (JN).

Discussion:

Mass spectral library searches to identify unknown compounds were performed as required, and all reported identifications were acceptable. All unknown compounds are qualified as estimated with tentative identification (JN).

12. System Performance: ACCEPTABLE/All criteria met.

No signs of degraded instrument performance were observed. The analytical systems were judged to have been in tune, within control, and stable during the course of these analyses.

13. Overall Assessment of the Data

Based on this evaluation, the laboratory adhered to the specified analytical method.

Accuracy was acceptable, as demonstrated by the %R values of most surrogates compounds. An evaluation of precision is not possible due to the lack of an MS/MSD and/or field duplicates; however, the surrogate recoveries were sufficiently similar from sample-to-sample that no matrix problem is expected.

The DataChem QA Status Report for lot AELB noted the following trends: 2,4,6-tribromophenol and di-n-octyl phthalate-d4 recoveries were trending below the mean, 2-fluorobiphenyl recoveries were trending above the mean, and the recoveries of 2,4,6-tribromophenol were going in a downward direction. No individual outliers were noted for lot AELB. The trends noted above did not significantly affect any sample results for lot AELB. The USAEC Control Chart Response letter accepts lot AELB with no action required.

Six analytes were qualified as estimated in all samples based on initial calibration and additional 19 were qualified based on internal standard recoveries in one sample.

All data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
SEMIVOLATILE ORGANIC ANALYSES: SOIL
METHOD: LM25
LOT NO.: ADSM

I. Deliverables and Documentation

All necessary documentation for Lot ADSM was provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages. Sample moisture was provided on the transfer file but moisture raw data logbook pages were not provided. MS/MSD analyses were not submitted. USATHAMA PAM 11-41 does not require MS/MSD analyses for Class 1A analyses. The state of Utah may require MS/MSD analyses for the assessment of sites within Utah. Transfer files, coding forms, DataChem QA Status Reports and the USAEC Control Chart Response letter were provided. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes and corrections were struck out by a single line and the entry initialed and dated by the analyst; correction fluid or tape was not found on any of the raw data; proper units for numerical values were used; the laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each sample in Lot ADSM. All forms were signed and dated. The field chain-of-custody forms indicate no problems with sample receipt and/or sample condition. All samples listed on the field chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for all samples in Lot ADSM. All forms were signed and dated. The laboratory lot and sample identifications suffixes were clearly indicated on all laboratory chain-of-custody forms. No discrepancy was found in the field ID and laboratory ID in tracking Samples 13CU-03-1, 13CU-02-3, and 13CU-02-03 (D on the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data.

III. Field Quality Control

The chain-of-custody forms list two sets of field duplicates, samples 13CU-02-3/13CU-02-3 (D, and samples 13WL-01/13WL-01 (D. No target compounds were detected in any of the replicate samples except di-n-butyl phthalate. This compound was also detected in the method blank and reagent blank. Due to blank contamination, the di-n-butyl phthalate results were qualified as not detected (U), as discussed in Section 4 below. An assessment of field precision could not be made.

IV. Technical Assessment.

1.0 Sample Holding Times: ACCEPTABLE/All criteria met.

The technical extraction holding time criterion listed in Method LM25 for semivolatiles in a soil matrix is 14 days from date sampled to extraction date. The analytical holding time criterion for semivolatile compounds in a soil matrix is 40 days from extraction date to date of analysis. All soil samples were extracted within 6 days of sampling, and analyzed within 21 days of extraction.

2.0 GC/MS Instrument Performance Check: ACCEPTABLE/All criteria met.

DFTPP was analyzed at the beginning of each twelve hour analytical sequence as required. All DFTPP data were provided, and all results were within the specified control limits.

3.0 Initial and Daily Calibration: ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Code	Qualifier	Sample	Method CRL (µg/g)	Recommended reporting limit (µg/g)
1,2,3-Trichlorobenzene	123TCB	UJ	All samples	0.032	0.625
Benzyl Alcohol	BZALC			0.032	
Chrysene	CHRY			0.032	
Dibenzofuran	DBZFR			0.038	
4-Bromophenyl phenylether	4BRPPE			0.041	
Benzo(a)anthracene	BAANTR			0.041	
1,2-Dichlorobenzene	12DCLB			0.042	
2,4,6-Trichlorophenol	246TCP			0.061	
Dimethylphthalate	DMP			0.063	
4,4'-DDD	PPDDD			0.064	
Atrazine	ATZ			0.065	
Dithiane	DITH			0.065	
Fluorene	FLRENE			0.065	
Chlorophenyl methyl sulfone	CPMSO2			0.066	
Vapona	DDVP			0.068	
4,4'-DDE	PPDDE			0.068	
Dibromochloropropane	DBCP			0.071	
Oxathiane	OXAT			0.075	
Dieldrin	DLDRN			0.079	
Hexachlorobenzene	CL6BZ			0.080	
Chlorophenyl methyl sulfide	CPMS			0.097	
2-Methyl naphthalene	2MP			0.098	
Lindane	LIN			0.100	
4,4'-DDT	PPDDT			0.100	

Compound	Code	Qualifier	Samples	Method CRL (µg/g)	Recommended reporting limit (µg/g)
Methoxychlor	MEXCLR	UJ	All samples	0.260	3.125
Endrin ketone	ENRDNK			0.280	
Dibenz (a,h) anthracene	DBAHA			0.310	
PCB-1016	PCB016	R	All samples	0.320	NA
PCB-1260	PCB260			0.790	
PCB-1262	PCB262			6.30	
Toxaphene	TXPHEN			12.0	

Compound	Qualifier	Sample Number	%D Value	%D Criteria
Bis(2-ethylhexyl)phthalate	J(+) / UJ(-)	All samples	%D = 98%	%D <± 25%
4-Chloroaniline	UJ	All samples	%D = 57%	
3-Nitroaniline	UJ	All samples	%D = 53%	
Chrysene	UJ	All samples	%D = 97%	

Discussion:

The initial calibration was performed at the proper frequency. Six standards were used, meeting the USATHAMA PAM 11-41 requirements for Class 1A analyses. During data assessment, only positive results in the associated samples would be qualified based on outlying curve linearity. All sample positive results were associated with compound calibrations curves with acceptable linearity.

Only one analyte, other than internal standards and surrogates, was detected in the lowest concentration standard (0.5 µg/L) of the initial calibration (ICAL). Only 16 (of 108) target analytes were detected in the 2.0 µg/L standard. In several instances, a compound certified reporting limit (CRL) is less than the lowest calibration standard concentration in which the compound was detected in the ICAL (when adjusted to µg/g). Due to this decreased sensitivity, there is an uncertainty whether or not these analytes can be consistently detected at low concentrations in a field sample, even if present at a concentration equal to or slightly above the CRL. Therefore, the CRL for each analyte was compared to the concentrations in the lowest standard in which the analyte was detected. The first detectable concentration (adjusted to µg/g) for that analyte should be used as the reporting limit for the analyte. This (revised) reporting limit has been flagged as UJ because it is an estimate of the true reporting limit for the analyte. The true reporting limit of the analyte is somewhere between the concentration of the lowest standard in which the analyte was not detected, and the concentration of the first standard in which the analyte was detected. The estimated reporting limits are therefore conservative estimates that may overestimate the reporting limit by the distance between adjacent standards. Only the CRL for non-detects are estimated (UJ), as summarized in the above table.

Four compounds (PCB-1016, PCB-1260, PCB-1262, and toxaphene) were not included in the initial calibration, in any daily calibration, and were not part of the list of compounds scanned for in any sample. These compounds were reported as not detected in all samples, without any laboratory qualifiers. All CRL for these compounds are rejected (R).

Eighteen compounds were detected in only the 50, 100, and 200 µg/L calibration standards. These compounds (4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 4,6-dinitro-2-creosol, pentachlorophenol, 3,5-dinitroaniline, supona, endrin aldehyde, endrin, endrin ketone, endosulfan II, endosulfan sulfate, methoxychlor, dibenz (a,h) anthracene, and 3,3-dichlorobenzidine) did not meet the required number of calibration standards for Class 1A analyses. There were no positive results for any of these compounds. Non-detected results would not be affected. No further action was taken.

Two closely eluting compounds (1,3-dichlorobenzene and 1,4-dichlorobenzene) were not resolved in the initial calibration at concentrations of 100 µg/L and 200 µg/L. The same peak was used to quantitate the response factors for both compounds. As the initial calibration is used to quantitate all compound results, this could potentially affect the quantitation of any positive results for either of these compounds. As there were no positive results for 1,3-dichlorobenzene or 1,4-dichlorobenzene in any lot ADSM samples, no data are affected. No further action was taken.

The continuing calibrations were analyzed at the required frequency. The continuing calibrations met the USATHAMA PAM 11-41 acceptance criteria of two-thirds of all percent difference (%D) values less than ±25%; however, each of the continuing calibrations had %D values above ±25%. The calibrations and compounds with non-compliant %D values are listed in the Data Quality Assessment Worksheet. Of the compounds with non-compliant %D values, only one compound {bis(2-ethylhexyl)phthalate} was detected in the associated samples. The positive results for bis(2-ethylhexyl)phthalate are estimated (J). A positive %D value indicates a decrease in instrument sensitivity and a possible low bias. The CRL for non-detected samples associated with a non-compliant %D value greater than 50% are estimated (UJ). All other CRL associated with non-compliant %D values were not significantly affected, and no action was taken.

4.0 Blank Analyses: ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	Sample Concentration	Blank Concentration	QC Criteria
Di-n-butyl phthalate	U at reported concentration	13CU-03-3 13CU-02-2 13CU-02-3 13WL-01 13WL-01 (D) 13WL-02	2.0 µg/g 1.4 µg/g 6.0 µg/g 2.0 µg/g 1.4 µg/g 3.7 µg/g	2.8 µg/g	Sample concentration less than CRL and greater than 10 x blank concentration

Discussion:

Method blanks were analyzed at the required frequency. Di-n-butyl phthalate was detected in the method blank and one reagent blank. This compound was also detected in several of the samples. Since phthalates are common laboratory contaminants, an action level of ten times the blank concentration is established for data assessment. Sample results above the CRL and below the action level are qualified U at the reported level, as summarized in the above table.

Four unknown (non-target) compounds were detected in the method blank. Unknowns found in the blanks were not present in the associated samples. No further action was taken.

5.0 Surrogate Recovery: ACCEPTABLE/With the following discussion.

Qualified Data: None

Discussion:

All surrogate spiking compound recoveries (%R) were reviewed. The upper and lower surrogate percent recovery limits from the control charts in the DataChem QA Status Report are based upon a standard matrix (ASTM Type II water) surrogate quality control spike. There are no control charts for field sample (natural matrix) surrogate recovery. For data assessment purposes, the surrogate recoveries were compared to the limits specified in the three day moving average percent recovery control charts in the DataChem QA Status Report, and the surrogate recovery limits specified in the EPA Contract Laboratory Program (CLP) 3/90 Statement of Work (SOW). The CLP SOW does not specify recovery limits for two of the USATHAMA specified surrogate compounds, diethylphthalate-d4 and di-n-octyl phthalate-d4. For these compounds, a recovery range of 20% to 130% was used to assess the field sample results. This range is the same as the range recommended in the CLP SOW for new surrogate compounds.

One sample (13WL-02) had a surrogate compound that was above the CLP SOW recommended control limits. No action is taken unless two or more surrogates in one fraction (acid or base/neutral) are outside the control limits. Numerous surrogates (49 of 130 total) in the field and blank analyses were outside the control limits specified in the three day moving average

percent recovery control charts in the DataChem QA Status Report. The samples and non-compliant surrogates are listed in the Data Quality Assessment Worksheet. Most of these surrogate recoveries were not significantly outside the control chart range. As the surrogates met the CLP SOW limits, and as the control chart non-compliance was not significant, no qualifiers were issued based on surrogate performance.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analyses: NOT SUBMITTED.

7.0 Field Duplicates: ACCEPTABLE/ With the following discussion.

Qualified Data: None.

Discussion:

Samples 13CU-02-3 and 13WL-01 had associated sample duplicates submitted for analysis. Di-n-butyl phthalate was detected in Sample 13CU-02-3, but was not detected in the replicate analysis [13CU-02-3(D)]. An evaluation of relative percent difference (RPD) can not be determined due to the lack of positive results in both the sample and duplicate. Sample 13WL-01 and the associated duplicate [13WL-01(D)] each had initially reported a positive result for di-n-butyl phthalate, with an RPD value of 35%. However, all di-n-butyl phthalate results were qualified as not detected at the reported level (U) due to blank contamination, as discussed in Section 4. Due to this, an assessment of precision could not be made.

8.0 Internal Standards Performance: ACCEPTABLE/All with the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	IS Area	Acceptance Limits
Analytes associated with Phenanthrene-d10	UJ	13CU-02-3(D)	26139	42004 to 168016
		13WL-01	30499	
		13WL-01(D)	37583	
		13WL-02	30952	
		13WL-03	40087	
		13WL-04	31829	
Analytes associated with Naphthalene-d8	UJ	13CU-02-3(D)	39167	52176 to 208702
		13WL-01	39607	
		13WL-01(D)	45348	
		13WL-02	36480	
		13WL-03	50105	
		13WL-04	43104	
Analytes associated with Acenaphthene-d10	UJ	13CU-02-3(D)	18717	27857 to 111426
		13WL-01	19955	
		13WL-01(D)	24165	
		13WL-02	18602	
		13WL-03	24669	
		13WL-04	21963	

Compound	Qualifier	Sample Number	IS Area	Acceptance Limits
Analytes associated with 1,4-Dichlorobenzene-d4	UJ	13CU-02-3(D) 13WL-01 13WL-01(D) 13WL-02 13WL-03 13WL-04	1189 10954 12704 10565 13761 12457	15452 to 61808
Analytes associated with Chrysene-d12	UJ	13CU-02-3(D) 13WL-01 13WL-01(D)	23503 31272 27804	33276 to 133102
Analytes associated with Perylene-d12	UJ	13CU-02-3(D)	25630	30988 to 123952

Discussion:

No quality control criteria for internal standards are specified in USATHAMA PAM 11-41 or the laboratory method. For data assessment purposes, the criteria from US EPA National Functional Guidelines were used to assess the internal standards.

Numerous (42 out of 90) internal standard (IS) areas were outside (all outliers were out low) the specified acceptance window (50% to 200% of associated continuing calibration internal standard area). No action was taken unless the IS area was outside the acceptance windows of both the initial and final continuing calibration. There were no positive results for any compounds associated with a non-compliant internal standard area. The CRL of the associated non-detected compounds are estimated (UJ) to reflect the possible low bias. The internal standards and the associated compounds are listed in Table 1 at the end of this Data Quality Assessment narrative. The internal standard areas were also outside the acceptance window in the reagent blank, analyzed immediately after the samples listed in the above table. There is a downward trend for all internal standard areas versus time for these analyses. This indicates a loss of instrument sensitivity, and not matrix problems.

All other IS areas were within the 50% to 200% acceptance window. All IS retention times were within the acceptance window of ±30 seconds of the associated continuing calibration IS retention time, with the exception of the 1,4-dichlorobenzene-d4 retention times in Sample 13CU-03-1. The retention times were within the acceptance window as established by the continuing calibration analyzed at the end of the calibration period. No action was taken.

9.0 Compound Identification: ACCEPTABLE/All criteria met.

All compound identifications were reviewed and are found to be acceptable.

10. Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/With the following discussion.

Qualified Data: None

Discussion:

Target compound quantitation was performed by the laboratory using a Finnegan instrument generated linear regression method. Insufficient data are present in the data package to accurately replicate the compound quantitations. Several compound quantitations were recalculated using the method described in the CLP SOW, with results similar to those reported by the laboratory. The compound quantitations were judged to be acceptable. The reported CRL met those listed in Method LM25. No transcription errors were found.

11. Unknown Compounds: ACCEPTABLE/With the following exceptions.

Qualified Data: All unknown compounds were qualified as estimated (JN).

Discussion:

Mass spectral library searches to identify unknown (non-target) compounds were performed as required, and all reported identifications were acceptable. All unknown compounds are qualified as estimated with tentative identification (JN).

12. System Performance: ACCEPTABLE/All criteria met.

No signs of degraded instrument performance were observed. The analytical systems were judged to have been in tune, within control, and stable during the course of these analyses.

13. Overall Assessment of the Data

Based on this evaluation, the laboratory adhered to the specified analytical method.

Accuracy was acceptable, as demonstrated by the %R values of most surrogate compounds. An evaluation of precision is not possible due to the lack of MS/MSD analyses, and as there were no positive compound results in the field duplicates (after qualification due to blank contamination). As the percent recoveries of surrogates were similar in all analyses, matrix effects should not be present, and should not have any impact on precision.

The DataChem QA Status report notes the following for Lot ADSM: 2-fluorophenol and terphenyl-d14 were above the upper control limit, diethyl phthalate-d4 was trending above the mean, phenol-d6 was trending below the mean, and terphenyl-d14 was going in a downward direction. The DataChem QA status report recommends that Lot ADSM be accepted. The USAEC Control Chart Response letter accepts lot ADSM with no additional action required. The above outliers and trends have no significant impact on the data quality.

Data that are rejected are unusable for any purpose. All other data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
ANTIMONY-GFAA ANALYSES: SOIL
METHOD: USEPA SW846 7041
LOT NO.: ADTB

I. Deliverables and Documentation

All necessary documentation for lot ADTB were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Final sample results were not available at this time in the project. The control chart, DataChem QA status report, and USAEC control chart response were not required for this method.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot ADTB were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot ADTB samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

Two sets of field duplicate samples (13CU-02-3/13CU-02-3D and 13WL-01/13WL-01D) were analyzed and reviewed. The relative percent difference (RPD) values for these two sets of field duplicate samples were 61% and 16%, respectively. The difference values between the original and duplicate samples for these two sets of field duplicate samples were all less than the two times the CRDL.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analyte was detected in the blanks at or above the reporting limits.

4.0 Matrix Spike Sample Analyses: ACCEPTABLE/With the following exceptions.

Qualified Data:

Analyte	Qualifier	Sample Number	% Recovery	QC Criteria
Antimony	J(+)/UJ(-)	All ADTB lot samples	53.5%	75-125%

Discussion:

Matrix spike (MS) analysis was performed on Sample S-104-93-1. The spike recoveries of antimony was 53.5%, which was less than the lower control limit of 75%. The post-digestion spike recovery of antimony was 75.5%, which was slightly above the lower control limit. All antimony results were qualified as estimated, because QC spikes were also outside of the limits (see Section 5.0).

5.0 QC Spike Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: See Section 4.0.

Discussion:

One QC spike analysis was performed with lot AEIJ samples. The percent recovery of antimony was 136%, which was greater than the upper control limit of 125%. All antimony results were qualified as estimated. All results were already qualified in Section 4.0, above.

6.0 Laboratory Duplicate Analyses: ACCEPTABLE/All criteria met.

One set of laboratory duplicate analysis (13CU-02-3/13CU-02-03MD) and one set of laboratory replicate analysis (13WL-01/13WL-01R) were performed and reviewed. All relative percent difference (RPD) values were within the control limit of 35%.

7.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limit for antimony was reviewed and found to be acceptable.

8.0 Calculations: ACCEPTABLE/All criteria met.

No transcription errors and calculation errors were noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiency was found.

The pre-digestion spike recovery of antimony was less than the lower control limit. The QC spike recovery of antimony was greater than the upper control limit. Matrix spike recoveries were also low. All antimony results were qualified as estimated.

All data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
ANTIMONY-GFAA ANALYSES: WATER
METHOD: USEPA SW846 7041
LOT NO.: AEIJ

I. Deliverables and Documentation

All necessary documentation for lot AEIJ were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. No final sample results were available at this time in the project. The control chart, DataChem QA status report, and USAEC control chart response were not required for this method.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot AEIJ were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot AEIJ samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field QC Summary

One field blank (13FB-03) was analyzed and reviewed. Antimony was not detected in this field blank at or above the reporting limit.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analyte was detected in the blanks at or above the reporting limits.

4.0 Matrix Spike Sample Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Matrix spike (MS) analysis was performed on Sample S-80-91. The spike recoveries of antimony was 52.8%, which was less than the lower control limit of 75%. The post-digestion spike recovery of antimony was 105.7%. Since post-digestion spike recovery and QC spike recovery were within the control limits, no action was taken.

5.0 QC Spike Analyses: ACCEPTABLE/All criteria met.

One QC spike analysis was performed with lot AEIJ samples. The percent recovery of antimony was 96.2%, which was within the control limit of 75% to 125%.

6.0 Laboratory Duplicate Analyses: ACCEPTABLE/All criteria met.

One set of laboratory duplicate analysis (S-80-91/S-80-91MD) and one set of laboratory replicate analysis (S-55-90/S-55-90R) were performed and reviewed. Antimony was not detected in any of the duplicate analyses.

7.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limit for antimony was reviewed and found to be acceptable.

8.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiencies were found. The control chart, DataChem QA status report and USAEC Chemistry Branch Response was not provided.

The pre-digestion spike recovery of antimony was less than the lower control limit. Since post-digestion recovery and QC spike recovery were within the control limits, no action was taken.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
ARSENIC-GFAA ANALYSES: SOIL
METHOD: B9
LOT NO.: ADSY

I. Deliverables and Documentation

All necessary documentation for lot ADSY were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control charts, DataChem QA status report and USAEC control chart response were provided in this data package. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot ADSY were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot ADSY samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field QC Summary

Two sets of field duplicate samples (13CU-02-3/13CU-02-3D and 13WL-01/13WL-01D) were analyzed and reviewed. The relative percent difference (RPD) values for these two sets of field duplicate samples were 11% and 35%, respectively.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/With the following discussion.

Qualified Data: None.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. The percent recoveries of two daily calibration standards (concentrations at 2.5 µg/l and 10 µg/l) were 118% and 116%, which were greater than the upper control limit of 110%. Since these two daily calibration standards were analyzed at end of the analysis run and all other calibration percent recoveries were within the control limits, no action was taken.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analytes were detected in the blanks at or above the reporting limits.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/All criteria met.

Matrix Spike and Matrix Spike Duplicate (MS/MSD) analyses were performed on Sample S-104-93-1. The spike recoveries of arsenic were within the control limit of 75% to 125%.

5.0 QC Spike Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

One low spike and two high spike analyses were performed with each sample lot. The percent recoveries of both high spike analyses were 99.6% and 105.6%, which were slightly greater than the upper control limit (UCL) of 97.9%. Since these two percent recoveries were within the control limits specified in the Functional Guidelines (7/88), no action was taken. The percent recovery of low spike analysis was within the control limits.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for arsenic were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiency was found. The Laboratory noted high spike recoveries are trending above the mean for arsenic analysis. The USAEC Chemistry Branch Response indicates that Lot ADSY is acceptable.

GFAA raw data listed µg/L on each sample result page should be reported as µg/g.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
ARSENIC-GFAA ANALYSES: WATER
METHOD: AX8
LOT NO.: AEIG

I. Deliverables and Documentation

All necessary documentation for lot AEIG were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control charts, DataChem QA status report and USAEC control chart response were provided in this data package. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot AEIG were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot AEIG samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

One field blank (13FB-03) was analyzed and reviewed. Arsenic was not detected in this blank at or above the reporting limit.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analytes were detected in the blanks at or above the reporting limits.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Matrix Spike and Matrix Spike Duplicate (MS/MSD) analyses were performed on Sample S-89-91. The MS and MSD spike recoveries of arsenic were 47.7% and 66.2%, respectively. Since arsenic concentration in the original sample was approximately four times the spike concentration, no control limits were applied to the MS/MSD recoveries. No qualifier was recommended.

5.0 QC Spike Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

One low spike and two high spike analyses were performed with each sample lot. The percent recovery of second high spike analysis was 108.7%, which were slightly greater than the upper control limit (UCL) of 105.6%. Since this percent recovery was within the control limits specified in the Functional Guidelines (7/88), no action was taken. The percent recoveries of low spike and first high spike analyses were within the control limits.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for arsenic were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation errors were noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiency was found. The Laboratory noted high spike recoveries are trending above the mean for arsenic analysis. The second high spike recovery was greater than the upper control limit. The USAEC Chemistry Branch Response indicates that Lot AEIG is acceptable.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
LEAD-GFAA ANALYSES: SOIL
METHOD: JD21
LOT NO.: ADSZ

I. Deliverables and Documentation

All necessary documentation for lot ADSZ were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control chart, DataChem QA status report and USAEC control chart response were provided in this data package. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot ADSZ were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot ADSZ samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

Two sets of field duplicate samples (13CU-02-3/13CU-02-3D and 13WL-01/13WL-01D) were analyzed and reviewed. The relative percent difference (RPD) values for these two sets of field duplicate samples were 32% and 76%, respectively. No data are qualified, but this precision should be considered when interpreting the data.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analytes were detected in the blanks at or above the reporting limits. Lead was detected in one QC blank (B/L-14241-1) at concentration of 1.084 µg/g. Since this was a QC blank of native RMA soil, no qualifications were recommended.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Matrix Spike and Matrix Spike Duplicate (MS/MSD) analyses were performed on Sample S-104-93-1. The MS and MSD spike recoveries of lead were 149.8% and 137.7%, respectively. Since the lead concentration were greater than four times the spike concentration, no control limits were applied to MS/MSD recoveries. No action was taken.

5.0 QC Spike Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

One low spike and two high spike analyses were performed with each sample lot. The percent recoveries of both high spike analyses were 98.6% and 103.9%, which were slightly greater than the upper control limit (UCL) of 97.7%. The percent recovery of low spike analysis was 112.5%, which was greater than the UCL of 109.3%. Since these percent recoveries were within the control limits specified in the Functional Guidelines (7/88), no action was taken.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for lead were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiencies were found. The Laboratory noted low spike and high spike recoveries in this lot are above the UCL. The USAEC Chemistry Branch Response indicates that Lot ADSZ is acceptable.

GFAA raw data listed µg/L on each sample result page should be reported as µg/g.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
LEAD-GFAA ANALYSES: WATER
METHOD: SD18
LOT NO.: AEIH

I. Deliverables and Documentation

All necessary documentation for lot AEIH were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control charts, DataChem QA status report and USAEC control chart response were provided in this data package. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot AEIH were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot AEIH samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

One field blank (13-FB-03) was analyzed and reviewed. Lead was not detected in this field blank at or above the reporting limit.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analyte was detected in the blanks at or above the reporting limits.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: ACCEPTABLE/With the following exception.

Qualified Data:

Analyte	Qualifier	Sample Number	% Recovery	QC Criteria
Lead	UJ	All lot AEIH Samples	45.4%, 42.8%, 46.5%	75% to 125%

Discussion:

Matrix Spike and Matrix Spike Duplicate (MS/MSD) analyses were performed on Sample S-86-91. The MS and MSD spike recoveries of lead were 45.4% and 42.8%, respectively. The post-digestion recovery of lead on Sample S-86-91 was 46.5%. All spike recoveries were less than the lower control limit of 75%. All lead results in the associated samples were qualified as estimated (UJ).

5.0 QC Spike Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None

Discussion:

One low spike and two high spike analyses were performed with each sample lot. The percent recoveries of both high spike analyses were 100.2% and 102.4%, which were slightly greater than the upper control limit (UCL) of 98.9%. The percent recovery of low spike analysis was within the control limits. Since these high spike percent recoveries were within the control limits specified in the Functional Guidelines (7/88), no action was taken.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for lead were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiencies were found. The Laboratory noted high spike recoveries in this lot are above the UCL. The USAEC Chemistry Branch Response indicates that Lot AEIH is acceptable.

The MS, MSD and post-digestion spike recoveries were less than the lower control limit of 75%. All lead results in the associated samples were qualified as estimated (UJ).

All data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
MERCURY-CVAA ANALYSES: SOIL
METHOD: Y9
LOT NO.: ADRR

I. Deliverables and Documentation

All necessary documentation for lot ADRR were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control charts, DataChem QA status report and USAEC control chart response were provided in this data package. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot ADRR were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot ADRR samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

Two sets of field duplicate samples (13CU-02-3/13CU-02-3D and 13WL-01/13WL-01D) were analyzed and reviewed. Mercury was not detected in Samples 13CU-02-3 and 13CU-02-3D at or above the reporting limit. The relative percent difference (RPD) values of mercury for Samples 13WL-01 and 13WL-01D was 28%.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analytes were detected in the blanks at or above the reporting limits.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: NOT PERFORMED.

5.0 QC Spike Analyses: ACCEPTABLE/All criteria met.

One low spike and two high spike analyses were performed with each sample lot. The percent recoveries of low spike and high spike analyses were within the control limits.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for mercury were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiencies were found. The Laboratory noted low spike range is trending above the mean for mercury analysis. The USAEC Chemistry Branch Response indicates that Lot ADRR is acceptable.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
MERCURY-CVAA ANALYSES: WATER
METHOD: CC8
LOT NO.: AELV

I. Deliverables and Documentation

All necessary documentation for lot AELV were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. Control chart, DataChem QA status report and USAEC control chart response were provided in this data package. Final sample results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot AELV were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot AELV samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

One field blank (13FB-03) was analyzed and reviewed. Mercury was not detected at or above the reporting limit.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The laboratory analyzed a continuing calibration standard every ten samples as required. All calibration percent recoveries were within the control limits.

3.0 Blank Analyses: ACCEPTABLE/All criteria met.

Calibration blanks (ICB and CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. Preparation blanks were prepared with the digestion batch as required. No target analyte was detected in the blanks at or above the reporting limits.

4.0 Matrix Spike/Matrix Spike Duplicate Sample Analyses: NOT PERFORMED.

5.0 QC Spike Analyses: ACCEPTABLE/All criteria met.

One low spike and two high spike analyses were performed with each sample lot. The percent recoveries of low spike and high spike analyses were slightly greater than the upper control limits (UCL). Since all spike recoveries were within the control limits specified in the Functional Guidelines (7/88), no action was taken.

6.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for arsenic were reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

7.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiencies were found. The Laboratory noted low spike and high spike recoveries in this lot were above the UCL for mercury analysis. The USAEC Chemistry Branch Response indicates that Lot AELV is acceptable.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
TOTAL URANIUM KINETIC PULSED-LASER PHOSPHORIMETRY ANALYSES: WATER
METHOD: KPLP
LOT NO.: ADXW

I. Deliverables and Documentation

All necessary documentation for lot ADXW were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot ADXW were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problem with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot ADXW samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

One set of field duplicate samples (13WL-S1/13WL-S1D) was analyzed and reviewed. The relative percent difference (RPD) values for this set of field duplicate samples were 12%. One field equipment rinse blank (13ER-07) was analyzed and reviewed. Total uranium was detected at concentration of 0.08 ± 0.01 µg/L. Total uranium result in this field equipment rinse blank was qualified as non-detected (U) due to blank contamination.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of r ≥ to 0.995 was met. The percent recoveries of low range and high range calibration check standards were 96% and 101%, which were within the control limit of 80% to 120%.

3.0 Blank Analyses: ACCEPTABLE/With the following exceptions.

Qualified Data:

Analyte	Qualifier	Sample Number	Action Level	QC Criteria
Total Uranium	U	13ER-07	0.45 µg/l	Sample results < 5X PB concentration.

Discussion:

Preparation blank (PB) was evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Preparation blanks were prepared with the digestion batch as required. Total uranium was detected in the PB at concentration of 0.09 ± 0.01 µg/l. Total uranium was detected in Sample 13ER-07 at concentration of 0.08 ± 0.01 µg/l, which was less than the concentration detected in the PB. Total uranium result in Sample 13ER-07 was qualified as non-detected (U).

4.0 Matrix Spike Sample Analyses: ACCEPTABLE/All criteria met.

Matrix Spike (MS) analysis was performed on Sample 13WL-S3. The spike recovery of total uranium was 80%, which was within the control limit of 70% to 130%.

5.0 Laboratory Duplicate Sample Analyses: ACCEPTABLE/All criteria met.

One laboratory duplicate sample analysis was performed on Sample 13WL-S3. The RPD value of laboratory duplicate analysis was 28%, which was within the control limit of 30%.

6.0 Laboratory Control Sample (LCS) Analyses: ACCEPTABLE/All criteria met.

One laboratory control sample analysis was performed and reviewed. The percent recovery of LCS analysis was 101%, which was within the control limit of 70% to 130%.

7.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for total uranium were reviewed and found to be acceptable.

8.0 Calculations: ACCEPTABLE/All criteria met.

No transcription errors and calculation errors were noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiency was found. The accuracy was acceptable, as demonstrated by the percent recovery values of the LCS and MS analysis. The precision was acceptable as demonstrated by the RPD value in the laboratory duplicate analysis. Total uranium result in Sample 13ER-07 (the equipment rinsate) was qualified as non-detected due to blank contamination.

All data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
TOTAL URANIUM KINETIC PULSED-LASER PHOSPHORIMETRY ANALYSES:
SOIL
METHOD: KPLP
LOT NO.: AEDY

I. Deliverables and Documentation

All necessary documentation for lot AEDY were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody (COC) forms for lot AEDY were completed properly, and all samples listed in the COC forms were analyzed. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for Lot AEDY samples. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. A minimum of 10% of the field ID and laboratory ID were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field QC Summary

One set of field duplicate samples (13WL-01/13WL-01D) was analyzed and reviewed. The relative percent difference (RPD) values for this set of field duplicate samples were 4.2%.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All Criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The minimum number of standards used for the initial calibration were met. The linearity requirement of $r \geq$ to 0.995 was met. The percent recoveries of low range and high range calibration check standards were 99% and 97%, which were within the control limit of 80% to 120%.

3.0 Blank Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None

Discussion:

Preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Preparation blanks were prepared with the digestion batch as required. Total uranium was detected in the PB at concentration of 0.02 ± 0.00 µg/l. All total uranium results in the associated samples were greater than the action level. No action was taken.

4.0 Matrix Spike Sample Analyses: ACCEPTABLE/All criteria met.

Matrix Spike (MS) analysis was performed on Sample 13WL-02. The spike recovery of total uranium was 108%, which was within the control limit of 70% to 130%.

5.0 Laboratory Duplicate Sample Analyses: ACCEPTABLE/All criteria met.

One laboratory duplicate sample analysis was performed on Sample 13WL-02. The RPD value of laboratory duplicate analysis was 3.1%, which was within the control limit of 30%.

6.0 Laboratory Control Sample (LCS) Analyses: ACCEPTABLE/All criteria met.

One laboratory control sample analysis was performed and reviewed. The percent recovery of LCS analysis was 80%, which was within the control limit of 70% to 130%.

7.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limits for total uranium were reviewed and found to be acceptable.

8.0 Calculations: ACCEPTABLE/All criteria met.

No transcription error or calculation error was noted in the sample result data.

V. Overall Assessment of the Data

On the basis of this evaluation, the laboratory adhered to the specified method. No technical deficiency was found. The accuracy was acceptable, as demonstrated by the percent recovery values of the LCS and MS analysis. The precision was acceptable as demonstrated by the RPD value in the laboratory duplicate analysis.

All data, as reported, are acceptable for use.

DATA QUALITY ASSESSMENT
METALS-ICP ANALYSES: SOIL
METHOD: JS12
LOT NO.: ADSX

I. Deliverables and Documentation

The checklists submitted by the laboratory were sufficient to meet the requirements in USATHAMA PAM-11-41. Control charts, DataChem QA status report and USAEC control chart response were provided in this data package. No final samples results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

The field chain-of-custody forms were present and complete for lot ADSX. All lot ADSX samples listed on the chain-of-custody were analyzed. Sample ID were tracked from the field chain-of-custody to the transfer file printout and no errors were noted. Internal chain-of-custody forms clearly indicated the laboratory numbers and field sample ID for each sample. No errors in field ID were noted.

III. Field QC Summary

Two sets of field duplicate samples (13CU-02-3/13CU-02-3D and 13WL-01/13WL-01D) were analyzed and reviewed. The relative percent difference (RPD) values for Samples 13CU-02-3 and 13CU-02-3D ranged from 0.8% to 71%. The RPD values for Samples 13WL-01 and 13WL-01D were ranged from 6.8% to 59%. No qualifiers are recommended, but this precision should be considered in data interpretation.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

Instrument calibration consisted of one blank and one standard. Curve linearity and instrument sensitivity could not be evaluated with the documentation provided. All calibration check standards were within ±10% of the true value. Plus or minus two times the standard deviation control limits were not utilized because historical calibration check results were not provided.

The laboratory analyzed a continuing calibration verification (CCV) standard every ten samples as required. The percent recovery of the CCV were within ±10% of the true value. Plus or minus two times the standard deviation control limits were not utilized because historical calibration verification results were not provided.

4.0 Blank Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Calibration blanks (CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. A preparation blank was prepared with the digestion batch as required. No CCB result was greater than the reporting limit or less than the negative reporting limit. No PB result was greater the reporting limit. Aluminum, zinc, barium, vanadium, calcium, chromium, iron, potassium, magnesium, manganese, and sodium were detected in one QC blank (Bl-14239-1). Since this was a blank of native RMA soil, no qualification was recommended.

5.0 Matrix Spike Sample Analyses ACCEPTABLE/With the following discussions.

Qualified Data:

Analyte	Qualifier	Sample Number	% Recovery	QC Criteria
Silver	J(+)/UJ(-)	All ADSX lot Samples	57.0%, 34.2%	75% to 125%
Barium	J(+)/UJ(-)	All ADSX lot Samples	42.5%, -37.5%	75% to 125%

Discussion:

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis was performed on Sample 133X-11-1. The MS recoveries of silver and barium were less than the lower control limit of 75%. All other MS recoveries were within the control limits. The MSD recoveries for all analytes were outside the control limits. Silver and barium results in the associated samples were qualified as estimated due to both MS and MSD recoveries less than the control limits. No qualifications were recommended for other analyte results because MS recoveries were within the control limits.

6.0 QC Spike Analyses: ACCEPTABLE/With the following discussions.

Qualified Data: None.

Discussion:

One low spike and two high spike analyses were performed with this sample lot. Recoveries were evaluated based on the upper and lower control limits (UCL and LCL) listed on the laboratory summary sheets. The second high spike recovery for vanadium was 94.2%, which was slightly less than the LCL of 94.5%. Since this spike recovery was within the control limits specified in Functional Guidelines (7/88). no qualifications are recommended. All other low spike and high spike recoveries were within the control limits.

7.0 Duplicate Sample Analyses: NOT APPLICABLE.

Laboratory duplicate analysis was not performed with this sample lot.

8.0 Certified Reporting Limits (CRL): ACCEPTABLE/With the following discussion.

Qualified Data: None.

The reporting limit for each element was reviewed. The reporting limits on Sample S-104-93-2 for silver, beryllium, cobalt, and thallium were raised by a factor of 2, as the result of matrix interference. All other reporting limits match the certified reporting limit listed in the laboratory SOP.

9.0 Calculations: ACCEPTABLE/All criteria met.

No transcription errors were noted in the sample result data.

V. Overall Assessment of the Data

Qualifications were required based on low matrix spike recoveries for silver and barium. Accuracy for all other analytes and precision for all analytes was acceptable.

The laboratory noted high spike recoveries trending above the mean for cadmium, lead, thallium and zinc, low spike recoveries trending above the mean for cadmium and manganese, low spike recoveries trending below the mean for antimony, and low spike range trending above the mean for chromium, molybdenum, nickel, thallium, and zinc. The USAEC Chemistry Branch Response indicates that Lot ADSX is acceptable.

No additional qualification is recommended based on these observations.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
METALS-ICP ANALYSES: WATER
METHOD: SS12
LOT NO.: AEIF

I. Deliverables and Documentation

The checklists submitted by the laboratory were sufficient to meet the requirements in USATHAMA PAM-11-41. Control chart, DataChem QA status report and USAEC control chart response were provided in this data package. Final samples results were not available at this time in the project.

Good documentation practices were observed by the laboratory in the following area: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and strip chart printouts were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

The field chain-of-custody forms were present and complete for lot AEIF. All lot AEIF samples listed on the chain-of-custody were analyzed. Sample ID were tracked from the field chain-of-custody to the transfer file printout and no errors were noted. Internal chain-of-custody forms clearly indicated the laboratory numbers and field sample ID for each sample. No error in field ID was noted.

III. Field QC Summary

One field blank (13FB-03) was analyzed and reviewed. Calcium, sodium, and zinc were detected in this blank at concentration of 234 µg/l, 564 µg/l, 27.4 µg/l, respectively. Sodium results in this blank was qualified as non-detected (U) due to laboratory blank contamination. All calcium results in the associated samples were greater than the action level. Zinc was not detected in any of the samples. No action was taken.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All samples were analyzed within the technical holding time (40 CFR, Part 136) of 180 days from date of collection to analysis.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

Instrument calibration consisted of one blank and one standard. Curve linearity and instrument sensitivity could not be evaluated with the documentation provided. All calibration check standards were within ±10% of the true value. Plus or minus two times the standard deviation control limits were not utilized because historic calibration check results were not provided.

The laboratory analyzed a continuing calibration verification (CCV) standard every ten samples as required. The percent recovery of the CCV were within ±10% of the true value. Plus or minus two times the standard deviation control limits were not utilized because historic calibration verification results were not provided.

4.0 Blank Analyses: ACCEPTABLE/With the following exception.

Qualified Data:

Analyte	Qualifier	Sample Number	Action Level	QC Criteria
Sodium	U	13FB-03	2,200 µg/l	Sample results < 5X blank contamination

Discussion:

Calibration blanks (CCB) and preparation blanks (PB) were evaluated for possible contamination effects. Calibration blanks were also evaluated for possible low bias. Continuing calibration blanks were analyzed after each continuing calibration as required. A preparation blank was prepared with the digestion batch as required. No CCB result was greater than the reporting limit or less than the negative reporting limit. No PB result was greater the reporting limit. Sodium was detected in one QC blank (BL-16458-1) at concentration of 437.04 µg/l. The sodium result in Sample 13FB-03 was qualified as non-detected (U).

5.0 Matrix Spike Sample Analyses ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis was performed on sample S-86-91. The MSD recovery of Barium was 65%, which was less than the lower control limit of 75%. Since MS recovery and average MS/MSD recovery of barium were within the control limit, no action was taken. All other spike recoveries were within the control limits of 75-125% for all analytes.

6.0 QC Spike Analyses: ACCEPTABLE/With the following discussions.

Qualified Data: None.

Discussion:

One low spike and two high spike analyses were performed with this sample lot. Recoveries were evaluated based on the upper and lower control limits (UCL and LCL) listed on the laboratory summary sheets. The recoveries for barium and manganese were slightly greater than the UCL in the high spike. The recovery for chromium was slightly less than the LCL in the high spike. The recovery for manganese was slightly less than the LCL in the low spike. Since these spike recoveries were within the control limits specified in Functional Guidelines (7/88). no qualifications are recommended.

7.0 Duplicate Sample Analyses: NOT APPLICABLE.

Laboratory duplicate analysis was not performed with this sample lot.

8.0 Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

The reporting limit for each element was reviewed. All reporting limits match the certified reporting limit listed in the laboratory SOP.

9.0 Calculations: ACCEPTABLE/All criteria met.

No transcription errors were noted in the sample result data.

V. Overall Assessment of the Data

Qualifications were required based on blank contamination for sodium. Accuracy for all other analytes and precision for all analytes was acceptable.

The laboratory noted high spike and low spike recoveries trending above the mean for cadmium and cobalt, low spike recoveries trending below the mean for manganese, and low spike recoveries going in a downward direction for manganese. Low spike recovery for manganese was below the LCL in Lot AEIF. The USAEC Chemistry Branch Response indicates that Lot AEIF is acceptable; however, the laboratory should investigate the sodium background level of 437 µg/L in the standard water used for the QC samples. Corrective action needs to be taken to minimize this degree of background contamination.

No additional qualification is recommended based on these observations.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
EXPLOSIVES ANALYSES: SOIL
METHOD: LW23
LOT NO.: ADST

I. Deliverables and Documentation

All necessary documentation for lot ADST were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages. The sample percent moisture values on the transfer files could not be confirmed. DataChem QA Status Reports and USAEC Control Chart Response were submitted. No final sample results were available at this time in the project.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot ADST. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot ADST. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancy was found.

III. Field Quality Control

Samples 13WL-01 and 13WL-01 (DUP) from lot ADST were identified as field quality control samples on the chain-of-custody forms. Target explosive compounds were not detected in either sample. Field duplicate precision was not calculable.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in lot ADST were extracted within five days of collection and were analyzed within three days of extraction. The 7-day extraction holding time and 40-day analysis holding time limits were met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for explosives compounds. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

The results of the daily calibration standard agreed with the initial calibration standard within 25%, with the following exceptions. From the ADST daily calibration results, the area count for tetryl on 9/16/93 at 20:07 was less than the lower acceptance limit of 678.1, at 640.9. The area count for 2,4,6-trinitrotoluene on 9/16/93 at 20:07 was less than the lower acceptance limit of 849.4, at 846.1. Since tetryl was not detected in any field samples from lot ADST, no qualification of sample results are required. Since 2,4,6-trinitrotoluene was not detected in any field samples from lot ADST, no qualification of the sample results are required.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One soil method blank was associated with the samples in lot ADST. Target explosives compounds were not detected in the method blank at or above the certified reporting limit (CRL).

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: NOT ANALYZED

The laboratory did not perform MS/MSD analyses with the samples from lot ADST.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot ADST were reviewed for explosives compounds; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. No positive identifications of explosives compounds were reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. No transcription error was noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary ACCEPTABLE/With the following exceptions.

Qualified Data:

Compound	Qualifier	Sample Number	Reason
1,3,5-Trinitrobenzene	UJ at CRL	13WL-01 13WL-03 13WL-01(DUP) 13WL-04 13WL-02	High spike and Low spike recovery values below control limits

Discussion:

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found. Daily calibration results for tetryl and 2,4,6-trinitrotoluene were less than the lower area acceptance limit, however no positive detections were reported for these compounds. No qualifiers were required.

An examination of the DataChem QA Status Report that includes lot ADST revealed the following items: 1,3,5-trinitrobenzene results in the high spike were below the lower control limit and 1,3,5-trinitrobenzene results in the low spike were below the lower control limit. The laboratory notes that the reason for the low 1,3,5-trinitrobenzene recovery values is not known.

The trends and outliers noted from the DataChem QA Status Report for lot ADST resulted in the laboratory's qualification of all non-detected 1,3,5-trinitrobenzene sample results with an "L" flag. The reviewer recommends that all 1,3,5-trinitrobenzene results for lot ADST be qualified UJ at the certified reporting limit. The data qualifiers are summarized in the table above.

The data, as qualified, are acceptable for use.

DATA QUALITY ASSESSMENT
EXPLOSIVES ANALYSES: WATER
METHOD: UW25
LOT NO.: AEKX

I. Deliverables and Documentation

All necessary documentation for lot AEKX were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of percent moisture logbook pages. The sample percent moisture values on the transfer files could not be confirmed. Transfer files were submitted by the laboratory. DataChem QA Status Reports were not provided. Final sample results were not available at this time in the project. A USAEC Control Chart response letter was provided which recommended that the data be accepted.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South site sample in lot AEKX. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in lot AEKX. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

No field blanks or field duplicate samples were submitted for analysis.

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All water samples in lot AEKX were extracted within seven days of collection and were analyzed within 11 days of extraction. The 7-day extraction holding time and 40-day analysis holding time limits were met.

2.0 Instrument Calibration: ACCEPTABLE/All criteria met.

The appropriate number of calibration standards were used to generate a zero-intercept model standard curve for explosives compounds. Linearity was acceptable for the standard curves. Recalculation results of the regression statistics for the curves agreed with the laboratory values.

3.0 Daily Calibration: ACCEPTABLE/With the following discussion.

Qualified Data:

Compound	Qualifier	Sample Number	Daily Calibration Area Count	Acceptable Range Area Count
2,4-Dinitrotoluene	J	S-82-91	239.5	224.8-231.4

Discussion:

The results of the daily calibration standard agreed with the initial calibration standard within 25%, with the following exceptions. From the AEKX daily calibration results, the area count for 2,4-dinitrotoluene on 10/12/93 at 17:24 was greater than the upper acceptance limit of 231.4, at 239.5. Since 2,4-dinitrotoluene was detected in Sample S-82-91 from lot AEKX, the sample result was qualified as estimated, J.

4.0 Blank Analysis: ACCEPTABLE/All criteria met.

One aqueous method blank was associated with the samples in lot AEKX. Target explosives compounds were not detected in the method blank at or above the certified reporting limit (CRL).

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: NOT ANALYZED

The laboratory did not perform MS/MSD analyses with the samples from lot AEKX.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The chromatograms and raw data for lot AEKX were reviewed for explosives compounds; false negatives or false positives were not found. There were no discrepancies between the raw data and the transfer files. Positive identifications of explosives compounds were not reported.

7.0 Compound Quantitation and Certified Reporting Limits (CRL): ACCEPTABLE/All criteria met.

An evaluation of compound quantitation was performed by recalculating the sample results from the raw data. No discrepancy was found. The CRL on the transfer file met those listed in the method. No transcription error were noted.

8.0 Chromatogram Quality: ACCEPTABLE/All criteria met.

A review of chromatogram quality revealed no problems. The baselines were stable, no electropositive displacement was found, and all early eluting peaks were resolved to the baseline.

V. Overall Assessment/QC Summary

On the basis of this evaluation, the laboratory followed the specified methods. Technical deficiencies were not found. Daily calibration results for 2,4-dinitrotoluene were greater than the upper area acceptance limit, and positive results were qualified (J).

The DataChem QA Status Report for lot AEKX was not included. The USAEC Chemistry Branch Response letter was submitted at a later date. The laboratory recommended that the data be accepted.

The data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
GROSS ALPHA AND GROSS BETA ANALYSES: SOIL
METHOD: WREP-300
LOT: AFER

I. Deliverables and Documentation

All necessary documentation for Lot AFER were provided by the laboratory to meet USATHAMA PAM 11-41 requirements for this data package, with the exception of Initial Calibration Data. DataChem QA Status Reports were submitted. Final sample results were not available at this time.

Good documentation practices were observed by the laboratory in the following areas: changes or corrections were struck out by a single line and the entry was initialed and dated by the analyst; no correction fluid or tape was found on any raw data; the proper units for numerical values were used; and all the laboratory notebook pages and chromatograms were signed and dated by the analyst.

II. Chain-of-Custody/Sample Identification

Field chain-of-custody forms were present and complete for each Tooele South Site sample in Lot AFER. All forms were signed and dated. The field chain-of-custody forms indicated no problems with sample receipt conditions. All Tooele South Site samples listed on Lot AFER chain-of-custody forms were analyzed.

Laboratory chain-of-custody forms were present and complete for each Tooele South Site sample in Lot AFER. All forms were signed and dated. The laboratory lot and sample identification suffixes were clearly indicated on all laboratory chain-of-custody forms. The field ID and laboratory ID for all samples were tracked from the chain-of-custody forms, the final sample results, transfer files, laboratory notebooks, and the raw data. No discrepancies were found.

III. Field Quality Control

Two field blanks (13FB-02 and 13FB-03) were analyzed with the samples in Lot AFER. Gross alpha and beta levels were below the lower limits of detection (LLD).

IV. Technical Assessment

1.0 Holding Times: ACCEPTABLE/All criteria met.

All soil samples in Lot AFER were analyzed within 180 days of collection.

2.0 Instrument Calibration: NOT PROVIDED.

Raw calibration data was not provided and was not reviewed. The summarized calibration factors were sufficient to perform sample calibrations.

3.0 Daily Calibration: NOT ANALYZED.

4.0 Blank Analyses: ACCEPTABLE/All criteria met.

One method blank was associated with the samples in Lot AFER. Gross alpha and beta levels were below the lower limits of detection.

5.0 Matrix Spike/Matrix Spike Duplicate Analyses: NOT ANALYZED.

6.0 Compound Identification: ACCEPTABLE/All criteria met.

The strip charts and raw data for Lot ADNS were reviewed for nitrate compounds; no false negatives or false positives were found. There were no discrepancies between the raw data and the final sample results. All identifications were reviewed and are acceptable.

7.0 Compound Quantitation and Reported Detection Limits: ACCEPTABLE/All criteria met.

An evaluation of compound quantitation and lower lizmits of detection (LLD) was performed based on updated formulas provided by the laboratory. Three transcription errors were found in this lot. The laboratory was contacted and corrected transfer file print-outs were resubmitted.

Field Site ID	Analyte Lab ID	Analyte	Incorrect Result	Correct Result
13-FB-02	UA-02220	beta G	0.150	7.75E-02
13-FB-03	UA-02599	alpha G	LT 0.0404	LT 4.24E-01
		beta G	0.900	6.7E-01

8.0 Laboratory Duplicate Analysis: ACCEPTABLE/All criteria met.

The laboratory prepared and analyzed a laboratory duplicate sample with the field samples from this lot. The relative percent difference values were within control limits of 40%.

V. Overall Assessment/QC Summary

One the basis of this evaluation, the laboratory followed the specified method. No technical deficiencies were found.

The DataChem QA Status Report noted that the high spike recovery value was greater than the upper control limit. The recommendation of the laboratory was to accept the data for this lot. The reviewer concurs with the laboratory's assessment.

The data, as corrected, are acceptable for use.