

US EPA ARCHIVE DOCUMENT



Wells G&H
7.6
SS3624

**REMEDIAL ACTION COMPLETION REPORT
DEBRIS, SLUDGE, AND MIXED-CONTAMINANT SOIL REMOVAL**

**APPENDIX V
CLP DATA Packages**



SDMS DocID 553624

**VOLUME 1
Compliance Sample Validation
Sample Delivery Group 18, Soil**

**Wildwood Property
Wells G & H Superfund Site
Woburn, MA**

Prepared For:

BEATRICE COMPANY

Prepared By:

**REMEDIATION TECHNOLOGIES, INC.
9 Pond Lane
Concord, MA 01742**

RETEC Project No.: 3-0947-730

MARCH 1995



Compliance Sampling Validation

RETEC performed a remedial action at the Wells G & H Superfund site involving the removal and disposal of construction debris, debris soil, and sludge material. Samples were collected to determine compliance with the mandated clean-up levels for criteria site pollutants. Approximately ten percent of the total number of samples collected during the remedial action were analyzed for the target analyte (TAL) and target criteria (TCL) listed compounds presented in the U.S. EPA Contract Laboratory Program (CLP).

Samples selected for criteria, TAL, and TCL pollutants were analyzed following U.S. EPA CLP protocols. Volatile organics were analyzed by purge and trap using gas chromatography equipped with a mass spectrum detector (GC/MS). The method was modified to satisfy the low detection limits required by the project. The modification consisted of lowering the calibration range from 10-200 micrograms per liter ($\mu\text{g/l}$) to 1.0-25 $\mu\text{g/l}$. Semi-volatile organics were analyzed using GC/MS techniques, with gel permeation column (GPC) clean-up practices. The method was also modified to extend the contract required detection limit down to 30 micrograms per kilogram ($\mu\text{g/Kg}$). Pesticides and PCBs were prepared and analyzed using GC and electron capture detection (GC/ECD) techniques with GPC clean-up practices. All methods discussed in this paragraph followed the requirements specified in: *U.S. EPA CLP Statement of Work, Document #OLM01.2, 1/91.*

Selected metal analyses for criteria and TAL pollutants followed the methodology presented in the U.S. EPA document: *CLP Statement of Work for Inorganic Analysis, document #ILM03.0 1/93.*

Final data was validated for accuracy by reviewing quality control procedures contained in each applicable method used. Quality control practices reviewed included:

- sample holding times;
- initial instrument calibrations;
- continuing instrument calibrations;
- surrogate compound recoveries;
- internal and external standard performance;
- field sample duplicates;
- trip and field blank results;
- method blank results; and
- matrix spike and matrix spike duplicates.

Sample results that were found to be out of quality control limits, for the referenced practices, were qualified following the procedures detailed in the U.S EPA Region I document: *Laboratory Data Validation - Functional Guidelines for Evaluating Organic (11/01/88) and Inorganic Analyses (2/01/89)*.

As part of the validation process, data are qualified using letter codes, which have specific meanings notifying the data user that some data have additional uncertainties. The data reviewer can use the following qualifiers:

- U = The material was analyzed for, but not detected;
- J = The associated numerical value is an estimated quantity;
- R = The data are unusable, re-sampling and re-analysis is necessary for verification;
- UJ = The material was analyzed for, but not detected. The sample quantitation limit is an estimated quantity;
- B = The *organic* analyte is present in the associated blank as well as in the sample; and
- B = The associated *inorganic* numerical value is between the contract required detection limit and the method detection limit.

At the present time, data are qualified in three ways: as unusable; estimated; or presumptively present. When data are rejected, it doesn't mean that the analyte was not there, it means that the analytical test was not valid. Unusable data are flagged with an "R". Reasons for rejecting data are low surrogate recoveries, gross accedence of holding times, or poor calibration. When data are flagged as estimated, "J", it means that the data should be used with caution. The data could be significantly imprecise and that the reported value is an estimated value.

Compounds detected in blank samples can be used to qualify detected values in associated field samples as non-detect (U), if it meets the following criteria:

- the sample concentration is less than 10x the concentration of a detected common organic laboratory contaminant, i.e., acetone, methylene chloride, 2-butanone, or 2-bis(ethylhexyl)phthalate, or

- the sample concentration is less than 5x the concentration of the remaining field constituents in a blank.

Presented below are the validated results for samples analyzed during the remedial program conducted at the Wells G & H Superfund site in Woburn, Massachusetts.

Samples were analyzed by New England Testing Laboratory in Providence, Rhode Island. The data received was acceptable. However, on November 3, 1994, several files on the GC/MS volatile organic analysis run were lost. A routine back-up of the files by the laboratory found many of them to be damaged. Attempts made to recover the data failed. No sample files were lost, but quality control samples such as tuning standards, calibration checks and method blanks were. For the most part, critical output records were available in hard copy form for the data gaps. The hard copy forms allowed for the proper validation of the data.

Samples from the site contained high levels of pesticides. Many of the samples saturated the GC detector, nullifying initial analytical runs. However, in the interest of determining PCBs to EPA reporting requirements, all pesticide samples were analyzed at 1x dilution, prior to dilution for pesticide quantitation.

Attachment A to this memorandum contains all validation work sheets and calculations.

Volatile Organic Compounds

SAMPLE CODE

COMMENT

Field Blank -8/30

Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.

SL-04

Qualify methylene chloride, acetone, a 2-butanone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.

SL-06/07 Qualify methylene chloride, acetone, and 2-butanone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.

SL-08 Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination.

SL-08MS/MSD Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination.

Field Blank - 10/4 Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.

1C-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results. Reject (R) xylene concentration for eluting past calibration curve concentration.

1D-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.

2A-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.

2D Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify toluene concentration as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.

- 4C Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- C Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- H Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- X Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- D-DL Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- Field Blank - 10/14 Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- Trip Blank - 10/14 Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- DP-7DL Qualify trichloroethene as estimated (J) for poor MS/MSD results.

Semi-Volatile Organics

SAMPLE CODE

COMMENT

Field Blank-8/30	Qualify 4-chloroamiline, 3-nitroaniline, 2,4-dinirtophenol, and 3,3-dichlorobenzidine as estimated (UJ) for poor relative standard deviation on the initial calibration curve.
SL-01	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-01RE.
SL-03	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-03RE.
SL-04	Qualify all compound quantified by the internal standards chrysene-d ₁₂ and perylene-d ₁₂ as estimated (UJ) for failed internal standard area values.
SL-04RE	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-04.
SL-6/7	Qualify bis(2-ethylhexyl)phthalate and di-n-butylphthalate as non-detect (U) for method blank contamination.
SL-08	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-08RE.
SL-08RE	Qualify bis(2-ethylhexyl)phthalate and di-n-butylphthalate as non-detect (U) for method blank contamination.
SL-12	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-12RE.
SL-13RE	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-13.

- SL-14RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-14.
- SL-15RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-15.
- SL-25RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-25.
- Field Blank-10/4 Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-butylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 1A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 1B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 1C Qualify 4-chloroaniline, hexachlorobutadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, pentachlorophenol, carbazole, di-n-octylphthalate, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 1D Qualify 4-chloroaniline, hexachlorobutadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, pentachlorophenol, carbazole, di-n-octylphthalate, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene as estimated (UJ) for failing the percent difference between the initial

and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.

- 2A Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 2D Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 2E Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 2F Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 3A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 3B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 4A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

- 4B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 4C Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 5A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 5B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- C Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate and bis(2-ethylhexyl)phthalate as non-detect (U) for method blank contamination.
- D Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- G Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

H Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate and bis(2-ethylhexyl)phthalate as non-detect (U) for method blank contamination.

SL-20 Qualify indeno(1,2,3-cd)pyrene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

X Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.

Pesticides and PCBs

SAMPLE CODE

COMMENT

Field Blank - 8/30 Qualify alpha-BHC, delta-BHC, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify beta-BHC, endrin, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin, 4,4-DDT, and methoxychlor for continuing calibration failure.

SL-05DL Qualify 4,4-DDT as estimated (J) for failing the relative standard deviation on the initial calibration curve and the percent difference on the performance evaluation mixture.

SL-6/7 Qualify alpha-BHC, delta-BHC, gamma-BHC, dieldrin, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify endrin, methoxychlor, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin ketone,

- endosulfan sulfate II, and endosulfan II as estimated (UJ) for continuing calibration failure.
- SL-08DL Qualify 4,4-DDT as estimated (UJ) for failing the relative standard deviation on the initial calibration.
- SL-08B Qualify alpha-BHC, delta-BHC, dieldrin, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration.
- SL-08BDL Qualify alpha-BHC, delta-BHC, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify endrin, beta-BHC, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin ketone, endosulfan sulfate, heptachloroepoxide, 4,4-DDE, endrin aldehyde, and endosulfan II as estimated (UJ) for continuing calibration failure.
- SL-10/11 Qualify 4,4-DDT as estimated (J) for failing surrogate recovery limits.
- SL-12 Qualify arochlor 1260 as estimated (J) for failing surrogate recovery limits.
- SL-12DL Qualify alpha-chlordane as estimated (J) for failing TCX surrogate recovery times.
- SL-13 Qualify alpha-chlordane and gamma-chlordane as estimated (J) for continuing calibration failure.
- SL-15 Qualify 4,4-DDT as an estimated value (J) for failing surrogate recovery limits. Qualify alpha and gamma chlordane as estimated (J) values for failing continuing calibration requirements.
- SL-25DL Qualify alpha-chlordane and arochlor 1260 as estimated (J) values for poor TCX and PCB surrogate retention times.

Field Blank - 10/5	Qualify all compounds as estimated (UJ) for failing surrogate recovery limits.
A	Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.
BDL	Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.
CDL	Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.
E	Correct typos on form I: alpha chlordane should be 1.7 ug/Kg JP. Gamma-chlordane should be 1.9 ug/Kg P.
HDL	Qualify all detected compounds as estimated values for failing the percent difference for field sample duplicates.
XDL	Qualify all detected compounds as estimated values for failing the percent difference for field sample duplicates.
15a-1	Qualify aroclors 1254 and 1260 as estimated values (J) for poor field duplicate precision.
15a-2	Qualify aroclors 1254 and 1260 as estimated values (J) for poor field duplicate precision.

Inorganics

SAMPLE CODE

COMMENT

1C	Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
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- 1D Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 2A Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 2D Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 4C Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- A Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- B Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- C Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.
- G Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- H Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.

SL-2 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.

SL-17/18 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.

SL-19 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.

SL-20 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.

X Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.

Attachment A

Validation Forms



TO: Jamie Greacen

FROM: Richard Roat

DATE: January 27, 1995

SUBJECT: Validation of Analytical Results of Samples Collected During the Soil and Debris Remedial Event at the Wells G & H Superfund site, Woburn, Massachusetts.

Revise to report format,

*Title
"Compliance Sampling Validation"*

RETEC performed a remedial action at the Wells G & H Superfund site involving the removal and disposal of construction debris, debris soil, and sludge material. Samples were collected to determine compliance with the mandated clean-up levels for criteria site pollutants. Approximately ten percent of the total number of samples collected during the remedial action were analyzed for the target analyte (TAL) and target criteria (TCL) listed compounds presented in the U.S. EPA Contract Laboratory Program (CLP).

Samples selected for criteria, TAL, and TCL pollutants were analyzed following U.S. EPA CLP protocols. Volatile organics were analyzed by purge and trap using gas chromatography equipped with a mass spectrum detector (GC/MS). The method was modified to satisfy the low detection limits required by the project. The modification consisted of lowering the calibration range from 10-200 micrograms per liter ($\mu\text{g/l}$) to 1.0-25 $\mu\text{g/l}$. Semi-volatile organics were analyzed using GC/MS techniques, with gel permeation column (GPC) clean-up practices. The method was also modified to extend the contract required detection limit down to 30 micrograms per kilogram ($\mu\text{g/Kg}$). Pesticides and PCBs were prepared and analyzed using GC and electron capture detection (GC/ECD) techniques with GPC clean-up practices. All methods discussed in this paragraph followed the requirements specified in: *U.S. EPA CLP Statement of Work, Document #OLM01.2, 1/91.*

Selected metal analyses for criteria and TAL pollutants followed the methodology presented the U.S. EPA document: *CLP Statement of Work for Inorganic Analysis, document #ILM03.0 1/93.*

Final data was validated for accuracy by reviewing quality control procedures contained in each applicable method used. Quality control practices reviewed included:

- sample holding times;
- initial instrument calibrations;
- continuing instrument calibrations;
- surrogate compound recoveries;

- internal and external standard performance;
- field sample duplicates;
- trip and field blank results;
- method blank results; and
- matrix spike and matrix spike duplicates.

Sample results that were found to be out of quality control limits, for the referenced practices, were qualified following the procedures detailed in the U.S EPA Region I document: *Laboratory Data Validation - Functional Guidelines for Evaluating Organic (11/01/88) and Inorganic Analyses (2/01/89)*.

As part of the validation process, data are qualified using letter codes, which have specific meanings notifying the data user that some data have additional uncertainties. The data reviewer can use the following qualifiers:

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- UJ = The material was analyzed for, but not detected. The sample quantitation limit is an estimated quantity;
- B = The *organic* analyte is present in the associated blank as well as in the sample; and
- B = The associated *inorganic* numerical value is between the contract required detection limit and the method detection limit.

At the present time, data are qualified in three ways: as unusable; estimated; or presumptively present. When data are rejected, it doesn't mean that the analyte was not there, it means that the analytical test was not valid. Unusable data are flagged with an "R". Reasons for rejecting data are low surrogate recoveries, gross accedence of holding times, or poor calibration. When data are flagged as estimated, "J", it means that the data should be used with caution. The data could be significantly imprecise and that the reported value is an estimated value.

Compounds detected in blank samples can be used to qualify detected values in associated field samples as non-detect (U), if it meets the following criteria:

- the sample concentration is less than 10x the concentration of a detected common organic laboratory contaminant, i.e., acetone, methylene chloride, 2-butanone, or 2-bis(ethylhexyl)phthalate, or
- the sample concentration is less than 5x the concentration of the remaining field constituents in a blank.

Presented below are the validated results for samples analyzed during the remedial program conducted at the Wells G & H Superfund site in Woburn, Massachusetts.

Samples were analyzed by New England Testing Laboratory in Providence, Rhode Island. The data received was acceptable. However, on November 3, 1994, several files on the GC/MS volatile organic analysis run were lost. A routine back-up of the files by the laboratory found many of them to be damaged. Attempts made to recover the data failed. No sample files were lost, but quality control samples such as tuning standards, calibration checks and method blanks were. For the most part, critical output records were available in hard copy form for the data gaps. The hard copy forms allowed for the proper validation of the data.

Samples from the site contained high levels of pesticides. Many of the samples saturated the GC detector, nullifying initial analytical runs. However, in the interest of determining PCBs to ~~client~~ ^{EPA} specific reporting requirements, all pesticide samples were analyzed at 1x dilution, prior to dilution for pesticide quantitation.

Attachment A to this memorandum contains all validation work sheets and calculations.

Volatile Organic Compounds

SAMPLE CODE

COMMENT

Field Blank -8/30	Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.
SL-04	Qualify methylene chloride, acetone, a 2-butanone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.
SL-06/07	Qualify methylene chloride, acetone, a 2-butanone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.
SL-08	Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination.
SL-08MS/MSD	Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination.

- Field Blank - 10/4 Qualify methylene chloride and acetone concentrations as estimated (J) for poor initial calibration results.
- 1C-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results. Reject (R) xylene concentration for eluting past calibration curve concentration.
- 1D-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- 2A-DL Qualify methylene chloride and acetone concentrations as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- 2D Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify toluene concentration as non-detect (U) for field blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- 4C Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- C Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
- H Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.

X	Qualify methylene chloride and acetone concentrations as non-detect (U) for method blank contamination. Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
D-DL	Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
Field Blank - 10/14	Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
Trip Blank - 10/14	Qualify methylene chloride and acetone concentrations as estimated (J) for poor continuing calibration results.
DP-7DL	Qualify trichloroethene as estimated (J) for poor MS/MSD results.

Semi-Volatile Organics

SAMPLE CODE

COMMENT

Field Blank-8/30	Qualify 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, and 3,3-dichlorobenzidine as estimated (UJ) for poor relative standard deviation on the initial calibration curve.
SL-01	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-01RE.
SL-03	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-03RE.
SL-04	Qualify all compound quantified by the internal standards chrysene-d ₁₂ and perylene-d ₁₂ as estimated (UJ) for failed internal standard area values.
SL-04RE	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-04.
SL-6/7	Qualify bis(2-ethylhexyl)phthalate and di-n-butylphthalate as non-detect (U) for method blank contamination.
SL-08	Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-08RE.

SL-08RE Qualify bis(2-ethylhexyl)phthalate and di-n-butylphthalate as non-detect (U) for method blank contamination.

SL-12 Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-12RE.

SL-13RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-13.

SL-14RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-14.

SL-15RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-15.

SL-25RE Do not use. Failed internal standard area values. Use compounds quantified under sample code SL-25.

Field Blank-10/4 Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-butylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

1A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

1B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

- 1C Qualify 4-chloroaniline, hexachlorobutadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, pentachlorophenol, carbazole, di-n-octylphthalate, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 1D Qualify 4-chloroaniline, hexachlorobutadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, pentachlorophenol, carbazole, di-n-octylphthalate, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 2A Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 2D Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 2E Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 2F Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 3A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

- 3B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 4A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 4B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 4C Qualify 2-nitrophenol, 4-chloroaniline, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, pentachlorophenol, carbazole, and di-n-octylphthalate as estimated (UJ) for failing the percent difference between the initial and continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.
- 5A Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- 5B Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- C Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate and bis(2-ethylhexyl)phthalate as non-detect (U) for method blank contamination.
- D Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.
- G Qualify indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

H Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate and bis(2-ethylhexyl)phthalate as non-detect (U) for method blank contamination.

SL-20 Qualify indeno(1,2,3-cd)pyrene as estimated (UJ) for failing the percent difference between the initial and continuing calibration check.

X Qualify 3-nitroaniline and 4-chloroaniline as estimated (UJ) for failing the relative standard deviation on the initial calibration curve and the percent difference on the continuing calibration check. Qualify di-n-butylphthalate as non-detect (U) for method blank contamination.

Pesticides and PCBs

SAMPLE CODE

COMMENT

Field Blank - 8/30 Qualify alpha-BHC, delta-BHC, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify beta-BHC, endrin, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin, 4,4-DDT, and methoxychlor for continuing calibration failure.

SL-05DL Qualify 4,4-DDT as estimated (J) for failing the relative standard deviation on the initial calibration curve and the percent difference on the performance evaluation mixture.

SL-6/7 Qualify alpha-BHC, delta-BHC, gamma-BHC, dieldrin, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify endrin, methoxychlor, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin ketone, endosulfan sulfate II, and endosulfan II as estimated (UJ) for continuing calibration failure.

SL-08DL Qualify 4,4-DDT as estimated (UJ) for failing the relative standard deviation on the initial calibration.

SL-08B Qualify alpha-BHC, delta-BHC, dieldrin, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration.

SL-08BDL Qualify alpha-BHC, delta-BHC, 4,4-DDT, and methoxychlor as estimated (UJ) for failing the relative standard deviation on the initial calibration. Qualify endrin, beta-BHC, and 4,4-DDT as estimated (UJ) for failing the percent difference on the performance evaluation mixture. Qualify endrin ketone, endosulfan sulfate, heptachloroepoxide, 4,4-DDE, endrin aldehyde, and endosulfan II as estimated (UJ) for continuing calibration failure.

SL-10/11 Qualify 4,4-DDT as estimated (J) for failing surrogate recovery limits.

SL-12 Qualify arochlor 1260 as estimated (J) for failing surrogate recovery limits.

SL-12DL Qualify alpha-chlordane as estimated (J) for failing TCX surrogate recovery times.

SL-13 Qualify alpha-chlordane and gamma-chlordane as estimated (J) for continuing calibration failure.

SL-15 Qualify 4,4-DDT as an estimated value (J) for failing surrogate recovery limits. Qualify alpha and gamma chlordane as estimated (J) values for failing continuing calibration requirements.

SL-25DL Qualify alpha-chlordane and arochlor 1260 as estimated (J) values for poor TCX and PCB surrogate retention times.

Field Blank - 10/5 Qualify all compounds as estimated (UJ) for failing surrogate recovery limits.

A Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.

BDL Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.

CDL Qualify 4,4-DDT as an estimated value (J) for failing the relative standard deviation for the initial calibration curve.

- E Correct typos on form I: alpha chlordane should be 1.7 ug/Kg JP. Gamma-chlordane should be 1.9 ug/Kg P.
- HDL Qualify all detected compounds as estimated values for failing the percent difference for field sample duplicates.
- XDL Qualify all detected compounds as estimated values for failing the percent difference for field sample duplicates.
- 15a-1 Qualify aroclors 1254 and 1260 as estimated values (J) for poor field duplicate precision.
- 15a-2 Qualify aroclors 1254 and 1260 as estimated values (J) for poor field duplicate precision.

Inorganics

SAMPLE CODE

COMMENT

- 1C Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 1D Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 2A Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 2D Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.
- 4C Qualify antimony as estimated (J) for failing matrix spike recovery. Qualify lead as estimated (J) for failing the percent difference on the duplicate injection. Qualify iron, manganese, and magnesium as estimated (J) for failed serial dilution analysis on the ICP.

- A Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- B Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- C Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.
- G Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- H Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.
- SL-2 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- SL-17/18 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- SL-19 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- SL-20 Qualify lead as an estimated value (J) for failing the matrix spike and duplicate injection precision limits.
- X Qualify antimony, chromium, copper, and lead as estimated (J) for failing matrix spike recovery limits. Qualify copper, iron, and lead as estimated (J) for failing duplicate precision requirements.

Attachment A
Validation Forms

**REVIEW OF ORGANIC
CONTRACT LABORATORY PACKAGE**

Site Name: *Wells G & H Superfund Site*

Reference Number:

The hard copied data package received at RETEC has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.: *NETL 18* SAS No.:
SDG No.: *18* Matrix: *soil*
No. of Samples: *16*

Sample Dates: *8/30 + 9/8/94*
Shipping Date: *8/30 + 9/8/94*
Date Rec'd by Lab: *8/31 + 9/9/94*

The CLP SOW for requires that specific analytical work be done and the general criteria used to determine the performance were based on the examination of:

- Data Completeness
- Holding Times
- GC/MS Tuning
- Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Dup.
- Field Duplicates
- Internal Std Performance
- Pest. Inst. Performance
- Compound Identification
- Compound Quantitation

Overall comments:

Data package was acceptable

Definition of qualifiers:

A = Acceptable data.
J = Approximate data due to quality control criteria.
R = Reject data due to quality control criteria.
U = Compound not detected.
UJ = Compound detection limit is approximate

Reviewer:

Date:

I. DATA COMPLETENESS

Missing Information, Date Lab Contacted, Date Received:

Data package complete

II. HOLDING TIMES:

Sample ID	Date Sampled	VOA	BNA		Pest.	
		Date Anal.	Date Extr.	Date Anal.	Date Extr.	Date Anal.
FB	8/30/94	9/07/94	9/01/94	9/05/94	9/01/94	9/13/94
SL-01	8/30/94	9/02/94	9/01/94	9/06/94	8/31/94	9/06/94
SL03A	8/30/94	9/02/94	9/01/94	9/08/94	8/31/94	9/05/94
SL-03B	8/30/94	9/02/94				
SL-04	8/30/94	9/04/94	9/01/94	9/05/94	8/31/94	9/05/94
SL-05	8/30/94	9/07/94	9/01/94	9/09/94	8/31/94	9/05/94
SL-6/7	8/30/94	9/04/94	9/01/94	9/06/94	8/31/94	9/06/94
SL-08	8/30/94	9/04/94	9/01/94	9/06/94	8/31/94	9/06/94
SL-10/11	8/30/94	9/02/94	9/01/94	9/09/94	8/31/94	9/06/94
SL-12	8/30/94	9/02/94	9/01/94	9/06/94	8/31/94	9/13/94
SL-13	8/30/94	9/02/94	9/01/94	9/08/94	8/31/94	9/13/94
SL-14	8/30/94	9/07/94	9/01/94	9/08/94	8/31/94	9/06/94
SL-15	8/30/94	9/02/94	9/01/94	9/08/94	8/31/94	9/13/94
SL-25	8/30/94	9/02/94	9/01/94	9/08/94	8/31/94	9/13/94
TB	8/30/94	9/07/94				

- VOA:
- Unpreserved: aromatics within 7 days, non-aromatics within 14 days of sample collection.
 - Preserved: Both within 14 days of sample collection.
 - Soils: Both within 10 days of sample collection.

- BNA & Pest:
- Extracted within 7 days, analyzed within 40 days, soils and water.

Action: If holding times are exceeded all positive results are estimates (J) and non-detects are estimated (UJ). If holding times are grossly exceeded then data unusable (R).

III. GC/MS TUNING (Form 5B)

The DFTPP performance results for semi-volatile analysis were reviewed and found to be within the specified criteria (page D-40/SV).

If no, samples affected:

Tuning passed all SVOC QC criteria

Calculations:

The BFB performance results for volatile organic analysis were reviewed and found to be within the specified criteria (page D-25/VOA) Form 5A.

If no, samples affected:

Tuning passed all VOC criteria

Calculations:

IVA. VOLATILE CALIBRATION VERIFICATION (Form 6A, 7A)

Date of Initial Calibration: 8/30 + 8/31/94

Dates of Continuing Calibration: 9/02, 9/04 + 9/07/94

Instrument ID: MACH 1

Matrix/Level: Soil/low

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
8/30	RSD	<i>methylene chloride (35.1)</i> <i>acetone (69.9)</i> <i>2-butanone (37)</i>
8/31	RSD	<i>methylene chloride (33)</i> <i>acetone (71)</i>
9/02	D	<i>methylene chloride (288)</i> <i>acetone (352)</i> <i>2-butanone (56)</i> <i>2-hexanone (29)</i>
9/04	D	<i>methylene chloride (78.1)</i> <i>acetone (125)</i>
9/7	D	<i>methylene chloride (456)</i> <i>acetone (202)</i>

Calculations:

Initial calibration uses 5 concentrations.

All Avg. RF's and RF's must be >0.05 ; if <0.05 , mark positive results (J) and non-detects (R) (page D-27/VOA).

All %D's must be $<25\%$; if $>25\%$ mark detects (J) and non-detects (UJ)

Some compounds must meet RRF of 0.01 (page D-28/VOA).

IVB. SEMI-VOLATILE CALIBRATION VERIFICATION (Form 6B, 7B)

Date of Initial Calibration: *9/5/94*

Dates of Continuing Calibration: *9/5, 9/5, 9/9 + 9/13/94*

Instrument ID:

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
<i>9/5</i>	<i>RF</i> <i>RSD</i>	<i>2,4-dinitrophenol (0.03)</i> <i>4-chloroaniline (43)</i> <i>3-nitroaniline (66)</i> <i>2,4-dinitrophenol (38)</i> <i>3,3-dichlorobenzidine (35)</i>
<i>9/13</i>	<i>D</i> <i>D</i>	<i>2,4-dinitrophenol (28)</i> <i>indeno(1,2,3-cd)pyrene (26)</i> <i>2-fluorobiphenyl (29)</i>

Calculations:

All Avg. RF's and RF's must be >0.05; if <0.05, mark positive results (J) and non-detects (R) page D-34/SV.
All %RSD's must be <30%; if >30% mark detects (J) and non-detects (UJ) if <50%
All %D's must be <25%; if >25% mark detects (J) and non-detects (UJ)
Tables for RRF, %D, and %RPD on pages D-46,47/SV.

V. BLANK ANALYSIS RESULTS

Laboratory Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
	<i>VBLK02</i>	<i>soil</i>	<i>methylene chloride</i>	<i>5.6 ug/Kg</i>
			<i>acetone</i>	<i>6.3</i>
			<i>2-butanone</i>	<i>13.1</i>
			<i>boric acid (TIC)</i>	<i>7.7</i>
	<i>VBLK03</i>	<i>soil</i>	<i>methylene chloride</i>	<i>1.5</i>
			<i>acetone</i>	<i>1.3</i>
			<i>hexane</i>	<i>4.4</i>
	<i>SBLKS1</i>	<i>soil</i>	<i>di-n-butylphthalate</i>	<i>22</i>
			<i>bis(2-ethylhexyl)phthalate</i>	<i>28</i>

Equipment and Field Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
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No contamination

If concentration < CRQL, report CRQL
If concentration > CRQL, but less than action level (5x or 10x), report as (U)
If concentration > than action level, report as (R)

VI. SURROGATE RECOVERIES (Form 2C, 2E)

Sample matrix:

<u>Samples</u>	<u>VOA</u>			<u>B/N</u>					
	<u>TOL</u>	<u>BFB</u>	<u>DCF</u>	<u>NBZ</u>	<u>FBP</u>	<u>TPH</u>	<u>PHL</u>	<u>2FP</u>	<u>TBP</u>
	<i>Pass criteria</i>			<i>Pass criteria</i>					

Calculations:

	<u>Water</u>	<u>Soil</u>	
TOL = Toluene-d ₈	88-110	84-138	Page D-50/VOA
BFB = Bromofluorobenzene	86-115	59-113	
DCF = 1,2 Dichloroethane-d ₄	76-114	70-121	
NBZ = Nitrobenzene-d ₅	35-114	23-120	Page D-56/SV
FBP = 2-Fluorobiphenyl	43-116	30-115	
TPH = Terphenyl-d ₁₄	33-141	18-137	
PHL,2FP,TBP	60-150	60-150	

VII. FIELD DUPLICATE PRECISION

Sample matrix: *soil*

Sample Nos.: *SL-25 and SL-12*

List compounds that do not meet the following RPD criteria:

- An RPD of < 30% for water
- An RPD of < 50% for soil

<u>Fraction</u>	<u>Compound</u>	<u>Sample Conc.</u>	<u>Dup Conc.</u>	<u>RPD</u>
<i>VOCs passed criteria</i>				
<i>SVOC</i>	<i>benzo(a)anthracene</i>	<i>310</i>	<i>117</i>	<i>90</i>
	<i>chrysene</i>	<i>644</i>	<i>533</i>	<i>19</i>
	<i>benzo(b)fluoranthene</i>	<i>482</i>	<i>473</i>	<i>2</i>
	<i>benzo(k)fluoranthene</i>	<i>206</i>	<i>182</i>	<i>12</i>
	<i>benzo(a)pyrene</i>	<i>326</i>	<i>234</i>	<i>33</i>
	<i>indeno(1,2,3-cd)pyrene</i>	<i>180</i>	<i>154</i>	<i>16</i>

If the results for any compound do not meet the RPD, then flag positive results as estimated (J).

VIII. INTERNAL STANDARD PERFORMANCE (Form 8A, 8B)

List the internal standard areas of samples that do not meet the criteria of +100% or -50% of the internal standard area on the continuing calibration standard.

<u>Sample ID</u>	<u>Date</u>	<u>I.S. Out</u>	<u>I.S. Area/RT</u>	<u>Acceptable Range</u>	<u>Action</u>
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VOC passed criteria

SVOC passed criteria

Positive results are flagged with (J)
Non-detects are flagged with (UJ)
Page D-43, 51/SV
Page D-47/VOA

IX. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3C)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
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VOC passed criteria

SVOC passed criteria

If any recoveries < 10%, flag positive results (J), flag non-detects (UJ). RPD for VOAs page D-50/VOA, SV on page D-57/SV, and Pest. on page D-58/pest.

X. PESTICIDE INSTRUMENT PERFORMANCE

List DDT retention times less than 12 minutes.

<u>Standard ID</u>	<u>Date/Time</u>	<u>RT</u>	<u>Samples Affected</u>	<u>Actions</u>
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4,4-DDT retention times > 12 minutes

If retention time < 12 min., reexamine for good separation, if not flag affected compounds (R)

List compounds which are not within the established windows.

<u>Compound</u>	<u>Date/Time</u>	<u>RT</u>	<u>RT Window</u>	<u>Samples Affected</u>
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Must be within 0.02 min. of the mean RT (page D-47/PEST)

If out of RT window and no peaks in expected RT window then its ok.

If out of RT window and peaks are in expected RT window, recalculate conc. using different STDs.

X. PESTICIDE INSTRUMENT PERFORMANCE (cont.) (Form 7D)

DDT and Endrin Degradation. List the standards which have a DDT or Endrin breakdown >20%.

<u>Standard ID</u>	<u>DDT or Endrin</u>	<u>% Breakdown</u>	<u>Samples Affected</u>
<i>PEM05</i>	<i>endrin</i>	<i>50.7</i>	<i>DB1701 column - non affected</i>

Calculations:

If breakdown >20%, flag positive results (J). If DDT is not present but DDD or DDE are, flag (R). Flag all positive results for DDD and/or DDE (J).

If breakdown >20%, flag positive results (J). If Endrin is not present but endrin aldehyde and/or endrin ketone are, flag (R). Flag all positive results for E. aldehyde and/or E. ketone (J).

XI. SURROGATE RECOVERIES (Form 2F)

Sample matrix:

	Column 1		Column 2	
<u>Samples</u>	<u>TCX</u>	<u>DCB</u>	<u>TCX</u>	<u>DCB</u>

Surrogate recoveries passed criteria

Calculations:

	<u>QC Limits</u>
TCX = Tetrachloro-m-xylene	60-150
DCB = Decachlorobiphenyl	60-150

XII. PESTICIDE CALIBRATION (Form 6E)

Initial Calibration: Must be calibrated with 3 conc. Calibration factors on page D-41/pest.
RSD on page D-43/pest. RSD ,15% for compounds on page D-43/pest.

List compounds which did not meet RSD < 10% or 15%

<u>Date</u>	<u>Compound</u>	<u>Mean</u>	<u>%RSD</u>	<u>Column</u>	<u>Samples Affected</u>
	<i>alpha-BHC</i>		23	<i>DB1701</i>	
	<i>alpha-BHC</i>		27	<i>DB608</i>	
	<i>delta-BHC</i>		24	<i>DB608</i>	
	<i>gamma-BHC</i>		21	<i>DB608</i>	
	<i>dieldrin</i>		21	<i>DB608</i>	
	<i>4,4-DDT</i>		34	<i>DB608</i>	
	<i>methoxychlor</i>		25	<i>DB608</i>	

Calculations:

Flag all positive results (J)

Analytical Sequence (Form 8D):

Did the lab follow the correct sequence every 72 hours? If no, data may be affected.

Correct sequence followed

XIII. PESTICIDE CALIBRATION (Form 7D, 7E)

Continuing Calibration:

List the compounds which did not meet the %D of < 15% on quantitation or 20% on confirmation for continuing calibration.

<u>Date</u>	<u>Compound</u>	<u>%D</u>	<u>Column</u>	<u>Sample Affected</u>
	<i>endosulfan</i>	44	<i>DB1701</i>	<i>INDBM02</i>
	<i>endrin aldehyde</i>	30	<i>DB1701</i>	"
	<i>endosulfan II</i>	33	<i>DB1701</i>	<i>INDBM03</i>
	<i>endosulfan sulfate</i>	37	<i>DB1701</i>	"
	<i>endrin aldehyde</i>	48	<i>DB1701</i>	"
	<i>endrin</i>	52	<i>DB1701</i>	<i>INDAM04</i>
	<i>decachlorobiphenyl</i>	48	<i>DB1701</i>	<i>INDBM04</i>
	<i>decachlorobiphenyl</i>	36	<i>DB608</i>	<i>INDBM02</i>
	<i>endosulfan sulfate II</i>	27	<i>DB608</i>	<i>INDBM03</i>
	<i>endosulfan II</i>	27	<i>DB608</i>	"
	<i>endrin ketone</i>	33	<i>DB608</i>	"
	<i>endrin</i>	29	<i>DB608</i>	<i>INDAM04</i>
	<i>4,4-DDT</i>	50	<i>DB608</i>	"
	<i>methoxychlor</i>	31	<i>DB608</i>	"
	<i>delta-BHC</i>	32	<i>DB608</i>	<i>INDBM04</i>
	<i>hepachloroepoxide</i>	26	<i>DB608</i>	"
	<i>4,4-DDE</i>	26	<i>DB608</i>	"
	<i>endosulfan II</i>	37	<i>DB608</i>	"
	<i>endosulfan sulfate</i>	42	<i>DB608</i>	"
	<i>endrin ketone</i>	56	<i>DB608</i>	"
	<i>endrin aldehyde</i>	32	<i>DB608</i>	"
	<i>alpha-chlordane</i>	37	<i>DB608</i>	"
	<i>gamma-chlordane</i>	49	<i>DB608</i>	"

IX. GPC and Florisil Clean-Up (Form 9A, 9B)

List compounds which did not use florisil clean-up or surpassed validation criteria:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>
	<i>florisil</i>	<i>endosulfan I</i>	<i>72</i>
		<i>dieldrin</i>	<i>54</i>
		<i>4,4-DDT</i>	<i>51</i>
		<i>methoxychlor</i>	<i>0</i>
		<i>decachlorobiphenyl</i>	<i>36</i>
	<i>GPC</i>	<i>4,4-DDT</i>	<i>72</i>

QC Limits on florisil %REC = 80-120%

QC Limits on GPC %REC = 80-110%

If %REC < 80%, qualify positive results (J) and non-detects (UJ). If %REC = 0, then (R) qualify non-detects

XV. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3F)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
-------------	-------------------	-----------------	-------------	--------------

SL-08B failed all criteria for matrix spike and matrix spike duplicate. High technical chlordane in sample contributed to matrix interferences. Chlordane levels were above added spiked concentrations.

XVI. SAMPLE QUANTITATION

VOA:

BNA:

PEST/PCB:

Method blank VBLK01 = ND

VBLK02 MC = 5.6 2-butanone = 13.1
Acetone = 6.3 Boric Acid 7.7 (291 RT)

VBLK03 MC = 1.5 Hexane 4.4 (4.42 CT)
Acetone = 1.3

SBLK51 Di-n-butylphthalate 22J
bis(2-ethylhexyl)phthalate 28J

VOA

Investigates - No STDs

CALCULATIONS: SL-01 Toluene_{db} = 104.41 %
Chlorobenzene = 1STD

$$\frac{415035 \times 50 \mu\text{g/L}}{321311 \times 1.237} = \frac{52.21 \mu\text{g/L}}{50.0 \mu\text{g/L STD}} \times 100 = 104.42 \%$$

SL-05 Bromofluorobenzene = 86.44 %
Chlorobenzene = 1STD

$$\frac{349837 \times 50 \mu\text{g/L}}{402219 \times 1.006} = \frac{43.22 \mu\text{g/L}}{50 \mu\text{g/L}} \times 100 = 86.45 \%$$

Internal STDs VOAs

No. TYP's

Initial calibrations

① 8/30/94 1256 HRS instrument # 5972

RRFs > 0.05 RSDs > 25% RSDs > 25 = methylene chloride = 35.1
Calcs - RRF \bar{x} ok RSDs ok acetone = 69.9
2-butanone = 37

Benzene RRF₁ = 0.949

$$\frac{81997 \times 50 \mu\text{g/L}}{432032 \times 1.0 \mu\text{g/L}} = 0.949 \quad \checkmark$$

chloroform RRF₅ = 4.034

$$\frac{177056 \times 5.0 \mu\text{g/L}}{43854 \times 5.0 \mu\text{g/L}} = 4.034 \quad \checkmark$$

② 8/31 1407 MACH-01

RRFs > 0.05 RSDs > 25 = acetone @ 71
methelene C. @ 33

Calcs \bar{x} RRFs = OK + RSDs

Toluene RRF₅ = 1.208

$$\frac{92836 \times 50 \mu\text{g/L}}{768707 \times 5 \mu\text{g/L}} = 1.208$$

ccals 9/2 @ 14:07 hrs

RRF₅₀ > 0.05
%D > 25% = methylene chloride 288
acetone 352
2-butanone 56
2-hexanone 29

REF₅₀ trichloroethane = 0.380

$$\frac{284051}{747286} \times \frac{50 \mu\text{g/L}}{50 \mu\text{g/L}} = 0.380$$

ccal 9/4 1407 hrs

RRF₅₀ > 0.05
%D > 25% = methylene chloride 781
acetone 1246

1,2-Dichloroethane = 0.971

$$\text{RRF}_{50} \frac{230348 \times 50}{237297 \times 50} = 0.971$$

ccal 9/7 1256 hrs

RRF₅₀ > 0.05
%D > 25% methylene chloride = 456%
acetone = 202

REF₅₀ Toluene 1.399

$$\frac{325000}{232994} = 1.3986$$

Tuning every 12 hrs

target mass 50 cv = 16.2%

$$\frac{2012}{12400} \times 100 = 16.2$$

Cost to Date 11/25

KNOWN COSTS
Since 25

OUTSTANDING COSTS

August	2729.24
Sept	502.54
Oct	1638.59
November	3285.63

SVOA

Surrogates

B/N

SL-01

1,2-Dichlorobenzene_{d4} = 64

$$\frac{1,2\text{-Dichlorobenzene}_{d4}}{1,4\text{-Dichlorobenzene}} = \frac{91612 \times 20 \text{ ug/L}}{51875 \times .984} = \frac{31.97 \text{ ug/L}}{50 \text{ ug/L}} \times 100 = 64\%$$

Acid

SL-04

Terphenyl_{d14} = 111%

$$\frac{152973 \times 20 \text{ ug/L}}{50623 \times 1.095} = \frac{55.70 \text{ ug/L}}{55 \text{ ug/L}} \times 100 = 111.4\%$$

Internal STDs

No TYPOS

I CALS.

9/5/94

1150 hrs

RRF > 0.05

RSDs < 30%

2,4-Dinitrophenol 0.03

4-Chloroaniline 42.5

3-Nitroaniline 66.2

2,4-Dinitrophenol 37.5

3,3-Dichlorobenzidine 35.1

% RSD cal OK RRF OK

RRF₀₀ Chrysene = 0.940

$$\frac{235235 \times 20 \text{ ug/L}}{125124 \times 40 \text{ ug/L}} = .940$$

CCAL 9/5/94 @ 1150 hrs

RRF₅₀ > 0.05
%ODs < 25%

RRF₅₀ Naphthalene = 0.932

$$\frac{292552 \times 20 \text{ ug/L}}{251120 \times 25 \text{ ug/L}} = 0.932$$

%ODs ok

CCAL 9/5/94 @ 2333 hrs

RRF₅₀ > 0.05
%ODs < 25%

2,4-Dinitrophenol 27.8%

RRF₅₀ Nitrobenzene 0.388

$$\frac{131070 \times 20 \text{ ug/L}}{270018 \times 25 \text{ ug/L}} = 0.388$$

%ODs ok

9/9 @ 1451

RRF₅₀ > 0.05 %ODs > 25 = Indeno(1,2,3-cd)pyrene

$$\text{RRF}_{50} \text{ Chrysene} = \frac{62391 \times 20 \text{ ug/L}}{56923 \times 25 \text{ ug/L}} = 0.876$$

Reported 0.877

RRF₅₀ Indeno(123-cd)pyrene = 0.803

$$\frac{57255 \times 20}{57012 \times 25} = 0.803$$

CCM 9/13 @ 1723 hrs

RRF₅₀ > 0.05 %D > 25% = indeno (123 cd) pyrene 26 %
2 Fluorobiphenyl 29 %

$$2\text{-Fluorobiphenyl} = 1.182$$

$$\frac{57656 \times 20 \text{ ug/L}}{39027 \times 25 \text{ ug/L}} = 1.1819$$

Tuning

DFTPP

@ 9/5/94 11:24 hrs

$$M/E 441 = 76.75$$

$$\frac{8.656}{11.276} \times 100 = 76.75$$

SDG 18-1 NETL wells G+H

Pesticides

Surrogates

SL-6/7 TCX-1 = 91

$$\text{FOUND} \quad \frac{167815 \times 5000 \text{ ml} \times 2 \text{ gpc}}{2305425 \times 2 \text{ ml} \times 35.2 \text{ g}} = 12.45 \text{ ug/kg}$$

$$\text{ADDED} \quad \frac{2 \text{ ml} \times 0.2}{(35.2)(.93)} \times 1000 = 13.7 \text{ ug/kg}$$

$$\frac{12.45 \text{ ug/kg}}{13.7 \text{ ug/kg}} \times 100 = 90.8 \%$$

SL-14 DCBZ = 140%

$$\text{FOUND} \quad \frac{207195 \times 5000 \text{ ml} \times 2 \text{ gpc}}{1844075 \times 35 \text{ g} \times .91 \times 2 \text{ ml}} = 19.82 \text{ ug/kg}$$

$$\text{ADDED} \quad \frac{2 \text{ ml} \times 0.2}{35 \text{ g} \times .91} \times 1000 = 14.11$$

$$\frac{19.82}{14.11} \times 100 = 140.4 \%$$

Calibration factors

medium mass obtained from
FORM 7E. Ratios on FORM 6E

DB608 aldrin Low = 1660900.00

INDBL01 16608 / 0.01 ng = 1660900.00 ✓

DB1701 endrin high = 648056.25

207378 / 0.32 = 648056.25 ✓

mean + RSD calculated correctly.

RSDs > 20%

DB1701

alpha-BHC = 23

DB608

alpha-BHC = 27

delta-BHC = 24

gamma-BHC = 21

dieldrin = 21

4,4-DDT = 34

methoxychlor = 25

DB170 Anoclor 1242 = 130885 peak 1

26177 / 0.2 ng = 130885 ✓

DB608 Anoclor 1254 = 63020 peak 2

12604 / .2 = 63020 ✓

Percent resolution Form 66

Resolutions > 60%

ENDRIN / DDT Breakdown

TIPOS - NONE

PEM02 9/5/94 DB1701

44 DDT = 7.67%

DDD = 17072 / 1348237.50 = 0.01266

0.01266 / 0.165 ug x 100 = 7.67% ✓

% D > 25%

DB1701	PEM02	endrin 27%, methoxychlor 26
"	PEM03	beta-BHC 41, endrin 31
"	PEM04	beta-BHC 46, endrin 67 44 DDT 29 methoxychlor 26
DB608	PEM02	4,4-DDT 39
	PEM03	4,4-DDT 41
	PEM04	beta-BHC 29 endrin 44 4,4 DDT 80
	PEM05	beta BHC 36 4,4 DDT 89

PEM05 endrin breakdown 50.7 combined = 52.7

Endrin Ketone 19470 / 901637.50 = 0.0216

Endrin Aldehyde 28399 / 877737.5 = 0.0329

0.0545 / 0.107 x 100 = 50.95%

Calc. Verification form 7E

1701	INDBM02	endosulfan	44
		endrin aldehyde	30
1701	INDBM03	endosulfan II	33
		endosulfan sulfate	37
		endrin aldehyde	48
1701	INDAM04	endrin	52
	INDB04	decachlorobiphenyl	48
DB608	INDBM02	decachlorobiphenyl	36
DB608	INDBM03	endosulfan sulfate II	27
		endosulfan II	27
		endrin ketone	33
DB608	INDAM04	endrin	29
		4,4-DDT	50
		methoxychlor	31
	INDBM04	deta-BHC	32
		Heptachlor epoxide	26
		4,4-DDE	26
		endosulfan II	37
		endosulfan sulfate	42
		endrin ketone	56
		endrin aldehyde	32
		alpha chlordane	37
		gamma chlordane	41

Analytical Sequence Form 8D - OK

Florisil Clean-up	Endosulfan I	72%	Form 9A
	Dieldrin	54%	
	4,4-DDT	51%	
	methoxychlor	0%	
	Decachlorobiphenyl	36%	

4,4-DDT = 51%

Recovered $\frac{31141}{1523412.5} \times 0.020 \text{ ng} / 2 \text{ ml} = 0.01022 \text{ ng/ml}$

$10.22 \text{ ng/ml} / 20 \text{ ng/ml} = 49\%$ $\frac{100 \mu\text{l}}{1 \text{ ml}} = 10.22 \text{ ng/ml}$

GPC check Form 9B

4,4-DDT 72%

Recovered $217924 / 1523412.5 = 0.143 \text{ ng}$

$0.143 \text{ ng} / 2 \text{ ml} \times 1000 = 71.5 \text{ ng/ml}$

added 100 ng/ml

$71.5 \text{ ng/ml} / 100 \text{ ng/ml} \times 100 = 71.5\%$

Pesticide Identification Form 10 A

FB alpha chlordane 116 %
 gamma chlordane 300 %

SLO1 gamma chlordane 179
 4,4-DDT 83

SLO3DL alpha chlordane 61
 Aroclor 1260 120

SL-04 gamma chlordane 32 %
 alpha chlordane 114
 4,4-DDT 132
 4,4-DDD 29

SLO5DL gamma chlordane 76
 alpha chlordane 95
 4,4-DDT 319

SL-6/7 alpha-chlordane 100
 4,4-DDE 32
 4,4-DDD 168

SL-08DL 4,4-DDT 433

SL-08B gamma-chlordane 43
 alpha chlordane 38

SL-12DL gamma chlordane 93
 alpha chlordane 81
 4,4-DDT 158

SL-13 gamma chlordane 251 Aroclor 1260 79
 alpha chlordane 360
 4,4-DDT 339

SL-14DL

4,4-DDT 154%
Aroclor 1260 79

SL-15

gamma chlordane 97
alpha chlordane 225
4,4-DDT 399

SL-25DL

gamma chlordane 62
alpha chlordane 40
4,4-DDT 95
Aroclor 1260 32

method blanks - all clean

Field blank run after sample SL-13

44 DDT $\frac{30977 \times 5000 \times 2}{831062.5 \times 1,000 \text{ ml} \times 2} = 0.186 \text{ ug/L}$

Qualifiers

Surrogates - 60-150 both >10 J
either <10 J positive R nondetects
both >150 J positive

Cal Factors RSD < 20 RSD > 20 J positives
US nondetects
RSD > 90 R undetects

Cal verification

PEMOS endrin 50 J results
R endrin if not detected

RPD > 25 J positives US negatives

INDB INDA > 25% J positive US negatives
> 90 R negatives

Abzil < 80 J positives US negatives
GPC if "0" R negatives

Identification 25-50 J
> 1-90 JN
91 R

FB US alpha + delta BHC, 44DDT and methoxychlor
 for RSDs > 20 on Initial Calibration
 US beta-BHC endrin and 44-DDT for PEM > 25%
 US endrin, 44DDT + methoxychlor for INDB03 failure
~~Request alpha + gamma chlordane for poor identification substance.~~

SLO1 ~~44-DDT 5 concentration for poor float + GPC clean up~~
~~5 4,4-DDT + gamma-chlordane for poor identification~~

SLO3 Performed 1x run on sample for PCBs on one column
 1701, not run on 608. Diluted sample for Pest.
 Run diluted sample on 1701 + 608.
 Ran PCBs on 608 later with out LLP sequence.
 Qualified with "Y"

SLO3DL ~~US 4,4-DDT for poor float clean up GPC too~~
~~I AROCLOR 1260 for poor identification~~

SL-04 ~~5 4,4-DDT poor float GPC clean up~~
 interferences present. ~~5 endosulfan I + dieldrin~~
~~poor float GPC result~~

SLO5 Same as SL-03

SL-05DL 5 4,4-DDT Poor initial cal RSD @ 34% PEM @ 41
~~float GPC @ 51%~~

SL-6/7 US + J alpha, delta + gamma BHC, dieldrin, 4,4-DDT +
 methoxychlor for poor initial cal RSDs > 20%
 5 DDT poor PEM US endrin + methoxychlor poor PEM
 US endosulfan sulfate II, endosulfan II, endrin ketone for
 poor INDB03 CAL

~~5 endosulfan I for poor float clean up 4,4-DDT for float GPC~~

Partial listing!

SL-08DL J 4,4-DDT poor ICAL, ~~Florsit + GPC~~

SL-08B full listing! J alpha + delta BHC, dieldrin + methoxychlor poor ICAL

J beta BHC endrin + 4,4 DDT for poor PEM

SL-08BDL J alpha + delta BHC, 4,4 DDT and methoxychlor for poor ICAL

J Beta-BHC, endrin 4,4 DDT for poor PEM results

J heptachloroepoxide 4,4 DDE endosulfan II
endosulfan sulfate endrin ketone endrin aldehyde
+ gamma chlordane poor INDBM04

~~J endosulfan + dieldrin poor Florsit + GPC~~

SL-10/11 J 4,4 DDT poor surrogates

SL-10/11 DL OK

SL-12 J Aroclor 1260 poor surrogates

SL-12DL J alpha-chlordane poor TCX surrogate retention time
~~J 4,4 DDT poor Florsit + GPC~~

SL-13 J alpha + gamma chlordane poor INDBM04
~~J 4,4 DDT poor Florsit + GPC~~

SL-14 ~~J 4,4 DDT poor Florsit + GPC~~

32 P.O. > MA 1519
60 P.O.
32 P.O.

SL-14 DL OK

SL-14B OK

SL-15 J 44 DDT Poor surrogates, ~~LPC + ELOISU~~,
PEM
J alpha + Gamma chlordane Poor INDBM3-1

SL-25 OK

SL-25DL J alpha-chlordane Aroclor 1260 poor TLX retention
finies
~~J 44 DDT poor first GPC then up~~

Volatiles

FB U Quality MC + acetone For MB Contamination
5 ~~Q~~ Quality MC acetone 2-butanone poor ICAL

SL-01 ok

SL-03A ok

SL-03B ok

SL-04 U Quality MC, acetone + MEK for MB Contamination
T Quality MC, acetone + for poor ICAL

SL-05 ok

SL-06/7 U Quality MC, acetone + MEK for MB Contamination
T Quality MC, acetone for poor ICAL

SL-08 U Quality MC + acetone for MB Contamination

SL-08MS/MSD Quality MC + acetone for MB Contamination

SL-10/11 ok

SL-12 ok

SL-13 ok

SL-14 ok

SL-15 ok

SL-25 ok

TB ok

Semi-vols

FB US 4 chloroaniline, 3 nitroaniline, 2,4-Dinitrophenol
and 3,3-Dichlorobenzidine poor ICAAL

SL-01 Dont use, internal standards over
SL-01RE ok

SL-03 - Dont use, internal stds over
SL-03RE - ok

SL-04 use, US J compounds quantified by CR +
PRY INSTDS. U bis-2-ethylhexyl phthalate MB

SL-04RE - Dont use

SL-05 - ok

SL-6/7 U quality Di-n-butylphthalate, bis(2-ethylhexyl)
phthalate MB contamination

SL-08 Dont use internal stds

SL-08RE ok U Quality bis-2-ethylhexyl phthalate MB
contamination

SL-12 Dont use internal stds

SL-12RE ok

SL-12B ok

SL-13 ok

SL-13RE Dont use internal std

SL-14 ok

SL-14RE Dont use

SL-15 use

SL-15RE Dont use

SL-25 ok

SL-25RE Dont use

**REVIEW OF INORGANIC
CONTRACT LABORATORY PACKAGE**

Case Number:
Laboratory: *NETL*
SDG: *18*
SOW:
Completion Date: *10/24/94*

Site Name: *Wells G & H Superfund Site*
No. of Samples/Matrix: *soil*
Reviewer: *RETEC*
Reviewer's Name: *R. Roat*

DATA ASSESSMENT SUMMARY

	<u>ICP</u>	<u>AA</u>	<u>Hg</u>	<u>Cyanide</u>
1. Holding Times	O	O	O	O
2. Calibrations	O	O	O	O
3. Blanks	O	O	O	O
4. ICS	O	O	O	O
5. LCS	O	O	O	O
6. Duplicate Analysis	O	O	O	O
7. Matrix Spike	X	X	X	O
8. Serial Dilution	O	O	-	-
9. Overall Assessment	O	O	O	O

O = Data had no problems or qualified due to minor problems
M = Data qualified due to major problems
Z = Data unacceptable
X = Problems, but do not affect data

Action Items:

I. HOLDING TIMES

Sample ID	Date Sampled	Hg Analysis Date	Cyanide Analysis Date	Metal Analysis Date	Action
SL-6/7	8/30/94	9/21/94	9/07/94	9/06/94	
SL-04	8/30/94	9/21/94	9/07/94	9/06/94	
SL-08	8/30/94	9/21/94	9/07/94	9/06/94	
FB	8/30/94	9/21/94	9/07/94	9/06/94	
SL-10/11	8/30/94			9/06/94	
SL-25	8/30/94			9/06/94	
SL-14	8/30/94			9/06/94	
SL-03	8/30/94			9/06/94	
SL-15	8/30/94			9/06/94	
SL-12	8/30/94			9/06/94	
SL-13	8/30/94			9/06/94	
SL-01	8/30/94			9/06/94	
SL-05	8/30/94			9/06/94	

Metals - 180 days from collection preserved pH < 2

Mercury - 28 days from collection preserved pH < 2

Cyanide - 14 days from collection preserved pH > 12

If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).

II. INSTRUMENT CALIBRATION (Form 2A)

1. Recovery Criteria - List the analytes which did not meet the percent recovery (%R) criteria for initial and continuing calibration.

<u>Date</u>	<u>ICV/CCV</u>	<u>Analyte</u>	<u>%R</u>	<u>Action</u>	<u>Samples Affected</u>
-------------	----------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:	<u>Accept</u>	<u>Estimate (J)</u>	<u>Reject (R)</u>
Metals:	90-110%	75-89%, 111-125%	< 75%, > 125%
Mercury:	80-120%	65-79%, 121-135%	< 65%, > 135%
Cyanide:	85-115%	70-84%, 116-130%	< 70%, > 130%

2. Analytical Sequence

- A. Did the laboratory use the proper number of standards for calibration as described in the SOW? *Yes*
- B. Were calibrations performed at the beginning of each analysis? *Yes*
- C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis? *Yes*
- D. Were the correlation coefficient for the calibration curves for AA, Hg, and CN- > 0.995? *Yes*
- E. Was a standard at 2xCRDL analyzed for all ICP analysis? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (Form 3)

List the blank contamination.

1. Laboratory Blanks

<u>DATE</u>	<u>ICB/CCB</u>	<u>PREP BL</u>	<u>ANALYTE</u>	<u>CONC.</u>
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Passed all validation criteria

2. Equipment/Trip Blanks: *Not applicable to soils*

<u>DATE</u>	<u>EQUIP BL #</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	-------------------	----------------	--------------

3. Frequency Requirements

- A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? *Yes*
- B. Was a calibration blank run every 10 samples or every 2 hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (cont)

Actions: *Passed validation criteria*

The action level for any analyte is equal to five times the highest concentration of that elements contamination in any blank. No positive results should be reported unless the concentration of the analyte exceeds the Action Level (AL).

1. When the concentration is greater than the IDL, but less than the AL, report the sample concentration detected with a U.
2. When the sample concentration is greater than the AL, report the sample concentration unqualified.

ELEMENT

MAX CONC.

AL UNITS

IV. ICP INTERFERENCE SAMPLE (Form 4)

1. Recovery Criteria

List any element in the ICS AB solution which did not meet the criteria for %R

	<u>Percent Recovery</u>		
	< 50%	50-79%	> 120%
Positive sample results	R	J	J
Non-detected samples	R	UJ	A

DATE ELEMENT %R ACTION SAMPLES AFFECTED

Passed all validation criteria

2. Frequency Requirements

- A. Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per eight hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

IV. ICP INTERFERENCE SAMPLE (cont)

3. Report the concentration of any element detected in the ICS solution > 2xIDL that should not be present.

<u>ELEMENT</u>	<u>CONC. DETECTED IN THE ICS</u>	<u>CONC. OF INTERFERENTS IN THE ICS</u>			
		<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>

Passed all validation criteria

Estimate the concentration produced by the interfering element in all affected samples.

<u>SAMPLE AFFECTED</u>	<u>ELEMENT AFFECTED</u>	<u>SAMPLE CONC.</u>	<u>SAMPLE INTERFERANT</u>				<u>ESTIMATED INTERF.</u>
			<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>	

Action:

1. The sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels*in the ICS solution.
2. Estimate (J) positive results for affected elements for samples with levels of > 50% or more.
3. Reject (R) positive results if the reported concentration is due entirely to the interferant.
4. Estimate (UJ) non-detected results for which false negatives are suspect.

V. **MATRIX SPIKE (Form 5A)**

Sample Number: **SL-08MS**

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
SSR - spikes sample result
SR - sample result

<u>ANALYTE</u>	<u>SSR</u>	<u>SR</u>	<u>S</u>	<u>%R</u>	<u>ACTION</u>
----------------	------------	-----------	----------	-----------	---------------

Passed validation criteria

Actions:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
2. If any analyte does not meet the %R criteria, follow the actions stated below:

	<u>Percent Recovery</u>		
	<u><30%</u>	<u>30-74%</u>	<u>>125%</u>
Positive Sample Results	J	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

- A. Was a matrix spike prepared at the required frequency? *Yes*
- B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not required*

VI. LABORATORY DUPLICATES (Form 6)

List the concentration of any analyte not meeting the criteria for duplicate precision.

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	0.5	15	11.6	25.5	none
Iron					
Lead					
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc	0.5	33	26.5	21.5	none
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >20% for water and >35% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >CRDL. If both samples are non-detected, the RPD is not calculated (NC).

VII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair.

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead	0.5	229	161	35	none
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >30% for water and >50% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >2xCRDL. If both samples are non-detected, the RPD is not calculated (NC).

VIII. LABORATORY CONTROL SAMPLE (Form 7)

List any LCS recoveries not within the 80-120% criteria and the samples affected.

DATE ELEMENT %R ACTION SAMPLES AFFECTED

Passed all validation criteria

Action:

	<u>Percent Recovery</u>		
	<u>< 50%</u>	<u>51-79%</u>	<u>> 120%</u>
Positive Results	R	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

A. Was an LCS analyzed for every matrix, digestion batch and every 20 samples? *Yes*

IX. FURNACE AA ANALYSIS

1. Duplicate Precision

X Duplicate injections and one point analytical spikes were performed for all samples, duplicate injections agreed within +/- 20%.

Duplicate injections and/or spikes were not performed for the following samples/elements:

Duplicate injections did not agree within +/-20% for samples/elements:

IX. FURNACE AA ANALYSIS (cont.)

2. Post Digestion Spike Recoveries

X Spike recoveries met the 85-115% recovery criteria for all samples.

Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements:

X MSA was used to quantitate analytical results when contractually required.

X Correlation coefficients > 0.995, accept results

Correlation coefficients < 0.995, for sample numbers/elements:

Method of standard addition (MSA) was not performed as required for samples/elements:

Actions:

1. Estimate (J) positive results if duplicate injections are outside +/-20% RSD or CV.
2. If the sample absorbance is < 50% of post digestion spike absorbance the following actions should be applied:

	<u>Percent Recovery</u>		
	<u><10%</u>	<u>11-84%</u>	<u>>115%</u>
Positive Result	J or R	J	J
Non-detected	R	UJ	A

3. Estimate (J) sample result if MSA was required and not performed.
4. Estimate (J) sample result if correlation coefficient was < 0.995.

X. ICP SERIAL DILUTION ANALYSIS (Form 9)

Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

Serial dilutions were not performed for the following:

X Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the IDL before dilution.

Report all results that do not meet the required laboratory criteria for ICP dilution.

<u>ELEMENT</u>	<u>IDL</u>	<u>50xIDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>%D</u>	<u>ACTION</u>
Aluminum						
Barium			110	127	15	none
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Silver						
Sodium						
Vanadium						
Zinc						

Action:

1. Estimate (J) positive results if %D > 15.

XI. DETECTION LIMITS (Form 10)

1. Instrument Detection Limits

X Instrument detection limit results were present and found to be less than the contract required detection limits (CRDL).

IDLs were not included in the data package

IDLs were present, but the criteria was not met for the following elements:

2. Reporting Requirements

- A. Were sample results on Form I reported down to the IDL not the CRDL for all analytes?
Yes
- B. Were sample results that were analyzed by ICP for Se, Tl, or Pb at least 5x IDL? *Yes*
- C. Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

XII. SAMPLE QUANTITATION

X Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

Sample results were beyond the linear range/calibration range of the instrument for the following elements:

1. Sample Calculation:

ICP:

AA Furnace:

Mercury:

Cyanide:

Metals

NETL 18-1

TAL metals	Sampled	Received	
	8/30	9/31	9/8
SL-67			
SL-04			
SL-08			SL-08B
FB			SL-12B
LEAD SL-10/11			SL-14B
SL-25			
SL-14			CVs on 9/7/94
SL-03			Mercury on 9/21
SL-15			ICP 8/30
SL-12			= 8/30
SL-13			
SL-01			
SL-05	↓	↓	

* Preparation steps are wrong for ICP + F

ICAL

Passed QC recovery/FAAS criteria
 ICP performed at beginning, followed by ICB blank
 CV performed every 2 hrs on 10 samples with ICB

ICD VAPOR - Passed QC limits
 Cyanide - Passed QC limits

CEDL Form 2B ± 20%

Antimony	153%		
Cobalt	11.7% (11.7 ug/L)	check	* page 0055 Form 2B marked wrong Cobalt should be 117.0 ppm
Beryllium	125%		
Mercury	75%		

Blanks - Pass QC Criteria < CRDL
- ILS are false negatives.

ICP interference ILSA MSB
Form 4 80-120% except AL, CA, Fe, Mg
Pass QC Limits

One Sample 75-125%

Passes Criteria

Duplicate
Copper 25.5 * Zinc 21.5 * ~~±35 Beyond~~ (MSJ)

Lab Control Sample - Passed QC Limits

ICP Serial Dilution - Tankers Barium 15%

* SL-04 } should be qualified "*"
SL-03 }

* "E" Qualifier for all Barium samples

Field blank Lead = 4 ug/L Calcium 138
Zinc 6
Sodium 697
Magnesium 10

Field dup 25 + 12 SL-12 SL-25 RPD
229 101 35

Qualifiers - None

SOC-19-VALIDATION

**REVIEW OF ORGANIC
CONTRACT LABORATORY PACKAGE**

Site Name: *Wells G & H Superfund Site*

Reference Number:

The hard copied data package received at RETEC has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.: *E1005-02* SAS No.:
SDG No.: *19-1* Matrix: *soil*
No. of Samples: *19*

Sample Dates: *10/4 + 10/11/94*
Shipping Date: *10/4 + 10/11/94*
Date Rec'd by Lab: *10/5 + 10/12/94*

The CLP SOW for requires that specific analytical work be done and the general criteria used to determine the performance were based on the examination of:

- Data Completeness
- Holding Times
- GC/MS Tuning
- Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Dup.
- Field Duplicates
- Internal Std Performance
- Pest. Inst. Performance
- Compound Identification
- Compound Quantitation

Overall comments:

Data package was acceptable

Definition of qualifiers:

A = Acceptable data.
J = Approximate data due to quality control criteria.
R = Reject data due to quality control criteria.
U = Compound not detected.
UJ = Compound detection limit is approximate

Reviewer:

Date:

I. DATA COMPLETENESS

Missing Information, Date Lab Contacted, Date Received: *Data package complete*

II. HOLDING TIMES:

Sample ID	Date Sampled	VOA	BNA		Pest.	
		Date Anal.	Date Extr.	Date Anal.	Date Extr.	Date Anal.
FB	10/04/94	10/15/94	10/06/94	10/07/94		
1C	10/04/94	10/15/94	10/05/94	10/06/94	10/05/94	10/07/94
1D	10/04/94	10/15/94	10/05/94	10/06/94	10/05/94	10/06/94
2A	10/04/94	10/15/94	10/05/94	10/07/94	10/05/94	10/07/94
2B	10/04/94		10/05/94	10/07/94	10/05/94	10/06/94
2C	10/04/94		10/05/94	10/06/94	10/05/94	10/06/94
2D	10/04/94	10/15/94	10/05/94	10/07/94	10/05/94	10/06/94
2E	10/04/94	10/15/94	10/05/94	10/06/94	10/05/94	10/07/94
2F	10/11/94		10/13/94	10/15/94	10/13/94	10/21/94
3A	10/11/94		10/12/94	10/15/94	10/13/94	10/21/94
3B	10/11/94		10/13/94	10/15/94	10/13/94	10/21/94
4A	10/04/94		10/05/94	10/06/94	10/05/94	10/06/94
4B	10/04/94		10/05/94	10/06/94	10/05/94	10/06/94
4C	10/04/94	10/15/94	10/05/94	10/07/94	10/05/94	10/07/94
5A	10/11/94		10/13/94	10/17/94	10/13/94	10/21/94
5B	10/11/94		10/13/94	10/17/94	10/13/94	10/21/94
1A	10/04/94		10/05/94	10/06/94	10/05/94	10/07/94
1B	10/04/94		10/05/94	10/06/94	10/05/94	10/06/94
TB	10/04/94	10/15/94				

- VOA:
- Unpreserved: aromatics within 7 days, non-aromatics within 14 days of sample collection.
 - Preserved: Both within 14 days of sample collection.
 - Soils: Both within 10 days of sample collection.

- BNA & Pest:
- Extracted within 7 days, analyzed within 40 days, soils and water.

Action: If holding times are exceeded all positive results are estimates (J) and non-detects are estimated (UJ). If holding times are grossly exceeded then data unusable (R).

III. GC/MS TUNING (Form 5B)

The DFTPP performance results for semi-volatile analysis were reviewed and found to be within the specified criteria (page D-40/SV).

If no, samples affected:

Tunning passed all SVOC QC criteria

Calculations:

The BFB performance results for volatile organic analysis were reviewed and found to be within the specified criteria (page D-25/VOA) Form 5A.

If no, samples affected:

Several files containing BFB information were lost during a memory error. No BFB exists for the FB, TB, 2A, and 1D. Avidavits were submitted by the analyst indicating compliance with the lost BFB standards.

Calculations:

IVA. VOLATILE CALIBRATION VERIFICATION (Form 6A, 7A)

Date of Initial Calibration: 8/30 + 8/31/94

Dates of Continuing Calibration: 10/14, 10/15/94

Instrument ID: *MACH 1*

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
8/30	RSD	<i>methylene chloride (35.1)</i> <i>acetone (69.9)</i> <i>2-butanone (41)</i>
8/31	RSD	<i>methylene chloride (45)</i> <i>acetone (68)</i>
10/14	D	<i>methylene chloride (685)</i> <i>acetone (384)</i> <i>bromoform (36)</i>
10/15	D	<i>methylene chloride (196)</i> <i>acetone (387)</i>

Calculations:

Initial calibration uses 5 concentrations.

All Avg. RF's and RF's must be >0.05; if <0.05, mark positive results (J) and non-detects (R) (page D-27/VOA).

All %D's must be <25%; if >25% mark detects (J) and non-detects (UJ)

Some compounds must meet RRF of 0.01 (page D-28/VOA).

IVB. SEMI-VOLATILE CALIBRATION VERIFICATION (Form 6B, 7B)

Date of Initial Calibration: *9/5/94*

Dates of Continuing Calibration: *10/6, 10/7, 10/14, + 10/17/94*

Instrument ID:

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
<i>9/5</i>	<i>RF</i> <i>RSD</i>	<i>2,4-dinitrophenol (0.03)</i>
		<i>4-chloroaniline (43)</i>
		<i>3-nitroaniline (66)</i>
		<i>2,4-dinitrophenol (38)</i>
		<i>3,3-dichlorobenzidine (35)</i>
<i>10/6</i>	<i>RF</i> <i>D</i>	<i>3-nitroaniline (0.02)</i>
		<i>4-chloroaniline (48)</i>
		<i>hexachlorobutadine (31)</i>
		<i>3-nitroaniline (84)</i>
		<i>4-nitroaniline (59)</i>
		<i>4,6-dinitro-2-methylphenol (28)</i>
		<i>pentachlorophenol (44)</i>
		<i>carbazole (37)</i>
		<i>3-nitroaniline (0.03)</i>
		<i>indeno(1,2,3-cd)pyrene (38)</i>
<i>10/7</i> <i>10/14</i>	<i>RF</i> <i>D</i>	<i>dibenz(a,h)anthracene (33)</i>
		<i>2-fluorobiphenyl (31)</i>
<i>10/17</i>	<i>D</i>	<i>indeno(1,2,3-cd)pyrene (27)</i>
		<i>dibenz(a,h)anthracene (31)</i>
		<i>terphenyl-d₁₄ (26)</i>

Calculations:

All Avg. RF's and RF's must be >0.05; if <0.05, mark positive results (J) and non-detects (R) page D-34/SV.
 All %RSD's must be <30%; if >30% mark detects (J) and non-detects (UJ) if <50%
 All %D's must be <25%; if >25% mark detects (J) and non-detects (UJ)
 Tables for RRF, %D, and %RPD on pages D-46,47/SV.

V. BLANK ANALYSIS RESULTS

Laboratory Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
10/15/94	VBLK02	soil	<i>methylene chloride</i>	9.5 ug/Kg
			<i>acetone</i>	6.6
10/07/94	SBLKS1	soil	<i>di-n-butylphthalate</i>	189

Equipment and Field Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
10/15/94	FB	water	<i>methylene chloride</i>	7.7 ug/l
			<i>acetone</i>	1.1
			<i>toluene</i>	1.7
10/15/94	TB	water	<i>methylene chloride</i>	1.1
			<i>acetone</i>	0.8
			<i>toluene</i>	1.1

If concentration < CRQL, report CRQL

If concentration > CRQL, but less than action level (5x or 10x), report as (U)

If concentration > than action level, report as (R)

VI. SURROGATE RECOVERIES (Form 2C, 2E)

Sample matrix:

<u>Samples</u>	<u>VOA</u>			<u>B/N</u>					
	<u>TOL</u>	<u>BFB</u>	<u>DCF</u>	<u>NBZ</u>	<u>FBP</u>	<u>TPH</u>	<u>PHL</u>	<u>2FP</u>	<u>TBP</u>
	<i>Pass criteria</i>			<i>Pass criteria</i>					

Calculations:

	<u>Water</u>	<u>Soil</u>	
TOL = Toluene-d ₈	88-110	84-138	Page D-50/VOA
BFB = Bromofluorobenzene	86-115	59-113	
DCF = 1,2 Dichloroethane-d ₄	76-114	70-121	
NBZ = Nitrobenzene-d ₅	35-114	23-120	Page D-56/SV
FBP = 2-Fluorobiphenyl	43-116	30-115	
TPH = Terphenyl-d ₁₄	33-141	18-137	
PHL,2FP,TBP	60-150	60-150	

VII. FIELD DUPLICATE PRECISION

Sample matrix: *soil*

Sample Nos.: *1D and 1C*

List compounds that do not meet the following RPD criteria:

- An RPD of < 30% for water
- An RPD of < 50% for soil

<u>Fraction</u>	<u>Compound</u>	<u>Sample Conc.</u>	<u>Dup Conc.</u>	<u>RPD</u>
<i>VOCs</i>	<i>1,2-dichloroethene</i>	<i>217</i>	<i>18,772</i>	<i>195</i>
	<i>2-butanone</i>	<i>11</i>	<i>ND</i>	
	<i>trichloroethene</i>	<i>93</i>	<i>4,910</i>	<i>192</i>
	<i>tetrachloroethene</i>	<i>73</i>	<i>2,430</i>	<i>188</i>
	<i>ethylbenzene</i>	<i>54</i>	<i>4,337</i>	<i>195</i>
	<i>xylene</i>	<i>117</i>	<i>12,750</i>	<i>196</i>
<i>SVOC</i>	<i>1,2-dichlorobenzene</i>	<i>526</i>	<i>627</i>	<i>17.5</i>
	<i>phenanthrene</i>	<i>63</i>	<i>ND</i>	
	<i>fluoranthene</i>	<i>43</i>	<i>ND</i>	
	<i>bis(2-ethylhexyl)phthalate</i>	<i>206</i>	<i>ND</i>	

If the results for any compound do not meet the RPD, then flag positive results as estimated (J).

VIII. INTERNAL STANDARD PERFORMANCE (Form 8A, 8B)

List the internal standard areas of samples that do not meet the criteria of +100% or -50% of the internal standard area on the continuing calibration standard.

Sample ID Date I.S. Out I.S. Area/RT Acceptable Range Action

VOC passed criteria

SVOC passed criteria

Positive results are flagged with (J)
Non-detects are flagged with (UJ)
Page D-43, 51/SV
Page D-47/VOA

IX. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3C)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

Date Sample No. Compound %REC Limit

VOC passed criteria

SVOC passed criteria

If any recoveries < 10%, flag positive results (J), flag non-detects (UJ). RPD for VOAs page D-50/VOA, SV on page D-57/SV, and Pest. on page D-58/pest.

X. PESTICIDE INSTRUMENT PERFORMANCE

List DDT retention times less than 12 minutes.

<u>Standard ID</u>	<u>Date/Time</u>	<u>RT</u>	<u>Samples Affected</u>	<u>Actions</u>
--------------------	------------------	-----------	-------------------------	----------------

All 4,4-DDT retention times > 12 minutes

If retention time < 12 min., reexamine for good separation, if not flag affected compounds (R)

List compounds which are not within the established windows.

<u>Compound</u>	<u>Date/Time</u>	<u>RT</u>	<u>RT Window</u>	<u>Samples Affected</u>
-----------------	------------------	-----------	------------------	-------------------------

Must be within 0.02 min. of the mean RT (page D-47/PEST)

If out of RT window and no peaks in expected RT window then its ok.

If out of RT window and peaks are in expected RT window, recalculate conc. using different STDs.

X. PESTICIDE INSTRUMENT PERFORMANCE (cont.) (Form 7D)

DDT and Endrin Degradation. List the standards which have a DDT or Endrin breakdown > 20%.

<u>Standard ID</u>	<u>DDT or Endrin</u>	<u>% Breakdown</u>	<u>Samples Affected</u>
<i>PEM02</i>	<i>endrin</i>	<i>35.5</i>	<i>DB1701 column</i>
<i>PEM03</i>	<i>endrin</i>	<i>36</i>	<i>DB1701</i>
<i>PEM04</i>	<i>endrin</i>	<i>78</i>	<i>DB1701</i>
<i>PEM05</i>	<i>4,4-DDT</i>	<i>33</i>	<i>DB1701</i>
<i>PEM06</i>	<i>endrin</i>	<i>37</i>	<i>DB1701</i>
<i>PEM07</i>	<i>endrin</i>	<i>32</i>	<i>DB1701</i>
<i>PEM02</i>	<i>endrin</i>	<i>33</i>	<i>DB608</i>
<i>PEM03</i>	<i>endrin</i>	<i>38</i>	<i>DB608</i>
<i>PEM04</i>	<i>endrin</i>	<i>31</i>	<i>DB608</i>
<i>PEM05</i>	<i>endrin</i>	<i>26</i>	<i>DB608</i>
<i>PEM10</i>	<i>endrin</i>	<i>24</i>	<i>DB608</i>

Calculations:

If breakdown > 20%, flag positive results (J). If DDT is not present but DDD or DDE are, flag (R). Flag all positive results for DDD and/or DDE (J).

If breakdown > 20%, flag positive results (J). If Endrin is not present but endrin aldehyde and/or endrin ketone are, flag (R). Flag all positive results for E. aldehyde and/or E. ketone (J).

XI. SURROGATE RECOVERIES (Form 2F)

Sample matrix:

<u>Samples</u>	<u>Column 1</u>		<u>Column 2</u>	
	<u>TCX</u>	<u>DCB</u>	<u>TCX</u>	<u>DCB</u>
<i>FB</i>		<i>7</i>	<i>25</i>	<i>28</i>

Calculations:

QC Limits

TCX = Tetrachloro-m-xylene 60-150
 DCB = Decachlorobiphenyl 60-150

XII. PESTICIDE CALIBRATION (Form 6E)

Initial Calibration: Must be calibrated with 3 conc. Calibration factors on page D-41/pest. RSD on page D-43/pest. RSD ,15% for compounds on page D-43/pest.

List compounds which did not meet RSD < 10% or 15%

<u>Date</u>	<u>Compound</u>	<u>Mean</u>	<u>%RSD</u>	<u>Column</u>	<u>Samples Affected</u>
10/05/94	<i>alpha-BHC</i>		23	<i>DB1701</i>	
10/17/94	<i>alpha-BHC</i>		24	<i>DB1701</i>	
	<i>4,4-DDD</i>		28	<i>DB1701</i>	
10/05/94	<i>gamma-BHC</i>		26	<i>DB608</i>	
	<i>alpha-BHC</i>		31	<i>DB608</i>	
	<i>delta-BHC</i>		22	<i>DB608</i>	

Calculations:

Flag all positive results (J)

Analytical Sequence (Form 8D):

Did the lab follow the correct sequence every 72 hours? If no, data may be affected.

Correct sequence followed

XIII. PESTICIDE CALIBRATION (Form 7D, 7E)

Continuing Calibration:

List the compounds which did not meet the %D of <15% on quantitation or 20% on confirmation for continuing calibration.

<u>Date</u>	<u>Compound</u>	<u>%D</u>	<u>Column</u>	<u>Sample Affected</u>
	<i>endrin</i>	72	<i>DB1701</i>	<i>INDAM03</i>
	<i>methoxychlor</i>	30	<i>DB1701</i>	"
	<i>4,4-DDT</i>	41	<i>DB608</i>	<i>INDAM04</i>
	<i>methoxychlor</i>	30	<i>DB608</i>	"
	<i>delta-BHC</i>	31	<i>DB608</i>	<i>INDBM04</i>

IX. GPC and Florisil Clean-Up (Form 9A, 9B)

List compounds which did not use florisil clean-up or surpassed validation criteria:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>
	<i>florisil</i>	<i>alpha-BHC</i>	<i>77</i>
		<i>4,4-DDT</i>	<i>51</i>
		<i>TCX</i>	<i>55</i>
		<i>decachlorobiphenyl</i>	<i>79</i>
	<i>GPC</i>	<i>4,4-DDT</i>	<i>117</i>
		<i>gamma-BHC</i>	<i>128</i>
		<i>hepachlor</i>	<i>126</i>
		<i>aldrin</i>	<i>125</i>
		<i>dieldrin</i>	<i>127</i>
		<i>endrin</i>	<i>206</i>

QC Limits on florisil %REC = 80-120%

QC Limits on GPC %REC = 80-110%

If %REC < 80%, qualify positive results (J) and non-detects (UI). If %REC = 0, then (R) qualify non-detects

XV. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3F)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
	<i>2D</i>	<i>gamma-BHC</i>	<i>133</i>	<i>46-127</i>
		<i>dieldrin</i>	<i>139</i>	<i>31-134</i>
		<i>endrin</i>	<i>161</i>	<i>42-139</i>
		<i>4,4-DDT</i>	<i>149</i>	<i>23-134</i>

XVI. SAMPLE QUANTITATION

VOA:

BNA:

PEST/PCB:

NET - 19-1

Wells G+H RD/RA

VOCs

Surrogates

4-4C BFB = 90%

Chlorobenzene = 1STD

$$\frac{350656 \times 50 \text{ ug/L}}{476413 \times 0.819} = 44.93 \text{ ug/L} / 50 \text{ ug/L} \times 100 = 89.8\%$$

2-2D TOL = 118%

Chlorobenzene = 1STD

$$\frac{597396 \times 50 \text{ ug/L}}{491300 \times 1.031} = 58.97 / 50 \times 100 = 117.9\%$$

Internal Stds.

QC Passed

M T4PO'S

ICALs

8/30/94

RRFS > 0.05

RSDs < 30%

methylene chloride 34.5

acetone 68

2-butanone 41

RSDs cal + RRFS ok

RRF05 Toluene = 1.637

$$\frac{386414 \times 5 \text{ ug/L}}{234005 \times 5 \text{ ug/L}} = 1.637$$

cal 8/31/94

RRF > 0.05 RSDs $< 30\%$ methylene chloride 45
acetone 68

Calcs for RSDs + RRF ok

RRF₅₀ 2-butanone = 0.527

$$\frac{141984 \times 50 \text{ ug/L}}{269644 \times 50 \text{ ug/L}} = 0.5265$$

CCAL 10/14 1256 hrs

RRF > 0.05 %D $< 25\%$ methylene chloride 685
acetone 384
bromoforn 36

%D cal ok

RRF₀₅ methylene chloride = 22.895

$$\frac{835701 \times 5 \text{ ug/L}}{36501 \times 5 \text{ ug/L}} = 22.895$$

CCAL 10/15/94 1407 hrs

RRF > 0.05 %D $< 25\%$ methylene chloride 196
acetone 397

RRF₅₀ benzene = 0.749

$$\frac{474518 \times 50 \text{ ug/L}}{633572 \times 50 \text{ ug/L}} = 0.749$$

Tuning BFB only for cal curves

8/30

$$EV\ 175 = 65.7\%$$

$$8152/12400 \times 100 = 65.7$$

Quantitation

4C acetone @ 5.0 ug/kg

$$\frac{51543 \times 50\text{ ng/ml} \times 5\text{ ml}}{17791 \times 342\text{ g} \times .81 \times 3.375} = 4.95\text{ ng/g} = 5\text{ ug/kg}$$

SVOA

surrogates = Pass QC criteria
NO TYPOS

and MS-1D PHL = 67% Dichlorobenzene = 1STD

$$\frac{203999 \times 20 \text{ ug/ml}}{56476 \times 1.439} = 50.20 \text{ ug/ml} / 75 \text{ ug/ml} \times 100 = 66.9\%$$

and MS-4C FRP = 88% alenaphthened₁₀ = 1STD

$$\frac{230637 \times 20 \text{ ug/ml}}{110171 \times 0.975} = 44.06 \text{ ug/ml} / 50 \text{ ug/ml} \times 100 = 88.1\%$$

Internal STDS.

NO TYPOS

Pass QC criteria

ICAL 9/5/94 11:50 hrs

RFFs > 0.05 2,4-Dinitrophenol 0.032 RRF₂₀

RSDs < 30%

4-chloroaniline	43%
3-nitroaniline	66%
2,4-Dinitrophenol	37
3,3'-Dichlorobenzidine	35

RRF + RSDs calculated correctly

$$\text{RRF}_{80} \text{ Pyrene } 1.685 \quad \frac{421706 \times 20 \times 2}{125124 \times 80} = 1.685$$

CCAL 10/6/94 11:50 hrs

RRF₅₀ > 0.05
%ODs < 25%

3-Nitroaniline	0.023
4-chloroaniline	48
hexachlorobutadiene	31
3-nitroaniline	84
4-nitroaniline	59
4,6-dinitro-2-methylphenol	28
Pentachlorophenol	44
carbazole	37

$$\text{RRF}_{50} \text{ Fluorene } 1.122 \quad \frac{190806 \times 20 \times 2}{136004 \times 50} = 1.12$$

%ODs calculated correctly

CCAL 10/7/94 11:50 hrs

RRF₅ > 0.05 3-nitroaniline 0.035

$$\text{RRF}_{50} \text{ naphthalene } = 0.813 \quad \frac{226237 \times 20 \times 2}{222692 \times 50} = 0.813$$

ccal 10/14/94 1745 hrs

RRFs > 0.05 %D > 25 = Indeno(1,2,3-cd)pyrene = 38
Dibenz(a,h)anthracene = 33
2-Fluorobiphenyl = 31

RRF₅₀ Chrysene = 0.892 $\frac{81333 \times 20 \times 2}{72964 \times 50} = .892$

CCAL 10/17/94 17:10 hrs

RRFs > 0.05 %D Indeno(123cd)pyrene 27
Dibenz(a,h)anthracene 31
terphenyl d14 26

Benzo(a)pyrene = 0.909 $\frac{94681 \times 40}{83306 \times 50} = .909$

Tuning - Pass criteria

10/14/94 17:19 hrs

m/z 441 = 74.34

11.234 / 15.112 = 74.34%

Pesticides =

SDG-19

Surrogates FB Failed on column 2 TCX + DCB
Remaining OK

2E DCB2 = 393%

$$\text{FOUND} \quad \frac{645038 \times 10,000 \mu\text{l}}{35.4 \text{ g} \times 0.79 \times 2 \mu\text{l} \times 2051375} = 56.218$$

$$\text{added} \quad \frac{2 \text{ ml} \times 0.2}{35.4 \times 0.79} \times 1000 = 14.30$$

$$56.218 / 14.30 \times 100 = 393\%$$

4B TCX 1 = 112%

$$\text{FOUND} \quad \frac{295034 \times 10,000 \mu\text{l}}{35.2 \text{ g} \times .78 \times 2 \mu\text{l} \times 3281700} = 16.37$$

$$\text{added} \quad \frac{2 \text{ ml} \times 0.2}{35.2 \times .78} \times 1000 = 14.56$$

$$\text{RECOVERED} \quad 16.37 / 14.56 \times 100 = 112\%$$

Calibration factors

medium mass obtained from form 7E
Ratios on form 6E

4,4-DDT HIGH DB1701 = 2446965.63

INDAHOI 4,4-DDT = $783029 / 0.32 = 2446965.63$ ✓

10/5/94 RSDs > 20% MEANS + RSDs calculated ok
DB1701 alpha-BHC 23

10/17/94 RSDs > 20 Calculations ok
DB1701 alpha-BHC = 24
4,4-DDD = 28

DB1701 Low alpha-BHC = 3322100.00

$33221 / 0.01 \text{ ng} = 3322100.00$

10/5/94 DB608 RSD's > 20 are alpha-BHC 31
delta BHC 22
calculations = ok gamma BHC 26

endrin medium = 988612.50

$79088 / 0.08 = 988612.50$

Cal factors

DB608

11/1/94

12SD's 420

Calculations ok

aldrin HIGH 4907431.25 $78.5789 / 0.16 = 4907431.25$

PCB Cal Factors form 6F

aroclor 1242

DB1701

10/5/94

Peak 1 = 157405

$31481 / 0.2 = 157405$

DB608

10/20/94

aroclor

1260

Peak 2 = 94835

aroclor 1016 + 1260 can be
combined into one sample
listed under 1016.

$18967 / .2 = 94835$ ✓

Resolution summary

resolutions > 60%

DDT / Endrin break-down

RSD < 25%

1701 PEM01 - Pass

701 PEM02 - 44 DDT = 26% RSD

endrin break down = 35.5 Combined = 39.9

PEM02 DB1701

endrin breakdown

endrin	133650	1123035	= 0.119
endrin aldehyde	30271	1467387.5	= 0.0206
endrin ketone	30692	2058087.50	= 0.0149

$$\frac{0.0206 + 0.0149}{0.119} \times 100 = 35.5$$

PEM03 DB1701

endrin breakdown 36.15

Combined 39.7

RPD < 25%

PEM04 DB1701

RPD endrin = 78%

PEM05 DB1701

RPD 4,4-DDT = 33%

PEM06 DB1701

endrin breakdown 36.8

Combined 39.6

RPD's beta-BHC 27

4,4-DDT 27

PEM07 1701

endrin breakdown 31.7

Combined 31.7

RPD's 4,4-DDT 27

PEM01 DB608 OK

PEM02 DB608

endrin breakdown 32.71 %

Combined 33.38

endrin ketone $14212 / 1107787.5 = 0.0128$

endrin aldehyde $20500 / 1031237.5 = 0.0198$

$$\frac{0.0128 + 0.0198}{0.1} \times 100 = 32.6\%$$

PEM03

RPD Beta-BHC 37%

4,4-DDT 27%

endrin breakdown 39.4

Combined 38

PEM04

RPD beta-BHC 29

4,4-DDT 37

endrin breakdown 31

Combined 31

PEM05 beta-BHC = 43

endrin = 59

4,4-DDT = 46

Methoxychlor = 37

endrin Breakdown 26.03

Combined 26.03

PEM06 OK

PEM07 4,4-DDT 27% RPD

PEM08 OK

PEM09 DB608

RPD 4,4-DDT = 41

PEM10 4,4-DDT = 30

endrin breakdown 24.37
combined 28.15

PEM11

RPD 4,4-DDT = 33

Calibration Verification RPD < 25%

INDAM03 DB1791
Endrin 72 to
Methoxychlor 30

INDAM04 ?

INDAM04 DB608
4,4-DDT = 41
methoxychlor = 30

INDBM04 DB6000
delta-BHC = 31

Florisil Clean-up 80-120
alpha BHC 77
4,4-DDT 76
TCX 55
DCB 79

GPC

BD-110

gamma BHC	128
heptachlor	126
aldrin	125
dieldrin	127
endrin	206
4,4-DDT	117

COMPONENT COMPARISON FORM 10A 90D + 25%

1C alpha chlordane 230%

2A alpha chlordane 89
gamma chlordane 530

2ADL alpha chlordane 117
gamma chlordane 506

2DMSD endrin 43

2EDL gamma chlordane 49
4,4-DDT 61

2F gamma chlordane 117

3A alpha chlordane 84
gamma chlordane 118
4,4-DDT 158

3B 4,4-DDT 30

4A alpha chlordane 47
gamma chlordane 95

5A	alpha chlordane	53
	gamma chlordane	194
	4,4-DDT	73

5B	alpha chlordane	28
	gamma chlordane	110

1A	aroclor 1254	119
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1C	aroclor 1254	39
----	--------------	----

2E	aroclor 1260	32
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**REVIEW OF INORGANIC
CONTRACT LABORATORY PACKAGE**

Case Number:
Laboratory: *NETL*
SDG: *19*
SOW:
Completion Date: *11/17/94*

Site Name: *Wells G & H Superfund Site*
No. of Samples/Matrix: *soil*
Reviewer: *RETEC*
Reviewer's Name: *R. Roat*

DATA ASSESSMENT SUMMARY

	<u>ICP</u>	<u>AA</u>	<u>Hg</u>	<u>Cyanide</u>
1. Holding Times	O	O	O	O
2. Calibrations	O	O	O	O
3. Blanks	O	O	O	O
4. ICS	O	O	O	O
5. LCS	O	O	O	O
6. Duplicate Analysis	O	O	O	O
7. Matrix Spike	X	O	O	O
8. Serial Dilution	X	-	-	-
9. Overall Assessment	O	O	O	O

O = Data had no problems or qualified due to minor problems
M = Data qualified due to major problems
Z = Data unacceptable
X = Problems, but do not affect data

Action Items:

I. HOLDING TIMES

Sample ID	Date Sampled	Hg Analysis Date	Cyanide Analysis Date	Metal Analysis Date	Action
4A	10/04/94			10/27/94	
4B	10/04/94			10/27/94	
4C	10/04/94	10/24/94	10/14/94	10/27/94	
2A	10/04/94	10/24/94	10/14/94	10/27/94	
2B	10/04/94			10/27/94	
2C	10/04/94			10/27/94	
2D	10/04/94	10/24/94	10/14/94	10/27/94	
2E	10/04/94			10/27/94	
1A	10/04/94			10/27/94	
1B	10/04/94			10/27/94	
1D	10/04/94	10/24/94	10/14/94	10/27/94	
1C	10/04/94	10/24/94	10/14/94	10/27/94	
3A	10/11/94			10/27/94	
3B	10/11/94			10/27/94	
5A	10/11/94			10/27/94	
5B	10/11/94			10/27/94	
2F	10/11/94			10/27/94	

Metals - 180 days from collection preserved pH < 2
 Mercury - 28 days from collection preserved pH < 2
 Cyanide - 14 days from collection preserved pH > 12
 If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).

II. INSTRUMENT CALIBRATION (Form 2A)

1. Recovery Criteria - List the analytes which did not meet the percent recovery (%R) criteria for initial and continuing calibration.

<u>Date</u>	<u>ICV/CCV</u>	<u>Analyte</u>	<u>%R</u>	<u>Action</u>	<u>Samples Affected</u>
-------------	----------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:

	<u>Accept</u>	<u>Estimate (J)</u>	<u>Reject (R)</u>
Metals:	90-110%	75-89%, 111-125%	< 75%, > 125%
Mercury:	80-120%	65-79%, 121-135%	< 65%, > 135%
Cyanide:	85-115%	70-84%, 116-130%	< 70%, > 130%

2. Analytical Sequence

- A. Did the laboratory use the proper number of standards for calibration as described in the SOW? *Yes*
- B. Were calibrations performed at the beginning of each analysis? *Yes*
- C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis? *Yes*
- D. Were the correlation coefficient for the calibration curves for AA, Hg, and CN- > 0.995? *Yes*
- E. Was a standard at 2xCRDL analyzed for all ICP analysis? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (Form 3)

List the blank contamination.

1. Laboratory Blanks

<u>DATE</u>	<u>ICB/CCB</u>	<u>PREP BL</u>	<u>ANALYTE</u>	<u>CONC.</u>
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Passed all validation criteria

2. Equipment/Trip Blanks: *Not applicable to soils*

<u>DATE</u>	<u>EQUIP BL #</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	-------------------	----------------	--------------

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? *Yes*

B. Was a calibration blank run every 10 samples or every 2 hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (cont)

Actions: *Passed validation criteria*

The action level for any analyte is equal to five times the highest concentration of that elements contamination in any blank. No positive results should be reported unless the concentration of the analyte exceeds the Action Level (AL).

1. When the concentration is greater than the IDL, but less than the AL, report the sample concentration detected with a U.
2. When the sample concentration is greater than the AL, report the sample concentration unqualified.

ELEMENT

MAX CONC.

AL UNITS

IV. ICP INTERFERENCE SAMPLE (Form 4)

1. Recovery Criteria

List any element in the ICS AB solution which did not meet the criteria for %R

	<u>Percent Recovery</u>		
	< 50%	50-79%	> 120%
Positive sample results	R	J	J
Non-detected samples	R.	UJ	A

<u>DATE</u>	<u>ELEMENT</u>	<u>%R</u>	<u>ACTION</u>	<u>SAMPLES AFFECTED</u>
-------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

2. Frequency Requirements

- A. Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per eight hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

IV. ICP INTERFERENCE SAMPLE (cont)

3. Report the concentration of any element detected in the ICS solution > 2xIDL that should not be present.

<u>ELEMENT</u>	<u>CONC. DETECTED IN THE ICS</u>	<u>CONC. OF INTERFERENTS IN THE ICS</u>			
		<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>

Passed all validation criteria

Estimate the concentration produced by the interfering element in all affected samples.

<u>SAMPLE AFFECTED</u>	<u>ELEMENT AFFECTED</u>	<u>SAMPLE CONC.</u>	<u>SAMPLE INTERFERANT</u>				<u>ESTIMATED INTERF.</u>
			<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>	

Action:

1. The sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels in the ICS solution.
2. Estimate (J) positive results for affected elements for samples with levels of >50% or more.
3. Reject (R) positive results if the reported concentration is due entirely to the interferant.
4. Estimate (UJ) non-detected results for which false negatives are suspect.

V. **MATRIX SPIKE (Form 5A)**

Sample Number: *MS-2D*

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
 SSR - spikes sample result
 SR - sample result

<u>ANALYTE</u>	<u>SSR</u>	<u>SR</u>	<u>S</u>	<u>%R</u>	<u>ACTION</u>
<i>antimony</i>	<i>90.2</i>	<i>0.0</i>	<i>130.4</i>	<i>69.2</i>	<i>estimate conc.</i>
<i>lead</i>	<i>6.1</i>	<i>4.4</i>	<i>4.3</i>	<i>38.1</i>	<i>estimate conc.</i>

Actions:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
2. If any analyte does not meet the %R criteria, follow the actions stated below:

	<u>Percent Recovery</u>		
	<u>< 30%</u>	<u>30-74%</u>	<u>> 125%</u>
Positive Sample Results	J	J ₁	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

- A. Was a matrix spike prepared at the required frequency? *Yes*
- B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not required*

VI. LABORATORY DUPLICATES (Form 6)

List the concentration of any analyte not meeting the criteria for duplicate precision.

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead	0.5	4.4	2.6	52.1	estimate
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >20% for water and >35% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >CRDL. If both samples are non-detected, the RPD is not calculated (NC).

VII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. *1C and 1D*

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum		1,005	1,586	44.8	
Antimony					
Arsenic					
Barium		11	71.5	146	J
Beryllium					
Cadmium					
Calcium		513	825	46.6	
Chromium		25.8	77.7	100	
Cobalt					
Copper		1.6	3.2	66.6	
Iron		249	470	61.4	
Lead		2.4	4.5	60.8	
Magnesium		41.6	79.6	62.7	
Manganese		9.0	15.0	50	
Mercury					
Nickel		2.2	ND		
Potassium					
Selenium					
Silver					
Sodium		34.4	48.6	34.2	
Thallium					
Vanadium		0.5	1.3	88.8	
Zinc		174	301	53.4	
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >30% for water and >50% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >2xCRDL. If both samples are non-detected, the RPD is not calculated (NC).

VIII. LABORATORY CONTROL SAMPLE (Form 7)

List any LCS recoveries not within the 80-120% criteria and the samples affected.

<u>DATE</u>	<u>ELEMENT</u>	<u>%R</u>	<u>ACTION</u>	<u>SAMPLES AFFECTED</u>
-------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:

	<u>Percent Recovery</u>		
	<u><50%</u>	<u>51-79%</u>	<u>>120%</u>
Positive Results	R	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

A. Was an LCS analyzed for every matrix, digestion batch and every 20 samples? *Yes*

IX. FURNACE AA ANALYSIS

1. Duplicate Precision

X Duplicate injections and one point analytical spikes were performed for all samples, duplicate injections agreed within $\pm 20\%$.

Duplicate injections and/or spikes were not performed for the following samples/elements:

Duplicate injections did not agree within $\pm 20\%$ for samples/elements:

IX. FURNACE AA ANALYSIS (cont.)

2. Post Digestion Spike Recoveries

X Spike recoveries met the 85-115% recovery criteria for all samples.

Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements:

X MSA was used to quantitate analytical results when contractually required.

X Correlation coefficients > 0.995, accept results

Correlation coefficients < 0.995, for sample numbers/elements:

Method of standard addition (MSA) was not performed as required for samples/elements:

Actions:

1. Estimate (J) positive results if duplicate injections are outside +/-20% RSD or CV.
2. If the sample absorbance is <50% of post digestion spike absorbance the following actions should be applied:

	<u>Percent Recovery</u>		
	<u><10%</u>	<u>11-84%</u>	<u>>115%</u>
Positive Result	J or R	J	J
Non-detected	R	UJ	A

3. Estimate (J) sample result if MSA was required and not performed.
4. Estimate (J) sample result if correlation coefficient was <0.995.

X. ICP SERIAL DILUTION ANALYSIS (Form 9)

Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

Serial dilutions were not performed for the following:

- Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the IDL before dilution.

Report all results that do not meet the required laboratory criteria for ICP dilution.

<u>ELEMENT</u>	<u>IDL</u>	<u>50xIDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>%D</u>	<u>ACTION</u>
Aluminum						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium			413	475	15.0	
Cobalt						
Copper						
Iron			2,495	2,890	15.8	
Lead						
Magnesium			462	574	24.2	
Manganese			80.0	90.0	12.5	
Nickel						
Potassium						
Silver						
Sodium						
Vanadium						
Zinc						

Action:

- 1. Estimate (J) positive results if %D > 15.

XI. DETECTION LIMITS (Form 10)

1. Instrument Detection Limits

- X Instrument detection limit results were present and found to be less than the contract required detection limits (CRDL).

IDLs were not included in the data package

IDLs were present, but the criteria was not met for the following elements:

2. Reporting Requirements

- A. Were sample results on Form I reported down to the IDL not the CRDL for all analytes?
Yes
- B. Were sample results that were analyzed by ICP for Se, Tl, or Pb at least 5x IDL? *Yes*
- C. Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

XII. SAMPLE QUANTITATION

X Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

Sample results were beyond the linear range/calibration range of the instrument for the following elements:

1. Sample Calculation:

ICP:

AA Furnace:

Mercury:

Cyanide:

NETL 19-1

Metals

Sampled Received

	TCL	LEAD	Sampled	Received
4A		X	10/4	10/5
4B		X		
4C	X			
2A	X			
2B		X		
2C		X		
2D	X			
2E		X		
1A		X		
1B		X		
1D	X			
1C	X			
3A		X	10/11	10/12
3B		X		
5A		X		
5B		X		
2F		X		

CHECK MS

ICAL + CCAL

ICP passed criteria %R, calculated correctly
 Furnace passed cold vapor passed, Cyanide passed.

CRDL %R ±20%

NO validation criteria

Manganese	127	122
Cadmium	126	
Nickel	124	
Lead	122	66.7
Mercury	55	

Blanks Pass Criteria < CRDL

ICP Interference

- Form 4 $\pm 20\%$ except Al, Ca, Fe, Mg
- Performers beginning + EMS, but before CCU
- Time / 8 hrs
- ICP interference only applicable if $[x]$ of Al, Ca, Fe + Mg are \geq concentration in original sample
- No transcription errors

Spike Sample

$\pm 25\%$ if spike added $\geq \frac{1}{4}$ of sample result

Pre-digested spike

Failed Antimony or Lead (F) 33

$$R = \frac{SSR - SR}{SA} \times 100$$

Quality

Exhalation

$$23.93 \frac{mg}{L} = \frac{23.930 \text{ ug/L} \times (2) \text{ Liters}}{1000 \times 1.514g \times .768} = 4.1246 \text{ ug/g or } 4.124$$

1-2 grams soil

1.514 grams

100 ml

200 ml

Duplicates

Lead failed Firmness 52% Quality est (5)

IF $[x] > 5 \times CRDL$ must be $\pm 20\%$

IF $[x] < 5 \times CRDL$ Then $\pm CRDL$

IF $[x] < CRDL$ Then no comparison

LCS

Pass

QC

Limits

ICP Serial Dilution

% D > 10%

and sample conc > 50x IDL

Failed

Chromium, Iron

Magnesium, Manganese

Correlation Coefficient > 0.995 for Hg + CN

10 ug/L x 2
.768 x 1.5

		50x
Chromium	0.5 mg/kg	27
Iron	0.5	27
Mag	0.7	36
Mang	0.2	910

metals

MS-1C - Qualify Antimony For failed spike
Lead for failed duplicate injection
Iron Magnesium For failed serial dilution

MS-1B - Qual antimony spike
Lead for duplicate
Iron, magnesium, manganese Serial dilution

MS-2A - Same quals as MS-1B

MS-2D Same as MS-2A except no Chromi qual, less than 50x IDL

MS-4C Same as MS-2D, no chromium

**REVIEW OF ORGANIC
CONTRACT LABORATORY PACKAGE**

Site Name: *Wells G & H Superfund Site*

Reference Number:

The hard copied data package received at RETEC has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.: *E1006-05* SAS No.:
SDG No.: *20-1* Matrix: *soil*
No. of Samples: *15*

Sample Dates: *10/5 + 10/18/94*
Shipping Date: *10/5 + 10/18/94*
Date Rec'd by Lab: *10/6 + 10/19/94*

The CLP SOW for requires that specific analytical work be done and the general criteria used to determine the performance were based on the examination of:

- Data Completeness
- Holding Times
- GC/MS Tuning
- Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Dup.
- Field Duplicates
- Internal Std Performance
- Pest. Inst. Performance
- Compound Identification
- Compound Quantitation

Overall comments:

Data package was acceptable

Definition of qualifiers:

- A = Acceptable data.
- J = Approximate data due to quality control criteria.
- R = Reject data due to quality control criteria.
- U = Compound not detected.
- UJ = Compound detection limit is approximate

Reviewer:

Date:

I. DATA COMPLETENESS

Missing Information, Date Lab Contacted, Date Received: *Data package complete*

II. HOLDING TIMES:

Sample ID	Date Sampled	VOA	BNA		Pest:	
		Date Anal.	Date Extr.	Date Anal.	Date Extr.	Date Anal.
A	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
B	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
C	10/05/94	10/15/94	10/12/94	10/13/94	10/11/94	10/27/94
D	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
E	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
F	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
G	10/05/94	10/15/94	10/12/94	10/14/94	10/11/94	10/27/94
H	10/05/94	10/15/94	10/12/94	10/13/94	10/11/94	10/27/94
X	10/05/94	10/15/94	10/12/94	10/15/94	10/11/94	10/27/94
TB	10/05/94	10/15/94				
FB	10/05/94	10/15/94	10/07/94	10/14/94	10/28/94	11/02/94
SL-02	10/18/94		10/24/94	10/27/94	10/21/94	10/27/94
SL-17/18	10/18/94		10/24/94	10/27/94	10/21/94	10/27/94
SL-19	10/18/94		10/24/94	10/27/94	10/21/94	10/27/94
SL-20	10/18/94		10/24/94	10/27/94	10/21/94	10/27/94

VOA: • Unpreserved: aromatics within 7 days, non-aromatics within 14 days of sample collection.
 • Preserved: Both within 14 days of sample collection.
 • Soils: Both within 10 days of sample collection.

BNA & Pest: • Extracted within 7 days, analyzed within 40 days, soils and water.

Action: If holding times are exceeded all positive results are estimates (J) and non-detects are estimated (UJ). If holding times are grossly exceeded then data unusable (R).

III. GC/MS TUNING (Form 5B)

The DFTPP performance results for semi-volatile analysis were reviewed and found to be within the specified criteria (page D-40/SV).

If no, samples affected:

Tuning passed all SVOC QC criteria

Calculations:

The BFB performance results for volatile organic analysis were reviewed and found to be within the specified criteria (page D-25/VOA) Form 5A.

If no, samples affected:

Several files containing BFB information were lost during a memory error. No BFB exists for the FB, TB, 2A, and D. Avidavits were submitted by the analyst indicating compliance with the lost BFB standards.

Calculations:

IVA. VOLATILE CALIBRATION VERIFICATION (Form 6A, 7A)

Date of Initial Calibration: 8/30 + 8/31/94

Dates of Continuing Calibration: 10/14, 10/15/94

Instrument ID: *MACH 1*

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
8/30	<i>RSD</i>	<i>methylene chloride (35.1)</i> <i>acetone (69.9)</i> <i>2-butanone (37)</i>
8/31	<i>RSD</i>	<i>methylene chloride (45)</i> <i>acetone (68)</i>
10/14	<i>D</i>	<i>methylene chloride (685)</i> <i>acetone (384)</i> <i>bromoform (36)</i>
10/15	<i>D</i>	<i>methylene chloride (196)</i> <i>acetone (387)</i>

Calculations:

Initial calibration uses 5 concentrations.

All Avg. RF's and RF's must be >0.05; if <0.05, mark positive results (J) and non-detects (R) (page D-27/VOA).

All %D's must be <25%; if >25% mark detects (J) and non-detects (UJ)

Some compounds must meet RRF of 0.01 (page D-28/VOA).

IVB. SEMI-VOLATILE CALIBRATION VERIFICATION (Form 6B, 7B)

Date of Initial Calibration: *9/5/94*

Dates of Continuing Calibration: *10/13, 10/14, + 10/27/94*

Instrument ID:

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
<i>9/5</i>	<i>RF</i> <i>RSD</i>	<i>2,4-dinitrophenol (0.03)</i> <i>4-chloroaniline (43)</i> <i>3-notroaniline (66)</i> <i>2,4-dinitrophenol (38)</i>
<i>10/13</i>	<i>D</i>	<i>3,3-dichlorobenzidine (35)</i> <i>4-chloroaniline (50)</i> <i>hexachlorobutadine (46)</i> <i>3-nitroaniline (54)</i> <i>4-nitroaniline (36)</i> <i>4-nitrophenol (34)</i> <i>pentachlorophenol (36)</i>
<i>10/14</i>	<i>D</i>	<i>benzo(g,h,i)perylene (35)</i> <i>indeno(1,2,3-cd)pyrene (38)</i> <i>dibenz(a,h)anthracene (33)</i> <i>2-fluorobiphenyl (31)</i>
<i>10/27</i>	<i>D</i>	<i>indeno(1,2,3-cd)pyrene (36)</i> <i>dibenz(a,h)anthracene (30)</i>

Calculations:

All Avg. RF's and RF's must be >0.05; if <0.05, mark positive results (J) and non-detects (R) page D-34/SV.
 All %RSD's must be < 30%; if > 30% mark detects (J) and non-detects (UJ) if < 50%
 All %D's must be < 25%; if > 25% mark detects (J) and non-detects (UJ)
 Tables for RRF, %D, and %RPD on pages D-46,47/SV.

V. BLANK ANALYSIS RESULTS

Laboratory Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
10/15/94	VBLK02	soil	<i>methylene chloride</i>	9.5 ug/Kg
			<i>acetone</i>	6.6
10/14/94	SBLKS1	soil	<i>di-n-butylphthalate</i>	25
			<i>bis(2-ethylhexyl)phthalate</i>	23

Equipment and Field Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
10/15/94	FB	water	<i>methylene chloride</i>	2.4 ug/l
			<i>acetone</i>	1.7
10/15/94	TB	water	<i>methylene chloride</i>	1.4
			<i>acetone</i>	1.1
			<i>toluene</i>	2.1

If concentration < CRQL, report CRQL

If concentration > CRQL, but less than action level (5x or 10x), report as (U)

If concentration > than action level, report as (R)

VI. SURROGATE RECOVERIES (Form 2C, 2E)

Sample matrix:

	VOA			B/N					
<u>Samples</u>	<u>TOL</u>	<u>BFB</u>	<u>DCF</u>	<u>NBZ</u>	<u>FBP</u>	<u>TPH</u>	<u>PHL</u>	<u>2FP</u>	<u>TBP</u>
	<i>Pass criteria</i>			<i>Pass criteria</i>					

Calculations:

	<u>Water</u>	<u>Soil</u>	
TOL = Toluene-d ₈	88-110	84-138	Page D-50/VOA
BFB = Bromofluorobenzene	86-115	59-113	
DCF = 1,2 Dichloroethane-d ₄	76-114	70-121	
NBZ = Nitrobenzene-d ₅	35-114	23-120	Page D-56/SV
FBP = 2-Fluorobiphenyl	43-116	30-115	
TPH = Terphenyl-d ₁₄	33-141	18-137	
PHL,2FP,TBP	60-150	60-150	

VII. FIELD DUPLICATE PRECISION

Sample matrix: *soil*

Sample Nos.: *H and X*

List compounds that do not meet the following RPD criteria:

- An RPD of < 30% for water
- An RPD of < 50% for soil

<u>Fraction</u>	<u>Compound</u>	<u>Sample Conc.</u>	<u>Dup Conc.</u>	<u>RPD</u>
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Passed validation criteria

If the results for any compound do not meet the RPD, then flag positive results as estimated (J).

VIII. INTERNAL STANDARD PERFORMANCE (Form 8A, 8B)

List the internal standard areas of samples that do not meet the criteria of +100% or -50% of the internal standard area on the continuing calibration standard.

<u>Sample ID</u>	<u>Date</u>	<u>I.S. Out</u>	<u>I.S. Area/RT</u>	<u>Acceptable Range</u>	<u>Action</u>
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VOC passed criteria

SVOC passed criteria

Positive results are flagged with (J)

Non-detects are flagged with (UJ)

Page D-43, 51/SV

Page D-47/VOA

IX. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3C)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
<i>VOC passed criteria</i>				
<i>10/15/94</i>	<i>CM5D</i>	<i>2,4-dinitrotoluene</i>	<i>103</i>	<i>28-89</i>
		<i>pentachlorophenol</i>	<i>122</i>	<i>17-109</i>

If any recoveries < 10%, flag positive results (J), flag non-detects (UJ). RPD for VOAs page D-50/VOA, SV on page D-57/SV, and Pest. on page D-58/pest.

X. PESTICIDE INSTRUMENT PERFORMANCE

List DDT retention times less than 12 minutes.

<u>Standard ID</u>	<u>Date/Time</u>	<u>RT</u>	<u>Samples Affected</u>	<u>Actions</u>
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All 4,4-DDT retention times > 12 minutes

If retention time < 12 min., reexamine for good separation, if not flag affected compounds (R)

List compounds which are not within the established windows.

<u>Compound</u>	<u>Date/Time</u>	<u>RT</u>	<u>RT Window</u>	<u>Samples Affected</u>
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Must be within 0.02 min. of the mean RT (page D-47/PEST)

If out of RT window and no peaks in expected RT window then its ok.

If out of RT window and peaks are in expected RT window, recalculate conc. using different STDs.

X. PESTICIDE INSTRUMENT PERFORMANCE (cont.) (Form 7D)

DDT and Endrin Degradation. List the standards which have a DDT or Endrin breakdown >20%.

<u>Standard ID</u>	<u>DDT or Endrin</u>	<u>% Breakdown</u>	<u>Samples Affected</u>
<i>PEM02</i>	<i>endrin</i>	<i>23</i>	<i>DB1701 column</i>
<i>PEM03</i>	<i>endrin</i>	<i>23</i>	<i>DB1701</i>
<i>PEM04</i>	<i>endrin</i>	<i>21</i>	<i>DB1701</i>
<i>PEM05</i>	<i>endrin</i>	<i>27</i>	<i>DB1701</i>

Calculations:

If breakdown >20%, flag positive results (J). If DDT is not present but DDD or DDE are, flag (R). Flag all positive results for DDD and/or DDE (J).

If breakdown >20%, flag positive results (J). If Endrin is not present but endrin aldehyde and/or endrin ketone are, flag (R). Flag all positive results for E. aldehyde and/or E. ketone (J).

XI. SURROGATE RECOVERIES (Form 2F)

Sample matrix:

<u>Samples</u>	<u>Column 1</u>		<u>Column 2</u>	
	<u>TCX</u>	<u>DCB</u>	<u>TCX</u>	<u>DCB</u>
<i>FB</i>	<i>22</i>	<i>25</i>	<i>31</i>	<i>28</i>
<i>MB</i>			<i>209</i>	<i>162</i>
<i>B</i>	<i>194</i>	<i>53</i>		
<i>C</i>	<i>182</i>	<i>242</i>		
<i>PBLK01</i>			<i>34</i>	<i>46</i>
<i>PBLK03</i>			<i>51</i>	<i>40</i>

Calculations:

QC Limits

TCX = Tetrachloro-m-xylene 60-150
 DCB = Decachlorobiphenyl 60-150

XII. PESTICIDE CALIBRATION (Form 6E)

Initial Calibration: Must be calibrated with 3 conc. Calibration factors on page D-41/pest. RSD on page D-43/pest. RSD ,15% for compounds on page D-43/pest.

List compounds which did not meet RSD < 10% or 15%

<u>Date</u>	<u>Compound</u>	<u>Mean</u>	<u>%RSD</u>	<u>Column</u>	<u>Samples Affected</u>
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Passed validation criteria

Calculations:

Flag all positive results (J)

Analytical Sequence (Form 8D):

Did the lab follow the correct sequence every 72 hours? If no, data may be affected.

Correct sequence followed

XIII. PESTICIDE CALIBRATION (Form 7D, 7E)

Continuing Calibration:

List the compounds which did not meet the %D of < 15% on quantitation or 20% on confirmation for continuing calibration.

<u>Date</u>	<u>Compound</u>	<u>%D</u>	<u>Column</u>	<u>Sample Affected</u>
	<i>endrin</i>	45	DB1701	INDAM04
	<i>methoxychlor</i>	58	DB1701	"
	<i>4,4-DDT</i>	60	DB1701	"
	<i>endosulfan sulfate</i>	33	DB1701	INDBM04
	<i>endrin ketone</i>	31	DB1701	"
	<i>endrin aldehyde</i>	37	DB1701	"

IX. GPC and Florisil Clean-Up (Form 9A, 9B)

List compounds which did not use florisil clean-up or surpassed validation criteria:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>
	<i>florisil</i>	<i>decachlorobiphenyl</i>	<i>131</i>
	<i>GPC</i>	<i>gamma-BHC</i>	<i>115</i>
		<i>aldrin</i>	<i>125</i>

QC Limits on florisil %REC = 80-120%

QC Limits on GPC %REC = 80-110%

If %REC < 80%, qualify positive results (J) and non-detects (UJ). If %REC = 0, then (R) qualify non-detects

XV. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3F)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
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MS/MSD was performed on a highly contaminated sample, C. Concentrations of technical chlordane saturated the GC/ECD. Spike values were un-readable. The MS/MSD sample is meaningless.

XVI. SAMPLE QUANTITATION

VOA:

BNA:

PEST/PCB:

Validation SDG 20-1

Debris pile	SHIPPED	RECEIVED	CRITERIA	FAL/TCL	
GROUP A	10/5	10/6	Compounds X		
B	↓	↓	X		
C				X	
D			X		
E			X		
F			X		
G			X		
H				X	
X				X	
TRIP					
Field			↓	↓	
SL-2	10/18	10/19	X		
SL-17/18	↓	↓	X		
SL-19	↓	↓	X		
SL-20	↓	↓	X		

VOA

Surrogates

- Passed QC criteria
- No transcription errors

Surrogates continued.

Sample B Toluene_D = 104.55 %
chlorobenzene 1STD

$$\frac{448209 \times 50 \text{ ug/L}}{415663 \times 1.031} = 52.29 \text{ ug/L} / 50 \text{ ug/L} \times 100 = 104$$

Sample H Bromofluorobenzene = 87.33 %
chlorobenzene = 1STD

$$\frac{182288 \times 50 \text{ ug/L}}{254875 \times .819} = 43.663 \text{ ug/L} / 50 \text{ ug/L} \times 100 = 87.33$$

Internal stds

No Transcription errors

Passed QC Criteria +100% -50% ± 0.50 min

Critical Calibrations

① 8/30/94 1256 hrs

REE > 0.05

RSDs < 30%

methylene chloride 35

acetone 70%

Calculations \overline{REE} + RSD ok

2-butanone 37%

RRF₂ Hexanone = 0.056 chlorobenzene = 1STD

$$\frac{5490}{245766} \times \frac{5 \mu\text{g/L}}{2 \mu\text{g/L}} = 0.056$$

ICAL 8/31/94 1487 hrs

RRFs > 0.05 RSDs < 30% methylene chloride 45.7
acetone 68.8

RRF and RSD calculated OK

Dioxane RRF₇₅ 0.930 1,4-Dichlorobenzene 1STD

$$\frac{1234794}{99284} \times \frac{50 \mu\text{g/L}}{75 \mu\text{g/L}} = 0.930$$

CCAL 10/14/94 1137 hrs

RRFs > 0.05 RSD < 25% methylene chloride 685
acetone 384

REF₅ MEK = 0.189 bromoform 36

$$\frac{6915}{36501} \times \frac{5 \mu\text{g/L}}{5 \mu\text{g/L}} = 0.189$$

ccal 10/15/94 1104 hrs

RRFs > 0.05 %ID < 25%

methylene chloride 196
acetone 387

Calculations %D ok

REF₅₀ trichloroethene 0.360

$$\frac{227873 \text{ 50 ug/L}}{633572 \text{ 50 ug/L}} = 0.3569$$

Sampling - Pass QC criteria

8/31/94 BFB

10/E SF = 16.6%

$$\frac{1622}{9747} \times 100 = 16.6\%$$

method blanks

VIBLK01 clean

VIBLK02 mc = 9.5 acetone 6.6 ug/kg

MS/MSD Pass QC criteria

Field blanks MC = 2.4 ug/L acetone = 1.7

Trap blanks MC = 1.4 ug/L acetone 1.1 toluene 2.1

Field dups H + X OK

Sample Quantitation

Sample H trichloroethene = 3.2 ug/kg

$$\frac{7589 \times 50 \text{ ng/ml} \times 5 \text{ ml}}{358525 \times .360 \times 5.192 \text{ g} \times .90} = 3.14 \text{ ng/g} = 3.14 \text{ ug/kg}$$

Qualifiers

Sample

C	Blank quality MC + acetone MB contamination J for poor %D cal
H	Same as C
X	Same as H
DDL	methylen chloride acetone poor cal (J)
FB	MC + acetone poor cal (J)
TB	Same as FB

SDG-20

SVOA

1/13/95

Surrogates

Passed QC criteria

No Transcription errors

Sample A 2-Fluorobiphenyl = 58%

$$\frac{139256 \times 20 \text{ ug/ml}}{108897 \times 1.195} = \frac{29.08 \text{ ug/ml}}{50 \text{ ug/ml}} \times 100 = 58.1$$

Sample SL-20 NBZ = 73%

$$\frac{93891 \times 20 \text{ ug/ml}}{150872 \times .341} = \frac{36.49 \text{ ug/ml}}{50 \text{ ug/ml}} \times 100 = 72.9\%$$

Internal Stds

Passed QC Criteria

No typos

ICAL

9/05/94

1150 hrs

RFB > 0.05

RSDs < 30%

4-chloroaniline 43

vs 3-nitroaniline 66

RFB + RSDs Calculated OK

2,4-Dinitrophenol 38

RFB₉₀ anthracene = 0.963

$$\frac{417740 \times 20 \text{ ug/ml}}{216890 \times 40 \text{ ug/ml}} = 0.963$$

ccal 10/13/94 1815 hrs

REFs > 0.05 %D < 25% vs 4-chloroaniline 50
hexachlorocyclopentadiene 42
% Ds calculated ok vs 3-nitroaniline 54
4-nitrophenol 34
4-nitroaniline 36
pentachlorophenol 36
vs Benzo(ghi)perylene 35
Sunogate 2-Fluorobiphenyl 28

REF₅₀ chloroform = 0.919
$$\frac{59406 \times 20 \text{ ug/ml}}{51730 \times 25 \text{ ug/ml}} = 0.9187$$

ccal 10/14/94 1745 hrs

REF > 0.05 %D < 25%
vs detects
Indeno (123cd)pyrene 3
dibenz(gh)anthracene 33
2-Fluorobiphenyl 31

REF₅₀ benzo(k)pyrene = 0.910

$$\frac{69623 \times 20 \text{ ug/ml}}{61209 \times 25 \text{ ug/ml}} = 0.9099$$

ccal 10/27/94 1614 hrs

5 defects

RRFS > 0.05

%D < 25%

indeno(123-cd)pyrene 36

dibenz (ah)anthracene 30

RRF₅₀ Chrysene 0.909

$$\frac{153410 \times 20 \text{ ug/ml}}{135009 \times 25 \text{ ug/ml}} = 0.909$$

Tuning - Passed QL criteria

w/z 51 = 47.33% 9/5/94

$$\frac{47.377}{100.00} \times 100 = 47.377\%$$

method blanks

Di-n-butylphthalate 25 ug/kg

bis (2 ethylhexyl)phthalate 23

Field blank - clean

MS/MSD

MSD %R

2,4-Dinitrotoluene 103%

sample C

Pentachlorophenol 122%

Field Dp. H+X = OK

Sample Quant

sample C bis(2-ethylhexyl)phthalate = 86 ug/l

$$\frac{16612 \times 20 \text{ ng/ul} \times 2 \text{ ul} \times 1000 \text{ ml}}{89402 \times .81 \times 50.9 \text{ g} \times 1.049 \times 2 \text{ ul}} = 85.9$$

Quantitation

- C Qualify di-n-butylphthalate bis(2-ethylhexyl)phthalate MB contamination
J 3-nitroaniline + 4-chloroaniline poor
Ical + ccal % RSD + %D.
- D J Qual Indeno + Dibenz poor %D Ccal
- G Same as D
- H Same as C
- SL-20 J Indeno poor %D
- X UJ 3-nitroaniline, 4-chloroaniline poor Ical + ccal
U Di-n-butylphthalate MB cont

Pest/PCBs

SDG-20

* J all results > 10%
J positives > 150%

Surrogates

			TCX ₁	TCX ₂	DCB ₁	DCB ₂
Fail	FB	DB1701 + DB608	22	25	31	23
	PBLK02 MB	DB608		209		162
	B	DB1701	194		53	
	C	DB1701	192		642	
	PBLK01	DB608		34		46
	PBLK03	DB608		51		40

Sample B 1701 TCX = 194%

Found $\frac{506015 \times 5000 \mu\text{l} \times 2 \text{ gpc}}{3263125 \times 2 \mu\text{l} \times 35.2 \text{ g} \times .92} = 26.96 \text{ ug/kg}$

added $\frac{2 \text{ ml} \times 0.2}{35.2 \times .92} \times 1000 = 13.86 \text{ ug/kg}$

$26.96 / 13.86 \times 100 = 193.8\%$

Sample F 608 85 DCB

Found $\frac{313457 \times 5,000 \mu\text{l} \times 2 \text{ gpc}}{0.91 \times 36 \text{ g} \times 2 \mu\text{l} \times 4632412.50} = 10.33 \text{ ug/kg}$

added $\frac{2 \text{ ml} \times 0.2}{36 \times .91} \times 1000 = 12.21 \text{ ug/kg}$

$$\text{Recovered} = 10.33 / 12.21 \times 100 = 84.6\%$$

* Calibration Factors

1 cal RSD < 10% 1 cal < 20%
* 5 Positions > 10%

DB1701
aldrin 16
endrin 21

DB1701 Low
aldrin = 3455000

$$34549 / 0.01 \text{ ng} = 3455000$$

608
4,4 DDT 18

4,4-DDT HIGH
2853000

$$912959 / 0.32 \text{ ng} = 2852996$$

DB608 MID
endrin = 2572625

$$205809 / 0.08 \text{ ng} = 2572625$$

alpha-chlordane HIGH
4023862.50

$$643817 / 0.16 \text{ ng} = 4023862.5$$

PCBs

DB1701
Aroclor 1248 peak 1 = 162250

$$32450 / 0.2 \text{ ng} = 162250$$

DB608
Aroclor 1242 peak 2 = 189375

$$37875 / 0.2 \text{ ng} = 189375$$

Percent resolution - Form 64

Pass QL Criteria > 60%

Endrin/4,4-DDT Breakdown %D < 25%

DB1701 PEM01 = OK * Σ results > 20%

PEM02 = endrin 23.14^x
Combined 23.14

PEM03 = endrin 23.4^x
Combined 26.2

PEM04 = endrin 21.4^x
Combined 28.3

PEM05 = endrin 27.2^x
Combined 32.3^x

PEM04 endrin breakdown = 21.438 %

e. aldehyde = $25687 / 2041062.5 = 0.0125$

e. ketone = $23853 / 2694425 = 0.0088$

endrin = $232071 / 2075025 = 0.112$

$$\frac{0.0125 + 0.0088}{0.112} = 19.01$$

Calibration Verification Form 7E RPD < 25%

RPDs calculated OK

* > 15%
 Σ positives

CCal →

INDA0104

DB1701

endrin = 45

4,4-DDT = 60

methoxychlor = 58

INDBM04 DBI701

endosulfan sulfate 33
endrin ketone 31
endrin aldehyde 37

Analytical Sequence Form 3D

Possible GC requirements

Ferisil check : Form 9A

Faded decachlorobiphenyl 131%

GPC clean-up Form 9B

gamma-BHC 115%
aldrin 111%

pesticide Identification Form 10A % DL 25%

Sample

A
alpha chlordane 45%
4,4-DOT 47%
1254 126%
1260 59%

ADL
gamma chlordane 105
4,4-DOT 1649

ADL 4X	1254	120%	
B	1260	100%	
BDL3X	alpha chlordane	118	
	gamma chlordane	174	
	4,4-DDT	849	
CDL	alpha - chlordane	78	
	gamma - chlordane	112	
	4,4-DDT	49	
D	gamma - chlordane	135	
DDL	alpha chlordane	41	
	gamma chlordane	133	
E	alpha - chlordane	45	
	gamma chlordane	114	
	4,4-DDT	52	
F	1260	54	
FDL	alpha chlordane	0K	
	gamma chlordane	56	
	4,4-DDT	227	

G	alpha chlordane	280
	gamma chlordane	540
	4,4-DDT	536
	1254	40

HDL	gamma chlordane	61
	4,4-DDT	240
	4,4-DDE	69
	4,4-DDD	157

X DL	gamma chlordane	66
	4,4-DDT	256
	4,4-DDE	54
	4,4-DDD	291

SL-17/18	alpha-chlordane	118
	gamma-chlordane	77
	4,4-DDT	928

SL-19	alpha-chlordane	36
	gamma chlordane	55

SL-20DL	alpha-chlordane	80
	gamma-chlordane	172

SL-2	gamma chlordane	135
	4,4-DDT	74
	alpha-chlordane	65

3456 ug/L

Method blanks - clean

MS/MSO - to contaminated to run

Field blanks - clean

Field clips H + X

*
>50, J positive results

<u>H</u>		X		RPD
4,4-DDE	162	4,4-DDE	2149	172
4,4-DDD	221	4,4-DDE	2664	169
4,4-DDT	305	4,4-DDT	3579	168
alpha-chlordane	395	alpha	6672	177
gamma-chlordane	405	gamma	6696	177
1254	4,879	1254	61581	170
1260	1,662	1260	20549	170

Sample Quantitation

A 4,4-DDT = 8.2 ug/kg DB1701

$$\frac{109118 \times 10,000 \text{ ng/ul}}{2527600 \times 35 \text{ g} \times .75 \times 2 \text{ ul}} = 8.2 \text{ ug/kg}$$

Qualifiers

FB US all compounds for poor surrogate recovery.

A J 4,4-DDT ICAL RSD > 15%

ADL ok

B ok

BDL J 4,4-DDT ICAL RSD > 15%

CDL J 4,4-DDT ICAL RSD > 15%

D ok

DDL ok

E correct typos alpha chlordane should be
1.7 ug/kg IP Gamma chlordane should be
1.9 ug/kg P

F ok

FDL ok

G ok

H ok

IT DL J all detects for poor %D on sample dup 750%

SL2 ok

SL-2DL ok

SL-20 ok

SL-20DL ok

SL-17/18 ok

SL-19 ok

XDL

J all defects for peer field dup
percent Difference $> 50\%$

**REVIEW OF INORGANIC
CONTRACT LABORATORY PACKAGE**

Case Number:
Laboratory: *NETL*
SDG: *20*
SOW:
Completion Date: *12/06/94*

Site Name: *Wells G & H Superfund Site*
No. of Samples/Matrix: *soil*
Reviewer: *RETEC*
Reviewer's Name: *R. Roat*

DATA ASSESSMENT SUMMARY

	<u>ICP</u>	<u>AA</u>	<u>Hg</u>	<u>Cyanide</u>
1. Holding Times	O	O	O	O
2. Calibrations	O	O	O	O
3. Blanks	O	O	O	O
4. ICS	O	O	O	O
5. LCS	O	O	O	O
6. Duplicate Analysis	O	O	O	O
7. Matrix Spike	X	O	O	O
8. Serial Dilution	X	-	-	-
9. Overall Assessment	O	O	O	O

O = Data had no problems or qualified due to minor problems
M = Data qualified due to major problems
Z = Data unacceptable
X = Problems, but do not affect data

Action Items:

I. HOLDING TIMES

Sample ID	Date Sampled	Hg Analysis Date	Cyanide Analysis Date	Metal Analysis Date	Action
<i>FB</i>	<i>10/05/94</i>	<i>10/24/94</i>	<i>10/14/94</i>	<i>10/27/94</i>	
<i>A</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>B</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>C</i>	<i>10/05/94</i>	<i>10/24/94</i>	<i>10/14/94</i>	<i>10/27/94</i>	
<i>D</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>E</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>F</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>G</i>	<i>10/05/94</i>			<i>10/27/94</i>	
<i>H</i>	<i>10/05/94</i>	<i>10/24/94</i>	<i>10/14/94</i>	<i>10/27/94</i>	
<i>X</i>	<i>10/05/94</i>	<i>10/24/94</i>	<i>10/14/94</i>	<i>10/27/94</i>	
<i>SL-02</i>	<i>10/18/94</i>			<i>10/27/94</i>	
<i>SL-17/18</i>	<i>10/18/94</i>			<i>10/27/94</i>	
<i>SL-19</i>	<i>10/18/94</i>			<i>10/27/94</i>	
<i>SL-20</i>	<i>10/18/94</i>			<i>10/27/94</i>	

Metals - 180 days from collection preserved pH < 2

Mercury - 28 days from collection preserved pH < 2

Cyanide - 14 days from collection preserved pH > 12

If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).

II. INSTRUMENT CALIBRATION (Form 2A)

1. Recovery Criteria - List the analytes which did not meet the percent recovery (%R) criteria for initial and continuing calibration.

<u>Date</u>	<u>ICV/CCV</u>	<u>Analyte</u>	<u>%R</u>	<u>Action</u>	<u>Samples Affected</u>
-------------	----------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:	<u>Accept</u>	<u>Estimate (J)</u>	<u>Reject (R)</u>
Metals:	90-110%	75-89%, 111-125%	< 75%, > 125%
Mercury:	80-120%	65-79%, 121-135%	< 65%, > 135%
Cyanide:	85-115%	70-84%, 116-130%	< 70%, > 130%

2. Analytical Sequence

- A. Did the laboratory use the proper number of standards for calibration as described in the SOW? *Yes*
- B. Were calibrations performed at the beginning of each analysis? *Yes*
- C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis? *Yes*
- D. Were the correlation coefficient for the calibration curves for AA, Hg, and CN- > 0.995? *Yes*
- E. Was a standard at 2xCRDL analyzed for all ICP analysis? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (Form 3)

List the blank contamination.

1. Laboratory Blanks

<u>DATE</u>	<u>ICB/CCB</u>	<u>PREP BL</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	----------------	----------------	----------------	--------------

Passed all validation criteria

2. Equipment/Trip Blanks: *Not applicable to soils*

<u>DATE</u>	<u>EQUIP BL #</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	-------------------	----------------	--------------

No contaminants detected above CRDL

3. Frequency Requirements

- A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? *Yes*
- B. Was a calibration blank run every 10 samples or every 2 hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (cont)

Actions: *Passed validation criteria*

The action level for any analyte is equal to five times the highest concentration of that elements contamination in any blank. No positive results should be reported unless the concentration of the analyte exceeds the Action Level (AL).

1. When the concentration is greater than the IDL, but less than the AL, report the sample concentration detected with a U.
2. When the sample concentration is greater than the AL, report the sample concentration unqualified.

ELEMENT

MAX CONC.

AL UNITS

IV. ICP INTERFERENCE SAMPLE (Form 4)

1. Recovery Criteria

List any element in the ICS AB solution which did not meet the criteria for %R

	<u>Percent Recovery</u>		
	< 50%	50-79%	> 120%
Positive sample results	R	J	J
Non-detected samples	R	UJ	A

DATE ELEMENT %R ACTION SAMPLES AFFECTED

Passed all validation criteria

2. Frequency Requirements

- A. Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per eight hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

IV. ICP INTERFERENCE SAMPLE (cont)

3. Report the concentration of any element detected in the ICS solution > 2xIDL that should not be present.

<u>ELEMENT</u>	<u>CONC. DETECTED IN THE ICS</u>	<u>CONC. OF INTERFERENTS IN THE ICS</u>			
		<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>

Passed all validation criteria

Estimate the concentration produced by the interfering element in all affected samples.

<u>SAMPLE AFFECTED</u>	<u>ELEMENT AFFECTED</u>	<u>SAMPLE CONC.</u>	<u>SAMPLE INTERFERANT</u>				<u>ESTIMATED INTERF.</u>
			<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>	

Action:

1. The sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels in the ICS solution.
2. Estimate (J) positive results for affected elements for samples with levels of > 50% or more.
3. Reject (R) positive results if the reported concentration is due entirely to the interferant.
4. Estimate (UJ) non-detected results for which false negatives are suspect.

V. **MATRIX SPIKE (Form 5A)**

Sample Number: *MS-C*

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
 SSR - spikes sample result
 SR - sample result

<u>ANALYTE</u>	<u>SSR</u>	<u>SR</u>	<u>S</u>	<u>%R</u>	<u>ACTION</u>
<i>antimony</i>	<i>76.7</i>	<i>0.0</i>	<i>123.2</i>	<i>62.3</i>	<i>estimate conc.</i>
<i>lead</i>	<i>241.8</i>	<i>84.3</i>	<i>121.9</i>	<i>129.1</i>	<i>estimate conc.</i>
<i>chromium</i>	<i>101.9</i>	<i>30.8</i>	<i>48.9</i>	<i>145.2</i>	<i>estimate conc.</i>
<i>copper</i>	<i>133.3</i>	<i>105.7</i>	<i>61.8</i>	<i>44.7</i>	<i>estimate conc.</i>

Actions:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
2. If any analyte does not meet the %R criteria, follow the actions stated below:

	<u>Percent Recovery</u>		
	<u>< 30%</u>	<u>30-74%</u>	<u>> 125%</u>
Positive Sample Results	J	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

- A. Was a matrix spike prepared at the required frequency? *Yes*
- B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not required*

VI. LABORATORY DUPLICATES (Form 6)

List the concentration of any analyte not meeting the criteria for duplicate precision.

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper		105.7	60.6	54.3	estimate
Iron		15,241	7,198	71.7	estimate
Lead	0.5	4.4	2.6	52.1	estimate
Magnesium					
Manganese		91.0	69.7	26.5	estimate
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >20% for water and >35% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >CRDL. If both samples are non-detected, the RPD is not calculated (NC).

VII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. *H and X*

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum		6,875	6,761	1.6	
Antimony		ND	7.3		
Arsenic		9.4	9.6	2.0	
Barium		155	193	22	
Beryllium		0.3	ND		
Cadmium		4.9	2.9	51	
Calcium		1,356	1,565	14.3	
Chromium		345	630	58	
Cobalt		5.5	4.5	20	
Copper		35.7	30.6	15.3	
Iron		18,642	12,290	41	
Lead		174	238	31	
Magnesium		1,503	1,749	15	
Manganese		160	122	50	
Mercury		1.9	1.4	27	
Nickel		14.9	10.2	37	
Potassium		393	436	10	
Selenium		ND	0.29		
Silver		0.6	1.0	50	
Sodium		51.5	51.4	0.2	
Thallium		ND	ND		
Vanadium		19.4	17.6	11.1	
Zinc		209	215	3	
Cyanide		0.6	0.5	18	

Action:

1. Estimate (J) positive results for elements which have a RPD > 30% for water and > 50% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is > 2xCRDL. If both samples are non-detected, the RPD is not calculated (NC).

VIII. LABORATORY CONTROL SAMPLE (Form 7)

List any LCS recoveries not within the 80-120% criteria and the samples affected.

<u>DATE</u>	<u>ELEMENT</u>	<u>%R</u>	<u>ACTION</u>	<u>SAMPLES AFFECTED</u>
-------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:

	<u>Percent Recovery</u>		
	<u>< 50%</u>	<u>51-79%</u>	<u>> 120%</u>
Positive Results	R	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

A. Was an LCS analyzed for every matrix, digestion batch and every 20 samples? *Yes*

IX. FURNACE AA ANALYSIS

1. Duplicate Precision

X Duplicate injections and one point analytical spikes were performed for all samples, duplicate injections agreed within +/- 20%.

Duplicate injections and/or spikes were not performed for the following samples/elements:

Duplicate injections did not agree within +/-20% for samples/elements:

IX. FURNACE AA ANALYSIS (cont.)

2. Post Digestion Spike Recoveries

X Spike recoveries met the 85-115% recovery criteria for all samples.

Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements:

X MSA was used to quantitate analytical results when contractually required.

X Correlation coefficients > 0.995, accept results

Correlation coefficients < 0.995, for sample numbers/elements:

Method of standard addition (MSA) was not performed as required for samples/elements:

Actions:

1. Estimate (J) positive results if duplicate injections are outside + -20% RSD or CV.
2. If the sample absorbance is < 50% of post digestion spike absorbance the following actions should be applied:

	<u>Percent Recovery</u>		
	<u>< 10%</u>	<u>11-84%</u>	<u>> 115%</u>
Positive Result	J or R	J	J
Non-detected	R	UJ	A

3. Estimate (J) sample result if MSA was required and not performed.
4. Estimate (J) sample result if correlation coefficient was < 0.995.

X. ICP SERIAL DILUTION ANALYSIS (Form 9)

Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

Serial dilutions were not performed for the following:

- X Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the IDL before dilution.

Report all results that do not meet the required laboratory criteria for ICP dilution.

<u>ELEMENT</u>	<u>IDL</u>	<u>50xIDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>%D</u>	<u>ACTION</u>
Aluminum						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead			249.2	220.5	11.5	none
Magnesium						
Manganese						
Nickel						
Potassium						
Silver						
Sodium						
Vanadium						
Zinc						

Action:

1. Estimate (J) positive results if %D > 15.

XI. DETECTION LIMITS (Form 10)

1. Instrument Detection Limits

X Instrument detection limit results were present and found to be less than the contract required detection limits (CRDL).

IDLs were not included in the data package

IDLs were present, but the criteria was not met for the following elements:

2. Reporting Requirements

- A. Were sample results on Form I reported down to the IDL not the CRDL for all analytes?
Yes
- B. Were sample results that were analyzed by ICP for Se, Tl, or Pb at least 5x IDL? *Yes*
- C. Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

XII. SAMPLE QUANTITATION

X Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

Sample results were beyond the linear range/calibration range of the instrument for the following elements:

1. Sample Calculation:

ICP:

AA Furnace:

Mercury:

Cyanide:



Sample C was a resample

DP-5

23-1

Metals	SDG-20 collected	Received	Analysis
FB	10/15	10/16	TAL
A	↓	↓	Pb
B			Pb
C			TAL
D			Pb
E			Pb
F			Pb
G			Pb
H			TAL
X			TAL
SL-2			10/19
SL-17/18	↓	↓	Pb
SL-19			Pb
SL-20			Pb

ICAL + CCAL

ICP Passed QC criteria for %R

Furnace passed QC Criteria

Cold vapor passed QC

Cyanide passed QC

calculations for %R correct.

No Transcription errors

CRDL %R $\pm 20\%$ (no validation criteria)

TRUE std [x] 2x CRDL

no transcription errors

LCS Form 7 Passed QC Criteria $\pm 20\%$

ICP ~~Serial~~ dilutions %10LD and sample conc >
SDX TX IDE

Failed SL-20 Lead "E"

~~cadmium~~
Correlation Coefficient > 0.995 for Hg + CN

Field dups - H + X

RPD > 50% IF [X] > 5x CROL
 $\pm 4x$ CROL IF [X] < 5x CROL

J POSITIVES

~~chromium~~ 5% RPD

CMSD 1.503 grams volume = 0.2 Liters

manganese = $\frac{15 \text{ ug}}{\text{L}}$

$$\frac{\frac{15 \text{ ug}}{\text{L}} \times 0.2 \text{ Liters}}{1.503 \text{ grams} \times .815} = 2.4 \text{ ug/g or mg/kg}$$

Blanks - Form 3

Pass QC Criteria $< CRDL$

No Transcription errors

ICP interference Form 4

- $\pm 20\%$ except Al, Ca, Fe, Mg
- Performed beginning and end of run
- Twice every eight hours
- Only applicable if concentration of Al, Ca, Fe + Mg are \geq concentration in original sample
- No Transcription errors

Pass QC Criteria

Spike Sample Recovery Form 5A

$\pm 25\%$

Failed	Antimony	62.3
	Chromium	145.2
	Copper	44.7
	Lead	129.1

CMS Sample

I positives vs nondetects
I positives
I positives vs nondetects
I positives

applicable if SA $\geq 1/4$ SR

Sample Duplicate - Form 6

CMS

$\Sigma F [x] > 5 \times CRDL, \pm 20\%$

(± 35 for soils)

$\Sigma F [x] < 5 \times CRDL, \pm CRDL$

$\Sigma F [x] < CRDL$ Then NO comparison

Failed for:

I positives

Copper

54

Lead 129

Iron

72

Manganese

~~26~~

Qualifiers

Sample

- A Quality lead as "J" failed spike + duplicate precision
- B Same as A
- C Quality Antimony US For spike
Chromium J spike, Copper J spike + dup
Iron J duplicate, Lead J spike + dup
- G same as B
- H Antimony US spike, Chromium J spike + Field dup
Copper J spike + dup Iron J dup, Lead J spike + dup
- SL-2 Same as G
- SL-17/18 Same as SL-2
- SL-19 Same as SL-17/18
- SL-20 Same as SL-19
- X Same as H
- FB ~~Antimony US, Copper US Spike~~

SDC-23 VALIDATION

**REVIEW OF ORGANIC
CONTRACT LABORATORY PACKAGE**

Site Name: *Wells G & H Superfund Site*

Reference Number:

The hard copied data package received at RETEC has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.: *E1116-12* SAS No.:
SDG No.: *23-1* Matrix: *soil*
No. of Samples: *12*

Sample Dates: *11/15/94*
Shipping Date: *11/15/94*
Date Rec'd by Lab: *11/16/94*

The CLP SOW for requires that specific analytical work be done and the general criteria used to determine the performance were based on the examination of:

- Data Completeness
- Holding Times
- GC/MS Tuning
- Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Dup.
- Field Duplicates
- Internal Std Performance
- Pest. Inst. Performance
- Compound Identification
- Compound Quantitation

Overall comments:

Data package was acceptable

Definition of qualifiers:

- A = Acceptable data.
- J = Approximate data due to quality control criteria.
- R = Reject data due to quality control criteria.
- U = Compound not detected.
- UJ = Compound detection limit is approximate

Reviewer:

Date:

I. DATA COMPLETENESS

Missing Information, Date Lab Contacted, Date Received: *Data package complete*

II. HOLDING TIMES:

Sample ID	Date Sampled	VOA	BNA		Pest.	
		Date Anal.	Date Extr.	Date Anal.	Date Extr.	Date Anal.
DP-5	11/15/94				11/21/94	12/14/94
DP-7	11/15/94	11/25/94	11/17/94	12/20/94	11/21/94	12/14/94
DP-G	11/15/94		11/17/94	12/20/94		
DP-15	11/15/94				11/21/94	12/14/94
DP-15a-1	11/15/94				11/21/94	12/14/94
DP-15a-2	11/15/94				11/21/94	12/14/94
FB-15	11/15/94	11/25/94	11/17/94	12/20/94	11/21/94	12/14/94
TB-15	11/15/94	11/25/94				
SL-02	11/15/94	11/25/94				
SL-17/18	11/15/94	11/25/94				
SL-19	11/15/94	11/25/94				
SL-20	11/15/94	11/25/94				
DP-1	11/15/94	11/25/94	11/17/94	12/20/94	11/21/94	12/14/94
DC-11	11/15/94	11/25/94	11/17/94	12/20/94	11/21/94	12/14/94

- VOA:
- Unpreserved: aromatics within 7 days, non-aromatics within 14 days of sample collection.
 - Preserved: Both within 14 days of sample collection.
 - Soils: Both within 10 days of sample collection.

- BNA & Pest:
- Extracted within 7 days, analyzed within 40 days, soils and water.

Action: If holding times are exceeded all positive results are estimates (J) and non-detects are estimated (UJ). If holding times are grossly exceeded then data unusable (R).

III. GC/MS TUNING (Form 5B)

The DFTPP performance results for semi-volatile analysis were reviewed and found to be within the specified criteria (page D-40/SV).

If no, samples affected:

Tuning passed all SVOC QC criteria

Calculations:

The BFB performance results for volatile organic analysis were reviewed and found to be within the specified criteria (page D-25/VOA) Form 5A.

If no, samples affected:

Passed validation criteria

Calculations:

IVA. VOLATILE CALIBRATION VERIFICATION (Form 6A, 7A)

Date of Initial Calibration: *8/30 + 8/31/94*

Dates of Continuing Calibration: *11/25, 11/26/94*

Instrument ID: *MACH 1*

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
<i>8/30</i>	<i>RSD</i>	<i>methylene chloride (35.1)</i> <i>acetone (69.9)</i> <i>2-butanone (37)</i>
<i>8/31</i>	<i>RSD</i>	<i>methylene chloride (45)</i> <i>acetone (68)</i>

Calculations:

Initial calibration uses 5 concentrations.

All Avg. RF's and RF's must be >0.05 ; if <0.05 , mark positive results (J) and non-detects (R) (page D-27/VOA).

All %D's must be $<25\%$; if $>25\%$ mark detects (J) and non-detects (UJ)

Some compounds must meet RRF of 0.01 (page D-28/VOA).

IVB. SEMI-VOLATILE CALIBRATION VERIFICATION (Form 6B, 7B)

Date of Initial Calibration: *12/06/94*

Dates of Continuing Calibration: *12/20, 12/22/94*

Instrument ID:

Matrix/Level: *Soil/low*

<u>Date</u>	<u>Criteria Out</u> RF, %RSD, %D	<u>Compound (value)</u>
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Passed validation criteria

Calculations:

All Avg. RF's and RF's must be >0.05 ; if <0.05 , mark positive results (J) and non-detects (R) page D-34/SV.

All %RSD's must be $<30\%$; if $>30\%$ mark detects (J) and non-detects (UJ) if $<50\%$

All %D's must be $<25\%$; if $>25\%$ mark detects (J) and non-detects (UJ)

Tables for RRF, %D, and %RPD on pages D-46,47/SV.

V. BLANK ANALYSIS RESULTS

Laboratory Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
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All method blank results were non-detect

Equipment and Field Blanks:

<u>Date</u>	<u>Lab ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration</u>
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All field and trip blank results were non-detect

If concentration < CRQL, report CRQL

If concentration > CRQL, but less than action level (5x or 10x), report as (U)

If concentration > than action level, report as (R)

VI. SURROGATE RECOVERIES (Form 2C, 2E)

Sample matrix:

	VOA			B/N					
<u>Samples</u>	<u>TOL</u>	<u>BFB</u>	<u>DCF</u>	<u>NBZ</u>	<u>FBP</u>	<u>TPH</u>	<u>PHL</u>	<u>2FP</u>	<u>TBP</u>

Pass criteria

Pass criteria

Calculations:

	<u>Water</u>	<u>Soil</u>	
TOL = Toluene-d ₈	88-110	84-138	Page D-50/VOA
BFB = Bromofluorobenzene	86-115	59-113	
DCF = 1,2 Dichloroethane-d ₈	76-114	70-121	
NBZ = Nitrobenzene-d ₅	35-114	23-120	Page D-56/SV
FBP = 2-Fluorobiphenyl	43-116	30-115	
TPH = Terphenyl-d ₁₄	33-141	18-137	
PHL,2FP,TBP	60-150	60-150	

VII. FIELD DUPLICATE PRECISION

Sample matrix: *soil*

Sample Nos.: *15a-1 and 15a-2* PCBs only

List compounds that do not meet the following RPD criteria:

- An RPD of <30% for water
- An RPD of <50% for soil

<u>Fraction</u>	<u>Compound</u>	<u>Sample Conc.</u>	<u>Dup Conc.</u>	<u>RPD</u>
<i>Soil</i>	<i>aroclor 1254</i>	<i>144</i>	<i>360</i>	<i>85</i>
	<i>aroclor 1260</i>	<i>83</i>	<i>198</i>	<i>82</i>

If the results for any compound do not meet the RPD, then flag positive results as estimated (J).

VIII. INTERNAL STANDARD PERFORMANCE (Form 8A, 8B)

List the internal standard areas of samples that do not meet the criteria of +100% or -50% of the internal standard area on the continuing calibration standard.

Sample ID Date I.S. Out I.S. Area/RT Acceptable Range Action

VOC passed criteria

SVOC passed criteria

Positive results are flagged with (J)
Non-detects are flagged with (UJ)
Page D-43, 51/SV
Page D-47/VOA

IX. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3C)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
<i>11/25/94</i>	<i>DP-7</i>	<i>trichloroethene</i>	<i>1,529</i>	<i>62-132</i>
		<i>toluene</i>	<i>1,835</i>	<i>59-139</i>
<i>12/20/94</i>	<i>DP-7</i>	<i>1,4-dichlorobenzene</i>	<i>4</i>	<i>28-104</i>
		<i>N-nitro-di-n-propylamine</i>	<i>17</i>	<i>41-126</i>
		<i>1,2,4-trichlorobenzene</i>	<i>14</i>	<i>38-107</i>

f any recoveries < 10%, flag positive results (J), flag non-detects (UJ). RPD for VOAs page D-50/VOA, SV on page D-57/SV, and Pest. on page D-58/pest.

X. PESTICIDE INSTRUMENT PERFORMANCE

List DDT retention times less than 12 minutes.

<u>Standard ID</u>	<u>Date/Time</u>	<u>RT</u>	<u>Samples Affected</u>	<u>Actions</u>
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All 4,4-DDT retention times > 12 minutes

If retention time < 12 min., reexamine for good separation, if not flag affected compounds (R)

List compounds which are not within the established windows.

<u>Compound</u>	<u>Date/Time</u>	<u>RT</u>	<u>RT Window</u>	<u>Samples Affected</u>
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Must be within 0.02 min. of the mean RT (page D-47/PEST)

If out of RT window and no peaks in expected RT window then its ok.

If out of RT window and peaks are in expected RT window, recalculate conc. using different STDs.

X. PESTICIDE INSTRUMENT PERFORMANCE (cont.) (Form 7D)

DDT and Endrin Degradation. List the standards which have a DDT or Endrin breakdown >20%.

<u>Standard ID</u>	<u>DDT or Endrin</u>	<u>% Breakdown</u>	<u>Samples Affected</u>
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Passed validation criteria

Calculations:

If breakdown >20%, flag positive results (J). If DDT is not present but DDD or DDE are, flag (R). Flag all positive results for DDD and/or DDE (J).

If breakdown >20%, flag positive results (J). If Endrin is not present but endrin aldehyde and/or endrin ketone are, flag (R). Flag all positive results for E. aldehyde and/or E. ketone (J).

XI. SURROGATE RECOVERIES (Form 2F)

Sample matrix:

<u>Samples</u>	<u>Column 1</u>		<u>Column 2</u>	
	<u>TCX</u>	<u>DCB</u>	<u>TCX</u>	<u>DCB</u>

Passed validation criteria

Calculations:

	<u>QC Limits</u>
TCX = Tetrachloro-m-xylene	60-150
DCB = Decachlorobiphenyl	60-150

XII. PESTICIDE CALIBRATION (Form 6E)

Initial Calibration: Must be calibrated with 3 conc. Calibration factors on page D-41/pest. RSD on page D-43/pest. RSD ,15% for compounds on page D-43/pest.

List compounds which did not meet RSD < 10% or 15%

<u>Date</u>	<u>Compound</u>	<u>Mean</u>	<u>%RSD</u>	<u>Column</u>	<u>Samples Affected</u>
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Passed validation criteria

Calculations:

Flag all positive results (J)

Analytical Sequence (Form 8D):

Did the lab follow the correct sequence every 72 hours? If no, data may be affected.

Correct sequence followed

XIII. PESTICIDE CALIBRATION (Form 7D, 7E)

Continuing Calibration:

List the compounds which did not meet the %D of < 15% on quantitation or 20% on confirmation for continuing calibration.

<u>Date</u>	<u>Compound</u>	<u>%D</u>	<u>Column</u>	<u>Sample Affected</u>
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Passed validation criteria

IX. GPC and Florisil Clean-Up (Form 9A, 9B)

List compounds which did not use florisil clean-up or surpassed validation criteria:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>
	<i>GPC</i>	<i>gamma-BHC</i>	<i>122</i>
		<i>aldrin</i>	<i>121</i>

QC Limits on florisil %REC = 80-120%

QC Limits on GPC %REC = 80-110%

If %REC < 80%, qualify positive results (J) and non-detects (UJ). If %REC = 0, then (R) qualify non-detects

XV. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Form 3F)

Must be performed for each group of samples of a similar matrix following the frequency:

- Each case of 20 field samples
- Each 20 field samples in a case
- Each group of soil samples of a similar concentration.
- Each 14 calendar day period which field samples were received.

List the samples not within RPD:

<u>Date</u>	<u>Sample No.</u>	<u>Compound</u>	<u>%REC</u>	<u>Limit</u>
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Passed validation criteria

XVI. SAMPLE QUANTITATION

VOA:

BNA:

PEST/PCB:

SDG-231

VOA

Surrogates - Passed QL Criteria

SL-17/18 DCE = 103%

$$\frac{196389 \times 50 \text{ ug/L}}{166302 \times 1.145} = 51.57 / 50 \text{ ug/L} \times 100 = 103\%$$

DPE-DL TOL = 100%

$$\frac{273360 \times 5 \text{ ug/L}}{210463 \times 1.189} = 5.46 / 5 \times 100 = 109\%$$

PRP = 99

$$\frac{137302 \times 5 \text{ ug/L}}{210463 \times 0.854} = 3.82 / 5 \times 100 = 76.4\%$$

Internal STDs - Passed QL Criteria

No TIPS.

ICAL 8/30/94 1256 hrs

1-25 ug/L

RRFs > 0.05

RSDs < 30%

MC = 35 acetone = 70

2-butanone = 37

calculations $\overline{\text{RRF}} + \text{RSDs}$ ok

RRF₀₂ acetone = 0.614

$$\frac{12400 \times 5 \text{ ug/L}}{50478 \times 2 \text{ ug/L}} = 0.614$$

ICal 8/31/94 5-100 ug/L

RRF₅ > 0.05

RSDs < 30

ML = 45

acetone 69

Calculations $\overline{RRF} \times RSD$ ok

RRF₇₅ bromoform = 0.375

$$\frac{557307 \times 50 \text{ ug/L}}{991204 \times 75 \text{ ug/L}} = 0.375$$

CCal 11/26/94 00:19 hrs

RRF₅ > 0.05

%ps < 25%

%D cal ok

RRF₅ toluene = 1.564

$$\frac{473862 \times 5}{303069 \times 5} = 1.564$$

CCAL 11/25/94 10:10 hr

RPF > 0.05 %Ds < 25%

%D calculated on

RPF₅₀ Vinyl chloride = 0.527

$$\frac{83762 \times 50}{159834 \times 50} = 0.527$$

MS/MSD

DP-7

Failed MS Trichloroethene 1529

Toluene 1835

MSD Trichloroethene - 114

method blank

VBLK 01 02 are clean

Field blank = clean

Trip blank = clean

Field dup 15-1 15-2 PCBs only.

Tuning - Pass Criteria

$$11/25/94 \quad m/z 177 = 6\%$$

$$287/4751 \times 100 = 6\%$$

VOC Qualifiers

DP-1 - Reject ^(R) concentration Trichloroethene for
Surpassing calibration curve (E)

DP-7 - Same as DP-1

DP-7 DL - J Trichloroethene for poor. m/mso

SVOC - ok

PCB/PCBs

15a-1 J arachnids 1254 + 1260 for poor
field dup

15a-2 J arachnids 1254 + 1260 poor field
dups.

Metals - ok

SDG-23

SVOCs

Surrogates

NBZ DUB

DP-7 MS

5

4

All others Passed Q.C. criteria

DP-6

FBP = 47%

$$\frac{8566053 \times 20 \mu\text{g/L} + 10526123 \times 0.70}{50} \times 100 = 4$$

Internal STDs

Passed Q.C. criteria - except:

DC PRY = 2763274

DP-6 PRY = 3312672

DP-7 PRY = 3752001

DP-7 MSO PRY = 2568302

DC RE PRY = 3084444

DP-6 RE PRY = 3701124

DP-7 RE PRY = 3936897

NO TPOs

ICAL

12/06/99

RRF₃ > 0.05 RSDs < 30% = All pass

RRF + RSDs Calculated Correctly

RRF₉₀ chrysene = 1.173

$$\frac{5785628 \times 20}{2466400 \times 40} > 1.173$$

CCAL 12/20 12:59

RRFs > 0.05 %D < 25

%D calculated OK

RRF₅₀ Benzo(a)pyrene = 1.802

$$\frac{2810782 \times 20}{1347949 \times 25} = 1.802$$

ccal 12/22 14:13

RRFs > 0.05 %Ds < 25

%D calculated OK

RRF₅₀ acenaphthene 0.430

$$\frac{3740846 \times 20}{509574 \times 25} = 0.430$$

Tuning - Passed QC in Berlin

$$m/z \ 69 = 47.6\%$$

$$60399 / 126774 \times 100 = 47.6$$

MS/MSD DP-7

Failed 1,4-Dichlorobenzene 4%

N-Nitroso-di-n-propylamine 17%

1,2,4-Trichlorobenzene 14%

Field dup - only PCBs

Method blanks - clean

Field blank - clean

EN
PAH

Pest/PCBs

Surrogates - Passed QC criteria

DP-1 TCX₁ = 70

FOUND
$$\frac{155350 \times 5000 \text{ ul} \times 2 \text{ GPC}}{2770525 \times 2 \text{ ul} \times .73 \times 31.5 \text{ g}} = 12.19$$

added
$$\frac{2 \text{ ml} \times 0.2}{31.5 \times .73} \times 1000 = 17.39$$

$$12.19 / 17.39 \times 100 = 70$$

MS/MSD

DP-7

Endrin MSD

46 RPD

Limit 42-139

Calibration Factors

ICAL RSDS < 10 Cal < 20

DB1701 44-007 mid = 1947537.5

$$155803 / 0.08 \text{ ng} = 1947537.5 \checkmark$$

Cal Factors

DB6008 PSDS 120 2 < 30%

aldrin_{LOW} = 4312800

$$43128 / 0.01 \text{ ng} = 4312800$$

Pass

DB1701 Aroclor 1242 peak 2 = 98285

$$19657 / 0.2 \text{ ng} = 98285$$

DB6008 Aroclor 1248 = peak 3 = 152925

$$30585 / 0.2 \text{ ng} = 152925$$

Percent Resolution Form 69
Pass -

Endrin / 4,4-DDT breakdown % RPD < 25%

Pass

PEM04 DB608

endrin breakdown = 11.88

endrin aldehyde = $13207 / 2419037.5 = 0.0054$

endrin ketone = $21407 / 3334912.5 = 0.0064$

$$\frac{0.0054 + 0.0064}{0.10} \times 100 = 11.80$$

Calibration Verification 7E RPD $\pm 25\%$

Passed

Analytical sequence - Pass

Florisil Check - Pass

GPC Check

gamma BHC - 122 80-110

aldrin 121

Method blanks - Clean

Field blank - Clean

Field dup:	15a-1	15a-2	RPD
analog 1254	144	360	95
analog 1260	83	198	92

**REVIEW OF INORGANIC
CONTRACT LABORATORY PACKAGE**

Case Number:
Laboratory: *NETL*
SDG: *23*
SOW:
Completion Date: *1/06/95*

Site Name: *Wells G & H Superfund Site*
No. of Samples/Matrix: *soil*
Reviewer: *RETEC*
Reviewer's Name: *R. Roat*

DATA ASSESSMENT SUMMARY

	<u>ICP</u>	<u>AA</u>	<u>Hg</u>	<u>Cyanide</u>
1. Holding Times	O	O	O	O
2. Calibrations	O	O	O	O
3. Blanks	O	O	O	O
4. ICS	O	O	O	O
5. LCS	O	O	O	O
6. Duplicate Analysis	O	O	O	O
7. Matrix Spike	X	O	O	O
8. Serial Dilution	X	-	-	-
9. Overall Assessment	O	O	O	O

O = Data had no problems or qualified due to minor problems
M = Data qualified due to major problems
Z = Data unacceptable
X = Problems, but do not affect data

Action Items:

I. HOLDING TIMES

Sample ID	Date Sampled	Hg Analysis Date	Cyanide Analysis Date	Metal Analysis Date	Action
<i>FB</i>	<i>11/15/94</i>			<i>11/15/94</i>	
<i>DC</i>	<i>11/15/94</i>			<i>11/15/94</i>	
<i>DC-MS</i>	<i>11/15/94</i>			<i>11/15/94</i>	
<i>DC-MSD</i>	<i>11/15/94</i>			<i>11/15/94</i>	

Metals - 180 days from collection preserved pH < 2
 Mercury - 28 days from collection preserved pH < 2
 Cyanide - 14 days from collection preserved pH > 12
 If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).

II. INSTRUMENT CALIBRATION (Form 2A)

1. Recovery Criteria - List the analytes which did not meet the percent recovery (%R) criteria for initial and continuing calibration.

<u>Date</u>	<u>ICV/CCV</u>	<u>Analyte</u>	<u>%R</u>	<u>Action</u>	<u>Samples Affected</u>
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Passed all validation criteria

Action:

	<u>Accept</u>	<u>Estimate (J)</u>	<u>Reject (R)</u>
Metals:	90-110%	75-89%, 111-125%	< 75%, > 125%
Mercury:	80-120%	65-79%, 121-135%	< 65%, > 135%
Cyanide:	85-115%	70-84%, 116-130%	< 70%, > 130%

2. Analytical Sequence

- A. Did the laboratory use the proper number of standards for calibration as described in the SOW? *Yes*
- B. Were calibrations performed at the beginning of each analysis? *Yes*
- C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis? *Yes*
- D. Were the correlation coefficient for the calibration curves for AA, Hg, and CN- > 0.995? *Yes*
- E. Was a standard at 2xCRDL analyzed for all ICP analysis? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (Form 3)

List the blank contamination.

1. Laboratory Blanks

<u>DATE</u>	<u>ICB/CCB</u>	<u>PREP BL</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	----------------	----------------	----------------	--------------

Passed all validation criteria

2. Equipment/Trip Blanks: *Not applicable to soils*

<u>DATE</u>	<u>EQUIP BL #</u>	<u>ANALYTE</u>	<u>CONC.</u>
-------------	-------------------	----------------	--------------

No contaminants detected above CRDL

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? *Yes*

B. Was a calibration blank run every 10 samples or every 2 hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

III. BLANK ANALYSIS RESULTS (cont)

Actions: *Passed validation criteria*

The action level for any analyte is equal to five times the highest concentration of that elements contamination in any blank. No positive results should be reported unless the concentration of the analyte exceeds the Action Level (AL).

1. When the concentration is greater than the IDL, but less than the AL, report the sample concentration detected with a U.
2. When the sample concentration is greater than the AL, report the sample concentration unqualified.

ELEMENT

MAX CONC.

AL UNITS

IV. ICP INTERFERENCE SAMPLE (Form 4)

1. Recovery Criteria

List any element in the ICS AB solution which did not meet the criteria for %R

	<u>Percent Recovery</u>		
	< 50%	50-79%	> 120%
Positive sample results	R	J	J
Non-detected samples	R	UJ	A

DATE ELEMENT %R ACTION SAMPLES AFFECTED

Passed all validation criteria

2. Frequency Requirements

- A. Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per eight hours? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

IV. ICP INTERFERENCE SAMPLE (cont)

3. Report the concentration of any element detected in the ICS solution > 2xIDL that should not be present.

<u>ELEMENT</u>	CONC. DETECTED <u>IN THE ICS</u>	CONC. OF INTERFERENTS <u>IN THE ICS</u>			
		<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>

Passed all validation criteria

Estimate the concentration produced by the interfering element in all affected samples.

<u>SAMPLE</u> <u>AFFECTED</u>	<u>ELEMENT</u> <u>AFFECTED</u>	<u>SAMPLE</u> <u>CONC.</u>	<u>SAMPLE INTERFERANT</u>				<u>ESTIMATED</u> <u>INTERF.</u>
			<u>AL</u>	<u>CA</u>	<u>FE</u>	<u>MG</u>	

Action:

1. The sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels in the ICS solution.
2. Estimate (J) positive results for affected elements for samples with levels of >50% or more.
3. Reject (R) positive results if the reported concentration is due entirely to the interferant.
4. Estimate (UJ) non-detected results for which false negatives are suspect.

V. **MATRIX SPIKE (Form 5A)**

Sample Number: *MS-C*

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
 SSR - spikes sample result
 SR - sample result

<u>ANALYTE</u>	<u>SSR</u>	<u>SR</u>	<u>S</u>	<u>%R</u>	<u>ACTION</u>
<i>lead</i>	<i>114.3</i>	<i>0.00</i>	<i>116</i>	<i>98.5</i>	<i>none</i>

Actions:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
2. If any analyte does not meet the %R criteria, follow the actions stated below:

	<u>Percent Recovery</u>		
	<u>< 30%</u>	<u>30-74%</u>	<u>> 125%</u>
Positive Sample Results	J	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

- A. Was a matrix spike prepared at the required frequency? *Yes*
- B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not required*

VI. LABORATORY DUPLICATES (Form 6)

List the concentration of any analyte not meeting the criteria for duplicate precision.

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead		0.00	0.00		none
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD >20% for water and >35% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >CRDL. If both samples are non-detected, the RPD is not calculated (NC).

VII. FIELD DUPLICATES : *No duplicates taken*

List the concentrations of all analytes in the field duplicate pair. *H and X*

<u>ELEMENT</u>	<u>CRDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>RPD</u>	<u>ACTION</u>
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					

Action:

1. Estimate (J) positive results for elements which have a RPD > 30% for water and > 50% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is > 2xCRDL. If both samples are non-detected, the RPD is not calculated (NC).

VIII. LABORATORY CONTROL SAMPLE (Form 7)

List any LCS recoveries not within the 80-120% criteria and the samples affected.

<u>DATE</u>	<u>ELEMENT</u>	<u>%R</u>	<u>ACTION</u>	<u>SAMPLES AFFECTED</u>
-------------	----------------	-----------	---------------	-------------------------

Passed all validation criteria

Action:

	<u>Percent Recovery</u>		
	<u>< 50%</u>	<u>51-79%</u>	<u>> 120%</u>
Positive Results	R	J	J
Non-Detected Results	R	UJ	A

2. Frequency Criteria

A. Was an LCS analyzed for every matrix, digestion batch and every 20 samples? *Yes*

IX. FURNACE AA ANALYSIS

1. Duplicate Precision

Duplicate injections and one point analytical spikes were performed for all samples, duplicate injections agreed within +/- 20%.

Duplicate injections and/or spikes were not performed for the following samples/elements:

Duplicate injections did not agree within +/-20% for samples/elements:

IX. FURNACE AA ANALYSIS (cont.)

2. Post Digestion Spike Recoveries

Spike recoveries met the 85-115% recovery criteria for all samples.

Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements:

MSA was used to quantitate analytical results when contractually required.

Correlation coefficients > 0.995 , accept results

Correlation coefficients < 0.995 , for sample numbers/elements:

Method of standard addition (MSA) was not performed as required for samples/elements:

Actions:

1. Estimate (J) positive results if duplicate injections are outside $\pm 20\%$ RSD or CV.
2. If the sample absorbance is $< 50\%$ of post digestion spike absorbance the following actions should be applied:

	<u>Percent Recovery</u>		
	<u>$< 10\%$</u>	<u>11-84%</u>	<u>$> 115\%$</u>
Positive Result	J or R	J	J
Non-detected	R	UJ	A

3. Estimate (J) sample result if MSA was required and not performed.
4. Estimate (J) sample result if correlation coefficient was < 0.995 .

X. ICP SERIAL DILUTION ANALYSIS (Form 9)

Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

X Serial dilutions were not performed for the following:

Lead: None detected in sample

Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the IDL before dilution.

Report all results that do not meet the required laboratory criteria for ICP dilution.

<u>ELEMENT</u>	<u>IDL</u>	<u>50xIDL</u>	<u>SAMPLE #</u>	<u>DUPLICATE #</u>	<u>%D</u>	<u>ACTION</u>
----------------	------------	---------------	-----------------	--------------------	-----------	---------------

Aluminum

Barium

Beryllium

Cadmium

Calcium

Chromium

Cobalt

Copper

Iron

Lead

Magnesium

Manganese

Nickel

Potassium

Silver

Sodium

Vanadium

Zinc

Action:

1. Estimate (J) positive results if %D > 15.

XI. DETECTION LIMITS (Form 10)

1. Instrument Detection Limits

- Instrument detection limit results were present and found to be less than the contract required detection limits (CRDL).

IDLs were not included in the data package

IDLs were present, but the criteria was not met for the following elements:

2. Reporting Requirements

- A. Were sample results on Form I reported down to the IDL not the CRDL for all analytes?
Yes
- B. Were sample results that were analyzed by ICP for Se, Tl, or Pb at least 5x IDL? *Yes*
- C. Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I? *Yes*

If No, the data may be affected. Use professional judgement to determine the severity of the effect and quality of the data.

XII. SAMPLE QUANTITATION

X Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

Sample results were beyond the linear range/calibration range of the instrument for the following elements:

1. Sample Calculation:

ICP:

AA Furnace:

Mercury:

Cyanide:

SDC-18

**SAMPLE DATA SUMMARY/DATA PACKAGE
INORGANICS ANALYSIS: WELLS G&H RD/RA
SDG: NETL18-1
WORK ORDER: NETL NETL18-1
PROJECT #: 3-0681-620**

Prepared for:

Remediation Technologies, Inc.
9 Pond Lane
Concord, MA 01742

Report Date: October 24, 1994

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SDG NARRATIVE

The following samples were received from Remediation Technologies, Inc.:

SAMPLE ID	MATRIX	DATE RECIEVED	pH	ANALYSIS
FB	WATER	31-Aug-94		TAL
SL01	SOIL	31-Aug-94	4.8	TOTAL LEAD
SL03	SOIL	31-Aug-94	5.2	TOTAL LEAD
SL04	SOIL	31-Aug-94	5.5	TAL
SL05	SOIL	31-Aug-94	5.2	TOTAL LEAD
SL6/7	SOIL	31-Aug-94	5.4	TAL
SL08	SOIL	31-Aug-94	4.6	TAL,
SL08MS	SOIL	31-Aug-94	4.6	TAL,
SL08MSD	SOIL	31-Aug-94	4.6	TAL,
SL10/11	SOIL	31-Aug-94	6.0	TOTAL LEAD
SL12	SOIL	31-Aug-94	5.8	TOTAL LEAD
SL13	SOIL	31-Aug-94	5.1	TOTAL LEAD
SL14	SOIL	31-Aug-94	5.5	TOTAL LEAD
SL15	SOIL	31-Aug-94	5.0	TOTAL LEAD
SL25	SOIL	31-Aug-94	5.8	TOTAL LEAD

These fifteen samples constitute Sample Delivery Group NETL18-1.

Custody records for this group follow this narrative.

The acronym "TAL" indicates the EPA TARGET ANALYTE LIST AS DOCUMENTED IN:

Contract Laboratory Program Statement of Work for Inorganics Analysis, USEPA, DOC# ILM03.0 (92/93).

The analytical methods described in the statement of work were used in performing the analysis and the data forms were completed as described in the deliverables section.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness.

Mark H. Bishop
Laboratory Director
New England Testing Laboratory, Inc

0003

CUSTODY RECORDS

0004

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS	<i>TAL/TEL full list</i> <i>Mixed-Contaminants</i> <i>Soil VOCs</i>					REMARKS
3-047-630		Wildwood								
SAMPLERS: CNA/ LACRIDANT										
RECEIVING LABORATORY: NETL										
SAMPLE NO.	DATE	TIME	SAMPLE LOCATION							
TB	8-30-94	—	Trip Blank	1						Analyze trip blank under sample for soil voc's
SL-6/7	8-30-94	3:00	Sludge location SL-6/7	1	X					
SL-04	8-30-94	12:00	Sludge location SL-04	1	X					
SL-08	8-30-94	2:25	Sludge location SL-08	1	X					
SL-08	8-30-94	2:26	MATRIX Spike Sludge location SL-08	1	X					
SL-08	8-30-94	2:30	MATRIX Spike Duplicate SL-08	1	X					
FLB	8-30-94	—	Field Blank	6	X					
SL-10/11	8-30-94	2:45	Sludge location 10/11	1	X					
SL-25	8-30-94	2:00	Sludge location SL-25	1	X					D.W. OF SL-12
SL-14	8-30-94	3:10	Sludge location SL-14	1	X					
SL-03	8-30-94	3:15	Sludge location SL-03	1	X					
SL-15	8-30-94	3:20	Sludge location SL-15	1	X					
SL-12	8-30-94	2:35	Sludge location SL-12	1	X					
SL-13	8-30-94	1:30	Sludge location SL-13	1	X					
SL-01	8-30-94	1:20	Sludge location SL-01	1	X					

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
<i>[Signature]</i>	8-30-94 14:00	VIA Fed EX			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for laboratory by: (Signature)	Date/Time		

REMARKS: See work order NETL # for definition of mixed-contaminants and soil VOCs

0005



REMEDATION TECHNOLOGIES
 9 Pond Lane
 Damonmill Square
 Concord, MA 01742
 (508) 371-1422
 Fax# (508) 369-9279

US EPA ARCHIVE DOCUMENT

No. 069

CHAIN OF CUSTODY RECORD

E0909-09

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS	<p style="text-align: center;">TEL Pesticides TEL PCBs Mixed-contaminant EPAAs PCBs</p>					REMARKS
SAMPLERS: C. M. LAQUIDAM										
RECEIVING LABORATORY: NETL										
SAMPLE NO.	DATE	TIME	SAMPLE LOCATION							
SL-08B	8-8-94	9:00	Sludge location SL-08B	1	X					RUSH (Next Wed)
SL-08B	8-8-94	9:05	SL-08B matrix spike	1	X					
SL-08B	8-8-94	9:10	SL-08B matrix spike duplicate	1	X					
SL-12B	8-8-94	10:00	Sludge location SL-12	1		X				
SL-14B	8-8-94		Tran Blank			X				
SL-14B	8-8-94	10:10	Sludge location SL-14	1			X			

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time Sept 8 1994	Received by: (Signature) VIA Fed EX	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received for laboratory by: (Signature) Kym Smith	Date/Time 9/9/94
REMARKS: 2000			



REMEDATION TECHNOLOGIES
 9 Pond Lane
 Damonmill Square
 Concord, MA 01742
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 Fax# (508) 369-9279

COVER PAGE

0008

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: NEW ENGLAND TESTING LABORATORY Contract: G&H RD/RA
 Lab Code: RI 010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1
 SOW No.: ILM02

EPA Sample No.	Lab Sample ID.
<u>SL-01</u>	<u>SL-01</u>
<u>SL-03</u>	<u>SL-03</u>
<u>SL-04</u>	<u>SL-04</u>
<u>SL-05</u>	<u>SL-05</u>
<u>SL-6/7</u>	<u>SL-6/7</u>
<u>SL-08</u>	<u>SL-08</u>
<u>SL-08MS</u>	<u>SL-08MS</u>
<u>SL-08MSD</u>	<u>SL-08MSD</u>
<u>SL-10/11</u>	<u>SL-10/11</u>
<u>SL-12</u>	<u>SL-12</u>
<u>SL-13</u>	<u>SL-13</u>
<u>SL-14</u>	<u>SL-14</u>
<u>SL-15</u>	<u>SL-15</u>
<u>SL-25</u>	<u>SL-25</u>
<u>FIELD BLANK</u>	<u>FIELD BLANK</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied? Yes No _____
 Were ICP backgrounds corrections applied? Yes No _____
 If yes-were raw data generated before application of background corrections? Yes No _____

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

0009

Signature: Mark H. Bishop Name: Mark H. Bishop
 Date: 10/25/94 Title: Laboratory Director

SAMPLE DATA

A: FORM 1

0011

U.S. EPA - CLP
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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-01

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-01

Level (low/med): MED

Date Received: 08/31/94

% Solids: 76.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	19.0			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-3

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-3

Level (low/med): MED

Date Received: 08/31/94

% Solids: 84.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	125			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-04

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-04

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 88.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3543			P
7440-36-0	Antimony	8.90	U		P
7440-38-2	Arsenic	3.27			F
7440-39-3	Barium	15.9	B	E	P
7440-41-7	Beryllium	0.16	U		P
7440-43-9	Cadmium	0.62	B		P
7440-70-2	Calcium	544	B		P
7440-47-3	Chromium	11.9			P
7440-48-4	Cobalt	2.34	B		P
7440-50-8	Copper	8.12		*	P
7439-89-6	Iron	6261			P
7439-92-1	Lead	72.7			F
7439-95-4	Magnesium	879			P
7439-98-5	Manganese	45.4			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	7.03			P
7440-09-7	Potassium	172	B		P
7782-49-2	Selenium	0.33	B	W	F
7440-22-4	Silver	0.62	U		P
7440-23-5	Sodium	109	B		P
7440-28-0	Thallium	0.16	U		F
7440-62-2	Vanadium	6.56	B		P
7440-66-6	Zinc	24.7		*	P
	Cyanide	0.20	U		C

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments: _____

0014

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-05

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-05

Level (low/med): MED

Date Received: 08/31/94

% Solids: 85.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	14.2			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-6/7

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-6/7

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3321			P
7440-36-0	Antimony	9.40	U		P
7440-38-2	Arsenic	2.87			F
7440-39-3	Barium	9.07	B	E	P
7440-41-7	Beryllium	0.16	U		P
7440-43-9	Cadmium	0.66	U		P
7440-70-2	Calcium	415	B		P
7440-47-3	Chromium	7.59			P
7440-48-4	Cobalt	1.32	B		P
7440-50-8	Copper	4.95		*	P
7439-89-6	Iron	3210			P
7439-92-1	Lead	8.74			F
7439-95-4	Magnesium	714	B		P
7439-96-5	Manganese	37.3			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	4.95	B		P
7440-09-7	Potassium	117	B		P
7782-49-2	Selenium	0.35	B	W	F
7440-22-4	Silver	0.66	U		P
7440-23-5	Sodium	101	B		P
7440-28-0	Thallium	0.16	U	W	F
7440-82-2	Vanadium	5.61	B		P
7440-66-6	Zinc	16.8		*	P
	Cyanide	0.20	U		C

Color Before: BROWN

Clarity Before: _____

Texture: _____

MEDIUM

Color After: COLORLESS

Clarity After: _____

Artifacts: _____

Comments: _____

0016

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-08

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-08

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 74.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5712			P
7440-36-0	Antimony	10.6	U		P
7440-38-2	Arsenic	11.0			F
7440-39-3	Barium	20.6	B	E	P
7440-41-7	Beryllium	0.19	B		P
7440-43-9	Cadmium	0.74	U		P
7440-70-2	Calcium	480	B		P
7440-47-3	Chromium	11.3			P
7440-48-4	Cobalt	1.12	B		P
7440-50-8	Copper	15.1		*	P
7439-89-6	Iron	5430			P
7439-92-1	Lead	51.3			P
7439-95-4	Magnesium	419	B		P
7439-96-5	Manganese	42.8			P
7439-97-6	Mercury	0.40			ICV
7440-02-0	Nickel	1.86	U		P
7440-09-7	Potassium	65.8	U		P
7782-49-2	Selenium	0.93			F
7440-22-4	Silver	0.74	U		P
7440-23-5	Sodium	114	B		P
7440-28-0	Thallium	0.19	U		F
7440-62-2	Vanadium	18.2			P
7440-66-6	Zinc	32.9		*	P
	Cyanide	0.30	U		C

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

0017

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-08MS

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-08MS

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 73.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7506			P
7440-36-0	Antimony	111			P
7440-38-2	Arsenic	19.6			F
7440-39-3	Barium	651		E	P
7440-41-7	Beryllium	18.3			P
7440-43-9	Cadmium	16.4			P
7440-70-2	Calcium	704	B		P
7440-47-3	Chromium	81.5			P
7440-48-4	Cobalt	165			P
7440-50-8	Copper	88.1			P
7439-89-6	Iron	5761			P
7439-92-1	Lead	209			P
7439-95-4	Magnesium	524	B		P
7439-96-5	Manganese	205			P
7439-97-6	Mercury	1.89			CV
7440-02-0	Nickel	168			P
7440-09-7	Potassium	170	B		P
7782-49-2	Selenium	5.72			F
7440-22-4	Silver	13.6			P
7440-23-5	Sodium	121	B		P
7440-28-0	Thallium	9.95			F
7440-62-2	Vanadium	186			P
7440-86-6	Zinc	184			P
	Cyanide	36.4			C

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

0018

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-08MSD

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-08MSD

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 76.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6470			P
7440-36-0	Antimony	10.2	U		P
7440-38-2	Arsenic	10.2			F
7440-39-3	Barium	21.3	B	E	P
7440-41-7	Beryllium	0.18	B		P
7440-43-9	Cadmium	0.72	U		P
7440-70-2	Calcium	320	B		P
7440-47-3	Chromium	11.3			P
7440-48-4	Cobalt	1.26	B		P
7440-50-8	Copper	11.7			P
7439-89-6	Iron	5448			P
7439-92-1	Lead	41.8			P
7439-95-4	Magnesium	432	B		P
7439-96-5	Manganese	40.9			P
7439-97-6	Mercury	0.35			CV
7440-02-0	Nickel	3.59	B		P
7440-09-7	Potassium	63.5	U		P
7782-49-2	Selenium	0.96	B		F
7440-22-4	Silver	0.72	U		P
7440-23-5	Sodium	91.6	B		P
7440-28-0	Thallium	0.18	U		F
7440-62-2	Vanadium	18.1			P
7440-66-6	Zinc	26.5			P
	Cyanide	0.30	U		C

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

0019

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-10/11

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-10/11

Level (low/med): MED

Date Received: 08/31/94

% Solids: 66.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	10.2			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-12

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-12

Level (low/med): MED

Date Received: 08/31/94

% Solids: 85.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	229			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-13

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-13

Level (low/med): MED

Date Received: 08/31/94

% Solids: 76.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	66.6			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-14

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-14

Level (low/med): MED

Date Received: 08/31/94

% Solids: 80.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	58.1			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-15

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-15

Level (low/med): MED

Date Received: 08/31/94

% Solids: 90.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	24.2			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

FORM I - IN

ILM02.0

0024

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

SL-25

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: SL-25

Level (low/med): MED

Date Received: 08/31/94

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	161			P

Color Before: BROWN

Clarity Before: _____

Texture: MEDIUM

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

FORM I - IN

ILM02.0

0025

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

FIELD BLANK

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): WATER

Lab Sample ID: FIELD BLANK

Level (low/med): LOW

Date Received: 08/21/94

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.0	U		P
7440-36-0	Antimony	57.0	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	1.0	U		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	138.0	B		P
7440-47-3	Chromium	3.0	U		P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	4.0	U		P
7439-89-6	Iron	15.0	B		P
7439-92-1	Lead	4.0			F
7439-95-4	Magnesium	10.0	B		P
7439-96-5	Manganese	1.0	U		P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	354.0	U		P
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	697.0	B		P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	3.0	U		P
7440-66-6	Zinc	6.0	B		P
	Cyanide	2.0	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

0026

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBW

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): WATER

Lab Sample ID: PBW

Level (low/med): LOW

Date Received: 08/21/94

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.0	U		P
7440-36-0	Antimony	57.0	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	1.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	42.0	B		P
7440-47-3	Chromium	3.00	U		P
7440-48-4	Cobalt	6.00	U		P
7440-50-8	Copper	4.00	U		P
7439-89-6	Iron	6.00	B		P
7439-92-1	Lead	1.00	U		F
7439-95-4	Magnesium	8.00	B		P
7439-96-5	Manganese	1.00	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	354	U		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	308	B		P
7440-28-0	Thallium	1.00	U		F
7440-62-2	Vanadium	3.00	U		P
7440-66-6	Zinc	4.00	B		P
	Cyanide	2.00	U		U

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

0027

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBS01

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: PBS01

Level (low/med): LOW

Date Received: 08/31/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5.21	U		P
7440-36-0	Antimony	7.81	U		P
7440-38-2	Arsenic	0.28	U		F
7440-39-3	Barium	0.14	U	E	P
7440-41-7	Beryllium	0.14	U		P
7440-43-9	Cadmium	0.55	U		P
7440-70-2	Calcium	5.48	B		P
7440-47-3	Chromium	0.41	U		P
7440-48-4	Cobalt	0.82	U		P
7440-50-8	Copper	0.55	U	*	P
7439-89-6	Iron	3.15	B		P
7439-92-1	Lead	0.14	U		F
7439-95-4	Magnesium	1.92	B		P
7439-96-5	Manganese	0.14	U		P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	1.37	U		P
7440-09-7	Potassium	48.5	U		P
7782-49-2	Selenium	0.28	U		F
7440-22-4	Silver	0.55	U		P
7440-23-5	Sodium	73.3	B		P
7440-28-0	Thallium	0.14	U		F
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	0.55	U	*	P
	Cyanide				

Color Before: YELLOW

Clarity Before: _____

Texture: _____

MEDIUM

Color After: COLORLESS

Clarity After: _____

Artifacts: _____

Comments:

0028

U.S. EPA - CLP
1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBS01

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

SDG No.: NETL18-1

Matrix (soil/water): SOIL

Lab Sample ID: PBS01

Level (low/med): MED

Date Received: 08/31/94

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	5.21	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

B: QC DATA

0030

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum	20010.0	19620.00	98.1	10000.0	10340.00	103.4	10150.00	101.5	P
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium	500000.0	489500.00	97.9	250000.0	259000.00	103.6	269700.00	107.9	P
Chromium									
Cobalt									
Copper	2503.0	2297.00	91.8	1250.0	1298.00	103.8	1281.00	102.5	P
Iron	10020.0	9874.00	98.5	5000.0	4965.00	99.3	4764.00	95.3	P
Lead									
Magnesium	3000.0	2845.00	94.8	250000.0	247600.00	99.0	243500.00	97.4	P
Manganese	500000.0	475500.00	95.1	1500.0	1543.00	102.9	1493.00	99.5	P
Mercury									
Nickel									
Potassium	500000.0	484900.00	97.0	250000.0	249600.00	99.8	241200.00	96.5	P
Selenium									
Silver									
Sodium	500100.0	494500.00	98.9	250000.0	254100.00	101.6	248500.00	99.4	P
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum				10000.0	10060.00	100.6			P
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium				250000.0	275300.00	110.1			P
Chromium									
Cobalt									
Copper				1250.0	1277.00	102.2			P
Iron				5000.0	4745.00	94.9			P
Lead									
Magnesium				250000.0	245300.00	98.1			P
Manganese				1500.0	1512.00	100.8			P
Mercury									
Nickel									
Potassium				250000.0	239400.00	95.8			P
Selenium									
Silver									
Sodium				250000.0	245500.00	98.2			P
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: SPEX

Continuing Calibration Source: JOHNSON & MATHEWS

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony	1000.0	1026.00	102.6	5000.0	5151.00	103.0	5309.00	106.2	P
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: SPEX

Continuing Calibration Source: JOHNSON & MATHEWS

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony				5000.0	5190.00	103.8			P
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium	20010.0	19990.00	99.9	10000.0	10330.00	103.3	10570.00	105.7	P
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium				10000.0	10620.00	106.2			P
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium	500.0	507.50	101.5	250.0	258.80	103.5	253.10	101.2	P
Cadmium	5010.0	4928.00	98.4	2500.0	2563.00	102.5	2522.00	100.9	P
Calcium									
Chromium	2046.0	1937.00	94.7	1000.0	1053.00	105.3	1053.00	105.3	P
Cobalt	5006.0	4870.00	97.3	2500.0	2685.00	107.4	2645.00	105.8	P
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel	8000.0	7763.00	97.0	4000.0	4198.00	105.0	4139.00	103.5	P
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium	5001.0	4813.00	96.2	2500.0	2643.00	105.7	2669.00	106.8	P
Zinc	3998.0	3734.00	93.4	2000.0	2039.00	102.0	2006.00	100.3	P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium				250.0	258.70	103.5			P
Cadmium				2500.0	2568.00	102.7			P
Calcium									
Chromium				1000.0	1059.00	105.9			P
Cobalt				2500.0	2694.00	107.8			P
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel				4000.0	4217.00	105.4			P
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium				2500.0	2689.00	107.6			P
Zinc				2000.0	2062.00	103.1			P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	5000.0	5000.00	100.0	2500.0	2648.00	105.9	2552.00	102.1	P
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA
 Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1
 Initial Calibration Source: LEEMAN
 Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead				2500.0	2533.00	101.3	2452.00	98.1	P
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver	2016.0	2007.00	99.6	1000.0	1057.00	105.7	1040.00	104.0	P
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEEMAN

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver				1000.0	1037.00	103.7			P
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: LEAMAN

Continuing Calibration Source: SPEX

RUN DATE: 9/1/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic	40.0	40.10	100.3	25.0	23.30	93.2			F
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA
 Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1
 Initial Calibration Source: LEEMAN
 Continuing Calibration Source: SPEX

RUN DATE: 9/2/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic	40.0	41.70	104.3	25.0	23.30	93.2	26.00	104.0	F
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: SPEX

Continuing Calibration Source: JOHNSON & MATTHEWSS

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	40.0	40.50	101.3	50.0	48.90	97.8	52.00	104.0	F
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: SPEX

Continuing Calibration Source: JOHNSON & MATTHEWS

RUN DATE: 9/2/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium	40.0	37.50	93.8	25.0	24.80	99.2	25.00	100.0	F
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: SPEX

Continuing Calibration Source: JOHNSON & MATTHEWS

RUN DATE: 9/6/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium	40.0	40.70	101.8	25.0	25.40	101.6	26.20	104.8	F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA
 Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1
 Initial Calibration Source: ERA
 Continuing Calibration Source: JOHNSON & MATHEWS

RUN DATE: 9/21/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury	5.0	5.20	104.0	2.5	2.44	97.6			CV
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: ERA

Continuing Calibration Source: JOHNSON & MATHEWS

RUN DATE: 9/16/94

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury	5.0	5.03	100.6	5.0	4.75	95.0			CV
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: FISHER

Continuing Calibration Source: BAKER

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide	100.0	96.40	96.4	100.0	96.40	96.4			C

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: New England Testing Laboratory, Inc. Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL18-1

Initial Calibration Source: FISHER

Continuing Calibration Source: BAKER

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide				50.0	49.80	99.6	49.80	99.6	C

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: JONHSON & MATHEWS

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum				NR				
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium				NR				
Chromium								
Cobalt								
Copper				50.0	56.80	113.6	53.40	106.8
Iron				NR				
Lead								
Magnesium				NR				
Manganese				30.0	34.30	114.3	33.90	113.0
Mercury								
Nickel								
Potassium				NR				
Selenium								
Silver								
Sodium				NR				
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: SPEX

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120.0	184.00	153.3	122.00	101.7
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: SPEX

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium				NR			NR	
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: SPEX

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium				10.0	10.90	109.0	10.80	108.0
Cadmium				10.0	12.80	128.0	11.40	114.0
Calcium								
Chromium				20.0	21.20	106.0	24.00	120.0
Cobalt				100.0	113.70	113.7	117.00	117.0
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel				80.0	89.30	111.6	84.80	106.0
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium				100.0	109.80	109.8	111.90	111.9
Zinc				40.0	44.00	110.0	46.60	116.5

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: JONHSON & MATHEWS

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead				80.0	75.50	94.4	82.40	103.0
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: _____

ICP CRDL Standard Source: SPEX

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver				20.0	21.80	109.0	21.50	107.5
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: SPEX

ICP CRDL Standard Source: _____

RUN DATE: 9/1/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic	10.0	9.90	99.0					
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: SPEX

ICP CRDL Standard Source: _____

RUN DATE: 9/2/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic	10.0	10.50	105.0					
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL18-1

AA CRDL Standard Source: JOHNSON & MATTHEWS

ICP CRDL Standard Source: _____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	3.0	2.60	86.7					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: JOHNSON & MATTHEWS

ICP CRDL Standard Source: _____

RUN DATE: 9/2/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	5.0	4.90	98.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: JOHNSON & MATTHEWS

ICP CRDL Standard Source: _____

RUN DATE: 9/6/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium	10.0	10.00	100.0					
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: JOHNSON & MATHEWS

ICP CRDL Standard Source: _____

RUN DATE: 9/21/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury	0.2	0.15	75.0					
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
2B
CRDL STANDARD FOR AA AND ICP

Lab Name: New England Testing Laboratory, Inc.

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

AA CRDL Standard Source: JOHNSOM & MATHEWS

ICP CRDL Standard Source: _____

RUN DATE: 9/16/94

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury	0.2	0.16	80.0					
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP

3

BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): mg/kg

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum	38.0	U	38.0	U	38.0	U	38.0	U	5.209	U	P
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium	8.0	U	8.0	U	8.0	U	8.0	U	5.483	B	P
Chromium											
Cobalt											
Copper	8.8	B	4.0	U	4.0	U	4.0	U	0.548	U	P
Iron	3.0	U	3.0	U	3.0	U	3.5	B	3.153	B	P
Lead											
Magnesium	16.1	B	10.7	B	7.4	B	11.0	B	1.919	B	P
Manganese	1.0	U	1.0	U	1.0	U	1.0	U	0.137	U	P
Mercury											
Nickel											
Potassium	-431.8	B	354.0	U	-1021.0	B	-785.0	B	48.526	U	P
Selenium											
Silver											
Sodium	414.1	B	411.5	B	252.4	B	122.1	B	73.338	B	P
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
3
BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum									38.000	U	P
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium									42.000	B	P
Chromium											
Cobalt											
Copper									4.000	U	P
Iron									5.800	B	P
Lead											
Magnesium									7.500	B	P
Manganese									1.000	U	P
Mercury											
Nickel											
Potassium									-483.000	B	P
Selenium											
Silver											
Sodium									308.400	B	P
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
3
BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum											
Antimony	57.0	U	57.0	U	57.0	U	57.0	U	7.814	U	P
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony								57.000 U		P	
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	C		1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic											
Barium	1.0	U	1.0	U	1.0	U	1.0	U	0.137	U	P
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
3
BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium								1.000 U		P	
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): mg/kg

Analyte	Initial	Continuing Calibration						Prepa-		M	
	Calib. Blank (ug/L)	C	1	C	2	C	3	C	Blank		C
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.137	U	P
Cadmium	1.0	U	1.0	U	1.0	U	-1.6	B	0.137	U	P
Calcium											
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	0.411	U	P
Cobalt	6.0	U	6.0	U	6.0	U	6.0	U	0.822	U	P
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel	10.0	U	10.0	U	10.0	U	-10.0	B	1.371	U	P
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium	3.0	U	3.0	U	3.0	U	3.0	U	0.411	U	P
Zinc	4.0	U	4.0	U	4.0	U	4.0	U	0.548	U	P
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium								1.000	U	P	
Cadmium								-1.300	B	P	
Calcium											
Chromium								3.000	U	P	
Cobalt								6.000	U	P	
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel								10.000	U	P	
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium								3.000	U	P	
Zinc								4.200	B	P	
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	C		1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead	38.0	U	38.0	U	38.0	U	38.0	U	5.209	U	P
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead			38.0	U						P	
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver	5.6	B	4.0	U	4.0	U	4.0	U	0.548	U	P
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver								4.000 U		P	
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	C		1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic		2.0 U			2.0 U					0.277 U	F
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic								2.000 U		F	
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

RUN DATE: 9/2/94

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum											
Antimony											
Arsenic	2.0	U	2.0	U	2.0	U					F
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead	-1.0	B	-1.1	B	-1.2	B		0.138	U	F	
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead								1.000 U		F	
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

RUN DATE: 9/2/94

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium	2.0	U	2.0	U	2.0	U		0.277	U	F	
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
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BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

RUN DATE: 9/2/94

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium								0.002 U		F	
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3

BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium	1.0	U	1.0	U	1.0	U		0.138	U	F	
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
3
BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		M
			1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium									1.000 U		F
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3

BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

RUN DATE: 9/21/94

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		M
			1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury	0.2	U	0.2	U					0.085	U	CV
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP
3
BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

RUN DATE: 9/16/94

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	C		1	C	2	C	3	C	C		
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury	0.2	U	0.2	U					0.200	U	CV
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3

BLANKS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

RUN DATE: 9/7/94

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	(CV)

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum	500000	500000	508500	509100.0	101.8	499500	499300.0	99.9
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium	500000	500000	514500	517100.0	103.4	546000	549000.0	109.8
Chromium								
Cobalt								
Copper	0	500	10	516.4	103.3	11	498.5	99.7
Iron	200000	200000	182000	183500.0	91.8	178700	181100.0	90.6
Lead								
Magnesium	500000	500000	499600	499300.0	99.9	489100	493100.0	98.6
Manganese	0	500	17	514.3	102.9	17	504.4	100.9
Mercury								
Nickel								
Potassium	0	0	-475	-365.7		-503	-543.0	
Selenium								
Silver								
Sodium	0	0	785	834.0		700	589.2	
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum								
Antimony	0	0	-22	36.7		-40	-43.4	
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum								
Antimony								
Arsenic								
Barium	0	500	24	527.2	105.4	24	555.3	111.1
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium	0	500	0	520.0	104.0	0	515.7	103.1
Cadmium	0	1000	15	1036.0	103.6	12	1035.0	103.5
Calcium								
Chromium	0	500	12	518.0	103.6	12	522.1	104.4
Cobalt	0	500	15	524.7	104.9	12	524.3	104.9
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel	0	1000	1	1001.0	100.1	-8	1010.0	101.0
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium	0	500	0	507.5	101.5	-1	516.1	103.2
Zinc	0	1000	56	1050.0	105.0	61	1067.0	106.7

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

DATE: 9/1/94

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	0	1000	-91	930.7	93.1	-55	888.2	88.8
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
4
ICP INTERFERENCE CHECK SAMPLE

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL-18-1

ICP ID Number: ICP-1

ICS Source: SPEX

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver	0	1000	0	924.6	92.5	0	920.6	92.1
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP
5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

SL-08MS

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

Matrix (soil/water): SOIL

Level (low/med): LOW

% Solids for Sample: 73.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Aluminum							NR
Antimony	75-125	110.9882	0.0000	141.10	78.7		P
Arsenic	75-125	19.6101	10.9748	9.33	92.5		F
Barium	75-125	651.1813	20.6475	561.35	112.3		P
Beryllium	75-125	16.2606	0.1860	13.86	116.0		P
Cadmium	75-125	16.4497	0.0000	14.08	116.8		P
Calcium							NR
Chromium	75-125	81.4922	11.3468	56.08	125.1		P
Cobalt	75-125	164.8752	1.1161	139.93	117.0		P
Copper	75-125	88.1099	15.0671	70.86	103.1		P
Iron							NR
Lead	75-125	209.4973	51.2653	139.98	113.0		P
Magnesium							NR
Manganese	75-125	204.5813	42.7831	139.45	116.0		P
Mercury	75-125	1.8933	0.4029	1.61	92.6		CV
Nickel	75-125	167.9004	0.0000	139.70	120.2		P
Potassium							NR
Selenium	75-125	5.7220	0.9301	4.67	102.7		F
Silver	75-125	13.6135	0.0000	13.86	98.2		P
Sodium							NR
Thallium	75-125	9.9471	0.0000	9.33	106.6		F
Vanadium	75-125	185.6736	18.2293	140.07	119.5		P
Zinc	75-125	184.1610	32.9244	139.48	108.4		P
Cyanide	75-125	36.4000	0.0000	35.74	101.8		C

Comments:

0095

U.S. EPA - CLP
5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

SL-08

Lab Name: NEW ENGLAND TESTING LABORATORY

Contract: G&H RIFS

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No. NETL-18-

Matrix (soil/water): SOIL

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)		Sample Result (SR)		Spike Added (SA)	%R	Q	M
			C	C	C				
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

U.S. EPA - CLP
6
DUPLICATES

EPA SAMPLE NO.

SL-08MSD

Lab Name: NEW ENGLAND TESTING LABORATORY

Contract: G&H RD/RA

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No. NETL-18-1

Matrix (soil/water): SOIL

Level (low/med): _____

LOW

% Solids for Sample: 74.1

% Solids for Duplicate: _____

76.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		5712.4734		6470.4838		12.4		P
Antimony		10.6028	U	10.2222	U			P
Arsenic		10.9748		10.1816		7.5		F
Barium		20.6475	B	21.3411	B	3.3		P
Beryllium		0.1860	B	0.1793	B	3.7		P
Cadmium		0.7441	U	0.7173	U			P
Calcium		480.2868	B	319.9374	B	40.1		P
Chromium		11.3468		11.2982		0.4		P
Cobalt		1.1161	B	1.2554	B	11.7		P
Copper		15.0671		11.6569		25.5	*	P
Iron		5429.7329		5448.2621		0.3		P
Lead		51.2653		41.7856		20.4		F
Magnesium		419.0883	B	431.6645	B	3.0		P
Manganese		42.7831		40.8889		4.5		P
Mercury	0.1	0.4029		0.3493		14.3		CV
Nickel		1.8601	U	3.5867	B	63.4		P
Potassium		65.8488	U	63.4853	U			P
Selenium	0.9	0.9301		0.9551	B	2.7		F
Silver		0.7441	U	0.7173	U			P
Sodium		113.8402	B	91.6413	B	21.6		P
Thallium		0.1860	U	0.1802	U			F
Vanadium	9.3	18.2293		18.1131		0.6		P
Zinc		32.9244		26.5419		21.5	*	P
Cyanide		0.3000	U	0.3000	U			C

U.S. EPA - CLP
7
LABORATORY CONTROL SAMPLE

Lab Name: NEW ENGLAND TESTING LABORATORY Contract: G&H RD/RA
 Lab Code: RI 010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1
 LCS Source: LEEMAN/SPEX
 Aqueous LCS Source: HG JOHNSON & MATHEWS
 Aqueous LCS Source: CN FISHER

Analyte	Aqueous (ug/L)			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Aluminum				1381.9	1300.4		80.0 120.0	94.1
Antimony				68.8	69.2			100.6
Arsenic				2.8	2.8		80.0 120.0	101.0
Barium				1381.9	1319.1		80.0 120.0	95.5
Beryllium				34.5	33.5		80.0 120.0	97.0
Cadmium				345.3	324.2		80.0 120.0	93.9
Calcium				35773.5	33998.6		80.0 120.0	95.0
Chromium				141.3	128.6		80.0 120.0	91.0
Cobalt				345.7	319.6		80.0 120.0	92.4
Copper				172.9	153.1		80.0 120.0	88.6
Iron				692.0	614.0		80.0 120.0	88.7
Lead				2.8	2.8		80.0 120.0	102.0
Magnesium				34675.4	31160.2		80.0 120.0	89.9
Manganese				207.2	188.5		80.0 120.0	91.0
Mercury				0.3	0.4		80.0 120.0	102.0
Nickel				552.5	517.1		80.0 120.0	93.6
Potassium				34530.4	31788.7		80.0 120.0	92.1
Selenium				2.7	2.7		80.0 120.0	99.5
Silver				139.2	69.5			50.0
Sodium				34530.4	32272.1		80.0 120.0	93.5
Thallium				2.8	2.8		80.0 120.0	102.5
Vanadium				345.3	320.8		80.0 120.0	92.9
Zinc				276.1	243.1		80.0 120.0	88.0
Cyanide	100.0	96.40	96.4					

U.S. EPA - CLP
7
LABORATORY CONTROL SAMPLE

Lab Name: NEW ENGLAND TESTING LABORATORY Contract: G&H RD/RA

Lab Code: RI 010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1

LCS Source: LEEMAN/SPEX

Aqueous LCS Source: HG _____

Aqueous LCS Source: CN _____

FOR LEAD BY ICP

Analyte	Aqueous (ug/L)			Solid (mg/kg)				%R	
	True	Found	%R	True	Found	C	Limits		
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead				345.3	313.8		276.2	414.4	90.9
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

U.S. EPA - CLP
9
ICP SERIAL DILUTION

EPA SAMPLE NO.

SL-08

Lab Name: NEW ENGLAND TESTING LABORATORY

Contract: G&HRD/RA

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-

Matrix (soil/water): SOIL

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	30710.00		32230.00		4.9		P
Antimony	57.00	U	0.00	U			P
Arsenic							NR
Barium	110.90	B	127.50		15.0	E	P
Beryllium	1.10	B	0.00	U			P
Cadmium	1.90	B	5.50	B	189.5		P
Calcium	2582.00		2737.50		6.0		P
Chromium	61.20		76.50		25.0		P
Cobalt	6.30	B	0.00	U	100		P
Copper	80.60		86.00		6.7		P
Iron	29190.00		30990.00		6.2		P
Lead							P
Magnesium	2253.00		2409.00		6.9		P
Manganese	230.00		242.50		5.4		P
Mercury							NR
Nickel	10.00	U	0.00	U			P
Potassium	354.00	U	0.00	U			P
Selenium							NR
Silver	4.00	U	0.00	U			P
Sodium	612.30	B	1862.00	B	204.1		P
Thallium							NR
Vanadium	97.90		101.00		3.2		P
Zinc	177.40		201.00		13.3		P

U.S. EPA - CLP
9
ICP SERIAL DILUTION

EPA SAMPLE NO.

SL-12

Lab Name: NEW ENGLAND TESTING LABORATORY

Contract: G&HRD/RA

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL-18-1

Matrix (soil/water): SOIL

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)		Serial Dilution Result (S)		% Difference	Q	M
		C		C			
Aluminum							P
Antimony							P
Arsenic							NR
Barium							P
Beryllium							P
Cadmium							P
Calcium							P
Chromium							P
Cobalt							P
Copper							P
Iron							P
Lead	1420.00		1395.00		1.8		P
Magnesium							P
Manganese							P
Mercury							NR
Nickel							P
Potassium							P
Selenium							NR
Silver							P
Sodium							P
Thallium							NR
Vanadium							P
Zinc							P

U.S. EPA - CLP
14
ANALYSIS RUN LOG

Lab Name: NEW ENGLAND TESTING LABORATORY Contract: G & H RD/RA
 Lab Code: RI 010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1
 Instrument ID Number: ICP-1 Method: P
 Start Date: 09/06/94 End Date: 09/06/94

EPA Sample No.	D/F	Time	% R	Analytes																					
				A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K E	S E	A I	N G	T L	V L
S0	1.00	1038		X				X		X	X	X	X					X		X					
S0	1.00	1041		X				X		X	X	X	X					X		X					
S0	1.00	1043		X				X		X	X	X	X					X		X					
S	1.00	1047		X				X		X	X	X	X					X		X					
S	1.00	1049		X				X		X	X	X	X					X		X					
S	1.00	1051		X				X		X	X	X	X					X		X					
ICV	1.00	1102		X				X		X	X	X	X					X		X					
ICB	1.00	1112		X				X		X	X	X	X					X		X					
CCV	1.00	1134		X				X		X	X	X	X					X		X					
CCB	1.00	1142		X				X		X	X	X	X					X		X					
ICSA	1.00	1146		X				X		X	X	X	X					X		X					
ICSAB	1.00	1152		X				X		X	X	X	X					X		X					
CRI	1.00	1202		X				X		X	X	X	X					X		X					
PBS	1.00	1211		X				X		X	X	X	X					X		X					
LCSS	1.00	1217		X				X		X	X	X	X					X		X					
SL-04	1.00	1224		X				X		X	X	X	X					X		X					
SL-6/7	1.00	1230		X				X		X	X	X	X					X		X					
SL-08	1.00	1238		X				X		X	X	X	X					X		X					
SL-08L	5.00	1247		X				X		X	X	X	X					X		X					
CCV	1.00	1257		X				X		X	X	X	X					X		X					
CCB	1.00	1303		X				X		X	X	X	X					X		X					
SL-08MS	1.00	1309		X				X		X	X	X	X					X		X					
SL-08MSD	1.00	1317		X				X		X	X	X	X					X		X					
PBW	1.00	1324		X				X		X	X	X	X					X		X					
FIELD BLANK	1.00	1329		X				X		X	X	X	X					X		X					
ICSA	1.00	1334		X				X		X	X	X	X					X		X					
ICSAB	1.00	1339		X				X		X	X	X	X					X		X					
CRI	1.00	1343		X				X		X	X	X	X					X		X					
CCV	1.00	1349		X				X		X	X	X	X					X		X					
CCB	1.00	1355		X				X		X	X	X	X					X		X					

C: QUARTERLY VERIFICATIONS

U.S. EPA - CLP
10
INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: New England Testing Laboratory

Contract: G & H RD/RA

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL18-1

ICP ID Number: ICP1

Date: 09/01/94

CV AA ID Number: COLEMAN-1

Furnace AA ID Number: FURNACE-1

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22		200	38.0	P
Antimony	206.83		60	57.0	P
Arsenic	193.00	BZ	10	2.0	F
Barium	455.40		200	1.0	P
Beryllium	313.04		5	1.0	P
Cadmium	226.50		5	4.0	P
Calcium	317.93		5000	8.0	P
Chromium	267.72		10	3.0	P
Cobalt	228.62		50	6.0	P
Copper	324.75		25	4.0	P
Iron	259.94		100	3.0	P
Lead	282.70	BZ	3	1.0	F
Magnesium	285.21		5000	3.0	P
Manganese	257.61		15	1.0	P
Mercury	253.70		0.2	0.2	CV
Nickel	231.60		40	10.0	P
Potassium	766.49		5000	354.0	P
Selenium	196.00	BZ	5	2.0	F
Silver	328.07		10	4.0	P
Sodium	589.59		5000	98.0	P
Thallium	276.40	BZ	10	1.0	F
Vanadium	292.40		50	3.0	P
Zinc	213.86		20	4.0	P

Comments:

U.S. EPA - CLP
10
INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: New England Testing Laboratory

Contract: G&H RD/RA

Lab Code: RI 010

Case No.: E0831-02

SAS No.: _____

SDG No.: NETL18-1

ICP ID Number: ICP1

Date: 08/26/94

CV AA ID Number: COLEMAN-1

Furnace AA ID Number: FURNACE-1

PAGE: 2

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead	220.35		3	38.0	P
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

U.S. EPA - CLP
11A
ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: New England Testing Laboratory Contract: G&H RD/RA
 Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1
 ICP ID Number: ICP-1 Date: 08/26/94

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		Al	Ca	Fe	Mg	-
Aluminum	308.22					
Antimony	206.83					
Arsenic						
Barium	455.40					
Beryllium	313.04					
Cadmium	226.50					
Calcium	317.93					
Chromium	267.72					
Cobalt	228.62					
Copper	324.75					
Iron	259.94					
Lead	220.35					
Magnesium	285.21					
Manganese	257.61					
Mercury						
Nickel	231.60					
Potassium	766.49					
Selenium						
Silver	328.07					
Sodium	589.59					
Thallium						
Vanadium	292.40					
Zinc	213.86					

Comments:

U.S. EPA - CLP
11B
ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: New England Testing Laboratory Contract: G&H RD/RA
 Lab Code: RI010 Case No.: E0831-02 SAS No.: _____ SDG No.: NETL-18-1
 ICP ID Number: ICP-1 Date: 08/26/94

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		-	-	-	-	-
Aluminum	308.22					
Antimony	206.83					
Arsenic						
Barium	455.40					
Beryllium	313.04					
Cadmium	226.50					
Calcium	317.93					
Chromium	267.72					
Cobalt	228.62					
Copper	324.75					
Iron	259.94					
Lead	220.35					
Magnesium	285.21					
Manganese	257.61					
Mercury						
Nickel	231.60					
Potassium	766.49					
Selenium						
Silver	328.07					
Sodium	589.59					
Thallium						
Vanadium	292.40					
Zinc	213.86					

Comments:

0127

U.S. EPA - CLP
12
ICP LINEAR RANGES (QUARTERLY)

Lab Name: NEW ENGLAND TESTING LABORATORY

Contract: G&H RD/RA

Lab Code: RI 010 Case No.: E0831-02

SAS No.: _____ SDG No.: NETL18-1

ICP ID Number: ICP-1

Date: 08/29/94

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	3.00	1000000.0	P
Antimony	3.00	50000.0	P
Arsenic			
Barium	3.00	50000.0	P
Beryllium	3.00	50000.0	P
Cadmium	3.00	50000.0	P
Calcium	3.00	2500000.0	P
Chromium	3.00	50000.0	P
Cobalt	3.00	50000.0	P
Copper	3.00	50000.0	P
Iron	3.00	500000.0	P
Lead	3.00	50000.0	P
Magnesium	3.00	1000000.0	P
Manganese	3.00	50000.0	P
Mercury			
Nickel	3.00	50000.0	P
Potassium	3.00	2500000.0	P
Selenium			
Silver	3.00	5000.0	P
Sodium	3.00	1000000.0	P
Thallium			
Vanadium	3.00	50000.0	P
Zinc	3.00	50000.0	P

Comments:
